Human Reproduction

(1) Primary sex organs testes are located in
(a) Abdominal Cavity (b) Lower abdominal cavity
(c) Gastric Cavity (d) Scrotum

(2) Zygote is known as
(a) Egg (b) Ovum (c) Fertilized egg (d) unfertilized egg

(3) Testes are maintained lower temperature by the scrotum is
(a) 1-2°C (b) 2-2.5°C (c) 2.5-3°C (d) 3-3.5°C

(4) Spermatogenesis is takes place in these cells
(a) Sertolic Cells (b) Lydiy Cells
(c) Islets of longer hens (d) Neuroglial Cells

(5) Seminiferous tubales occur in
(a) testes (b) ovary (c) Liver (d) Kidney

(6) Ovaries are located in
(a) Ovarian pouches
(b) upper abdomen one on each side
(c) Lower abdomen one on each side
(d) lower abdomen both at left side

(7) Birth canal is formed by
(a) Vagina + Vestibule (b) Cervical Canal + Vagina
(c) Vestibule + Urethra (d) Uterus + Vagina

(8) The correct flow of sperms include
(a) Seminal Vesicle → Vasadeference → Vasa efferentia → epidydimis → retetestes.
(b) Seminifarous tubules → rete testes → vasa efferantia → epididymis → vasadeferons
(c) Seminifrous tubules → epididymis → vasa deference → vasa efferentia
(d) Seminiferous tubules → vasa efferentia → vasa defefrences → epididymis → retetestes

(9) No of mammary lobes are present in mammary gland
(a) 10-15 (b) 15-20 (c) 20-30 (d) 150-200

(10) Milk in mammary gland is stored in
(a) reservoir (b) lumen of alveoli
(c) milk crop (d) mammary sacs

(11) Which of the following indicates the correct flow of milk until the milk is sucked out?
(a) Alveoli of mammary lobes – mammary tubules – cavities of alveoli – mammary duct – lactiferous duct
(b) Alveoli of Mammary lobes – cavities of alveoli – mammary tubules – mammary duct – mammary ampulla – lactiferous duct
(c) Alveoli of Mammary lobes – cavities of alveoli – mammary duct – lactiferous duct
(d) alveoli of mammary lobes – cavities of alveoli – lactiferous duct – mammary ampulla – mammary duct

(12) Match the two columns & choose the correct

Column A		Column B
A.	Dog	I) 112 – 120 days
B.	Elephant	II) 270 – 290 days
C.	Human	III) 607 – 641 days
D.	Pig	IV) 60 – 65 days
		V) 145 – 155 days

	A	B	C	D
1)	I	II	IV	V
2)	V	III	IV	II
3)	IV	III	II	I
4)	IV	III	II	V

13) The canal which connects the cavities of scrotal sacs & abdominal cavity is
a) Birth canal b) inguinal canal
c) Gubern aculum d) Spermatic canal

14) The sertoli cells & leydig cells of male reproduction organ on the chief cells of spermatogenesis are perform following function
a) Sertoli cells of sperm + leydig cells destruct's the sperms.
b) Sertoli cells nourishes the sperms & produce inhibin while leydig cells produce androgens
c) Sertoli cells produce F.S.H & leydig cells produce testosterone
d) None of these

15) The human penis is made up of these columns of tissue are
a) two lower corpora carvenosa & one upper tissue is corpus spongiosum
b) two upper columns corpora carvernosa & lower tissue is carpus spongiosum
c) dorsal corpora cavernosa, ventural corpus spongiosum & middle corpus mesoravium d) none of these

16) The enlarged & balbas end of penis is covered by a loose fold of skin is called
a) glans penis b) vestibule c) prepuce d) all

17) Capacitation means
a) copulation
b) ability of sperm to get fertilization with ovum
c) ability of sperm to fertilize ovum after getting some changes in female genital tract
d) none of these

18) Menstrual cycle means
a) reproduction cycle in females
b) cyclic changes that occurs in the endometrium every month
c) cyclic changes occur every month in testes
d) all

19) Match the following & choose the correct

A) Menstrual phase	I. Menopause
B) Follicular phase	II. LH & F.S.H.
C) Ovulatory phase	III. Menstrual flow lasts for 3-5 days
D) Luteal phase	IV. Remaining parts of graffian follicle transform as the corpus luteum
	V. Release of ovum

	A	B	C	D
1)	I	II	III	IV
2)	III	II	I	IV
3)	III	II	V	IV
4)	III	IV	V	I

20) In human being placenta is called
a) allantoic placenta b) chrorionic placenta
c) chrio allantoic placenta d) yolk sac placenta

21) The milk produced the initial few days of lactation is called
a) Rostrum b) clostrum c) Mansum d) Breast feeding

22) How many eggs are released by the ovary of a female dog if it gave birth six puppies?
a) 6 b) 12 c) 4 d) 1

23) During development the process of formations of neural tube is referred as
a) No to chard b) acylation c) neurolatian d) lactation

24) Which are of the following statements about human sperm is correct
a) the sperm lies in the acrosome dissolves the egg results in fertilization
b) acrosome serves no particular function
c) acrosome has a conical pantreal structure used for piercing & penetrating the egg resulting fertilization
d) acrosome serves as sensory structure

25) Scrotal sacs remains absent in
a) whale b) Echidna c) elephant d) all

26) In woman menstruation can be deferred by the administration of
a) LH only
b) Combination of FSH & LH
c) Combination of oestrogen & progstrone
d) FSH only.

27) which of the following hormone play essential role in spermatogenesis
a) Testosterone b) FSH c) LH d) all

28) Ovulation takes place in a month during
a) 11 – 14 days b) 14 – 16 days
c) 16 – 28 days d) 20 – 28 days

29) The female hormone that causes deposition of fat in the breast and hips as well as growth of pubic hair, during puberty is
a) LH b) FSH c) Progesterone d) oestrogen

30) Read the following statements
Assertion (A) : collective product of the testes. Seminal vesicles & prostrate glands
Reasons: (R) cowpers glands seminal vesicle & prostrate gland constitute the accessory genital glands
a) Both 'A' & 'R' are true and 'R' is the correct explanation of 'A'
b) Both 'A' & 'R' are true, but 'R' is not the correct explanation of A.
c) Assertion is true. Reason is false
d) Assertion & reasons are false

31) Assertion (A) sertoli cells are being involved in the process of spermatogenesis
Reason (R) Nutrition of developing sperm is provided by sertoli cells.
a) Both 'A' & 'R' are true and R is the correct explanation of 'A'
b) Both A & R are true, but 'R' is not correct explanation of 'A'
c) A is true but 'R' is false
d) Both A & R are false

32) Match the following columns & choose the correct

a) spermatogenesis	I. Uterus
b) Corpus luteum	II. Testosterone
c) Fetus	III. Serminiferous tubule
d) Leydig cells	IV. Oestrogen
	V. Progesterone

	A	B	C	D
1)	III	V	II	I
2)	IV	V	I	II
3)	III	IV	I	II
4)	III	V	IV	I

33) The body is covered by fine hair, eye lids separate & eyelashes are formed by the end of
a) 24 weeks in third trimester
b) 24 weeks in 2nd trimester
c) 36 weeks in 2nd trimester
d) 36 weeks in 3rd trimester

34) Spermatic cord joins the
a) testes with dorsal abdominal wall
b) testes with ventral abdominal wall
c) scrotal sacs & ventral abdominal wall
d) scrotal sacs & dorsal abdominal wall

35) Match the following columns & choose the correct Answer

A. Chorion	I. Nourishment
B. Allontois	II. Protection
C. Yolk sac	III. Fluid
D. Amnion	IV. Excretion
	V. Nervous co-ordination

	A	B	C	D
1)	II	IV	V	III
2)	II	I	III	IV
3)	II	IV	I	III
4)	II	V	IV	III

36) Match the following columns & choose the correct Answer

	Column I		Column II
A.	Oxytocin	I.	Stimulates ovulation
B.	Prolactin	II.	Implantation & Maintains pregnancy
C.	Leutinizing hormone	III.	Lactation after child birth
D.	Progesterone	IV.	Uterine contraction during labour
V.	Reabsarption of water by nephrans		

	A	B	C	D
1)	IV	V	III	II
2)	IV	III	I	II
3)	V	III	I	II
4)	IV	III	II	I

37) Match the following & choose the correct

A.	Secondary sex organ	I.	Uterus
B.	Sertoli Cells	II.	Fallopian tube
C.	Serosa	III.	Ovary
D.	Blastocyst stage	IV.	Inhibin
		V.	Epididymis

	A	B	C	D
1)	I	II	III	IV
2)	V	IV	III	II
3)	V	IV	I	II
4)	V	IV	II	I

38) Match of the following three columns and choose the correct Answer.

Organ – I	II – Description location	III – Function
a) Ovaries	primary sex organ, upper pelvic cavity on both lateral sides of the uterus	Produce ovarian female sex hormone
b) Mammary gland	Composed of lobes within the breast	Produce & secret milk for nourishment of infant
c) Clitoris	Rounded projection at lower abdomen	Provides feeling of pleasure during sexual stimulation
d) Follopion tubes	Open ended tubes that extends from the ovaries to the uterus	Convey or a towards uterus site of fertilization

39) Transfer a sperms in to the female genital tract is called

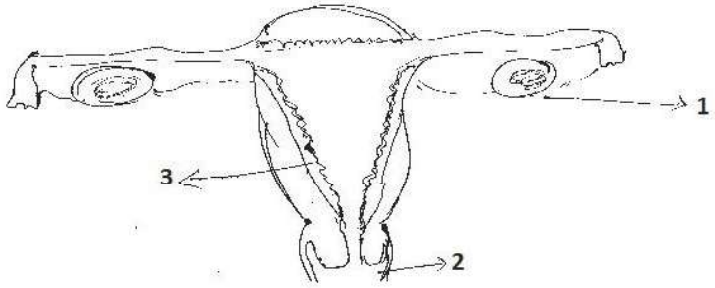
a) ejaculation b) fertilization

c) insemination d) Neuralation

40) Formation & development of blastocyst and its attachment to the uterine wall is called

a) partirution b) puberty c) implantation d) gestation

41) Find the correct series of names



a) Cervix, Vagina, Ovary b) Ovary, Cervix, Vagina
c) Ovary, Vagina, Cervical canal d) Ovary, Vagina, Endometrium

42) Transfer of sperm in to the female genital tract is called
a) gametogenesis b) fertilization c) insemination d) implantation

43) Male reproductive system consist of
a) testis, epididymis, vasa deferentia & Vagina
b) testis, epididymis, vasa deferentia, urethra & penis
c) testis, ovaries, vasa deferentia & urethra
d) testis, vasa deferentia, urethra & vulva

44) On of the following is the correct passage of spermatozoa during insemination
a) Seminiferous tubules – Rete testis - vasa efferentia - vasa deferensia – vagina of female
b) Seminiferous tubules - vasa efferentia – epididymis - vasa deferensia – Ejaculatory duct –
Urethra - vagina of female
c) Seminiferous tubules - Rete testis - vasa efferentia – epididymis - vasa deferensia – Ejaculatory duct - vagina of female
d) Seminiferous tubules – testis - vasa deferensia - vagina of female

45) One of the following shapes & size count of sperm is normal for motility & fertility
a) 30% b) 40% c) 60% d) 80%

Key

1) d 2) c 3) b 4) b 5) a 6) c 7) b 8) b 9) b 10) c 11) b 12) 3 13) b 14) b 15) b 16) c 17) c 18) b 19) 3 20) c 21) b 22) d 23) c 24) b 25) d 26) c 27) d 28) b 29) d 30) b 31) b 32) 2 33) b 34) a 35) 3 36) 2 37) 3 38) c 39) c 40) c 41) c 42) c 43) d 44) d 45) d

Reproductive Health

World Health Organisation (WHO) states that reproductive health is a total well-being in all aspects of reproduction, *i.e.,* physical, emotional, behavioural and social.

Reproductive health programmes are important in the areas of better awarness about sex-related matters, increased number of medically assisted deliveries and better postnatal care leading to decreased maternal and infant mortality rates, increased number of couples with small families, better detection and cure of STDs and overall increased medical facilities for all sex-related problems, etc. All these aspects indicate improved reproductive health of the society.

- India has first initiated the action plans and programmes in 1957 at the national level to attain total reproductive health. These programmes are called family planning programmes. Currently, they are called as Reproductive and Child Health Care (RCH) Programmes.

Some Objectives of Reproductive Health

The objectives and requirement of RCHprogrammes are

(i) Create awarness among people for reproduction related aspects.

(ii) Provide facilities and support for building up a reproductively healthy society.

(iii) Introduction of sex-education in schools to give right information.

(iv) Educating infertile couples and those in marriageable age group about the following

(a) Birth control options

(b) Care of pregnant woman

(c) Postnatal care of mother and child

(d) Importance of breast feeding.

(e) Various assisted reproductive technologies available for infertile couple.

Population Explosion

Uncontrolled increase in population leads to high pressure on resources and food. Therefore, birth control is required.

The increased medical facilities and improved technologies resulted in better living conditions, which have explosive impact on the growth of population.

The reasons for population explosion are

(i) Decline in death. rate, maternal and infant mortality rate.

(ii) Increase in the number of people in the reproductive age.

Birth Control or Contraception

The population growth can be controlled only by adopting suitable contraceptive methods.

Some other ways include

(i) Raising the marriageable age to 18 for females and 21 for males.

(ii) Incentives given to couples with small families.

Methods of Birth Control

Natural methods of contraception work on the principle of avoding chances of meeting between the gametes. This can be done by following periodic abstinence, coitus interruptus and lactational amenorrhoea.

Barrier methods for fertilisation is based .on preventing ovum and sperm coming closer. This is done with the help of using condoms, diaphragms, cervical caps, spermicidal creams, etc. Intra-Uterine Devices (IUDs), are introduced into the uterus. The IUDs in use are Lippes loop, Cu-T,

Cu-7, multiload 375, LNG 20, etc. The Cu ions released by IUDs suppress sperm motility.

Oral contraceptives are hormonal prepartions used as pills, *e.g.,* Saheli (once a week pill). Injections and implants are progesterone-estrogen combination. Their effective period is longer than pills.

Surgical methods block the transport of gametes and thereby prevent conception. Vasectomy is used in males and tubectomy in females.

Medical Termination of Pregnancy (MTP)

Voluntary or intentional t~rmination of pregnancy before full term is called Medical **Termination of Pregnancy** (MTP) or induced abortion.

MTP has been legalised by the government. ofiJndian in 1971With strict condttions

to avoid its misuse, especially in case of illegal femal foeticide

MTPs are safe during first trimester (up to 12 weeks of pregnancy) after that MTPs are riskier.

Prevention of Sexually Transmitted Diseases. (STDs)

Diseases or infections, which are transmfttedithrough sexual contact are called Sexually Transmitted Disease (STDs) or Veneral Diseases (VDs) or Reproductive Tract Infections (RTI).

The infections could be avoidedlpreveuted by the, following practices

(i) Avoiding sex with unknown partner or multiple partners.

(ii) Using condoms during coitus.

(iii) Seeking medical help in case of doubt and getting it completely cured.

Example Syphilis, .gonorrhoea, chlamydiasis, trichomoniasis, AIDS, hepatitis-B. genital herpes, etc.

Infertility

Infertility is a problem in which married couples are unable to produce children inspite of unprotected sexual cohabitation. The reasons of infertility may be physical, congenital, diseases, drugs, immunological or even psychological.

Reproductive Technique

There are special techniques called Assisted Reproductive Technologies (ART) to help couple produce children.

These techniques are

(i) *In vitro* Fertilization

In Vitro Fertilisation (IVT) or test-tube programme is the method in which ova from the

wife on a donor female and the sperms from the husband or a donor allowed to fuse under simulated conditions in the laboratory.

The zygote (32 celled stage) is transferred into the uterus or Fallopian tube for further development. *This process is called Embryo Transfer (ETJ can be done by*

(a) **Zygote Intra Fallopian Transfer** (ZIFT)

In this method, zygote or embryo up to eightblastorneres into the Fallopian tube,

(b) **Intra Uterine Transfer** (IUT)

Embryos with more than eight blastomeres are transferred into the uterus in this method.

(ii) **Gamete Intra Fallopian Transfer** (GI FT)

It is a method in which transfer of an ovum collected from a donor female into another female is done, who cannot 'pro'duceova but can provicfe' suitable conditions for fertiHsation and further development of the foetus up to parturition.

(iii) Intra Cytoplasmic Sperm Injection (GIFT)

It is a method, in which sperm.is directly injected into the ovum to form an embryo in the. laboratory and then embryo transfer is carried out.

(iv) Artificial Insemmation

It is the method' in' which semen is collected from the husband or a healthy-denor and artificially introduced into the vagina or intothe.uterus-This method is used in cases, where infertility is due to the inability of the male partner to inseminate.the female ordue to very low sperm counts in the ejaculates.

- These all techniques require extremely high precision, handling by specialised professionals and expensive instrumentation. Therefore, these facilities are presently available only in very few centres in the country.
- Emotional, religious and social factors are also deterrants in the adoption of these methods.
- Our laws also permit legal adoption and it is as yet, one of the best methods for couples not having their own children.

Amniocentesis

Amniocentesis is a prenatal diagnostic technique, in which a sample of amniotic fluid from the womb of a pregnant woman is taken during the early stages of foetal development and the cells are cultured and analysed.

- This technique helps in diagnosis of chromosomal abnormalities, the sex of the foetus and the development disorders could be detected. However, it is being misused by some people for destroying the female foetuses.

***

Human Reproductive Health

1. STDs are known as
   a) Samato tropic diseases b) sexually transmitted diseases
   c) asexual transmitted diseases d) AIDS

2. Match the following columns & choose the correct

Columns – I		Column – II
A.	Gonorrhea	I) Trichomonas Vaginatis
B.	Hepatitis-B	II) Troponema Pallidium
C.	Trichomaniasis	III) HBV
D.	Syphilis	IV) Neisseria Gonorrhea

	A	B	C	D
1)	V	IV	III	I
2)	V	IV	I	II
3)	V	IV	III	II
4)	V	IV	II	III

3) The coitus period of the menstrual cycle is
   a) 10th – 14th days b) 10th – 16th days
   c) 10th to 17th days d) 11th to 17th days

4) Match the following & choose the correct answer

A. IUDS	I) Ammio centensis
B. OCPs	II)Intra uterine Devices
C. Barrier method	III)Oral contra captive pills
D. MTP	IV) Medical Termination of Pregnancy

	A	B	C	D
1)	I	II	III	IV
2)	II	III	IV	V
3)	II	IV	III	V
4)	II	V	IV	III

5) One of the following method's is known as surgical contraceptive method
   a) vasectomy b) Tubectomy c) a & b d) Implants

6) One of the following disease can be detect by the process of Amnio centensis?
a) Down's syndrome b) Turner's syndrome
c) Edward's syndrome d) all

7) In IVF-ET method. The mother whom nourishes the embryo transferred in her uterus. Such mothers are known as
a) Embryonated mother b) Pregnant mother
c) Surrogate mother d) None of these

8) Match the following & choose the correct answer

A. ZIFT	I. In vitro fertilization & embryo transfer
B. GIFT	II. Intra Cytroplasmic sperm injection
C. ICSI	III. Zygote intra fallopian transfer
D. AI	IV. Atrificial insemination
	V. Gamate intra fallopian transfer

	A	B	C	D
1)	I	II	III	IV
2)	III	IV	II	I
3)	III	IV	V	II
4)	III	V	II	IV

9) In vitro fertilization is a technique that involves transfer of which one of the following in to the folllopian tube?
a) embryo only upto '8' cell stage
b) Either Zygote or early embryo upto '8' cell stage
c) Embryo of 32 cells stage
d) Zygote only

10) Celions released from copper releasing intra uterine devices (IUDs)
a) Increase phagocytosis of sperms
b) make uterus unsuitable for implantation
c) Suppress sperm motility
d) prevent ovulation

11) Cu-T prevents pregnancy by preventing
a) Ovulation b) fertilization
c) implantation of fertilized egg d) development of embryo

12) Orchidectomy is
a) Surgical Removal of Testes b) Surgical Removal of Ovaries
c) Inflammation of Testes d) non-descent of testes in scrotum

13) Woman who consumed the drug 'thalidomide' for relief from vomiting during early months of pregnancy gave birth to children with
a) hare-lip b) no spleen
c) under development limbs d) hexadactlyly

14) Human egg is
a) micro lecithal b) Alecithal c) mesolecithal d) macro lecithal

15) At menopause there is rise in urinary excretion of
a) STH b) FSH c) LTH d) MSH

16) In woman ovum fails to get fertilized, which one of the following in unlikely?
a) corpuslateum will disintegrate
b) oestrogen secretion further decrease
c) primary follicle starts developing
d) progesterone secretion rapidly declines

17) Inability conceive or produce children even after '2' years of unprotected sexual cohabitation is called
a) Insemination b) Involution c) Fertilisation d) Infertility

18) In vitro fertilization followed by transfer of Embryo in to the female genital tract is one such method and is commonly known as
a) Gamete intra fallopian transfer b) Sterilistaion
c) Test tube baby programme d) Intra Uterine insemination

19) Medical termination of pregnancy is relatively safe upto
a) 3 months of pregnancy b) 4 months of pregnancy
c) 6 months of pregnancy d) 7 months of pregnancy

20) A foetal sex determination test based on the chromosomal pattern in the Amniotic fluid surrounding the developing embryo is called
a) Chromosomal mapping b) Foeticides
c) Amniocentesis d) Assisted Reproductive Technology

21) Match the following & choose the correct answer

Column I		Column II
A.	Removal of small part of fallopian	I. In vitro fertilization
B.	Removal of small part of vas-deference	II. In vivo fertilization
C.	Fusion of gametes within the female	III. Vasectomy
D.	Fusion of gemetes outside the body	IV. Amenorrhea
		V. Tubectomy

	A	B	C	D
1)	I	II	III	IV
2)	V	IV	III	II
3)	V	III	II	I
4)	V	II	III	I

22) Statements

a) Assertion (A) The duration from day 10 to 17 of the menstrual cycle is called the fertile period

Reason (R) chances of fertilization are very high during this period

a) both ‘A’ & R are true, R is the correct explanation of ‘A’

b) Both ‘A’ & R are true, R is not the correct explanation of ‘A’

c) A is true but ‘R’ is false

d) A is false but ‘R’ is true

23) Which one of the pair is correctly matched

a) AIDS – Balantidium coli

b) Syphilis – Treponema Pallidium

c) Gonorrhoea – leishmania donarani

d) typhoid – Mycobacterium leprae

24) Assertion (A) As long as the mother breast feeds the child fully chances of conception are almost nil

Reason (R) Lactational Amenorrhea can be seen during the period of intense lactation following parturition

a) Both ‘A’ & R are true, R is the correct explanation of ‘A’

b) Both ‘A’ & R are true, but ‘R’ is not the correct explanation of ‘A’

c) A is true but R is false

d) d) A is false but ‘R’ is true

25) Which of the following is a method of birth control?
a) GIFT b) IVT-ET c) HTF d) IUDs

Key

1) B 2) 2 3) c 4) 4 5) c 6) d 7) c 8) 4 9) b 10) b 11) b 12) a 13) c 14) b 15) b 16) b 17) d 18) c 19) a 20) c 21) 3 22) a 23) b 24) a 25) d

16. GENETICS

INTRODUCTION:

- The term genetics was coined by Bateson.
- The sequence of Amino acids in a protein was determined by genetic code.
- Genetic code was given by Nirenberg.
- The word Gene was coined by Johannsen.
- Functional part of DNA – Gene
- Principles of inheritance are proposed by – G.J. Mendel.
- Father of Genetics – G.J. Morgan
- Father of Modern Genetics – T.H. Mendel.
- Name of the magazine in which mendels work was published proceedings of the natural history society of Brumn.
- Mendalism was rediscovered by – Devries – Tschermar & Corrons
- Mendel conducted his breeding experiments on – Pisum Sativum (Sweet Pea Plant)
- Cindrella of Genetics – Drosophila
- The crossing of genetically different organisms is know as Hydbridization.
- The mundelian factors are known as Genes.
- The Indian Scientist associated with artificial synthesis of gene – Hargovind Kohrana.
- Pair of contrasting characters are called – Alleles.
- The character which is expressed in hybrid during crossing called – Dominant character.
- The sub divisions of a gene – Cistron – Recon – Muton
- The smallest functional unit – Cistron

- Inter changeable unit during crossing over – Recon
- The unit that undergo mutation – Muton.
- Genes are arranged in a chromosome – Linear.
- Contrasting characters identified by Mendel – 7

Character	**Dominant**	**Recessive**
Height	Tall	Dwarf
Position of flower	Axial	Terminal
Pod colour	Green	Yellow
Pod shape	Non constricted	Constricted
Flower colour	Red	White
Seed colour	Yellow	Green

- Cross made to study the inheritance of a pair of Alleles – Mono hybrid cross.
- The phenol typic ratio in dihybrid cross 9:3:3:1 (in F_2)
- The geno typic ratio in dihybrid cross 1:2:1:2_____4:2:1:2:1 = 16
- The exchange of a parts of Non sister chromatids between homologous chromosomes – Crossing over.
- (Black Cross) – The crossing of F_1 individual (Hybrid) with any of homozygous parent.
- Test Cross – The crossing of F_1 individual (Hybrid) with recessive parent.
- Hybrid is also known as Heterozygous Dominant.
- If cross results in the formations of a new character. It is due to incomplete dominance.

Reciprocal Cross – The cross by changing the sex of the parents is the reciprocal cross.

Dihybrid – An individual which is (Hybrid) Heterozygous in two pairs of Alleles.

Eg. RRYY, rryy,

RrYy

Multiple Alleles – More than two allelic form exit for certain genes Eg. I^A. I^B of a gene determine the pheno types of the four blood groups A,B,O,AB

Common Groups in India.

'O' - 30%

'B' - 35%

'A' - 25%

'AB' - 10%

Epistasis – When one gene influences the expression of another non – allelic gene. It is termed as Epistasis.

Polygenic traits – Skin colour, height of human show a gradation from one extreme to the other i.e. due to additive effects of two or more genes for the trait. Such traits are called polygenic traits.

Pleiotropy – The ability of a gene to produce more than one pheno cancel typic effect is called Pleiotropy.

Sex linked in heritance – linked on 'X' chromosomes.

1) Haemo philia 2) Colour blindness 3) Nephrogenic diabetes insipides (NPI)

Sex linked genes – These genes are located in Autosomes & their expression is limited to one sex. These are responsibe for primary & secondary sexual characters.

Eg. Breast Development in women, Milk production, Beard in man etc.

Sex influenced genes – Also located on autosome but their expression is influenced by sex. Eg. Baldness in man dominant in woman is recessive.

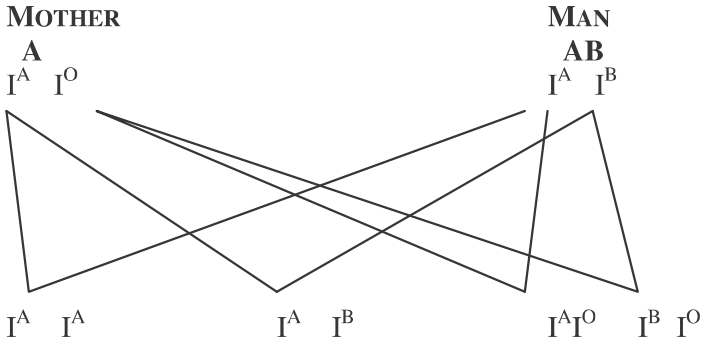
'Y' linked genes – This always Inherit froms father to son.

Eg. Hyper trichosis – (hairs on pinna)

NUMERICAL PROBLEM

Q. A woman sues a man for the support of her child. She has type 'A' blood, her child type 'O' and the man type 'AB' could man be father?

Solution:



In breeding – The process of mating among closely related individuals. Eg. Self pollination in plants.Marriages between first cousins.

Out breeding – The crosses between the unrelated pure breeding population are called out cross & out breeding offspring produced are hybrids.

Hybrid Vigour (or) Heterosis – The superioty of hybrids over the parent is called hybrid vigour.

Cross-breeding – Cross breeding is the mating of individuals from different races or speices. Eg. Horse & donkey - mule

Linkage and Crossing Over :

1. The Deviation from the law of independent assortment was first studied by Bateson and Punnet in 1906.
2. Independent assortment is possible when the alleles of the different characters are located on the different homologous.
3. The linkage is said to be complete when liked genes are closely located. Complete linkage is reported in male drosophila.
4. The test cross ratio in complete linkage is 1 : 1 in dihybrid cross.
5. The lined genes which are widely located in chromosomes and have chance of separation by crossing over are called incompletely lined genes and their inheritance is incompletely inheritance. It is common in female Drosophila.

6. When heterozygous male Drosophila with grey colour body and long wigs is crossed with black bodied vestigial winged female the gray long and black vestigial are produced in the ratio 1 : 1, which shows complete linkage.
7. When heterozygous female Drosophila with grey long characters is crossed with black vestigial male Drosophila gray long, gray vestigial, black long and black vestigial are produced in 41.5% : 8.5% : 8.5% : 41.5%., which shows incomplete linkage.
8. The principle limitation of linkage groups explains that the number of linkage groups is restricted to the number of haploid set of chromosomes.
9. The incomplete linkage occurs due to occurrence of recombination's of liked genes. This occurs through crossing over in which nonsister chromatids of homologous chromosomes exchange.
10. Crossing over is of two types. Somatic and germinal or meiotic crossing over.
11. Somatic crossing over occurs in the chromosomes of the body cells of an organism, during the mitotic cell division. It has no genetical importance. Reported in the somatic cells of Drosophila by Curt Stern.
12. Germinal crossing over occurs in the meiotic cells of the gonads during gametogenesis. It has genetic importance.
13. Crossing over occurs durint tetrad stage.
14. The nuclear enzyme endonuclease cause the break of chromosomes during meiotic division.
15. The fusion of chromosomal segments take place due to an enzyme linkage.
16. Crossing over necessary feature of evolution.
17. It was Morgan who proved that the phenomenon linkage occurs due to genes linked together in a chromosome. The inheritance of these linked genes is called Linkage.
18. The nonallelic genes present on the same chromosome are said to be linked genes.
19. Morgan proved that genes are linearly arranged in chromosome.
20. The dominant genes of both the pairs are located in one chromosome of the homologous pair and their recessive alleles are located in the other chromosome. These heterozygotes are said to be cis-heterozygotes (AB on one chromosome, at on another).
21. The dominant gene of one pair and the recessive gene of the other pair are located in one member of the homologous pair, recessive gene of the first pair and the dominant gene of the second pair are located in the other chromosome. This hterrozygote is said to be trans heterozygote.

Sex Determination:

1. The chromosomes are two types. The somatic chromosomes are called autosomes and the sex chromosomes are called allosomes or heterochromosomes.
2. The two sex chromosomes are X and Y.

3. The X chromosomes was discovered by H. Henking and called it 'x' body. Later Mc Lung, 1902 confirmed the presence of x chromosome and suggested its role in sex determination.
4. E.B. Wilson discovered the presence of x chromosome in both the sexes.
5. Stevens and Wilson noticed in Lygaeus turicius that x homologue in male is smaller and called it as y chromosome.
6. Chromosomal Sex Determination:

1. XX female and XY male:
   Females are homozygous and males are heterozygous.
   Eg: Man and Drosophila
   Karyotype of man : 44 AA + XY
   Karyotype of woman : 44 AA + XX
2. XX female and XO male :
   In this, female is with two X chromosomes and male is with one X Chromosome.
   Eg. Insect of orthroptera and heteroptera.
3. ZW female and ZZ male :
   Males are homozygous and females are heterozygous.
   Eg. Birds, butterflies, some moths and fishes.

7. Environmental sex determination can be studied in Bonelia. The young ones which are attached to the proboscis develop into males, other into females.
8. Hormonal sex determination can be noticed in cattle. The female cow in the cattle will be sterile and is called free martin. This is studied by Lillie.

Sex Linked inheritance:

1. Sex linked inheritance was first studied my Morgan in Drosophila and named it as sex linkage.
2. The genes present on X chromosomes are called sex linked genes and their inheritance is ex liked inheritance.
3. Haemopilia and colour blindness are the two important sex linked recessive characters in man.

Haemophilia:

1. It is the most dangerous disease of all the sex linked triats.
2. This is the hereditary disease discovered by **John Colt of Philadelphia.**
3. Haemophilia A is due to the absence of antihaemophilic globulin factor, VIII factor.
4. Haemophilia B is due to the absence of plasma thromboplastin factor, XI factor.

4. Haemophilia appeared as a mutant in queen Victoria and form her it was transmitted to her descendants. So it is called royal disease.
5. The females are normal, carriers and haemophilic, where males are normal and haemophilic.
6. It is the sex linked recessive character, genes for this trait are located in X chromosome only.
7. Sex linked characters always are transmitted from male to his grand sons through the carrier daughter. This type of inheritance is called cris corss inheritance or skip generation inheritance.
8. Heterozygous females are carriers.

Colour Blindness:

1. Colour blindness was discovered by Wilson, 1911.
2. The persons with this disorder cannot distinguish the red and green colour.
3. Red colour blindness is called protonopia.
4. Green colour blindness is called deuteronopia.
5. It is also the sex linked recessive character and the genes are located in X chromosome.
6. Inheritance is similar to that of the haemophilla.

Nephrogenic diabetes insipides: NPI

1. Sex linked disorder
2. Symptoms are polydipsia, excessive thirst and polyuria, excessive urine formation. These people are called water dirinkers.
3. Inheritance is similar to that of haemophilla.
4. Other sexlinked trait in man are:
    a) Anhydrotic ectoderm (non functional sweat glands)
    b) Night blindness
    c) Myopia near sightedness
    d) Juvanile glaucoma (Hardning of eye ball)
    e) Whitefore lock.
5. Certain genes are located in both X and Y chromosome as alleles. These genes are called XY linked genes and their inheritance is called XY linked inheritance.
   Ex; a) Xeroderma pigmentosum
    b) Nephritis (Kidney disease)
    c) Retinitis pigmentosum
6. Sex linked dominant inheritance trait is defective enamel, which is more common in females.

7. The genes present on the Y chromosomes are called holandric genes or y linked genes. Inheritance is called y linked inheritance.
   Eg: a) Hyper trichosis (hair on pinna)
   b) Ichthyosis hytrixgravis
8. The Y linked inheritance is always from father to son.

Sex limited genes:

1. These genes are located in autosomes and their expression is limited to one sex.
2. The expression in vertebrates is governed by hormones.
3. These are responsible for secondary sexual and primary sexual characters.
4. Eg: Breast development in woman, beard in man, milk production in cattle, brilliant plumage of peocock.

Sex influenced genes:

1. These are also located on autosomes but their expression is influenced by sex.
2. Examples:
   a) Bladness in man:
   This character is dominant in man and recessive in women.

Genotype	Man	Woman
BB	Bald	Bald
Bb	Bald	Normal
Bb	Normal	Normal or non Bald

   b) The horn condition in sheep.

Genes and chromosomes:

1. W. Flemming described the splitting of chromosomes and coined the term chromatin for the stainable material.
2. Rorx suspected the role of chromosomes in inheritance.
3. Benden and Bovery 1887 reported that the number of chromosomes in each species is constant.
4. The term chromosome was coined by Waldyer.
5. W.S. Sutton and T. Boveri suggested that chromosomes were the physical structures acting as messengers in heredity.
6. Morgan described the functions of chromosomes in heredity.

7. Heitz, 1935, Kuwanda, Geitter and Kauffman described the morphology of chromosomes.
8. Prokaryotic chromosome contains genetic double helical DNA without basic proteins. Some have circular DNA.
9. The extra chromosomal circular DNA present in bacteria is called plasmid.
10. Chromosome contains euchromatin and heterochromatin.
11. Euchromatin contains more DNa and is genetically active substance.
12. Heterochromatin is a deep stained region of chromosome. Dring interphase they form the chromocentres or false nucleoli. These regions are genetically inert. They control the biosythesis of nucleic acids.
13. the major components of Eukaryotic chromosomes are DNA and RNA, histones and nonhistone proteins and metallic ions.
14. Histones are the basic proteins containing basic amino acids like arginine and lysine. Thesebasic proteins are associated with DNA and act as repressors of gene activity.
15. non histone proteins are mostly acidic and act as enzymes. These are phosphoproteins, DNA polymerase, RNA polymerase, DNA pyrophosphorylase and nucleiosidase triphophotase.
16. The metallic ions are Mg, Ca. They make the organization of chromosome intact.

Special chromosomes:

1. Ploytene chromosomes:
    a) the special chromosome present in the salivary glands trachea, gut of Drosophila are polytene chromosomes.
    b) These were discovered by C. Balblani.
    c) The name polytene was suggested by Kollar because of occurrence of many chromonema.
    d) Polytene chromosomes consist of closely coiled homologous pair of chromosomes. This pairing is called somatic pairing.
    e) Polytene chromosomes are permanent prophase chromosomes which contain 1000 times more DNA.
    f) The dark bands of polytene chromosomes contain euchromatin and the light bands contain heterochromatin which contains little DNA and more RNA and proteins.
    Polytene chromosome is caused by endomitosis in which the duplicated chromosomes do not separate, nuclear membrane does not lost and spindle Is not formed.
    g) In some, during the development of polytene chromosome develop swelling on dark bands of inter bands. These swelling are called puffs or bulbs, which are related to the synthesis of RNA and proteins.

h) The chromosomal RNA differs from that of cytoplasm and nucleus.
i) The chromonema of the chromosomes latrally give of loops. These rings are called Balbinai rings which are rich in DNA and RNA.

2. Lampbrush chromosomes.
   a) Fishes, amphibians, reptiles, brids during deplotene stage contain lampbrush chromosomes.
   b) These were reported by Ruckert in 1892. These chromosomes contain main axis and lateral loops. Main axis contains four chromatids or two bivalent chromosomes.
   c) Ris discovered that these loops of lampbrush chromosomes contain fibrils.
   d) These chromosomes are rich in RNA and proteins. Synthesis of protein and yolk takes places in these chromosomes near loops.

Human genetics:

1. Sir Archiboild Garrod laid the foundation of human genetics. He is the father of human genetics. The genes in man are grouped as following:

Group	Chromosomes	Length	Centromere
A	1,2,3	Longest	Metacentric
B	4,5	Smaller than A	Submetacentric
C	6,7,8,9,10,11,12 & x	Medium	Submedian
D	13,14,15	Shorter than C	Acrocentric
E	16,17,18	Short	Submedian
F	19,20	Shorter than E	Median
G	21,22,& Y	Shortest	Acrocentric

Chromosomal aberrations:

1. The chromosomal aberrations are due to non disjunctions of chromosomes.
2. Non disjunction was first studied by c.Bridges in Drosophila.
3. These aberrations cause syndromes in human being.
4. syndrome refers to a group of symptoms that occurs together and characterize a disease.
5. Sex chromosomal abnormalities.
   a) These are mainly due to non disjunction in X chromosomes.
   b) Klinfelter syndrome and Turner syndrome are sex chromosomal syndromes.

Klinfelter syndrome:

a. This was discovered by Harry in 1942.
b. Presence of one Extra 'X' Chromosoe in male causes this syndrome.
c. Karyotype is 44 + XXY
d. The symptoms are sterility, testis under developed, long limbs, mental retardation, degenerated seminiferous tubules.

Tuner syndrome:

a. This was discovered by turner in 1938.
b. This is due to the loss of one X chromosome in females.
c. The karyotype is 44 + X.
d. The symptoms are sterility in females, no development of ovaries or streak ovaries, absence of menstrual cycle, webbed neck.
e. There are no bar bodies in the buccal cells and no drumstick bodies in the blood cells.

Super male condition or criminal syndrome:

a. This is due to extra y chromosomes in male.
b. Karyotype is 44 + XYY.
c. Symptoms are unusual height, mental retardation, criminal bent of mind and abnormalities in development.

Super female condition:

a. This is due to the presence of extra X chromosomes in female.
b. Karyotype is 44 + XXX.
c. Symptoms are mental retardation, abnormal development of sex organs.

AUTOSOMAL ABNORMALITIES:

1. **Down's or idiotic or mongoloid syndrome:**

a. Discovered by Down in 1866.
b. Due to the nondisjunction of 21^{st} pair of autosomes or due to the trisomy of 21^{st} pair.
c. Symptoms are broad forehead, flat hands, stumpy fingers, permanently opening mouth, projecting lower lip, mental retardation,

2. **Edwar's syndrome:**

a. Due to the trisomy of 17^{th} or 18^{th} pair of autosomes.

b. Symptom is mental retardation.

3. Pataun's syndrome:

a. Due to the trisomy of 1st or 8th or 13th pair of chromosomes

b. It Symptom is mental retardation.

4. Philadelphia 22:

a. Difficiency of part of the long arm of chromosome 22, due to its translocation to chromosome 9.

b. It is chronic myelocytic leukemia.

5. Cri-du-chat syndrome:

a. Due to the deletion of short arm of chromosome 5 and translocation to chromosome 15.

b. Cat like mewing infant, widely spaced eyes.

6. Mongoloid:

a. Translocation of long arm of chromosome 22 to 15.

b. Symptoms of down syndrome.

7. Burkitt lymphoma:

a. Translocation of chromosome 8th to long arm of 14.

8. Wilms tumor:

a. Due to the deletion of short arm of chromosome 11.

b. Embryonic kidney tumor.

9. Bloom syndrome:

a. Sister chromatid exchange in somatic cells, chromosomal instability.

b. Death before age 30 due to cancer.

INBORN ERROR OF METABOLISM:

1. Francis Garrod stated the inborn errors of metabolism. These are gene controlled and their inheritance is Mendelian inheritance.
2. The following are the inborn errors of metabolism in man:

a. Alkaptonuria:

1. Due to the loss of enzyme homogentisc acid oxidase.
2. Symptoms are darking of urine, arthritis.

b. Phenyl ketonuria (PKU):

1. Due to the loss of enzyme phenyl dehydrogenase.
2. Symptoms are excretion of phenylalanine in urine, mental retardation.

c. Goitrous cretinism:

1. due to the loss of idotyrosine deiodinase.
2. Symptoms are thyroid malfunction and mental retardation.

d. Glycogen storage:

1. Due to the loss of enzyme glucose 6 phophotase.
2. Symptom is liver enlargement duo to glycogen storage.

e. Galactosemia:

1. Due to the loss of enzyme galactose – 1- phosphate.
2. Symptoms ae liver enlargement, galactose in urine.

f. Sickle cell anaemia:

1. Due to the amino acid replacement in haemoglobin.
2. Due to the single base change in beta chain of haemoglobin, which results in a change of glutamic acid into valine at 6^{th} position of the beta chain of haemoglobin.
3. This is an example for plelotrophy, in which single gene effecting more than one character.
4. symptoms are low oxygen concentration, RBC sickle shaped.

g. Albinism:

1. Due to the absence of enzyme which converts tyrosine into melanin.
2. Symptoms are total lack of melanin in the skin.

The above disorders are recessive disorders:

a) **Acondroplasi :** Individuals are small, disproportionate with abnormally short arms and legs 20% reach adulthood.
b) **Tylosis:** Extremely thick skin.
c) **Anomychia:** Absence of some or all the nails of the digits.
d) **Dentinogenesis imperfecta:** Crows of teeth wear down.
e) **Polydactyle:** Extra digits.
f) **Brachydactyle:** Hnads are short, stocky, thick palms and fingers are short.
g) **Manfansyndrome:** Long tapering fingers with poor musculature.
h) **Hantington chorea:** Disorganised muscular movement.

14. Qualitative and quantitative inheritance:

1. The classical mendelian traits are qualitative phenotypic traits.
   Eg. Antigen antibodies of blood groups in man, black and white coat in guinea pig.
2. The quantitative phenotypic traits are economically important measurable Phenotypic traits like height, weight, skin pigmentation, susceptibility to diseases and intelligence in man. These are also called metric traits.
3. The quantitative phenotypic traits cause continuous variations in which they form a spectrum of phenotypes which blend imperceptivity form one type to another.
4. Quantitative traits may be modified by environmental conditions and governed by many genes.
5. The non allelic genes effecting the phenotype of a single quantitative trait are called polygenes or cumulative genes and their inheritance is quantitative inheritance.

5. Nature of Gene:

1. Smallest unit of gene which contains the information for the synthesis of a polypeptide chain is called cistron or compion.
2 The smallest unit of indivisible DNA that undergoes change resulting in mutation is a single nucleotide is called muton
3 The smallest unit of DNA which is capable of causing a change by recombination or replacement is also a single nucleotide and is called recon.

6. Gene regulation:

1) Francoids Jacob and Jacques Monad 1961 proposed operon concept for gene regulation.
2) Operon is the long chain of DNA segment which contains operator site and structural genes.
3) The action of structural genes is regulated by operator site through repressor protein produced by the action of gene is known as the regulator gene.
4) The expression of the structural genes is depended on whether the operator switch is off or on.
5) When the switch is on, the three genes are transcribed by RNA polymerase into a single stretch of mRNA covering all the three genes.
6) Each single gene is generally known s cistron and the transcribed long mRNA covering all the three structural genes is called polycistronic.

7. Nurospora genetic:

1) Enzyme control various biosynthetic pathways.
2) Beadie and Tatum discovered biochemical mutations in Nurospora crassa, for which they were awarded Nobel Prize in 1958.
3) Beadle and Tatum proposed one gene one enzyme hypothesis. It means that in a biosynthetic pathway several steps are involved. Each step is controlled by specific enzyme which is synthesized under the control of specific gene.
4) Neurospora crassa is a favourite experimental material for research of physiological genetics and cytogenetics.
5) Arginine pathway was studied in N.crassa.
6) One gene one enzyme hypothesis was later modified into one cistern one polypeptide hypothesis.

Bar bodies:

1. the genetically inactive X chromosome or condensed X chromosome is called heteropycknotic chromosome or heterochromatinised chromosome.
2. the female is with one bar body.
3. The number of bar bodies in any organism is number of X chromosomes – 1.
4. In Turner's Syndrome female, no bar body is present.
5. In female with four X chromosomes the bar bodies present are three.

Population genetics:

1. Population genetics is the study of the frequencies of genes in a population.
2. Mendelian population: It is an interbreeding group of population which occurs as acommunity in an area.
3. **Gene pool:** Aggregation of all genes in a Mendelian population.
4. Population in a locality is said to be dynamic system.
5. **Gene frequency:** It refers to the proportion alleles as represented in a Mendelian population or refers to the proportion of an allele in the gene pool as ompared with other alleles at the same locus.
6. The gene frequency can be calculated by dividing the number of particular gene in question with the total number of genes present on that locus in the population.
7. **Genotype frequency:** It is the total number of a kind of individuals from a population all which exhibit similar characters with respect to the locus under consideration.
8. **The population:** Mating random is panmicitic population.
9. The group of animals and plants, non interbreeding in its character is said to be solates.
10. Hardy-Weinberg law can be applied only in the case of panmictic population.
11. Hardy-Weinberg law states that the relative frequencies of various kinds of genes in large and randomly mating sexual panmictic population tend to remain constant from generation to generation in the absence of mutation, selection and gene flow.
12. **Genetic drift:** Rapid increase of a particular gene in a small population.

Twins:

1. The two babies born at a time from a mother are called twins.
2. Twins are due to multiple pregnancy. Three types.

3. Identical twins:

a) Identical twins are similar in their characters.
b) There are developed from single zygote. So they are monozygotic.
c) During cleavage the zygote divides into two blastomers, they separate, develop independently into two different feoti.

4. Non identical or fraternal twins:

a) They are formed by the fertilization of two eggs by two sperms. As they develop from two different zygotes, they are called dizgotic twins. They may be same sex or different.
b) The geneotypes of these two are also different. So they are called nonidentical twins.

5. Siamese twins or conjoined twins:

a) These twins develop from a single egg. So they are monozygotic.
b) These are similar to identical twins but they are physically joined.

Modern trends in genetics:

1. **Genetic engineering:**

a) The term genetic engineering was coined by A.C.Pai.
b) The branch of science which deals with the artificial synthesis of new genes and the subsequent alteration of genome of an organism is called genetic engineering.
c) Genetic engineering aims at adding, removing or repairing a part of the genetic material, there by changing the genotype and phenotype according to the requirements.

2. **Genome:** The total number of genes present in a haploid set of chromosomes together called genome.
3. **Genetic surgery:** Mutations can be caused by deleting the selected parts of a chromosome by passing laser beams. This phenomenon is called genetic surgery.
4. **Genetic counseling:** Giving advise and guiding regarding recurrence of genetic disorders to the persons who are going to be married. This helps in the improvement of offspring in the next generation.
5. **Eugenics:** It deals with the application of laws of genetics to the improvement of human race. Fransis Galton coined this term.
6. **Euphenics:** Improvement of human race by environmental means. It is the symptomatic treatment of genetic disorder.
7. **Euthenics:** The science concerned with the improvement of human race through better environment education and training.
8. **Pedigree analysis:** It is a system to analyse the distribution and inheritance of traits in the family.
9. **Dysgenics:** A situation that tends to be ahrmful to the hereditary qualities of future generation.
10. **Genecology:** Study of the genetic composition of populations in relation to habits.
11. **Somatic hybridization:**

a) Hybridisation through protoplast fusion is known as parasexual hybridization because it doesnot involve sexual fusion.
b) Protoplast fusion was first studied by H.Harris J.F. Watkins 1965.
c) Protoplast fusion is the fusion of the cells belonging to the different speices.

12. **Clone:** Genetically identical set of cells or individuals is called clone.
13. **Eutelegenesis:** Muller proposed the utilization of sperm banks containing the preserved frozen sperms of outstanding creative individuals. This method is called germinal choice or eutelegenesis.
14. The cytoplasmic hereditary particles are called plasmagenes. Their inheritance is called extrachromosomal inheritance or cytoplasmic inheritance. This can be observed in kappa particles in paramecium, and torsion in gastropod shells.

GENETICS

1. The term gene was used by
   (1) Johansen (2) Mendel
   (3) Lamack (4) Cuvier

2. Genetic code was given by
   (1) Watson & Crick
   (2) Beedle & Tatum
   (3) Nirenberg
   (4) Bridges & Kings

3. Greger john Mendel is famous for profounding
   (1) Inheritance of acquired characters
   (2) Theory of Mutation
   (3) The Cell theory
   (4) Laws of heredity

4. The term gene refers
   (1) A portion of RNA
   (2) A portion of DNA
   (3) The linkage group
   (4) The sequence of Amino acid in a protein

5. Identify the correct statement.
   (A) Gene mutation is caused by a change in the sequence of nitrogen bases.
   (B) Change in actual size of gene
   (C) A change in structural configurationin DNA molecule
   1) A is correct & B also correct
   2) A is false but B & C are correct
   3) A is true but B & C are false
   4) A is false & B is false C is true

6. Sex linked genes are present on
   (1) 'X' chromosomes only
   (2) 'Y' chromosomes only
   (3) Either on X & Y chromosomes
   (4) None of these

7. A male child would be born if
   (1) Mother eats well during pregnancy
   (2) The genetic composition of the child included 'XY' set of chromosomes
   (3) Father is healthier than Mother
   (4) The genetic composition of the child included 'XX' set of chromosomes

8. Red green color blindness appears due to
   (1) Over activity of Adernal gland
   (2) Inheritance through 'X' chromosomes
   (3) Excessive drinking of Alcohol
   (4) Deficiency of Vitamin 'D'

9. Which of the following is proved to be hereditary
   (1) Physical fitness
   (2) Color blindness
   (3) Gigantism
   (4) Memory

10. Which one of the following is a sex linked disease
    (1) Cancer (2) Haemophilia
    (3) Hydrophobia (4) Diabetes

11. Person whose father is color blind marries a lady who is the daughter of a color blind man, their children will be
    (1) All normal

(2) All sons color blind
(3) All color blind
(4) Some sons normal & some color blind.

12. Haemolytic jaundice is caused due to a dominant gene but only 10% of the people actually develop the disease. A heterozygous man marries a homozygous woman what proportion of the children would be expected to develop the haemolytic disease?
(1) 1/5% (2) 1/10%
(3) 1/15% (4) 1/20%

13. Genetics is the study of
(1) Mutation
(2) Reproductive Physiology
(3) Heridity & its variation
(4) Development & Differentiation

14. Genetic Recombinations occur through
(1) Meiosis & Mitosis
(2) Mitosis & Fertilization
(3) Fertilization of Meosis
(4) All of the above

15. Five out of 20 plants obtained by selfing red flowered plants were having white flowers. This is an indication that the plants is
(1) Homozygous (2) Heterozygous
(3) Homogenous (4) Heterogeneous

16. American Scientist who did extension work on drosophila
(1) Huxley (2) T.H. Morgan
(3) Crick (4) Mendel

17. The dihybrid ratio of Mendel
(1) 9 : 3 : 3 : 1 (2) 3 : 1
(3) 1 : 2 (4) 1 : 2 : 2 : 1

18. Branch of science concerned with improvement of making by applying laws of heredity.
(1) Euthenics (2) Eugenics
(3) Ecology (4) Genetics

19. A cross between pure black male & pure white female rats is made, what is the ratio of blacks in to white in F_1 generation
(1) All whites (2) All blacks
(3) 3 : 1 (4) 1 : 3

20. A Hybrid is
(1) Homozygous dominant
(2) Heterozygous dominant
(3) Heterozygous
(4) Mutant

21. What type of gamates are formed from a plant of genotype Tt Rr ?
(1) Tt & Rr (2) TR & Tr
(3) TR, Tr, tR, tr (4) Tr, tr only

22. Baldness is
(1) Sex linked inheritance
(2) Sex controlled trait
(3) Sex dominant trait
(4) None of these

23. Genotypic ratio of dihybrid cross is

(1) 1 : 2 : 1 : 2 : 4 : 2 : 1 : 2 :1
(2) 1 : 3 : 2 : 4 : 2 : 1 : 2 : 1
(3) 1 : 2 : 4 : 2 : 1 : 2 : 1 : 3
(4) 1 : 2 : 4 : 2 : 4 : 2 : 1 :

24. Hybrid vigour is due to
    (1) Chiasma
    (2) Linkage
    (3) Crossing over
    (4) Heterozygosity

25. In a dihybrid cross, yellow is dominant over green & round seed coat is dominant over the wrinkled they were crossed & a typical mendelian dihybrid ratio 9 : 3 : 3 : 1 was obtained there are 1600 members of progeny. How many of them are likely to be wrinkled ?
    (1) 100 (2) 300
    (3) 400 (4) 600

26. One of the following has greatest number of chromosomes.
    (1) Taena solium
    (2) Columba livia
    (3) Homosapian
    (4) Paramacium Caudatum

27. Which one is a test cross
    (1) Tt & tt (2) TT & TT
    (3) TT & Tt (4) Tt & Tt

28. Number of autosomes in human sperm is
    (1) 11 (2) 22
    (3) 44 (4) 45

29. Backcross to the recessive parents is known as
    (1) Linkage (2) Crossing over
    (2) Test cross (4) Reversion

30. Sex linked characters are
    (1) Dominant (2) Recessive
    (3) Lethal (4) Not inherited

31. Mule is an offspring of
    (1) Male & Female donkey
    (2) Cow & Ox
    (3) Male ass & Mare
    (4) Male horse & Female ass

32. Albinism is
    (1) Sex linked character
    (2) Hereditary character
    (3) Non – hereditary character
    (4) Acquired character

33. Barr body is found in man & associated with
    (1) Male Sex chromosome
    (2) Female auto some
    (3) Male auto some
    (4) Female Sex chromosome

34. Two allelic genes are located on
    (1) The same chromosome
    (2) Two homo logous chromosome
    (3) Two Non – homologous chromosomes
    (4) Any two chromosomes

35. A person meets with an accident & great loss of blood has occurred. There is no time to analyse his blood group. It is safe to transfer blood of group.
    (1) AB & Rh +ve (2) AB & Rh-ve
    (3) O –ve (4) O + ve

36. In human beings the skin colour is controlled by
    (1) Multiple alleles
    (2) Lethal genes
    (3) Polygenic effect
    (4) None of these

37. Match the following & Choose the correct answer.
(A) XYY chromosomes
(B) OX chromosomes
(C) XXY chromosomes
(D) XY chromosomes
(E) XX chromosomes
1. Female
2. Male
3. Criminal Syndrome
4. Kline filter syndrome
5. Turners syndrome

	A	B	C	D	E
1)	I	II	III	IV	V
2)	III	V	IV	I	II
3)	III	V	IV	II	I
4)	III	II	V	IV	I

38. Identify the correct statement.
(A) Blood group 'o' is universal donor
(B) 'AB' Blood group is universal recipient.
(C) Blood Group 'o' can receive blood from 'AB' & AB can receive from 'o'
(D) Blood 'o' can receive from 'o' & AB can receive from all
(i) A is correct B is false
(ii) A + B + C are correct & D is false
(iii) A + D are correct & B is false
(iv) A + B + D are true & C is false

39. A man with 'A' group of blood marries a woman with 'B' group of blood. The possibility of blood group of their children will be
(1) 25% With AB group & 25% with 'A' group
(2) 25% With 'B' group
(3) 25% with 'O' group
(4) All

40. A man known to be victim of Haemophilia marries a normal woman whose father was known to be a bleeder then it is expected that
(1) One fourth of their children will be bleeders
(2) Half of their children will be bleeders.
(3) All their children will be bleeders
(4) None of their children will be bleeder.

41. The scientist who independently rediscovered Mendel's work was
(1) Correns
(2) Tschermak
(3) De Vries
(4) each of these

42. The statement, only one factor of each pair of factors enters a gamete relates to
(1) law of segregation
(2) law of independent assortment
(3) linkage
(4) incomplete dominance

43. A gene is
(1) a sequence of amino acids in a protein
(2) a segment of DNA which synthesizes a polysaccharide
(3) a segment of DNA which synthesizes a polypeptide
(4) a segment of mRNA

44. The typical Mendelian F_2 dihybrid phenotypic ratio is
(1) 9 : 3 : 3 : 1
(2) 1 : 1 : 1 : 1
(3) 3 : 1 : 3 : 1
(4) 3 : 3 : 1 : 1

45. The typical Mendelian F_2 dihybrid genotypic ratio is
(1) 1 : 2 : 4 : 2 : 1 : 4 : 2 : 1 : 1
(2) 1 : 2 : 2 : 4 : 1 : 2 : 1: 2 : 1
(3) 1 : 2 : 2 : 2 : 4 : 2 : 2 : 1 : 1
(4) 1 : 2 : 2 : 4 : 1 : 1 : 1 : 2 : 1

46. All genes present in a population are collectively called
(1) Genotype (2) multiple alleles
(3) gene pool (4) genome

47. All genes present on a haploid set of chromosomes are together called
(1) multiple genes
(2) genome
(3) gene pool
(4) genotype

48. All genes located on a chromosome are called
(1) multiple alleles
(2) linked genes
(3) pleiotropic genes
(4) polygenes

49. A gene which produces more than one phenotypic effect is termed
(1) polygene
(2) pleiotropic gene
(3) epistatic gene
(4) codominant gene

50. An autosome of man is
(1) half chromosome
(2) any chromosome other than X chromosome
(3) any chromosome other than Y chromosome
(4) any chromosome other than X and Y chromosome

51. The diploid number of chromosomes of drosophila melanogaster is
(1) two
(2) four
(3) six
(4) eight

52. The chromosome composition which indicates Turner's syndrome is
(1) 44 + XO
(2) 44 + XX
(3) 44 + XY
(4) 44 + XXY

53. Klinefelter's syndrome is indicated by the chromosomal composition
(1) 44 +XO
(2) 44 + XX
(3) 44 + XY
(4) 44 + XXY

54. The genes which function as dominant genes in one sex and as recessive genes in the other sex are called
(1) sex influenced genes
(2) sex linked genes
(3) sex limited genes
(4) holandric genes

55. Genes which control milk production in mammals are termed
(1) sex linked
(2) sex limited
(3) sex influenced
(4) holandric

56. Genes which are normally not transmitted from fathers to daughters are
(1) sex influenced
(2) Y-linked genes
(3) sex limited genes
(4) X-linked genes

57. Which of the following is determined by a dominant gene in man?
(1) colour blindness
(2) haemophilia
(3) Rh antigen
(4) albinism

58. "Erythroblastosis foetalis" is likely to occur in a foetus resulting from marriage between
(1) Rh^+ woman and Rh man
(2) Rh woman and Rh^+ man
(3) woman of blood group A and a man of blood group B
(4) woman who is a 'Universal Donor' and a man who is a 'Universal Recipient'

59. Rh blood group was discovered by
(1) Landsteiner and Benzer
(2) Benzer and Weiner
(3) Weiner, Landsteiner and Levine
(4) Benzer and Levine

60. Muton is defined as
(1) a unit of mRNA that can damage
(2) a unit of tRNA that can change
(3) a unit of DNA that can change
(4) all of these

61. The genes that determine the blood groups of man are termed
(1) non-allelic genes (2) multiple alleles
(3) epistatic genes (4) pleiotropic genes

62. Epistatic genes are
(1) a pair of allelic genes one of which is dominant over the other
(2) a pair of allelic genes one of which influences the effect of the other
(3) non-allelic genes which interact with each other to influence the effect of one of them
(4) two genes which do not always form a heterozygous pair

63. A pleiotropic gene is
(1) one of several genes all of which produce the same phenotypic effect
(2) a gene that produces more than one phenotypic effect
(3) a gene which is incompletely dominant
(4) one gene of a pair of co-
(5) dominant genes

64. A nucleoside in DNA is composed of
(1) a nitrogen base and deoxyribose
(2) a phosphate base and deoxyribose
(3) a phosphate and deoxyribose
(4) a nitrogen base, deoxyribose and a phosphate

65. "Double helix" model for the structure of DNA was proposed by
(1) Jacob and Monad
(2) Watson and Crick
(3) Morgan and Bridges
(4) Benzer and Levine

66. An operon contains segments of DNA called
(1) cistron and operator
(2) cistron and regulator
(3) operator and regulator
(4) regulator and promoter

67. The initiation codon is
(1) AUG (2) UAG
(3) UGA (4) all of these

68. The codon which does not code for any amino acid is
(1) UAA (2) UAG
(3) UGA (4) all of these

69. The term 'genetic code' refers to
(1) the entire sequence of all triplets bases in DNA
(2) a single codon
(3) all possible triplet base sequences called codons and the amino acids they specify
(4) all possible triplet bases sequences called anticodons

70) One of the following is the sex influence character
1) Diabetes 2) Baldness
3) Development of breast
4) appearance of mustaches & Beard

71) A colour blind man married a woman who is the daughter of a colour blind father and mother homogenous normal vision. What is the probability of their daughters being colour blind
1) 50% 2)100%
3) 75% 4) 25%0

72) DNA finger printing is a method for identifying individuals paternity & forensic work. The DNA can be obtain from:
1) Blood, Semen & Hairs
2) vaginal fluid
3) 1 & 2
4) None of these

73) A woman's father shows IP. but her mother & husband are normally pigmented . What will be the pheno type ratio of her children
1) 50% sons
2) 50% daughter
3) 100% sons
4) 1 & 2

75) A man marries with a normal woman, who is the daughter of Hemophilic father. How many of their children generically get affected.
1) 50% daughters are affected & 50% son are affected
2) 50% son are affected & 50% daughters are normal
3) 50% son & 50% daughters are affected
4) All

76) Assertion (A): Erythro blostosis fetalisis is hemolytic disease of the fetus
Reason (R): It is due to Rh in compatibility between the mother (Rh^-) and the Growing fetus (Rh^+)
1) A is true, R is false
2) A is true & R is true but R is not the correct explanation of A
3) A is true & R is false but R is the correct explanation of A
4) A is true R is true and R is the correct explanation of A

72) One of the following is correct

S. No.	Sex chromosome	Hyperbolic sets of autosomes	x/A	Sexual phenotype
I	xx	AA	1.0	Male
II	xy	AA	0.5	Female
III	xxy	AA	1.0	Female
IV	X0	AAA	0.33	Mata male

1) I & II 2) II & III
3) III & IV 4) IV & I

KEY

1. 1	2. 3	3. 4	4. 2	5. 3
6. 1	7. 2	8. 2	9. 2	10. 2
11. 4	12. 4	13. 3	14. 3	15. 2
16. 2	17. 1	18. 2	19. 2	20. 3
21. 3	22. 1	23. 1	24. 4	25. 3
26. 2	27. 1	28. 2	29. 2	30. 2
31. 3	32. 2	33. 4	34. 2	35. 4
36. 3	37. 3	38. 4	39. 4	40. 2
41. 4	42. 1	43. 3	44. 1	45. 2
46. 3	47. 2	48. 2	49. 2	50. 4
51. 4	52. 1	53. 4	54. 1	55. 2
56. 2	57. 3	58. 2	59. 3	60. 3
61. 2	62. 3	63. 2	64. 1	65. 2
66. 1	67. 1	68. 4	69. 3	70. 2
71. 1	72. 3	74. 4	75. 4	76. 4

17. ORGANIC EVOLUTION

SYNOPSIS

1. Branch of biology which deals with origin of species – Evolution.
2. Modern theory which explain the origin of species was proposed by – Oparin.
3. The theory spontaneous creation was proposed by – Arisk.
4. Biogenetic law was proposed by –Louis Pasteur.
5. Eternity of present conditions – Linnaeus.
6. The term evolution was coined by – Herbert Spencer.
7. Who proposed the origin of life from water – Thales.
8. Who stated that terrestrial animals were evolved from aquatic animals – Anaximander.
9. protein was synthesized in the laboratory for the first time by – S.L. Miller.
10. Fossils are first identified by – Xenophanes.
11. Who stated that universe continuously undergo changes – Haraclitus.
12. The development of complex organisms from simple organism – Organic evolution.
13. Age of earth – 4,500 million years.
14. Age of first life is estimated to be – 2000 million years.
15. The first ever attempt to explain origin of life in an orderly manner was made by – Lamarck.
16. The book published by Lamarck – Philosophic Zoologique.
17. Principle of Lamarck theory – Influence of environment.
    - Theory of use and disuse.
    - Inheritance of acquired character.
18. Example for excess use – Giraffee, was in aquatic bird.
19. Example of disuse – Loss of limbs in snakes, eyes in dwelling amphibians.
20. the principle of Lamarck which is a Subject of control – Inheritance of acquired character.
21. Who disproved inheritance of acquired characters by decandalisation of tall in mouse – August Weismann.
22. Theory of germ plasm was proposed by – August Weismann.
23. the followers of Lamarck are called – Neolamarckist.
24. Noted Neo Lamarckists – Augar, Guier, Smith, Meedogall, Jower, Kamerer.
25. Writer of Zoomania – Erasmus, Darwin.
26. the theory of Natural selection was proposed by – Charles Darwin. Charles Darwin was influenced by population theory proposed by Malthus.
27. Book written by Darwin – Origin of Species.
28. Name of the ship on which Darwin traveled – H.M.S. Beagle.

29. Inlands which influenced Darwin – Galapogus.
30. the birds attracted attention of Darwin – Finch birds.
31. Scientists expressed same views like Darwin – Alfre Rusell Wallace.
32. The Descent of Man and Selection in Relation to Sex was written by – Charless Darwin.
33. Who was familiar as Bull dog of Darwin – Huxley.
34. Pangenesis theory was proposed by – Charles Darwin.
35. Principles of Natural Selection – Prodogality of production, constancy of population, struggle for existence, vaiations. Natural selection survival of the fittest.
36. Who stated Natural selection as survival of fittest – Herbert Spencer.
37. Defects of Natural selection – causes of variation and explained.
    - presence of vestigial organs.
    - over specialization.
38. Neo – Darwinism was proposed by – Seval Wright, Julion Huxley.
39. Example which Devries experimented – Evening primrose (oenothera lamarchkiana).
40. Raw materials for organic evolution – mutations.
41. Heritable mutations- Germinal mutations.
42. Mutations associated with sex chromosomes – Sex linked mutations.
43. Recessive mutations in female can express if they are homozygous.
44. common mutations in man – albinism, hare lip, hyperdactyli.
45. Mutation caused by changed in chromosomal number – Polyploidy – Anuploidy.
46. Structural changes in a chromosome are called – Chromosomal aberrations.
47. Loss of a piece – Deficiency.
48. A part is repeated – Duplication.
49. Exchange of bits – Translocation.
50. Breakage and reverse attachment – Inversion.
    - 2n – 1 - Monosomic
    - 2n + 1 – Trisomic
    - 2n – 2 - Nullisomic
51. Gene mutation – are also called – Point mutations.
52. If mutations are due to chemicals or radiation – induce.
53. Mutagens – X – rays, ultra violet rays, mustard gas, ion etc.
54. Factors causing organic evolution – variations, hereditary isolation, natural selection, mutations.
55. Organs with similar origin, structure but different functional – homologous organs.
56. Example of homologous organs – Fore limb of vertebrates – mouth parts of insects.
57. The modifications according to environment – Divergent evolution.

58. Example of divergent evolution – Homologous organs.
59. Organs differ in origin and structure but functional similar – Analogous organs.
60. Examples of analogous organs – wing of bird and butterfly, fins of fishes and flipper of whale.
61. The similarities in different organisms because of the common habitat – Adaption radiation (Convergent evolution).
62. Examples for convergent evolution – Analogous organs.
63. Animals showing characters of two closely related but different groups – connecting links.
64. Connectine link between Annelida and Arthropoda – peripatus.
65. Connecting link between Reptiles and Mammals – Monotremes.
66. Organ more pronounced in one animals and reduced in the other and functionless – Vestigeal organs.
67. Number of vestigial organs in man – 180 (Widersheim).
68. Moving museum of antiquities – Man.
69. Some vestigial organs of man – Appendix, plica semilunaris, muscles of pinna, coccyx, panniculus carno.
70. Vestigial organs of reptiles – hind limbs of Python.
71. Vestigial organs of whales – tail flukes.
72. When vestigeal organs pronounce in full form and function they are called – Atavistic organs.
73. The Phenomina of development of atavistic organs – Atavism.
74. Example of Atavism – Lion boy, Tail boy.
75. Branch of biology which deals with development of embryo – Embryology.
76. Recapitulation theory was proposed by Ernest hackle.
77. Recpitulation theory states that – Ontogeny repeats phylogeny.
78. Blastula represent – Primordial metazoans.
79. Gastrula represent – Diploblastic animals.
80. Presence of ancestral characters in embryos – recapitulation.
81. Who stated that organisms recapitulate characters of embryo their ancestors but not adults – Von Bayer.
82. Example of recapitulation theory – gill slits in the embryo of man, tail in the embryo of man.
83. Branch of biology deals with study of ancient animals – Palaeontology.
84. Relics of ancient animals present in earth strata – Fossils.
85. Fossils were first identified by – Xenophanes.
86. Documentary evidences of evolution – fossils.
87. Insects are fossilized in – amber.
88. Unaltered fossil preserved in ice – Wooly mammoth – Irish deer.
89. Fossil mine – hane cock pond (America).
90. Forms of fossils – Moulds, casts, coprolites, foot prints.

91. the chart prepared basing on the fossils available in strata – geological time scale.
92. The period without life in earth – Azoic era.
93. The first formed organisms lived during – Archaeozoic era.
94. Era of protozoans and sponges – Proterozoic.
95. higher invertebrates, fishes and amphibians lived during – Palaeozoic era.
96. Age of aves and mammals – Coenozoic era.
97. Age of man –psychozoic era or present era.
98. Fossilization stared during – Palaeozoic era.
99. Golden age of fishes – Devonian.
100. Golden age of mammals – Coenozoic era.
101. Man came into existence during – plestocene.
102. Origin of Modern man – Holocene.
103. Indian fossil man – rama pithicus.
104. Branch of biology deals with functional aspects of organs – physiology.
105. Physical basis of life – protoplasm.
106. physiological similarities – Nature of Hormones.
- Nature of Enzymes.
- nature of Respiratory pigment.

THEORIES OF EVOLUTION

A. Lamarchkism:

1. Jean Baptish Lamarck, a French naturalist put forward the first important theory on organic evolution. He descreibed it in his book 'Philosophic Zoologique', published in 1809.
2. Erasmus Darwin explained the descent of organisms by modifications of one living filament in his book Zoonomia.
3. E. Darwin was the first person who stated that million of years have been required for the process of organic evolution and that all life arose from one primordial protoplasmic mass.
4. According to Lamarck:
    a) Environment has an influence on the form and organization of an organism.
    b) Regular and continuous use of an organ develops it further and organs which are put to disuse degenerate gradually. This is called law of use and disuse.
    c) Acquired characters are inherited by the offspring.
5. Girafee acquired a long neck and long forelimbs due to constant stretching.
6. Snakes lost eyes due to contact disuse.
7. Proteus lost eyes due to disuse in caves.

8. Lamarckism was supported by **Geffory St Hilaire. Robort Chambers and Herbert Spencer,** but opposed by **G. Cuvier and Weismann.**
9. Weismann did decandalisation experiments on rats for 22 generations and proved that the characters acquired by the somatoplasm are not inherited by the offspring.
10. According to weismann only the germplasm is continued from generation to generation. This theory is called **theory of continuity of germ plasm.** The characters which effect the germplasm are transmitted from generation to generation.
11. Boaring of ears and nostrils in Indian women has been continued from centuries but their progeny donot show any trace of holes. Jewish and Muslim boys have been circimised for centuries but this has not resulted in a tendency towards the reduction of perpuse.
12. Castle and Phillips performed transplantation experiments. They transplanted ovary of black female guinea pig into a white guinea female and the recipient Is mated with male guinea pig and progeny is found to be black.
13. Neolamarckists follow the Lamarckism. Neolamarckists are **Dougall, Smith, Tower, Kammerer.**
14. Kammerer worked on proteus anguineus which is a cave amphibian. Pale coloured poorly developed eyed cave amphibian became brown coloured when exposed to light.
15. Mc Dougall conducted learning experiments on rats and he concluded that learning is an acquired character and is inheritable.
16. F.B. Summer reared mice in warm and cold temperatures and found that mice reared in warm temperatures are found to contain long ears and tails and are inheritable.
17. Lindsey subjected cold blooded and warm blooded animals to various environmental conditions and found that some changes in these organisms are inheritable.
18. Kammerer kept black and yellow spotted Salamandra maculosa in yellow box, for years and found that yellow spots become larger and the progeny of these organisms are more yellow in colour.

B. DARWINISM:

1. Charles Darwin traveled on the ship H.M.S. Beagle. He described his journey in 'A naturalist voyage around the world'.
2. he described his natural selectiontheory of organic evolution in his famous book 'Origin of Species'.
3. Darwin was influenced by malthus essay on population written in his paper 'On the principles of populations'.

4. Views similar to those Darwin were expressed Alfred Russel Wallace. He presented his ideas in his paper 'On the tendency of varieties to depart indefinitely from original stock'.
5. Darwin was also influenced by an essay on the **'Principles of geology' by Charles Lyell.**
6. Wallace devised a chart for explaining natural selection.

OBSERVED FACTS	CONCLUSION
i. enormous power of fertility in organisms ii. Roughly constant population of each species.	Struggle of existence
i. Struggle for existence. ii. Variations and heredity	Survival of the fittst Or natural selection
i. Survival of the fittest. ii. Continous and gradual improvement of organisma generation after generation.	Origin of new speices.

7. According to Malthus population increase geometrically but food and other resources increase in arithmetic ratio.
8. Abnormal increase of the population of any one species Is not observed in nature, because of offspring perish in good number.
9. Darwin concluded that the most fit organisms with beneficial variations will survive. He called this phenomenon as natural selection.
10. Interspecific struggle found with in the animals of same species. It is the most severe check on the rate of reproduction.
11. Interspecific struggle found among the animals of different species. The lower animals are more affected by this.
12. Environmental struggle: All the animals struggle against the natural calamities.
13. Variation are harmful, useful or useless. Organisms with harmful variations will be eliminated in the struggle. Useful variations are significant and make organism fit in the struggle. The useless variations are insignificant regarding evolutionary view point.
14. The original idea of survival of the fittest was proposed by Herbert Spencer. The same was called as natural selection by Charles Darwin.
15. Herbert Spencer coined the phrase "'survival of the fittest". Darwin offered the theory of artificial selection to explain certain non benefitial variations in domesticated animals.
16. Darwin suggested the theory of sexual selection to explain the occurrence of certain nonbeneficial variations in one of the sexes of a species.
17. Darwin also offered the theory of pangenesis. It states that all the organs in the body of animals produce miniature of themselves. These miniatures are called panagenes or gemmules.

18. Pangenesis theory was disproved by Galton.
19. Darwin neglected the importance of mutations in the process of evolution. He considered them as sports of nature.
20. Examples of natural selection are industrial melanism, resistance of mosquitoes to pesticides and sickle cell anemia.
21. Industrial mealanism was observed in peppered moth. Kettlewell's experiments on Biston betularia (pepered moth) regarding the industrial melanism illustrates that nature offers a discriminatory survival value to certain organisms.
22. Biston betularia is a light coloured. Carboia is mutant form with dark coloured wings. After industrialization Carbonia increased to 90%.
23. With the repeated use to DDT the resistant mosquitoes multiplied and the succeptible mosquitoes were eliminated by D.D.T.
24. heterozygous sickle cell anaemia is favoured by nature as the sickle cells kill the malaria parasite.
25. J. lederberg and E. Lederberg conducted Lederberg replica experiment to support the Darwinism.
26. Objection to Darwinism:
    a) It could not explain the origin of variations but recognized the presence of variations.
    b) The minor variations are non adaptive in nature. How these are favoured by nature.
    c) Over specialization of organs like antlers in deers and canines in tigers cannot be explained.
    d) No distinction between heritable and nonheritable variations.
    e) Not in all cases the intermediate forms exist.
27. Darwin believed that the adaptations result from mainly by single process, natural selection. New species are evolved due to the cumulation of minor variations in the various generations.
28. Neodarwinists are T.H. Huxley, Herbert Spencer, D.S. Jordon, Asa Gray, e. haeckel and Weismann.
29. Weismann rejected Darwin theory except its principle element of naural selection.
30. Neodarwinists believe that adaption results mainly from multiple forces and natural selection in only one among them.
31. Neodarwinians also believe that characters are not inherited as usch but there are characters terminers, the determiners or bihores, which control only the development. The ultimate character would result out due to interaction of the determines and the environment during development.
32. Variation are due to mutations, gene recombinations, migrations and genetic drift.
33. Genetic variations in populations are due to isolation mechanisms.
34. Changes in the gene frequencies lead to speciation.

35. The selection of animals with desired characters is the artificial selection Eg: selection of wild jungle fowls by man.
36. Sexual selection theory states the origin of secondary sexual selection characters. Males are more in populations. Females always choose the males with brilliant plumage or ornamentations. These character have no survival value, but established as they are sexually selected.

C. MUTATIONS:

1. Theory of mutations was proposed by Hugo von De vries.
2. De vries worked on Oenothera lamarckiana (evening primrose).
3. Mutation are sudden changes. These are considered to be the raw material for evolution.
4. Bateson used the terms discontinuous variations to refer theses changes.
5. Mutations are sudden changes in geneotype, involving quantitative and qualitative alterations in the genetic material itself.
6. The normal condition of the organism is called wild type and those in which mutations occur is called mutant forms.
7. Some of the mutant varieties on record are Ancon sheep, albino rats, hornless cattle and racing horses.
8. Mutations according to the types of cells are somatic mutations and germinal mutations.
9. Somatic mutations occur in non reproductive cells. These mutations are insignificant as they perish with death of the organism. Common somatic mutations in man are unilateral retinoblastoma in heterochromia of the iris.
10. Germinal mutation occur in the germinal cells. These are heritable and of immense germinal significance. These are the raw materials for evolution.
11. Mutations according to the size and quantity are point mutation or gross mutations.
12. Point mutations are the gene mutations. These are the changes in a nucleotide or nucleoside pair.
13. Point mutations are classified into deletion mutations, insertion mutations, substitution mutations.
14. In the deletion mutations single gene or nucleotide pair breaks common in bacteriophages.
15. Insertion or addition mutations are caused due to the addition of one or more extra nucleotides to a gene.
16. Substitution mutations are due to the substitution of one nucleotide by other. When one purine base is substituted by otherpurine base, it will be called transition. When purine is substituted by pyramidine base it will be called transversion.

17. Gross mutations are the mutations in which changes occur in more than one nucleotide pairs or in the entire gene or in the entire chromosome or in the sets of chromosomes. These are due to the rearrangement of genes within the genome and may involve the process like deletion, inversion and translocation.
18. The breakage or of loss a part of chromosome is deletion.
19. A piece of chromosome having the same genes replicating itself is known as duplication.
20. The breakage of a part of chromosome and reunion of the same in a reverse order is inversion.
21. The separation of a part of chromosome and the union of the same with another chromosome is called translocation.
22. Mutations according to the types of chromosomes are autosomal and sexchromosomal mutations.
23. Mutations according to their origin are spontaneous mutations and induced mutations.
24. Spontaneous mutations suddenly occur in the nature. These are also called background mutatios.
25. Induced mutations are induced artificially in the living organisms by exposing them to abnormal environment such as radiations, some physical conditions and chemicals.
26. Mutations according to the directin are forward mutations and backward mutations.
27. In an organism, when mutation create a change from wild type to abnormal phenotype, the mutations will be called forward mutations. Most of the mutations are this type.
28. When the mutations create a change by which abnormal phenotype becomes the wild type the mutation will be called backward or reverse mutation.
29. Mutations according to magnitude of phenotype are dominant mutations, recessive mutations, isoalleles and lethal mutations.
30. Dominant mutations have dominant phenotypic effect. Eg: Aniridia condition man, in which iris of eye is absent. These mutations are rare in nature.
31. Most of the mutations are recessive mutations. The phenotypic effect of mutation of a recessive gene is seen only after one or more successive generations, when the mutant gene is able to recombine with another similar recessive gene.
32. Some mutations alter the phenotype of an organism so slightly that they can be detected only by special techniques. Mutant genes that cause slightly modified phenotypes are called isoalleles. They produce identical phenotypes in homozygous or heterozygous combinations.
33. Some mutations result in the death of the organism concerned and are called lethal mutations and the genes are called lethal genes.

34. The genes seldom mutate. The genes that can mutate are called mutable genes. The mutability of some genes is influenced by other genes which are called mutator genes.
35. The agents inducing the mutations are called mutagenic agents. These includes radiations, chemicals and temperature.
36. Most natural mutations are caused by cosmic rays. The radioactive materials like theorem, radium and uranium are also mutagenic radiation agents.
37. Kerala in India has the high intensity of radiations because of high concentrations of thorium in the soil.
38. Mutations can artificially be induced by X rays, gamma rays, a;pha rays, beta rays, electrons protons and other fast moving particles.
39. Chemical mutagenic agents are mustard gas, nitrogen mustard, sulphur mustard, phenol, formaldehyde, nitrous acid, peroxide, caffeine and benzylpyrene. Chemical mutagens cause mutation when it enters into the nucleus of the cell.
40. Formaldehyde, nitrous acid and peroxides are naturally produced in the body.
41. An increase of temperature by 10 degrees celcius increases the mutation rate by two to three times.
42. Some mutagenic chemicals like acridine get inserted between two bases of DNA causing their loss or addition. This causes the lateral shift of the coding frames. These mutations are called as gibberish or frame shift mutations.
43. The mutant strains of microorganisms and higher plants and animals which have lost the ability to synthesize one or more essential compounds are known as autotrophs or nutritional mutants. The original stains in which they synthesize enzyme are called prototrophs.
44. nutritional mutants were first isolated in Neurospora by Beadle and Tatum.
45. Mutations which have more than one phenotypic effect are known as Pleiotraphic mutations.
46. Mutations are chromosomal or genomatic and gene mutations.
47. Genomatic mutations are the mutations in the genome. These are polyploidy and anuploidy or heteroploidy.
48. Organism with more than two sets of chromosomes are polyploidy. These are triploid, tetraploid, pentaploid etc.
49. If the chromosomal set are all of the same kind, derived from the same species, it is said to be autopolyploidy.
50. If the chromosomal set are of the different kind, derived from the different species, it is said to be allopolyploidy.
51. The mutatioins in the number of chromosomes in a haploid or diploid chromosomes, is called anuploidy or heteroploidy.

Monosomic	2n – 1
Trisomic	2n _ 1
Tetrasomic	2n + 2
Monosomic	2n – 1
Bullisomic	2n – 2
Double monosomic	2n – 1 – 1
Double tetrasomic	2n + 1 + 1

52. Anuploidy is because of nondisjunction of chromosomes.
53. Functional gene in which mutation occurs is called muton.

1. Genetical similarities - Nature of D.N.A. & R.N.A.
   - Details of mitotic and meotic divisions
   - Nature of protoplasm
   - Cellular organization of organs.
2. Examples of bio-chemical recapitulations:
   - Excretion of Ammonia by tadpole of frog like fish.
   - Excretion of Ammonia, urea, acid by embryo of bird.
3. Precipitation tests are introduced by – C.H.F. Nattal.
4. Experimental animal for precipitation tests – Rabbit.
5. Basis for precipitation tests – Antibody – Antigen reaction.
6. Animal closely related with man – Chimpanze..
7. Whales are closely related with – pigs.
8. Branch of biology deals with animal distribution – Zoogeography.
9. animals of urasia are similar to – North America.
10. North America is separated from urasia by – Baring straight.
11. Globe was divided into regions basing on distribution by – Sedatter.
12. Division of earth into regions was recently did by – Darligton.
13. The region in which India falls – Oriental region.
14. Euthopian region includes – Africa, Madagascar.
15. Nearctic region – North America, Greenland.
16. Arctic region – South America.
17. Palaearctic region – Europe and part of Asia
18. Australian region – Australia.
19. Region with marsupial mammals – Australia.
20. Animal of Arctic pole – Polar bear.
21. Animal of Antarctic pole – Penguin bird.
22. Example of discontinuous distribution – Dipnoi, Peripatus.
23. Branch of biology deal with classification organisms, - Taxonomy.
24. Father of Taxonomy – Linnaeus.
25. Founder Taxonomy – Aristotle.

26. Systema Naturae was written by – Linnaeus.
27. Lowest taxon in Taxonomy – Species.
28. Population which can inter breed and beget fertile progress – Species.
29. Species was first defined by – John Ray.
30. Basis for the classification – Structure similarities.
31. number of species identified – 10,00,000.
32. first chordates are evolved during – Ordovecian.
33. Animals are named in which language – Latin a Latinized English.
34. The first name of animals represent – Genetic.
35. The second name represent – Species.
36. Chromosomal composition of man – 44 + XY.
37. Chromosomal composition of woman – 44 + XX.
38. Deficiency of onel 'X' chromosome from women (XO) – Turner's syndrome – Female with degenerate ovaries.
39. Presence of '21st' chromosomes thrice – Down's syndrome.
40. presence of '18th' chromosome – Edward syndrome.
41. Addition of extra 'Y' chromosome in man "XYY' – criminal syndrome.
42. The study of undesirable traits in man – dysgenies.
43. Branch of genetics dealing with improvement of human race – Eugenics.
44. Sex linked inheritance – Haemophelia, colour blindness.
45. Sex influenced inheritance – Baldness.
46. Sex linked inheritance – Production of work beard.
47. Genes whose action result in death in a standard environment – Lethal genes.
48. An animal in which one part is phenotypically male and other female – Gynandromoph. Bilateral, Antoria - Posterior, sexpebled.

ORGANIC EVOLUTION

1. The Book "Origin of species" was written by
   (1) Lamark
   (2) Charles Darwin
   (3) Erasmus Darwin
   (4) Hugo devries

2. Darwin called the survival of the fittest as
   (1) Variations
   (2) Natural selection
   (3) Arrival of the fittest
   (4) None of the above

3. Industrial Melanism is well illustrated by
   (1) Biston betularia (2) Cock
   (3) Rats (4) Drosophila

4. Neo Darwinism was explained by
   (1) Kettle well (2) Kamarer
   (3) Malthus (4) Mendel

5. Wings of insects, birds, bat are good examples of
   (1) Homologous (2) Analogous
   (3) Non adaptive (4) All

6. Organims of different groups moving to a common environment
   (1) Divergent evolution
   (2) Convergent evolution
   (3) Organic evolution
   (4) Adaptive radiation

7. Plica, Penniculus, Vermiform, Appendix, Coccyx, hind limb bones of python are
   (1) Adaptive organs
   (2) Non adaptive organs
   (3) Vestigeal organs
   (4) None of the above

8. Number of vestigial organs in Human body are
   (1) 206 (2) 180
   (3) 160 (4) 360

9. Identify the correct statement regarding the Homologous organs
   (1) Organs originally similar but functionally different
   (2) Organs originally dissimilar but functionally similar
   (3) It is a type of divergent evolution
   (4) Fore limbs of vertebrates & mouth parts of insects are the examples of Homologous organs
   (5) Wings of Butterfly, Bat & Birds are the examples of Homologous organs
   (1) i, ii, v (2) i, ii, iv
   (3) i, iii, iv (4) ii, iv, v

10. Match the following & Choose the correct answer.
   (A) Connecting link between reptiles, birds.
   (B) Connecting link between Annelida, Anthropoda
   (C) Connecting link between Reptiles & Mammals
   (D) Connecting link between Plants & Animals
   (E) Connecting link between Non chordates & Chordates
   1) Duck billed platypus
   2) Balenoglasus

3) Euglena
4) Archepteryx
5) Peripatus

	A	B	C	D	E
1)	IV	V	II	I	III
2)	I	II	III	IV	V
3)	IV	V	I	III	II
4)	V	IV	I	III	II

11. Evolution is defined as
(1) History of race
(2) Development of race
(3) History & development of race with Variations
(4) Progressive history of race.

12. Appearance of ancestral characters in the new borns
(1) Homologous (2) Atavism
(3) Anobolism (4) Analogous

13. One of the following is known as living fossil found in Newzealand
(1) Limulus (2) Coela canth
(3) Sphenodan (4) Archeopteryx

14. As evident from records, which era had no life
(1) Azoic (2) Proterozoic
(3) Paleozoic (4) Caenozoic

15. A species inhabiting different geographical areas is known as
(1) Allopatric (2) Sympatric
(3) Biospecies (4) None

16. One of the following brings out artificial mutation
(1) X – rays
(2) Mustard gas
(3) Ultra Violet rays
(4) All

17. Descent with change or modification is the theme of
(1) Mutation theory
(2) Organic evolution theory
(3) Variation theory
(4) Heredity theory

18. Which of the following is the recapitulation theory
(1) Presence of Vestigeal organs
(2) Wings of Birds & insects
(3) Presence of gills in Tadpole
(4) None of these

19. Larmarks theory of evolution is based up on
(1) Inheritance of acquired characters
(2) Use & disuse
(3) Effect of environment
(4) All of these

20. Which of the following acquired characters are heritable
(1) Somatic (2) Germinal
(3) Both of these (4) None of these

21. Isolation results in
(1) Recapitulation (2) Reproduction
(3) Speciation (4) Barriers

22. Coenozoic era is called
(1) Age of fishes
(2) Age of reptiles
(3) Age of mammals
(2) Age of birds

23. The theory of continuity of germ palsm was profounded by

(1) Lamarck (2) Weismann
(3) Wallace (4) Hugo devries

24. Ontogeny repeats phylogeny (Biogenetic law) was proposed by
(1) Ernst Hackel
(2) Erasmus Darwin
(3) Lamarck
(4) Van baer

25. Who established the precipitation method of blood tests for finding at the inter relationship among different animals
(1) Lonarde vansel (2) Foxon
(3) Haeckel (4) H.F. Nuttel

26. Philosophic Zoologique was written by
(1) August Weismann
(2) Charles Darwin
(3) Lamarck
(4) Sir Francis Galton

27. Match the following & Choose the correct answer.
(A) Philosophique Zoologique
(B) Historia animalium
(C) Origin of Species
(D) Zoonamia
(E) Systema naturae
1) Erasmus Darwin
2) Carolus Lineus
3) Lamarck
4) Aristotle
5) Charles Darwin

	A	B	C	D	E
1)	III	IV	II	I	V
2)	III	IV	V	I	II
3)	IV	V	III	II	I
4)	III	V	IV	I	II

28. Mutation which have more than one phenotypic effect are known as _____ mutation
(1) Gene mutation (2) Pleotropic
(3) Environmental (4) None

29. Gene mutation changes the heritable phenotypic characters by altering
(1) The sequency of templates of RNA synthesis
(2) The sequency of the RNA in Cytoplasm
(3) The Sequence of Amino acids of protein formed in parents
(4) The somatic characters of parents.

30. Along with Darwin who proposed natural selection theory
(1) August Wiesmann (2) Wallace
(2) Herbert Spencer (4) Lamarck

31. One of the several objections to natural selection theory of Darwin is
(1) Acquired characters are not inherited
(2) Accumulation of small variation is not possible
(3) Large variations are harmful
(3) Many animal posses characteristics of inutility & even those that are positively harmful.

32. The following are the statements about vestigial organs.
(A) The organs were functioning earlierbut now it is non functional is called vestigeal
(B) Man is known as the "Moving museum of Antiquities"

(D) Human hands & legs are vestigial organs
(E) Wings of birds & mouth of python is vestigial
(1) A & B are correct.
(2) B & D, C are correct.
(3) B & C are correct, D & E are false.
(4) 1 & 3 are correct.

33. The golden age of reptiles
(1) Paleozoic (2) Coenozoic
(3) Mesozoic (4) Psychozoic

34. Abiogenesis means
(1) origin of life from non living organism
(1) origin of life from living organisms
(2) origin of molecules & protoplasm
(4) Spontaneous generation

35. Which one of the following biologist gave the most logical Bio-chemical theory of origin of life
(1) Oparin (2) Stanley Miller
(3) Haeckel (4) Orey

36. Which one of the following periods does not belong to the coenozoic era
(1) Eocene (2) Oligocene
(3) Plicene (4) Devonion

37. The earliest evidence of life on the earth is
(1) '6' million years ago
(2) 300 million years ago
(3) '3' billion years ago
(4) '6' billion years ago
(3) Coenozoic (4) Psychozoic

39. Match the following & Choose the correct answer.
(A) Biogenetic law
(B) Mutation
(C) Germ plasm
(D) Biogenesis
(E) Pangenesis

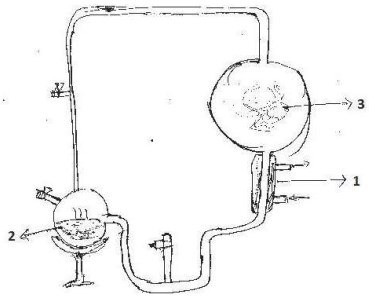
1) August Weismann
2) Darwin
3) Louis Pasteur
4) Enust Haeckle
5) Hugo devries

	A	B	C	D	E
(1)	IV	V	III	I	II
(2)	IV	V	II	I	III
(3)	IV	V	I	III	II
(4)	V	IV	III	II	I

40. The chance of elimination of a gene from a small population is an example of
(1) Selection Pressure
(2) Speciation
(3) Genetic Drift
(4) Adoptation

41. Theory of abiogenesis is believed by the scientist
(1) Aristotle, Thales
(2) Plato & Von Helmant
(3) Darwin & Katalvell
(4) 1 & 2

42. Find the correct series of names



(1) Water, Heat source
(H_2O, CH_4, NH_3, H_2)
(2) Heat source, condenser
(H_2O, CH_4, NH_3, H_2)
(3) Condenser, Water,
(H_2O, CH_4, NH_3, H_2)
(4) Condenser, Electrodes, Water & Heat source

43. Name the moth which is used by Barnard Kettlevell, for practical proof of Industrial melanism in Natural selection.
(1) Bombyxmori
(2) Musca domestica
(3) Biston betularia
(4) tse tse fly

44. Assertion (A): Changes in the structure of chromosomes is chromosomal mutations
Reason (R): Chromosomal mutations occur due to deletion, addition, duplication & inversion of chromosomes.
(1) A is true R is false
(2) A is true R is true, but r is not the correct explanation of A
(3) A is true, R is true but R is the correct explanation of A
(4) A is true R is false but R is the correct explanation of A.

45. The existence of deliterious genes with in the population is called.
(1) Genetic drift
(2) Genetic load
(3) founder effect
(4) Bottle neck effect

KEY

1. 2	2. 2	3. 1	4. 1	5. 2
6. 2	7. 3	8. 2	9. 3	10. 3
11. 3	12. 2	13. 3	14. 1	15. 1
16. 4	17. 2	18. 3	19. 4	20. 2
21. 3	22. 3	23. 2	24. 1	25. 4
26. 3	27. 2	28. 2	29. 3	30. 3
31. 4	32. 4	33. 3	34. 1	35. 1
36. 2	37. 4	38. 4	39. 3	40. 3
41. 4	42. 3	43. 3	44. 3	45. 2

18. APPLIED BIOLOGY

1. Aqua Culture

Culturing of aquatic organisms is named aqua culture; culturing or growing of organisms in sea water is named as Maoriculture.

If organisms are cultures in brackish water is called brackish water aqua culture.

If the fishes are cultured in water is called Pisciculture.

If Crab is cultures called crab culture

If the pearls oyster edible oyster are cultured in water is called oyster culture or pearl culture.

The method of artificial pearl culture is invented by a Japan hailing scientist "Kokichi Mikimoto" fin fishery capturing and culturing of fin fishes is called fin fishery.

Culturing of prawn / shrimp is called prawn / shrimp culture.

Prawns are cultured in fresh water & marine water. Eg. of fresh water prawn is palaeman,

Eq. of marine water prawn is peaneus.

Sea weed culture, culturing of sea weed is called Sea weed culture.

Shell Fishery : Culturing of shell organisms like Molluses, Crabs etc. is called Shell fishery.

Organisations:

CMFRI	:	Central Marine Fisheries research Institute – Cochin.
CIFA	:	Central Institute of Fresh water Aqua Culture, Kausalyaganga, Orissa.
CIBA	:	Central Institute of Brackish Water Aqua Culture Chennai.
CICFRI	:	Central Inland Culture Fisheries Research Institute, Barrakpore, Kolkata.
MPEDA	:	Marine Products Export Development Authority (Prompting the culture Fishery activities in India)
SIFT	:	State Institute of Fishery Technology, Kakinada, A.P.

Nutritional & Commercial Values:

Fishes, Prawns, Lobsters, Crabs, Mussels, Oysters and Squids are edible a 100 gram of fish meat contains
15 to 22% protein.

0.5 to 20% fats.

150 to 800 Mg of Calcium.

20 to 700 Mg of Phosphorus.

4 to 20 Mg of Iron & Other Minerals, Vitamins.

100 to 900 K.Cal of Energy.

Fish Meat is rich in essential Amino Acids like “Methionine & Lysine” which are important for brain.

Shark liver oil contains Vitamin A

Cod Liver oil contains Vitamin D & water soluble vitamins.

Fish meat is the best source for heart patients without cholesterol.

Omega 3 (W_3) Fatty acid (Cholesterol reducing) is present more in marine fishes like in the oil of Sardines & Tunas.

Oil extracted from oil sardine is used industrially.

Fish guano (Solid Waste) is used as Fertilizer.

Fish Meal is prepared from scrap, fish is used as source of animal protein in poultry feed.

Shagreen (Skin of Shark) is used as an abrasive.

Pearl oysters are cultured for the production of pearls which have economic value.

Fish Culture:

Fishes are cultured by the following stages:

1. Breeding,
2. Hatching

3. Pond Management:

a) Nursery Pond
b) Rearing Ponds.
c) Stocking Ponds / Marketing Ponds.

Major Carps:

Catla Catla, Labeo Rohita, Cirhinus mirigala, ophiocephalus (Murrels)

Exotic Carps : Silver Carp, Gross Carp etc.

Mono Culture : Culture of single species in one pond.

Poly Culture : Culture of compatible species together in pond .
Eq. Culturing of Rohus, Mirigal in one pond is called poly culture.

Integrated Culture: is a commodity farming two or more economically important organism are farmed together on a common Infra Structure base,.

Eg. Poultry cum Pisci culture & Paddy cum Pisci Culture etc.

Poultry:
Commonly the rearing of chicks (Broilers & Layers) is called poultry.

The word poultry farming is also applied to the raising of wide variety of several species of domesticated birds viz chickens, turkeys, ducks, geese, guina fowls, pigeons. Peafowls, quails, pheasants and emus.

In India it is mainly related to the rearing of Birds like chickens & ducks.

India ranks 5th in the world egg production , Andhra Pradesh ranks first among the Indian states in poultry farming.

IVRI : Indian veterinary research institute, Izat Nagar developed the fast growing broiler strains.

NECC : National Egg Coordination Committee farmed in 1981 by the poultry farmers.

NABARD : National Bank for Agriculture & rural development provides financial assistance for poultry farming.

National Value of Poultry Products:

1. Food value of Egg: 100 gms of egg contains 13.3% protein, 11.5% Fat, 173 Kcal Energy, 27 mg Ca, 102 mg Phosphorus. Egg contains Vitamin A, D & Riboflavin.

Food value of Chicken (Broiler Bird)

100 gms of meat chicken contains 20% protein, 2.5 % fat, 14 mg calcium, 200 mg phosphorus & 109 Kcal energy.

Biological value: is defined as the percent of the nitrogen uptakes & Nitrogen lost, as Nitrogen is the Integral Component of Proteins.

$$BV = \frac{\text{Retained Nitrogen}}{\text{Absorbed Nitrogen}} \times 100$$

Where
Retained Nitrogen =Nitrogen in take (Nitrogen lost through faeces + Nitrogen lost through urine)

Absorbed Nitrogen = Nitrogen intake – Nitrogen lost through Faeces.

PER (Protein Efficiency Ratio) : it is used to measure amount of protein utilized in the growth.

$$PER = \frac{\text{Weight Gain}}{\text{Intake Protein}}$$

Debeaking :Clipping 1/3rd the upper beak in young chickens is called debeaking. The first debeaking is to be done as the tenth day and the second debeaking at the age of 13th or 14th week.

Cannibalism:Eating of same species is called Cannibalism. In birds often it is seen peaking of the exposed cloaca of bird by other bird in a flock. It is also called Ven pecking. Some times bird are pecking feathers & layed eggs etc.

Dubbings :Pruning of combs & wattles in the poultry birds is called dubbing.

Broodiness :The instinct of the female bird to brood eggs is called Broodiness.

Prolapse :Falling down of uterus containing eggs is called Prolapse.

Culling :The removal of unproductive, cannibalistic & sick birds from the flock is called culling.

Deworming :Treating the sick birds for the expulsion of intestinal parasites is called deworming.

Poultery Diseases: Poultry disease are transmitted mostly by air water, feed, droppings, feathers, hatches & insect vectors or by directly contact. Here viral bacterial & fungal diseases are discussed.

Viral Disease:

Ranikhet Disease : it is caused by virus paramyxo virus, highly pathogenic & common at all ages. Causing mass mortality. Symptoms are coughing & complete or partial paralysis.

Mareks Disease: Highly infections disease caused by virus of herpes group. Mostly affects an two to four month old birds, characterized by enlargement of sciatic nerve, enlargement of spleen etc.

Gumboro Disease: (Infectious bursitis) contagious disease, spread through contaminated feed & water. It is caused by IBD (Infectious Bursal Disease) Virus. Symptoms: loss of appitite, white diarrhoea & enlargement of bursa fabricus.

Bacterial Disease:

A) **Fowl cholera** caused by Pasteurella aricida bacteria. Characterized by yellowish coloration of the droppings followed by greenish diarrhea. Pin point foci on liver & pin point hemorrhages pericardium & bluish discoloration of combs. Penicillin & Tetracycline are effective for treatment.

B) **Infections coryza (Roup Disease)** caused by haemophilus gallinarum, infects through feed and water. Symptoms are Nasal & Eye discharge with foul smell. Acute respiratory problem, inflamed & swollen eyes.

C) **CRD (Chronic Respiratory Disease)** caused by myco plasma gallisepticum. Transmits through eggs, nasal discharge & droppings. Characterized by sneezing, swollen sinuses, respiratory distress, snoring & inflamed eyes.

Fungal Disease :

A) **Aspergillosis (Brooder Pneumonia)** caused by aspergillus fumigatus. Infection causes through inhalation of fungal spores. Difficulty in breathing, congested lungs with nodules are symptoms. This disease mostly affects the brooders, copper sulphate is given with drinking water for treatment.

B) **Aflatoxicosis** caused by aspergillus flavus, spreads through contimanated food & water. Symptoms are reduced immunity & susceptibility to infections.

C) **Thrush (Moniliasis)** caused by odium albicans (monilia) it is an intestinal disorder, lesions in the mouth & gut occurred.
Nystatin is used for treatment to this disease.

BIO TECHNOLOGY

Bio technology is the controlled use of biological agents like micro organisms or certain cellular components for beneficial purposes.

Or

Any technique in which a living organism is used to produce a useful product or desirable chemical change.

The Bio Technologist Herberl Boyer & Stanly Cohen were awarded the 1996 Lemelson- MIT prize for Invention & Innovation.

rDNA : Recombination DNA this technology involves breaking a DNA moleculeat desired places. Isolation & Insertion into another DNA Molecule. The product thus obtained is called rDNA.

A restriction fragment containing desired base sequence (desired gene) can be identified by southern blot technique. This DNA is to be cloned is called Donor DNA.

Chimeric DNA : complementary sticky ends of Donar DNA & Vector DNA are joined by using an enzyme ligase to form a hybrid DNA called rDNA or Chimeric DNA.

rDNA technology involves 6 steps:-

i) Isolation of Donar DNA for cloning.

ii) Isolation of vector.

iii) Formation of Chimeric DNA.

iv) Uptake of Chimeric DNA

v) Selection of the cells containing Chimeric DNA.

vi) The genetically engineered bacteria are propogated in large quantities & the product generated by the transplanted gene is recovered from the culture.

Exo nucleases cut the terminal ester bonds.

Endo nucleases cut the internal ester bonds. Restriction Endo nucleases are the molecular scissors in rDNA technology.

Endo nucleuses cut DNA with blunt ends.

The sequence that read the same on both strands are palindromes.

DNA ligases are molecular glue gum, they are legate to two ends of DNA.

Vecotors, plasmids, casmids & bacteriophages are molecular vehicles.

PCR (Polymerase Chain Reaction) involves three phases.

1. De naturation.
2. Annealing
3. Extension.

rDNA & PCR technology is used in producing vaccines interferrons, hormones & Mono clonal Antibodies.

Micro organisms are also used industrially to produce Alcohols, Acids, Vitamins, Antibiotic & Enzymes.

Types of Vaccines:

1. **Attenuated whole agent vaccine:** They contains live micro organisms that have been cultured under conditions & make disable their virulent properties.
   Eg:Vaccines are used for Yellow Fever, Measles, Rubella & Mumps.

2. **In activated whole agent vaccine :** this type of vaccines in which previously virulent property having organisms are killed by heat or chemicals.
   Eg. Flu, Cholera, Bubonic plague & Hepatitis A.
3. **Toxid Vaccines** contains toxoid which are in activated exo toxins from micro organisms.
   Eg. Tetanus, Diptheria.

4. **Component Vaccine or Sub unit Vaccine :** Rather than introducing an in activated or attenuated micro organisms to an immune response.
   Eg. HBV & HPV etc.

5. **Conjugate vaccine**
   Eg. Haemophilus influenza type B vaccine.

6. **Recombinanl vector Vaccines :** by combining the physiology of one micro organism & the DNA of the others, immunity can be created against disease that have complex infection process.

7. **DNA vaccines** created from an infectious agent is DNA called DNA vaccine.

Interferon's : are small glycoprotein's produced by the viral infected animal cells as means of defense to produce antiviral state in the other cells.

Monoclonal Antibodies: Antibodies produced by a clone of specific lymphocytes are called monoclonal antibodies. The technique of hybridization of somatic cell is called **Hybridoma Technology**.

B Lymphocytes are fused with a myeloma cell (Cancer) to produce a hybridoma cell.

Mono clonal antibodies are useful diagnostically to detect HIV, HLA & Immune responses etc.

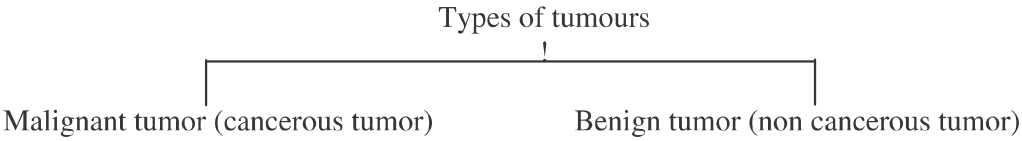
CELL CYCLE REGULATION

(Cancer Biology & Stem Cells)

- The Interphase & division phase are the two phases of the cellcycle
- Interphase is the longest phase. It is sub divided into G1, S & G2 phases.
- G1 phase cell prepares to replicate DNA
- In 'S' phase DNA is replicated
- G2 phase is the preparatory phase for the division
- Cell cycle is regulated by enzymes are Kinases & Cyclins
- P53 proteins are also regulate the cell cycle.
- The three checkpoints of cell cycle regulation are G1, G2 & final check point.
- Mcdk cyclin complex act as G2 checkpoint.
- Paul Nurse, Le land Hartwell & Tim Hunt were awarded Nobel prize in medicine for the year 2001 for their discovery of cdc gene mutants & cell cycle regulation.
- The research of cell cycles has passed the possibilities of cancer treatment & skin repair without grafting.

Cancer Biology:

Cells begin to grow & divide erratically resulting in a mass of cells termed as tumors.
Neoplasm: The abnormal mass of cells is referred to as neoplasm.
Cancer: Cancer is a group of syndromes that are caused by mutations in somatic cells.
Study of Tumors is called Oncology



Malignant Tumor: These are tumors from which cells can detach & migrate to other parts of the body. When they give rise to secondary tumors these are harmful & lethal.

Benign Tumors: These are small, localized with a fibrous outer capsule. They do not exhibit metastasis & this tumor cell never migrate to other parts of the body. These tumor are harmless & can removed by simple surgery.

Cadherins: Cadherins are the intercellular adhesion protein molecules that play a part in keeping cells together. In cancer cells these protein molecules partly or entirely missing.

Metastasis: The ability of canceric cells to spread to other areas of the body is called metastasis.

There are three stages of cancer:
1) Initiation 2) Promotion 3) progression

Types of Cancers:

1) Carcinoma: are malignant tumors of the epithelial cells of cancers of glandular tissues, brain, skin, kidneys etc. (85%)
2) Sarcoma: malignant tumors of connective tissue or organs that originate from mesoderm. Eg: bone, cartilage, blood vessel & muscles cancers etc.(2%)
3) Leukemia: Malignant tumors of stem cells of haemopoitic tissues. Eg: Chronic myclocytic leukemia, Acute T' cell leukemia (4%)

Carcinogens: are causative agents of cancers

Oncogenes; Genes that have the potential of causing tumors are called oncogens or tumor inducing genes.

Types of Oncogenes:

a) Viral oncogenes: These are carried by retroviruses
ii) Cellular oncogenes: (In host cells)
Proto oncogenes is a normal gene that can become a cellular oncogen, code for protein that can help to regulate cell growth & differentiation.
iii) Inactivation of tumor suppressor genes: Genes that suppress the activity of oncogenes are called tumor suppressor genes. Eg: Gene p53 codes for a protein called P53 protein that suppresses the tumor formation.

Mutations in DNA Repair Genes;

Sometimes DNA repair genes become Non functional due to mutation or deletion of that part of the DNA. Such conditions lead to DNA repair syndrome & can result in a cariety of cancers.

Some times Neutrophil granules secrete free radicals that damage DNA.

Cancers can be induced by different pollution factors like Radiation, exposure to different carcinogenic agents like dioxins, benxopyrenes, heavy metals & occupational pollutants like arsenic coal - tax etc.

Environmental factors like X-rays, UV rays & radio active radiations etc.

Stem Cells: are ancestral cells which can divide and give rise to progeny that undergo differentiation.

Zygote is a totipotent cell. It can give rise to whole organism.

Pleuropotant Cells: arise from totipotent cells. They give rise to most but not all types of cells.

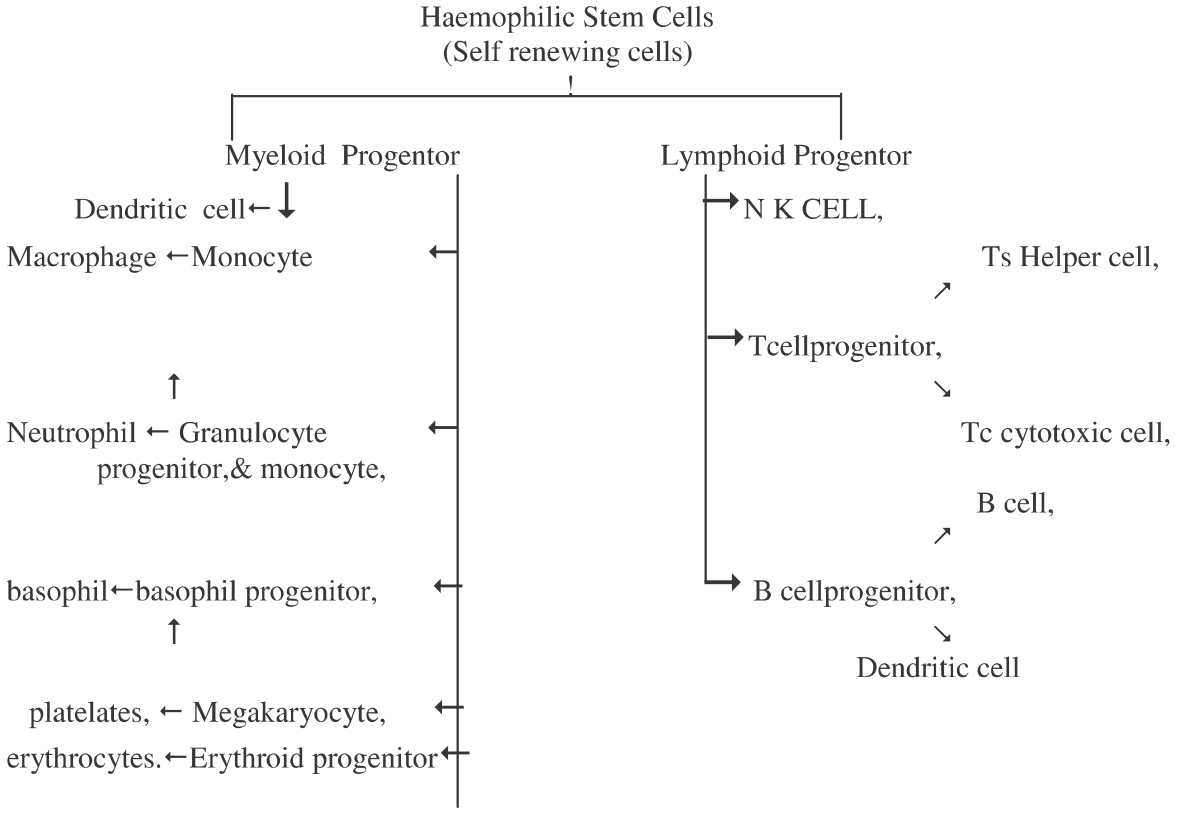
Embryonic inner cell mass of blastocyst contains pleuripotent cells.

Multipotent Cells: are differentiated from pleuripotent cells these cells can give rise to only a limited no of cells types.
Unipotent Cells: are differentiated from the multipotent cells. Each unipotent cell gives rise to a single modified cell type.

Embryonic Stem Cells: are cultures of cells derived from the epiblast tissue of the inner cell mass of blastocyst. Embryonic cells are pleuripotent cells & give rise to three germ layers – ectoderm, endoderm & mesoderm.

Adult Stem Cells: are undifferentiated cells found throughout the body that divide to replenish dying cells & regenerate damaged tissues also known as somatic stem cells. Haemopiotic stem cells (HSC's) are pleuripotent cells & multipotent cells.

Secondary stem cells: are mycloid stem cells & lymphoid stem cells. These are Non renewing cells. Myeloid stem cells give rise to committed progenitors like erythroid progenitors, megacaryocyte, basophil & esinophil, granulocyte, monocyte progenitor & lymphoid progenitor.



Application: Transplantation of Haemopoitic stem cells to the patients who require them. Stem cells are used to deceased or damaged cells in the brain & treaty cell based disease like Parkinson disease. Stem cell therapy is done for bone marrow transplant, which is used to treat leukemia & other types of cancers & various blood disorders.all above disarsers can be freaked by the multipotenl stem cells are in blood of umbilical cord.

Bio –Medical Technology

- Bio medical technology is also called Bio engineering
- The engineering techniques are used in this of Biophysics & Biochemistry.
- Bio medical technology is the combination of Biophysics & Biochemistry.
- Most of the tools of Bio technology are used for Diagnostic Imaging.
- Bio- Medical technology includes
    1. X-ray radiography generally used to Diagnosing of bone disorders
    2. Angiography is used generally for Cardiac disorders
    3. CAT: Computerized Axial Tomography
    4. MRI: Magnetic Resonance Imaging
    5. PET: Position Emission Tomography
    6. Sonography
    7. ECG: Electro Cardio Graphy
    8. EEG: Electro encephalography
    9. Polygraphy
    10. ELISA (enzyme linked Immuno Sorbant Assay) & Western blot used to confirmation test for HIV.
    11. Endoscopy
    12. Laser microsurgery
    13. Haemo dialysis organ 14) Organ Transplantation

    Organ Transplantation: Transferring of organs from a body (donor) to another (recipient or patient) is called organ transplantation. Donor may be living or deceased (dead) while recipient is living.
    Organs transplantation can recognized as life saving while tissue transplants are a life enhancing.

    Types of Transplants:

    1. Autograft: Self tissue transformed from one body side to another. Eg: transferring healthy blood vessel from any organ to replaced damaged coronary artery.
    2. Isograft: Tissue transferred between genetically Identical individual.
    3. Allograft: Organ is transplanted from a genetically non identical member of the same species.

4. Xenograft: transplants of organ from one species to another. Xenograft transplantation is often an extremely dangerous type of transplant. Eg: Porcine valves.
5. Split transplantation: Some times an organ of decreased donor may be divided between two recipients especially in Adult & child.
6. Domino transplantataion: In this method complete set of organs are transplanted HLA used to detect Histo compability is named. Histocompability leucocyte antigen test.
   Or (Human leucocyte Antigen)

Graft Rejection: Donar's Tissue or organ is rejected by recipient due to incompability. In the allograft skin becomes revascularised between 3 to 7 days. The vascularisation decreases by 7 to 10 days. The grafted tissue undergoes necrosis on 10^{th} day & completely rejected by 12 to 14 days.

APPLIED BIOLOGY

1. Gambusia is
   (1) Air breathing fish
   (2) Sport fish
   (3) Ornamental fish
   (4) Larvivorous fish

2. The scientific name of common carp is
   (1) Catla, Catla
   (2) Cteno pharyngodon idella
   (3) Cyprinus Carpio
   (4) Channa punctata

3. Depletion of O_2 in fish pond is due to
   (1) Accumulation of organic matter
   (2) Algal die off
   (3) 3 or 4 consecutive cloudy & Rainy day
   (4) All the above

4. Shagreen is
   (1) Skin of sole fishes
   (2) Dried skin of shark
   (3) Skin of cod fish
   (4) None of these

5. One of the following is at its lowest level in the fish food
   (1) Actin
   (2) Myosin
   (3) Cholestrol
   (4) Actinomyosin

6. These birds are reared for eggs.
   (1) Broilers (2) Cocks
   (3) Layers (4) Cockerels

7. Pullorum disease of poultry is other wise known as
   (1) Pink diarrhea
   (2) White diarrhoea
   (3) Fowl fox
   (4) Small pox

8. Fowl cholera was caused by
   (1) Virus
   (2) Bacteria
   (3) Protozoan Parasite
   (4) Nematodes

9. Gumboro disease is caused by
   (1) Fungus (2) Virus
   (3) Bacteria (4) Ticks & Mites

10. Match the following & Choose the correct answer.
    1) Spirochaetosis
    2) CRD
    3) Fowl typhoid
    4) Pullorum
    a) Salmonella Pullorum
    b) Salmonella gallin arum
    c) Mycoplasma
    d) Spirochaetes

	A	B	C	D
1)	I	II	III	IV
2)	IV	III	II	I
3)	IV	III	I	II
4)	II	III	I	IV

11. The Balanced diet of poultry birds is called
    (1) Mass (2) Mash
    (3) Mask (4) Meal

12. Animals in which genes are transferred are
    (1) Transgenic Animals

(2) Clones
(3) Both
(4) Productive animals

13. Surrogate mother is
(1) A healthy young female of interior genotype
(2) A healthy young male of superior geno type
(3) A healthy young female
(3) A healthy high productive female

14. A baby sheep was produced by cloning in
(1) 1994 (2) 1997
(3) 1996 (4) 1995

15. The cells which are obtained form a single cells
(1) Clone (2) Cloning
(3) Aggregrates (4) Cell mixture

16. Embryo cloning can be developed by
(1) Embyonic stem cells
(2) Nuclear transfer
(3) Both
(4) Cytoplasm

17. Retro viruses are
(1) Single strained DNA virus
(2) Single strained RNA viruses
(3) Double strained RNA viruses
(4) Double strained DNA viruses

18. In gene transfer Retro viruses function as
(1) Vectors (2) Stimulation
(3) Both (4) Injection

19. Antibody is produced in response to
(1) Antibody
(2) Antigen
(3) Immunoglobulin
(4) None of these

20. Read the following statement & Choose the correct answer.
A) HIV stands for Human Immune deficiency Virus
B) Each HIV having person may not has AIDS
C) HIV can be transmit by injections, semen & blood
(1) A is correct & B is not correct
(2) B is correct explanation of A. But C is not correct.
(3) A is correct B is correct & C also correct.
(4) A is correct & C is not correct explanation of A

21. HIV ancestral form is found in
(1) African monkey (2) Blood
(3) Hamster (4) All

22. HIV was first identified by
(1) Montagnier (2) Leuven hoek
(3) Pasteur (4) Huxley

23. HIV can be transmitted by
(1) Sexual contact
(2) Through blood
(3) From mother to foetes
(4) All

24. The enzyme which carries viral RNA into DNA
(1) Ligase
(2) Reverse transcriptase
(3) Reverse transiage
(4) None

25. The Incubation period of type 'A' hepatitis is
(1) 7 days (2) 15 days
(3) 30 days (4) 60 days

26. Allergin produces
(1) Specific IgM antibodies
(2) Specific IgE antibodies
(3) Non-specific proteins
(5) Chemical substance

27. Central Inland Fisheries Research Institute is located at
(1) Mumbai
(2) Chennai
(3) Cochin
(4) Calcutta

28. The substance which is useful in reduction of cholesterol level in blood is
(1) vitamin A
(2) methionine
(3) vitamin D
(4) N-3 fatty acid

29. CMFRI is located at
(1) Cochin
(2) Calcutta
(3) Mumbai
(4) Bhuvanehswar

30. The institute which develops poultry vaccines is
(1) CIFE
(2) IVRI
(3) NECC
(4) CIFA

31. Some birds have the habit of pecking or eating other birds. This phenomenon is termed
(1) culling
(2) cannibalism
(3) debeaking
(4) dubbing

32. Genetic immunity is called
(1) innate immunity
(2) sterile immunity
(3) acquired immunity
cell mediated immunity

33. Destruction of antigens by T-cells is called
(1) humoral immunity
(2) cell mediated immunity
(3) passive immunity
(4) innate immunity

34. Lymphokines are secreted by
(1) B-cells
(2) macrophages
(3) Td-cells
(4) Tc-cells

35. What is the mode of transmission of HIV?
(1) sexual contact
(2) injection syringe and needle
(3) breast feeding
(4) all of them

36. HIV destroys
(1) T-lymphocytes
(2) B-lymphocytes
(3) Td-cells
(4) Tc-cells

37. Exaggerated immune response to antigen is called

(1) AIDS
(2) hepatitis
(3) HAV
(4) hypersensitivity

38. Cell mediated hypersensitivity is
(1) immediate hypersensitivity
(2) delayed hypersensitivity
(3) anaphylaxis
(4) local anaphylaxis

39. Histamines are secreted by
(1) mast cells
(2) T-lymphocytes
(3) B-lymphocytes
(4) neutrophils

40. Which are known as blocking antibodies?
(1) I_gE
(2) I_gG
(3) I_gM
(4) I_gD

KEY

1. 4	2. 3	3. 4	4. 2	5. 3
6. 3	7. 2	8. 2	9. 2	10. II
11. 2	12. 1	13. 1	14. 2	15. 1
16. 3	17. 2	18. 1	19. 2	20. 3
21. 1	22. 1	23. 4	24. 2	25. 3
26. 2	27. 4	28. 4	29. 1	30. 2
31. 2	32. 1	33. 2	34. 3	35. 4
36. 1	37. 4	38. 2	39. 1	40. 2

CANCER BIOLOGY & STEM CELL

1. Cell cycle is regulated by
   a. Cyclins b. Kinases c. A & B d. By wheel movement

2. Cell cycle consist of
   a. 'S' Phase b. 'M' Phase c. G_1 & G_2 Phase d. All

3. Growth and preparation of the chromosomes for replication occurs in the phase
   a. S Phase b. G_1 Phase c. G_2 Phase d. M Phase

4. In G_2 Phase Following events occurs
   a. Synthesis of DNA & duplication of the chromosomes
   b. Growth and preparation for mitosis
   c. Division Phase
   d. None
5. A typical cell cycle (Division Phase & Inter Phase) lasts for
   a. Twenty to Thirty hours
   b. Twenty to Twenty four hours
   c. Twenty to Twenty seven hours
   d. Eighteen to Twenty hours

6. Match the following & choose the correct answers
   a. S Phase — 1. Growth and preparation of chromosomes
   b. G_1 Phase — 2. Cell completes mitotic division
   c. G_2 Phase — 3. Amount of DNA is doubled
   d. M Phase — 4. Post DNA Synthesis Phase

	A	B	C	D
1)	1	3	4	2
2)	3	1	4	2
3)	1	2	3	4
4)	2	1	3	4

7. One of the protein acts as a transcriptional activator
   a. P 52 Protein b. P 53 Protein c. A & B d. None

8. Paul Nurse, Leland Hart Well & Tim Hunt were awarded noble prize in Medicine for the year 2001 for
   a. Discovery of cdc gene mutants b. Discovery of check points
   c. Discovery of cdc gene mutants & Cell cycle regulation
   d. Discovery of Centrosomes

9. One of the following complex acts as G_2 check point
   a. Cdk cyclin complex b. M-Cdk Cyclin complex
   c. A & B d. None

10. The study of tumors is called
   a. Tumerology b. Oncology c. Conchology d. Asteology

11. One of the following is known as Cancerous Tumour
   a. Beningn tumors b. Malignent tumors c. Leukaemia d. None

12. Tumor inducing genes are called
   a. Carcinogenes b. mutagens c. Oncogenes d. None

13. Tumors suppressors genes are
   a. Genes that suppress the activity of oncogenes
   b. Gene P 53 c. A & B d. None

14. Match the following and choose the correct

   a. Carsinoma 1) Cancer of Spleen and lymphnodes
   b. Sarcoma 2) Bone & Muscle Cancer
   c. Leukaemia 3) Trachea, Skin and Brain Cancer
   d. Lymphoma 4) Blood Cancer

	A	B	C	D
1)	1	3	2	4
2)	2	1	3	4
3)	3	2	4	1
4)	4	3	1	2

15. Stem cell is defined as
   a. Ancestral Cells which can divide and give rise to progeny that undergo differentiation
   b. Totipotent Cell
   c. A & B
   d. None

16. The Stem cell can give rise to a single modified cell type
   a. Pleuripotent cells b. Multipotent cells
   c. Unipotent cells d. Totipotent cell

17. Hemopoitic stem cell is an example of
    a. Pleuripotent cell b. multipotent cell
    c. A & B d. Unipotent cell

18. Basophil progenitor and eosinophil progenitor give rise the cells are
    a. Basophil b. Neutrophil
    c. Basophil & Eosinophil d. lymphocytes

19. The pollutants becomes of cause of cancer are
    a. Tobacco, Alcohol, Cosmetics b. Drugs & Chemicals
    b. c. Hexachlorophene, dioxins & Benzo pyrenes d. All

20. Benign tumours are
    a. None Cancerous tumors
    b. Tumor cells can't exhibited metastasis & never migrate to other parts of the body
    c. These are harmless and can be removed by simple surgery
    d. All the above

Key

1. C	2. D	3. B	4. B	5. B
6. 2	7. B	8. C	9. B	10. B
11. B	12. C	13. C	14.3	15. C
16. C	17. C	18. C	19.D	20. D

Bio Medical Technology

(1) Bio Medical Technology Is Also Called
A) Bio Physics B) Bio Chemistry C)Bio Engineering D) Biome

2) Bio Medical Techno,Logy Is Also Related With
A)Diagnostic Imaging
B) Monitoring Of Bodys Vital Functions Like Ecg , Eeg, Polygraphy.
C) Bio Chemical Tests Like , Elisa, Western Blot, Endoscopy, & Laser Microsurgery, Dialysis, Transplantation, Etc.
D)None Of These.
A) A+B+C+D Are False
B) A+B+D Are True But C Is False
C)A+B+Care True & D Is False
D) A+B+C+D Are True .

3) X Ray Isespecially Useful In The Detection Of
A) Pathology Of Abdomen
B) Pathology Of Skeletal System
C) Pathogenicity Of Brain
D)Pathology Of Cardiac System

4) Cat Or (Ct Scanning) Is Called,
A) Computed Automated Transplant B) Computed Axial Tomography
C) Computed Axial Transparancy D) None

5) Angiology Is Known As
A)Study Of Blood B) Study Of Heart
C) Study Of Blood Vessels D)Study Of Bones

6) Digital Substraction Angiography (D S A) Is Used For
A)Tracing The Blocks In Brain
B) Tracing The Blocks In Bone
C) Tracing The Blocks In Blood Vessels
D)Tracing The Blocks Of Blood Vessels Of Eyes

7) Benefits Of X Rays Are
A) No Side Effects
B) No Radiations Remains In Patient After Examination
C) A & B
D) There Are Slight Chanches Of Cancer From Radiation

8) Match The Following & Choose The Correct Answer

A) C A T 1) Electro Encephalography
B) Eeg 2) Magnetic Resonance Imaging
C) M R I 3) Computerised Axial Tomograhy
D) E Cg 4) Electro Cardiography

	A	B	C	D
1)	3	2	1	4
2)	3	1	2	4
3)	1	2	3	4
4)	2	1	3	4

9) Organ Transplant Can Be Recognised As
A) Life Enhancing
B) Life Saving
C) Life Terminating
D) Life Destructing

10) Auto Graft Is
A) Self Tissue Transferred From One Body Side To Another
B) Tissue Transferred Between Genitically Identical
C) Tissue Transferred Between Genitically Non Identical Members.
D) Transplant Of Tissue Or Organ From One Species To Another

11) The Major Organs That Can Be Transplanted Are
A) Heart, Lung, Kidney , Liver, Pancreas, Intestine Etc
B) Blood, Lymph, Csf C) Brain , Bone , Bone Marrow
D) None Of These

12) Xenograft Means
A) Grafting Of Organs Or Tissues Between Identical Animals
B) Grafting Of Organs Of One To Another
C) Rejecting Or In Compability
D) Porcine Heart Valves

13) Split Transplantation Means
A) Organ Of A Donar Is Divided Between Two Reciepients
B) Complete Set Of A Organ Is Transplanted
C) Artificially Made Organ Are Transplanted
D) None

14) Domino Transplantation Is Usually Performed For
A) Cystic Fibrosis & Blood B) Heart
C) Heart & Lungs D) None

15) The Diagnostic Test Is Done Todetect Graft Rejection Is
A) HLA B) ELISA C) VDRL D) WIDAL

16) Commonly Enzyme Linked Immuno Sarbant Assay Test Is Performed To Detect
A) HAV B) HBV C) HIV D) HDV

17) In Sandwich Elisa The Substrate Is Used
A) Coupled Antigen B) Separate Antigen
C) Coupled Antibodies D) Separate Antibody

18) One Of The Test Is Performed By The Reaction Of Antigen & Antibody In Result It Forms Precipitate
A) Blood Grouping B) VDRL
C) Estimation Of Hb% D) Bloodglucose

19) In Pregnancy Test One Of The Protien Is Measured In Urine Sample
A) Creatine B) Myosin
C) Human Chorionic Gonadotropin D) Relaxin

20) During The Test Of Eeg Electrical Signals Of The Brain Are Recorded , The Record Is Called
A) Electro Cardiogram B) Electro Encephalograph
C) Electro Encephelogram D) Electro Cardiograph

21) In Cat Scan The Cross Section The Pictures Of The Body Is Seen As An X Ray Slice Which Image Is Recorded On A Film Is Called
A) Magnetic Resonance Image B) Super Position Image
C) Cardiograph D) Tomogram

22) Ct Scan Is Commonly Helpful To Detect Anatomical Organs Of The Body Like
A) Liver, Gall Bladder, Pancreas, Spleen B) Aorta, Kidneys, Uterus& Overies
C) A & B D) None

23) P Wave Indicates
A) Atrial Polarisation B) Atrial De Polarisation
C) Atrial Repolarisation D) All

24) Q R S Complex Denotes
A) Ventricular Repolarisation B) Ventricular Depolarisation
C) Ventricular Depression D) Ventricular Suppression

25) The Interval From The Beginning Of The Qrs Complex To The Apex Of The T Wave Is Referred As
A) Differacttion Period B) Dispersion Period
C) Absolute Refractory Period D) None

Key

1)C	2)3	3)B	4)B	5) C
6)C	7) C	8) 2	9)B	10) A
11) A	12) B	13)A	14) C	15)A
16) C	17) C	18) B	19) C	20) C
21)D	22) C	23) B	24)B	25)C

NEET/EAMCET Zoology (Model Question Paper – I)

1. The branch of Zoology which deals Heeridity and variation
   a. Evolution b. Palean to logy c. Cell brology d. Genetics

2. Inter convertibility of soologel is
   a. Physical change b. Chemical change c. Physico chemical change
   d. None of these

3. Read the following statements and choose the correct answer
   A. The body of sponges consists of epithelial tissues only
   B. All the four types of tissue are present in the body of sponges
   C. Only epithelial and connective tissues are present
   D. Structurally organized tissues are absent in the body of sponges
   a) A & B are true b) C&D are true c) Only B is correct d) Only D is true

4. Match the following and choose the correct answer

A. Polyembryony	1)Schistosoma haematobium
B. Liver fluke	2) Dibothriocephalus latus
C. Bilharziasis	3) Trematoda
D. Largest tape worm	4) Hymenolepis nana
	5) Fasciola

   a)A-2, B-1,C-3, D-4, b)A-3, B-5, C-1, D-4
   c) A-3, B-5, C-1,D-2 d) A3, B-4,C1,D-2

5. One of the following Animal performs Nocturnal periodicity
   a) Rhabiditi form larva b) Miracidium c) Microfilaria d) Planula

6. Water canal system in Sponges perform
   a) Locomotion b)Nutrition & Respiration
   c)Circulation & Reproduction d) B & C

7. Lymph performs vasodilation and known as middleman between blood and blood vessel can be defined as
   a) Blood – corpuscles = lymph b) plasma-RBC = lymph
   c) Blood (Corpuseles + clotting factors) = lymph d) Blood – RBC = lymph

8. Match the following and choose the correct answer

A. Stratified cuboidal epithelium	1) Ducts of parotid glands
B. Simple cuboidal epithelium	2) Thyroid gland
C. Simple columnar epithelium	3) Cornea of eye
D. Simple squamous epithelium	4) Conjunctiva of eye
	5) Trachea and Brachi

1) A-5, B-3, C-2, D-1 2) A-4, B-2, C-1,D-5
3) A2, B-4, C-1, D-3 4) A-5, B-2,C-3,D-4

9. In pheretima ring vessels are present 12 pairs each in these segments

a) 10,11,13 & 14 b)9,10,13,& 14
c) 10,11,12 & 13 d) 9,10,11,12

10. The chlorogogen cells empty their waste substance in to the lumen of intestime the emptied chlorogogen cells are called
a) Xonthic cells b) Waste cells c) eleocytes d) Erythrocytes

11. The body cavity of cockroach is not a true body cavity because filled with blood is called.
a) Haemato fluid b) Haemolymph c) Haemo coel d) Pseudocuel

12. The Rapid increase in the number of cells in the organ of host due to the presence of a parasite is knows as
a) Hypertrophy b) Necrosis c) Hyperplasia d) Aplasia

13. The mastisgatory organ present in the following Echinoderm & is named
a) Asteridea - mouth b) Ophiuroidea - Suckers
c)Echinoidea - Aristotle lanten d) crinoidea - basket flower

14. Arrange the following in order
1. Tibia 2. Coxa 3. Femur 4. Trochanter 5. Tarsus
a) 2-1-3-5-4 b)1-2-4-5-3 c)2-4-3-1-5 d) 2-3-4-5-1

15. The arrangement of Abdominal ganglions in cockroach is
a) 1,2,3,5,6,7 b) 1,2,3,4,6,7 c) 1,3,4,5,6,7 d)1,2,3,4,5,7

16. In pheratima blood glands are present in these segments
a) 1,2,3,4 b) 4,5,6,7 c) 4,5,6 d)6,7,8,9

17. One of the following mulluscan animal do not consists rasping organ
a) Pila & unio b) Chiton and teredu
c) Unio and dentalium d) Myfilus and Architenthes

18. Water vascular system is the chief system in Echinodermata comprises with various canal the lateral canal of this system is also called.
a) Ambulacral canal b) Longitudinul canal
c) Podial Canal d) Radial canal

19. Read the following statement and choose the correct answer
A. In pheretima Dorsal blood vessel is collecting and distributing blood vessel.
B.Dorsal blood vessel is considered as true heart in Earth worm
1) A & B are false 2) A Is correct and B is correct explanation to A
3) A is false &B is true 4) A is correct explanation to B But B is false

20. Choose the correct statement regarding malaria and its parasite:
I. Malaria caused in man by plasmodium Vivax
II. Every year malarial day celebrated on 20th August.
III. Sexual cycle of plasmodium discovered by Ronold Ross in female Anopheles
IV. Aniso gamy & ISO gamy are the Naturally seen Reproduction in Plasmodium
a) I, II & IV b)II,III & IV c) I,II & III d) III,IV, II

21. The sequence of the passage of Hexaconth in secondary host from stomachis
a) Small intestine - Stomach - Liver - Heart - Voluntary muscle
b) Stomach - small intestine - Heart - Voluntary muscle - liver
c) Stomach - small intestine - Heart - Voluntary muscles – liver
d) Stomach – small intestine - liver - Heart - voluntary muscles

22. Match the following columns & choose the correct answer

A. Ozone	1)Bhopal tragedy
B. CO_2	2)Tajmahal
C.MIC	3)Kyuto protocol
D. SO_2	4) Hills reaction
	5) Montreal protocol

1)A-3, B-5, C-2,D-1 2) A-5, B-3, C-1,D-2
3) A-1, B-2,C-3,D-4 4) A-4, B-1,C-3,D-2

23) Statement: chordate characters are present in the class Lavacae of urochordates Reason: Lavacae exhibit Neoteny
a)S&R correct b) S is correct and R is false

c) S & R are correct R is not the correct explanation to S
d) S & R are correct and R is the correct explanation to S

24. The study of the migration of bird is
a) Migrinology b) Orintheology c) Nidology d) phenology

25. In Bufo venomous glands of skin are modified glands of
a) Infraorbital b) Parotid c) Submaxillery d) Sublingual

26. Dental formula of man is
a) $\frac{2\,0\,1\,3}{2\,0\,1\,3}$ b) $\frac{2\,1\,3\,2}{2\,1\,3\,2}$ c) $\frac{2\,0\,3\,3}{1\,0\,2\,3}$ d) $\frac{2\,1\,2\,3}{2\,1\,2\,3}$

27. Kupffer cells are found in
a)Gall bladder b) pencrees c) liver d)Stomach

28. During O_2 transport the oxyhacmoglubin at the tissue level liberates O_2 to the cells due to.
a) O_2 tension is high & CO_2 is low and high pH
b) O_2 tension is high and CO_2 is low
c) O_2 tension is low & CO_2 is high
d) O_2 tension is high and CO_2 tension is low

29. The Normal Range of B.P. is 120/80 Hg. If it is high is dangerous to brain and kidneys the range of High B.P. is
a) $13^0/90$ b) 190/110 c) 180/100 d) 150/100

30. The one of the following artery consists deoxygenated blood
a)Carotid artery b)phrenic c) pulmonary d) Coeliac

31. A Joint which allows angular movement in only are plane is
a)Pivot Joint b) Saddle joint c)Hinge joint d)Gliding joint

32. Glomerular filtrate contains
a) Nitrogenous waste only b)Nitrogenous waste and Glucose
c)Nitrogenous waste , Salls of Na,k,ca,mg and Glucose and anino acids Hormnes and vitamins
d) Nitrogenous waste, Salls of Na,k,ca,mg and Glucose

33. During museles contraction Actin filements extend from
a)M Line b) Z Line c)Myosin filament d) All

34. Foraman of monro is an aperture between
a) I & II ventricle of Brain b) III & IV ventricle
c) II & III ventricle d) II & IV Ventricle

35. Arrange the following parts of Human along with the path of parturition
A)Vulva B) Vagina c)Vestibule d)uterus
1) C-B-A-D 3) B-D-C-A
2) A-B-C-D 4) D-B-C-A

36. Match the following columns and choose the correct answer

A. Biogenatic law	I. August weisman
B. Mutation	II. Darwin
C. Germplasm	III. Louis pasture
D Biognesis	IV. Ernst Hackle
	V. Hugo devries

	A	B	C	D
a)	IV	V	IV	I
b)	IV	V	II	I
c)	IV	V	I	III
d)	V	IV	III	II

37. Match the following and choose the correct answer

A. MHC	I) Antigen binding fragment
B. HLA	II) B Lymphucytion
C. IgE	III) Histo compatibility leukocyte Antigen test
D. Fab	IV) Major Histo compatibility complex
	V) Antigen presenting fragment

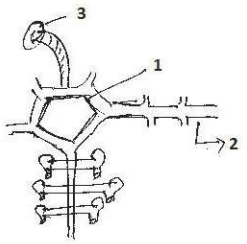
	A	B	C	D
a)	IV	III	I	II
b)	IV	III	II	I
c)	IV	II	I	III
d)	III	I	II	IV

38. A person whose father is colorblind marries a lady who is the daughter of colorblind man. Their children will be.
a) All normal b) All sons color blind
c) All colorblind
d) Half sons are normal and remaining half will be colorblind

39. Genetic code was given by
a) Watson and crick b) Beadle & Taturn
c) Nirenberg d) Bridges & kings

40. A man who is a son of bald mother & non-bald father married a non bald homozygous women. If they have two sons what is the Genetic probability of them being bald
a) 50% bald & 50% normal
b) 50% homozygous bald &50% non homozygous bold
c) 50% heterozygous bald 50% Hemozygous non bald
d) All the above is correct

41. Look at the diagram and find out correct series of names



a) Madreparile, Ambulacral canal, Tube foot
b) Madreparile, Radial canal, Ambulacral canal
c) Ambulacral canal, Radial canal, Tube foot
d) Ambulacral canal, Radial canal, Tube foot

42. Find out the correct statement
A) In Gastropoda uneven growth rotates the visceral moss upto 180 and this process is called torsion.
B) During torsion Gastropods becomes a symmetrical
C) Redula is Absent in Gastropods
a) A+B and C are correct. b) B+C are correct, C is false.
c) A+B are correct, C is false. d) A, B and C are false, none is true.

43. (Assertion) A: Infection of the urinary tract is more common in woman than in man.
(Reason) R: Due to short urethra, which is more close to the anal aperture.
a) A is true, R is false.
b) A is true, R is true, but R is not the correct explanation of A.
c) A is true, R is true and but R is the correct explanation of A.
d A is false, R is false and R is the correct explanation of A.

44. One of the following organ of Human is known as the living super computer
a) Kidney b) Liver c) Heart d) Brain

45. The existence of deleterious genes with in the population is called
a) Genetic drift b) Genetic load c) Founder effect d) Bottle neck effect

Key

1) d	2) c	3)d	4)c	5)c	6)d	7)d	8)2
9)c	10)c	11)c	12)c	13)c	14)c	15)b	16)c
17)c	18)c	19)2	20)c	21)d	22)2	23)d	24)d
25)b	26)c	27)c	28)c	29)b	30)c	31)c	32)c
33)b	34)c	35)4	36)d	37)b	38)d	39)c	40)c
41)c	42)c	43)c	44)b	45)b			

NEET/EAMCET Zoology (Model Question Paper – II)

1. The two kingdom system was replaced by five kingdom in the year
   a. 1758 b. 1859 c. 1969 d. 1919

2. Which one of the following is not true regarding species
   a. Member of a species can interbreed
   b. Variations occur among members of a species
   c. Each species is Reproductively Isolated from every other species
   d. Gene flow does not occur between the population of a species

3. Read the statement and choose the correct answer
   Assertion: (A) Two kingdom system was proposed by lineus
   Reason: (R) five kingdom system was proposed by whittaker
   a) If Both Assertion (A) & Reason (R) are true & Reason is the correct explaination of Assertion.
   b) If Both A & R are true. But R is not the correct Explanation of A
   c) If A is true R is false
   d) Both A&R are false.

4. What is common about Trypanosma, Noctiluca, Monocystis and Giardia
   a. These are all unicellular protist
   b. They have flafella
   c. They produce species
   d. These are all parasites

5. Which one of the following animals is correctly matched with its particular named taxomonic category
   a. Cuttle fish - Mollusca - Class
   b. Human - Primate-the family
   c. Housefly - Musca -an order
   d. Tiger - Tigris-the species

6. The chordate feature shared by the Non chordates are
   a. Bilateral symmetry
   b. b. Triploblastic condition and Bilateral symmetry
   c. Metamerism
   d. All of the ab

7. Which of the following pairs are correctly matched

	Animals		Merphological features
I.	Crocodile	-	Four chambered Heart
II.	Sea urchin	-	Parapodia
III.	Obelia	-	Metagenesis
IV.	Lemur	-	The codont

a) I,II & III b) I,III & IV
c) I & IV d) I &II

8. Dental formula of man is

a) $I\frac{2}{1}C\frac{1}{1}Pm\frac{3}{2}m\frac{3}{3}$ b) $I\frac{2}{2}C\frac{1}{1}Pm\frac{2}{2}m\frac{3}{3}$

c) $I\frac{2}{1}C\frac{0}{0}Pm\frac{3}{2}m\frac{3}{3}$ d) $I\frac{2}{1}C\frac{2}{2}Pm\frac{2}{2}m\frac{3}{3}$

9. In cockroach during respiration opening and closing of spiracles is influenced by
   a) O_2 tension in Haemolymph & CO_2 in trachea
   b) CO_2 tension in Hypognathus Head and O_2 tension in Abdomen
   c) CO_2 tension in Hemolymph & O_2 tension in trachea
   d) All

10. Frogs are not easily predated by predators because of
    a. Well developed fore limbs &Hindlimbs
    b. Leaping action c. Slimmy skin d. Camoflague

11. Choose the three correct statement of the following regarding circulation in Rana tigrina
    I) Heart is "3" Chambered
    II) Heart situated in pericardial cavity
    III) Conus arteriosus is absent
    IV) Blood contains erythrocytes leucocytes and thrombocytes
    V) Sinus venosus is not a pacemaker
    a) I,II&V b) I,III & IV c) I,II & III d)I, II & IV

12. The Adoloscence is a very vulnerable phase. The age of Adoloscence of man is
    a. 16-21 years b. 10-16 years c. 12-16 years d. 12-18 years

13. Match the following columns and choose the correct answer

A - Opioids	1) Opium poppy
B - Morphine	2) Acetylation of morphine
C - Cannabinoids	3) Unripe seed capsule of poppy plant
D - Cucaine	4) Erythroxylum coca
	5) Cannabis sativa

	A	B	C	D
I	1	3	4	5
II	1	2	5	4
III	1	2	4	5
IV	1	3	5	4

14. The correct series of the scolex is as following

a) A – Structural mouth B – Hooks
C – Sucker D – Proglottids

b) A – Postellum B – Hooks
C – Sucker D – Proglothids

c) A – Mouth B – Tentacle
C – Sucker D – Segment

d) A – Sucker B – Hairs
C – Ring D – Proglothids

15. Refer the following features

a. Adenohy pophysis produces gonado trophins
b. Besides sex cell Hermones are also produced by test is and over
c. Test sterone is produced by lydig cells
d. Oestrogen is produced by ovary

Which of the above factors influence scendry sexual characters

a) III & IV b) II,III &IV c) II & III d)I,II,III & IV

b)

16. Repressor protein is produced by

a) Regulator Gene b) operator Gene
b) c) Structural Gene d)Promoter Gene

17. Which of the following statement is true for lymph
    a. WBC & Serum
    b. All components of Blood excepts RBCs & Some proteins
    c. RBCs WBCs & plasma
    d. RBCs WBCs & platelets

18. Assertion: the theory of "survival of the fittest" is widely misunder stood.
    Reason (A): Evolution does not always increase the chances of aspecies survival & species do not survive when such chances happen rapidly
    a) If both Assertion and reason are true & R is the correct explanation of the Assertion
    b) If both Assertion & Reason are true. But R is not correct explanation of A
    c) If A is true But R is false
    d) If both Assertion & Reason are false

19. An Artificial pacemaker is implanted subcutaneously and connected to Heart in these patients
    a) Having a high B.P
    b) 6) 90% black age of the three main coronary arteries
    c) With irregularity in the Heart rhythm
    d) Suffering from arterio sclerosis

20. Match the following columns A&B and choose the correct answer

	Column – A		Column – B
A	Renal Portal system	1	Carries blood to various body parts
B	Pulmonary vein	2	Is a Portal vein
C	Dossal aorta	3	Carries oxygenated blood
D	Pulmonary artery	4	Carries deoxygenated blood
		5	Absent in man

Orders:

	A	B	C	D
A	5	1	3	2
B	5	3	1	4
C	4	5	3	1
D	5	1	2	3

21. Human skull consists of 24 bones they are
    a) Cranium 8 + facial 12, + ear ossicles =8
    b) Cranium 8+ facial 14+ ear ossicles=6
    c) Cranium 7+ facial 13+ ear ossicles=8
    d) Cramium 6+ facial 12+ ear ossicles=8

22. Match the following columns

Column A		Column B	
A	Cuboidal	1	Epidermis ofskin
B	Ciliated	2	Inner lining of blood vessels
C	Columner	3	Inner surface of Gall bledder
D	Squamous	4	Inner living of fellopran tube
E	Keratinised squamous	5	Lining of pancreatic duct

Order:
    a) A-5, B-4, C-2, D-3, E-1
    b) A-3, B-4,C-5,D-2,E-1
    c) A-5, B-4, C-3,D-2,E-1
    d) A3,B-4,C-5, D-1, E-2

23. Match the following columns

Column A		Column B
Glycogenesis	1	Conversion of Glycogen to Glucose
Glycosuria	2	Conversion of Glucose to Glycogen
Glyconeogenesis	3	Excretion of Glucose in urine
Glycogenolysis	4	Conversion of Non-carbohydrate sources to Glucose
	5	Cenversion of glucose to starch

Codes
    a) A-1,B-2,C-3,D-4
    b) A-2,B-3,C-4,D-1
    c) A-2,B-1,C-3,D-4
    d) A-1,B-5,C-2,D-4

24. In Human Heart beat initiation is followed by
    a) S.A node - A.V node - purkenje fibres

b) S.A node - A.V node - Bundle of Hiss - purkenje fibres
c) Purkenje fibres – S.A node – A vnode
d) S. Anode - Bundle of Hiss – A.Vnode – purkenje fibres

25. G-6-P dehydrogenase deficiency is associated with hemolysis
a) Lymphocytes b) RBCs c) platelates d) leucocytes

26. Which one of the following pairs is in correct
a) Leukaemia - Blood cancer
b) Sickle cell anaemia - Heredital
c)Eosinophilia - Hypersensitivity
d) Thrombocy to penia -Malaria

27. Blood Pressure means
a) The pressure of Blood which increase the body temperature of man.
b) Diasistolic Pressure c) Normal B.P. is 120Hg/80 Hg
d) When heart beat comes down Blood flows with pressure in vessles.

28. One of the followings is correct regarding Vitamin D
a) Sunshine vitamin
b) Which gives strength to the bones& is known as Ca^{+} vitamins
c) U.R Rays are Responsible for the synthesis of vitamin D.
d) All the above are correct.

29. One of the PEM disease in which Ribs become prominent limbs become thin skin becomes dry thin and wrinkled is
a) Kwasherkiar b) pellagra c) marasmus d) osteopeoporosis

30. Name the infective organism of pneumonia
a) Pneumococcal bacterium b) Streptococeus pneumoniae
c) Mycobacterium pneumonia d) a & b

31. Which one of the following statement regarding cilia is not correct
a) Cilia are hair like cellular appendages
b) The organized beating of cilia is controlled by fluxes of Ca+ across the membrane
c) Micro tubules of cilia are composed of tubulia
d) Cilia centain an outer ring of nine doublet micro tubules surrounding two single micro tubules

32. Hydra can paralise te pray by
a)Nematocysts b) Tentacles c)mouth d)None of these

33. Cholorogogen cells of earthworm are Homologus to this orgen of vertebrate
a) Kidney b) liver c) Spleen d) lung

34. Match the following columns

Columns – A		Columns - B	
A	Heterodont	1	Without tail
B	Gorilla	2	Bos indicus
C	Apes	3	With tails
D	Cow	4	Mammalia
		5	Herbivores

Codes
a) A-1,B-2,C-3,D-4
b) A-5,B-4,C-2,D-1
c) A-4,B-5,C-1,D-2
d) A-2,B-3,C-1,D-5

35. Which one of the following is not a characteristics of cnidaria
a) Gastro vascular cavity b) Ectoderm
c)mesoderm d) A lack of true tissue

36. Identify the sex of the follows animal
a) male frog - a compulsory pad on the first digit of the hind limb
b) Female cockroach - Anal cerci
c) Male shark - Claspers borne on pelvic fins
d)Female Ascoris - Sharply curved posterior end

37. Life period of mammalian erytho cytes is
a) 110 days b) 120 days c) 140 days d) 280 days

38. Match the following columns

Columns - A		Columns – B	
A	Chondrocytes	1	Bene forming
B	Ostesocytes	2	Cartilage forming
C	Osteoblast	3	Bone maintaining
D	Osteoclast	4	Bone eating

Codes:

a) A-4,B-2,C-1,D-3
b) A-1,B-2, C-3, D-4
c) A-2,B-4,C-3,D-1
d) A-2,B-3,C-1,D-4

39. People living at sea level have around 5 million RBCs permm 3 of blood. Where as those livig at on altitude of 5400 meters have around 8 million. This is because at high altitude
a) People get pollution free air to breath and more O_2 is available
b) People eat more Nutritive food. There fore more RBCs are formed
c) Atmospheric O_2 level is less & Hence more RBCs are needed to absorb the required amount of O2 to survive
d) There is more U.V Radiations which enhances RBCs production

40. A person is undergoing prolonged fasting. His urine will be found to contain abnormal quantities of
a) Fats b) ketones c)Glucose d) Aminoacid

41. Which one of the following is correctly match
a) Leutinizing Hurmone failure of ovulation
b) Insulin - Diapetes insipidus
c) Thyroxine - Tetany
d) Parathyroid Hormone - Diabetes mellitus

42. The father has blood group AB and mother "O". The child is supposed to have this one of the Blood group
a) A only b) Bonly c) A or B d) B or O

43. Inheritance of skin color in humans is a example of
a)Chromosemal aberration b)Co-dominance
c)Polygenic in heritance d) point mutation

44. The person with Turners syndrome has
a) 44 Autosomes & x chromosome
b) 44 Autosomes & xyy chromosome
c)45 Autosomes & xyy chromosome
d) 45 Autosomes & x chromosome

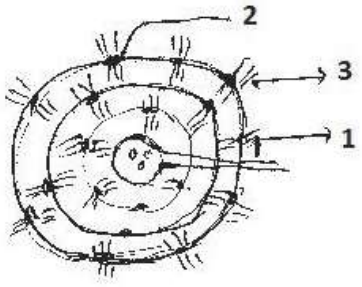
45. Match the following columns

Column – A		Column-B	
A	Paleantology	1.	Change in chromosomes
B	Mutation theory	2.	Genetic drift
C	Gene mutation	3.	Charles Darwin
D	Bottl neck effect	4.	Study of fossils
		5.	Hugo devries

Codes

a) A-1,B-2,C-3,D-4
b) A-2,B-5,C-4.D-4
c) A-4,B-5,C-1,D-2
d) A-2,B-1,C-3,D-4

46. Find out the correct series of diagram



a) Artery, Lacunae, Canaliculi
b) Canaliculi, Volk man's canal, Vein
c) Volk man's canal, Bone lacunas, bone lamellae
d) Volk man's canal, Lacunae, Canaliculi

47. One of the following blood cell produces Allergic reaction

a) Basophil b) Eosinophil
c) Neutrophil d) Lymphocytes

48. Male reproductive system consists of

a) A pair of testes, Epidermis, Vasa deferentia and Vagina
b A pair of testes, Epidermis, Vasa deferentia , Urethra and Penis
c) Testes, Ovaries, Vasa deferentia and Urethra
d) Testes, Vasa deferentia , Urethra and Vulva

49. DNA finger printing is a method for identifying individuals paternity and forensic work. The DNA can be obtain

a) Blood,Semen and Hairs b) Vaginal fluid

c) 1 and 2 d) None of them

50. Assertion (A): Changes in the structure of Chromosomes is Chromosomal mutations.
Reason (R): Chromosomal mutations occur due to deletion, Addition, Duplication and Inversion of Chromosomes

a) A is true, R is false.
b) A is true, R is true and R is not the correct explanation of A.
c) A is true, R is true and R is the correct explanation of A.
d) A is true, R is false and R is the correct explanation of A

Key

1) c	2) d	3) b	4) a	5) d	6) d	7) b	8) b
9) c	10) d	11) d	12) d	13) 4	14) b	15) d	16) b
17) b	18) c	19) c	20) 2	21) b	22) c	23) b	24) b
25) c	26) d	27) b	28) d	29) c	30) d	31) b	32) a
33) b	34) c	35) c	36) c	37) b	38) d	39) c	40) b
41)	42)	43)	44)	45)	46) d	47) b	48) b
49) c	50) c						

NEET/EAMCET Zoology (Model Question Paper – III)

1) Movement of pseudopodia is due to change in
a) Temperature b) Viscosity c)light d) pressure

2) Entomoeba gingivalis is found in Buccul cavity of man. It is known as
a)pathogenic parasite b) Non pathogenic parasite
c) Intermediate parasite d) Hyperparasite

3) A Sponge can be distinguished from other animats by the presence of
a) Hollow body b) Coelom c) Chaenocyte d)Dermal papillae

4) Read the following statement and choose the correct answer
I) The body of sponges consists of epithelial tissues only
II) All the four types of tissues ore present in the body of spange
III) Only epithelial and connective tissues are present
IV) Structurally organized tissues are absent in the body of spanges
a) I&II are correct b) only IV is correct
c) III & IV is correct d) none of these.

5) Match the following and choose the correct answer

A) Chainocyte	1) Help in formation of spicules
B) Archeocyte	2) performs nutrition, Excrtion, Resp & Reproduction
C) Seleroblast cell	3) Nutrition
D) Water canal system	4) Totipotency

	A	B	C	D
a)	3	1	2	4
b)	3	4	2	1
c)	3	4	1	2
d)	3	1	2	4

6) Which of the coelenterate does not exhibit Metagenesis
a) Obelia b) Aurelia c)Hydra d)Physalia

7) The Mesoglea
a)Consists of fibrous only b) IS Constitute of cells
c)Partly cellular and partly fibrous d)Neither cellular nor fibrous

8) Hypnotoxin is a poisonous fluid produced by
a)Parasitic protozoa b)Spanges c) Nematocyst d) Ascaris

9) Read the follows statement and choose the correct answer
A) Cnidarians are diploblastic tissue grade and Radiates
B) Cnidarians are called radiate because of radial symmetry is performed by this group
C)All cnidarians are Exclusively marine in habita
a) A & C are correct b)B&C are correct
c) A&B are true d) A & B & C are false

10) Apolysis is the process of
a) Development of unfertilized b) Seperation of gravid proglo thid
c) Destruction of phagocytes d) Cellular digestion

11) Liver flukes life history consists of the larval stages
a) Miracidium → Sporocyst → Metacercaria
b) Miracidium → Sporocyst → Radia → Cercaria → Metacercaria
c)Miracidium → Radia → Sporocyst → Metacercaria
d) Matacercasia → Cercaria → Radia → Sporocyst

12) The term platy helmin this was coined by
a) Linncous b) Gegan baur c)Grover d) Leukart

13) Measly pork contains
a) Cystiecercus larva b) Hexaconth
c) Adult tape worm d)Fertilized egg

14) Match the following and choose the correct answer
A) Polyembryony 1) Schistosoma heematobium
B) Liver fluke 2) Dibothrio cephalus
C) Biharziasis 3) Trematoda
D) Largest tape worm 4) Hymenolepis nana
E) Smallest tape worm 5) Fasciola.

	A	B	C	D	E
a)	2	1	3	4	5
b)	3	5	1	4	2
c)	3	5	1	2	4
d)	3	4	1	5	5

15) Rhabiditi form larva is produced in the development of
a) Taina solium b) Ascaris lumbricoids
c) Plasmodium d) Wuch ereria boncrofti

16) Name the larva which performs Nocturnal periodicity
a) Rhabiditi form larva b) micro filaria c) planula d) paranchymula

17) Earth worm has
a) Chambered Heart b) Lateral hearts
c) Venous heart d) Beaded hearts

18) If light exposed to earthworm in night time at its burrow
a) Earth worm comes out b) Gets back into burrow
c) Remain as it is d) performs dance

19) Blood glands in earth worms produces
a) Chlorogugen cells b) Blood cells and hemoglobin
c) Mucus d)None of these

20) In cockroach open type of blood circulation is present, the Blood of cockroach is called
a) Haemuglobin b) Haemolymph c) Heomolith d) Haemocuel

21) Name the scientist who invented artificially pearl culture
a) H.G kohrana b)Kokichimikimoto c) Madam curie d)Dr. Salim Ali

22) Read the following statement and choose the correct answer
A. Echinoderms are spiny skinned Animals
B. Water vascular system is the chief life process of these Animals.
C. Water vascular system perform locomotion
a) A&B are true (C) is false b) B & C are true & A is false
c) A & C are true (B) is false d) A&B&C are true none is false

23) Percentage of CO_2 in Atmosphesic Air is
a) 0.003% b) 0.3% c) 0.03% d)3%

24) Cougulation of blood in the vessels is prevented during normal conditions by
a) Prothrombin b) Ca+ c) Fibrnogen d) Heparin

25) Blood vessels which carry blood from lungs to heart are
a) Pulmonary arteries b) Pulmonary veins
c) cardiac arteries d) Coronary veins

26) Heart beat in Mammals is initiated by
a)S.A node b) A.V. node c) Purkenji fibers d) Carotid labryuth

27) Persons Suffering from Hypertension should take following precautions
a) Avoid emotional disturbances and excitement
b) Avoid Standing c)Sleep as much as possible d) Increase their warms

28) Genetic code was given by
a) Watson and crick b) Beadle & Tatun
c) Nirenberg d) Bridges and kings

29) The term gene refers
a) A protein of RNA b) A protein of DNA
c) The linkage group d) The sequence of Amino acid in a protein

30) Identify the correct statement
A. Gene mutation is caused by change in the sequence of nitrogen bases.
B) Change in Actual size of gene
C) A change in structural configuration in DNA Mulecule
a) A is correct & B also correct
b) A is false But B & C are correct
c) A is true but B & C are false
d) A is false & B is false but "C" is true

31) What type of gemmates are formed from a plant of genotype Tt Rr
a) Tt & Rr b)TR & tr c)TR, Tr, tR,tr d) Tr,tr only

32) In a dilybrid cross yellow is dominant over green and Round seed coat is dominant over the wrinkled they were crossed and a typical mendal lion ratio 9:3:3:1 was obtained there are 1600 members of progeny. How many of them are likely to be wrinkled
a) 100 b) 300 c) 400 d) 600

33) A women sues asgains a man has blood group AB and the woman contains Blood Group 'O' and child Blood group is "O" would be the

man is the father of this child or not.

a)Man is a father of child
b) Women & Man Both are complex
c)Man is not a father of that child and woman's complain is wrong
d) None of them

34) Match the following and choose the correct answer

A. Biogenetic law	1. Angust Weisman
B. Mutation	2 Darwin
C.Germ plasm	3. Lonis pasture
D. Biogenesis	4. Ernst Hackle
E. Panginesis	5. Hugu deries

	A	B	C	D	E
a)	4	5	3	1	2
b)	4	5	2	1	3
c)	4	5	1	3	2
d)	5	4	3	2	1

35) One of the following snake is cannabolic in natures
a) Naja naja b) Naja Hannah c)Krait d) Echis carinata

36) A Dipnoi fishes are called 'uncles of Amphibia Beens they exhibit connecting cheracters like aerial mode of respiration and incomplete trichamberedd heart
a) A&R are true but R is not the correct explanation of "A"
b) A&R are false but R is the correct explanation of "A"
c) A&R are true and R is their correct explanation of "A"
d) A is correct but R & explanation are false.

37) When partial pressure of Co_2 rises the oxygen dissociation curve of hemoglobin at 37c will
a)Shifts towards right
b)Shifts towards left
c)become irregular
d) Remain unchanged

38) Re absorption of H_2o in Nephrons is controlled by
a) ACTH b) STH c) Vasopressin d) oxytocin

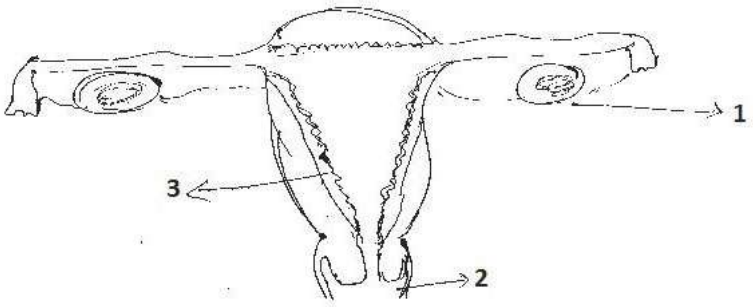
39) Diphyo dent is
a) Apart of pelvic girdle of mammal
b)A type of teeth in Rabbit
c) A toothless space in jaws of Rabbit
d) teeth are replaced twice in man

40) Match the following and choose the correct answer

A. Kupfer cells	1) Caecum
B. 1.5 pH	2) Insulin
C. Cellulose digestion	3)Gastric Juice
D. Lacteals	4) Liver
E. Diabetes mellitus	5)Lymphatic Blood vessels of villi

	A	B	C	D	E
a)	4	3	1	2	5
b)	4	3	1	5	2
c)	4	2	1	3	5
d)	5	3	1	2	4

41) Find out the correct series of names



a) Cervix, Vagina, Ovary b) Ovary, Cervix, Vagina
c) Ovary, Vagina, Cervical canal d) Ovary, Vagina, Endometrium

42) One of the following is correct.

S.No.	Sex Chromosomes	Haplord cells of Autosomes	X/A	Sexual phenotype
I	XX	AA	1.0	Male
II	XY	AA	0.5	Female
III	XXy	AA	1.0	Female
IV	XO	AAA	0.33	Male Female

a) I and II b) II and III c)III and IV d)IV and I

43) Find out the correct statement.
(Assertion) A: Alzheimer's disease is the most common form of dimentia
(Reason) R: Dimential includes paralysis and damage of meninges and loss of memory
a) A is true, R is false.
b) A is true, R is true and R is not the correct explanation of A.
c) A is true, R is true and R is the correct explanation of A.
d) A is true, R is false and R is the correct explanation of A

44) One of the following is known as Auto immune disease
a) Diabetes mellilias and thyroid
b) Graves disease and Rheumatoid Arthritis
c) Blood groups dismatch
d) All

45) The existence of deleterious genes with in the populations is called
a) Genetic drift
b) Genetic load
c) Founder effect
d) Bottle neck effect

Key

1)6	2)b	3)c	4)b	5)c	6)c	7)d	8)c	9)c
10)6	11)6	12)b	13)a	14)c	15)6	16)b	17)b	18)b
19)b	20)b	21)b	22)d	23)c	24)d	25)b	26)a	27)a
28)c	29)b	30)c	31)c	32)c	33)c	34)c	35)b	36)c
37)a	38)c	39)d	40)b	41)d	42)c	43)c	44)b	45)b

NEET/EAMCET Zoology (Model Question Paper – IV)

1) The branch of zerology which deals disease causing organism is called
   a) Pathology b) Paedology c)Etiology d) Ethology

2) The daughter verlicella formed in longitudinal biney fission is
   a) Mesotroch b)Telotroch c)Antero troch d)none

3) Name the Binary fission in which plane of fission is cross the kinety
   a)Symmetrogenic b) Homothetogenic c) Asymmetrogenic
   d)Heterogenic

4) Inter convertibility of solgel is
   a) Natural change b)Physical change
   c) Chemical change d)Physico-chemical change.

5) Match the following and choose the correct answer

A. Filopodea	I. Chlamydo phyrs
B. Axopodia	II. Arcella
C. Reticulopodia	III. Mastigamoeba
D. Lobopodia	IV. Lecithium

	A	B	C	D
1	V	IV	II	I
2	V	I	IV	II
3	V	IV	I	II
4	IV	III	II	I

6) Read the following statement and choose the correct answer
   1) The body of sponges consists of eipithelial tissues only.
   2) All the four types of tissue are present in the body of sponges
   3) Only epithelial and connective tissues are present
   4) Structurally organized tissues are absent in the body of sponges.
   a) 1 & 2 are correct b) 3&4 are correct
   c)only2 is correct d)Only 4 is correct

7) Which of the following coelenterate does not exhibit metagenesis
   a) Obelia b) Aurlia c)Hydra d)Physalia

8) Life history of liver fluke consists of these larval stages

a) Miracidium → Sporocyst → Meta cercasia

b) Mirocidium → Sporocyst → Radia ⟶ Metacercoria

c) Miracidium → Sporocyst → Radia → Cercaria → Metracercaria

d) Metacercaria → Cercaria → Radia → Sporocyst → Miracidum

9) Match the following and choose the correct answer

A. Polyembryony	I. Schistosoma haematobium
B.Liver fluke	II. Dibathriocephlus latus
C. Bilharziasis	III. Trematoda
D. Largest tape worm	IV. Hymenolepis nana
E. Smallest tape worm	V. Fasciola

	A	B	C	D	E
a)	II	I	III	IV	V
b)	III	V	I	IV	II
c)	III	V	I	II	IV
d)	III	IV	I	II	V

10. The larva which performs Nocturnal periodicity

a)Planula b)Rhabiditiform larva c)Microfilaria d)Cysficercus

11. In earth worm lateral Heat can be differentiated from lateral oesopheal Hearts by the presence of.

a) 2 pairs of valves b) 3 pairs of valves c4 pairs of valves d) All

12. The Rapid increase in the number of cell in the organ of host due to the presence of a parasite is known as

a) Hyperplasia b)Hyper trophy c)Over growth d)Necrosis

13. Match the following and choose the correct answer

A.	Stralified cubiodal epithelium	I	Ducts of parotid
B	Simple cubiodal epithelium	II	Thyroid gland
C	Simple columnar epithelium	III	Cernea of eyes
D	Simple Squamaus epithelium	IV	Canjuntiva of eyes
		V	Trachea and bronchi

	A	B	C	D	E
1	V	III	II	I	IV
2	IV	II	I	V	III
3	II	IV	I	III	V
4	V	II	III	IV	I

14. Every year Malaria day celebrated on
a)20th August b) 22 August c)26 August d)25 August

15. In Pheretima Ring vessels are present 12 pairs each in these segments
a) 9,10,11,12 b)10,11,12, & 13 c)10,11,13&14 d) 9,10,13&14

16. Which of the following is the correct matching set.
a) Pharynx - Grinding food
b) Clitellum - Coupulation
c) Blood gland -Respiration
d) Coelomicfluid - Hydraulic skeleton

17. Break bone fever is also known as
a) Yellow fever b) encephalilts c) Dengue fever d) viral fever

18. Pollon Basket is present on the tibia of the following leg/
a)Ist pairs b) II pair c) IV pair d) III pairs

19. Read the following and choose the correct answer
A.Museles in cockroach are striated in the form of bundles
B. In cock roach body wall does not show museles but are confined to segment
1) A is correct and B is false
2) A is in correct and B is true
3)B is correct and correct explaination to A
4) A & B are correct A is correct explaination to B

20. Aristotle's lanten in echinoids is known as
a) Alimentery organ b) Supplementary organ
c) Mastigtory orgen d) All

21. Aquictic organisms with limited power of locomotion are called
a)Plankton b) Nektons c) Neustons d)Periphytons

22. Statement Assertion 'chordate characters' are present in the class lervacea of urochordates Reason Larvaceae exhibit neoteny
1) A & R are correct
2) A is correct R is false
3) A & R are correct R is not the correct explanation to A
4) A & R are correct and R is the correct explanation to A

23. Dental formula of man is
a) 2/2, 0/0, 3/3, 3/2 b) 2/2, 1/1, 2/2, 3/3
c) 2/2, 1/1, 2/2, 3/2 d) 2/1, 0/0, 2/2, 3/3

24. Arrange the following veins of man according to their collecting blood from the posterior to anterior end.
a) Hepatic portal vein b) Hypogastric vein c) Hepatic vein
d) Ilialumbar vein
i) d-b-c-a ii) b-d-a-c iii) a-d-b-c iv) c-a-b-d

25. Wharton's duct is associated with
a) Parotid glands b) Infra orbital
c) Submallary gland d) Sublingual lglad

26. A joint which allows angular movement in only one plane is
a) Saddle Joint b) Hinge joint c) pivot joint d) Gliding joint

27. Kupffers cells are found in
a)Gall bladder b) Pancreas c) liver d) stomach

28. Glomerular filtrate contains
a) Nitrogenous waste only b)Nitrogenous waste and glucose
c) Nitrogenous waste salt of Na, k,Ca 4 mg and glucose
d) Nitrogenous wastes salts of Na,k,Ca mg & glucose Amino acids hormones and vitamins

29. The percentage of water reabsorbed from renalfluid in the proximal convoluted tubule(PCT) is
a) 64% b)70% c)80% d) 55%

30. Pulmonry vein brings the blood
a) Deoxygenated b) oxygenated
c) oxygenated and deoxygenated d) Impure blood

31. The pace makers are present in the Heart of Human
a) S.A node b)A.V node c)a & b d)SAV node

32. Person suffering from Hypertension should take following precautions.
a) Avoid emotional disturbances and excitement
b) Avoid standing c)Sleep as much as possible
d) Should performs heavy exercise

33. Genetic code was given by
a) Watson and crick b) Bandlee & Taturn
c) Niren berg d) Bridges and kings

34. Identify the correct statement
A. Gene mutation is caused by a change in the sequence of Nitrogen bases
B. Change in Actual size of gene
C. A change in structural configuration in DNA molecule
1) A is correct and B also correct
2) A is false but B & C are true
3) A is true but B & C are false
4) A is false B is false but C is true

35. A woman sues against a man has blood group AB and the woman contains blood group "O" and child blood group is "O" would be the man is the father of that child or not
a) Man is a father of child b) Woman complain is true
c) Man is not a Biological father and woman complain is false
d) None of the above

36. A person whose father is color blind marries a lady who is the daughter of a color blind man their children will be
a)All Normal b) All sons color blind
c) All color blind
d)Half sons normal and remaining half are color blind

37. Match the following and choose the correct answer

A. Biogenetic law	I. August weisman
B. Mutation	II. Darwin
C. Germplasm	III. Louis pasture
D. Biogenesis	IV. Ernst Hackle
E. Pangenesis	V. Hugodeveries

	A	B	C	D	E
1	IV	V	III	I	II
2	IV	V	II	I	III
3	IV	V	I	III	II
4	V	IV	III	II	I

38. If D cells in the pancreas of an Adult man are destroyed the process affected is

a) Proteolysis b) Cytolysis c) Glycogenesis d) Glycogenolysis

39. Match the following and choose the correct answer

A. MHC	I) Antigen binding fragment
B. HLA	II) B Ly mphocyte
C. IgE	III)Histo compatibility leucocyte Antigen test
D Fab	IV) Major Histo compability complex

	A	B	C	D
1)	IV	III	I	II
2)	IV	III	II	I
3)	IV	II	I	III
4)	III	I	II	IV

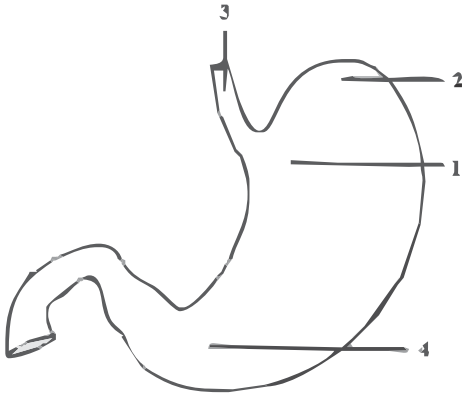
40. Xenograft Means

a)Grafting of organs or tissue between Identical animals
b)Grafting of organs one to another
c) Rejection of organ
d) Grafting of porcline Heart valves

41. Mouth parts of Cockroach are

a) Sponging & sucking type b) Biting & Chewing type
c) Homologus organs d) 2 & 3

42. Find out the correct series of names



1) Oesophagus, Cardiac stomach, fundus & pyloric
2) fundus, Oesophagus, Cardiac stomach & pyloric
3) fundus, Cardiac, Oesophagus & pyloric
4) Cardiac, fundus, Oesophagus & pyloric

43. Find out the correct statement

A: Vomiting in throwing out of the contents of the stomach through the mouth.
B: Vomiting controlled by the vomiting centre is known as medulla oblongata.
C: Indigestion casus due to over eating, spicy foods & anexiety.
D: The normal frequency of Bowel movement and decreased liquidity of the faecal discharge is diarrohea.

a) A & B are true and C & D are false.
b) A, D & C are true and B is false.
c) A, B & C are true and D is false.
d) A, B, C & D are true and none is false.

44. Assertion (A): In birds a muscular ventriculus is called Gizzard.
(Reason) R: Because it Grinds the food.

a) A is true, R is false.
b) A is true, R is true but R is not the correct explanation of A.
c) A is true, R is true and R is the correct explanation of A.
d) A is true, R is false and R is not the correct explanation of A

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45. One of the following is useful measures for prevention & control of TDA abuse among the Adolescents.

A: Avoid undue parental pressure & responsibility of parents and teachers.
B: Seeking help from peers education & counseling.
C: Seeking help from professionals, Alcohol & Drugs consumptive persons.

a) A & C are true, B is false
b) A & B are true and C is false
c) B & C are true, A is false
d) A, B & C are true & none is false.

Key

1)c	2)b	3)b	4)d	5)4	6)d	7)c	8)c	9)c
10)c	11)c	12)a	13)2	14)a	15)b	16)d	17)c	18)a
19)4	20)c	21)a	22)4	23)b	24)2	25)c	26)b	27)c
28)d	29)a	30)b	31)c	32)a	33)c	34)3	35)c	36)d
37)3	38)d	39)2	40)b	41)b	42)3	43)c	44)c	45c

NEET/EAMCET Zoology (Model Question Paper –V)

1) Binomial Nomenclature was introduced by
   a) A.P De Condole b) Schleiden c) Linnaeas d) None of the above

2) Branch of biology connected with the improvement of human race through laws of heredity is
   a) Eugenics b) Euthenics c) Euphenics d) Ethology

3) Statement: Sub species has a geographical area & geographically isolated from other sub species
   Reason: When members of species are geographically isolated they give rise to a subspecies
   a) Both are correct & reason is the correct explanation of statement
   b) Reason is the correct explanation to the statement but statement is false
   c) Both are in correct
   d) Reason is incorrect & statement is true

4) Father of Taxonomy is called
   a) William Harvey b) Carolous Linneaus
   c) Aristotle d) Theophrastus

5) Read the following & choose the correct answer.
   A: Macro conjugant swims freely in water in search of micro conjugant
   B: Micro conjugant does not metamorphose to become an adult
   1) A & B are true & B is correct explanation to A.
   2) B is incorrect, A is true
   3) A & B are true, A is correct explanation of B.
   4) A is incorrect B is true

6) Match the following and choose the correct answer

A) filopodia	1) chlamydo phyrs	
B) Axopodia	2) Arcella	
C) Reticulopodia	3) mastigamoeba	
D) Lobopodia	4) lecithium	

	A	B	C	B
1)	V	IV	II	I
2)	V	I	IV	II
3)	V	IV	I	II
4)	IV	III	II	I

7) Earth worm has
a) Chambered Heart b) lateral heart
c) venous heart d) beaded heart

8) Which one of the following is known as Haemopoitic tissue
a) Cartilage b) bone c) bone marrow d) tendon

9) Epiphyseal plate disappears in
a) childrens b) adults c) foetus d) man after 40 years

10) Match the following & choose the correct answer

A) Stratified Cuboidal epithelium	1) ducts of parotid
B) Simple Cuboidal epithelium	2) Thyroid glands
C) Simple columnar epithelium	3) Cornea of eyes
D) pseudo stratified epithelium	4) conjunctiva of eyes
E) simple squamous epithelium	5) trachea & large bronchi

	A	B	C	D	E
1)	V	III	II	I	IV
2)	IV	II	I	V	III
3)	II	IV	I	III	V
4)	V	II	III	IV	I
5)	I	II	III	IV	V

11) Apoplysis is the process of
a) development of unfertilized egg b) separation of gravid proglottid
c) destruction of phagocytes d) cellular digestion

12) liver flukes life history consists of the larval stages
a) Miracidium→sporocyst→ metacercaria
b) Miracidium→sporocyst → Radia → carcaria → metacercaria
c) Miracidium→Radia → Sporocyst → metacercaria
d) Metacercaria → cercaria → Radia → sporocyst

13) The term platyhelminthus was coined by
a) Linneaus b) Gegenbaur c) Grover d) Leukart

14) Measly pork contains
a) cystiercus larva b) hexacanth c) adult tape worm d) fertilized egg

15) Match the following & choose the correct answer

A. Polyembryony	1. schistosoma haematobium
B. Liver fluke	2. dibothrio cephalus
C. Bil harzians	3. trematoda
D. Largest tape worm	4. hymenolepsis nona
E. Smallest tape worm	5. fasciola

	A	B	C	D	E
a)	2	1	3	4	5
b)	3	5	1	4	2
c)	3	5	1	2	4
d)	3	4	1	2	5

16) Rhabiditi form larva is produced in the development of
a) Taenia solium b) Ascaris lumbricoids
c) plasmodiumd) wucharira bancrofti

17) Name the larva which performs nocturnal periodicity
a) Rhabiditiform Larva b) Microfilaria
c) Planula d) Paranchymula

18) If light exposed to earth worm in night time at its burrow
a) earth worm comes out b) gets back into burrow
c) remain as it is d) performs dance

19) Blood glands in earth worms produces
a) chlorogogen cells b) blood cells & hemoglobin
c) mucus d) none

20) In cockroach open type of blood circulation is present, the blood of cockroach is called
a) hemoglobin b) haemolymph c) haemolith d) haemocoel

21) Name the scientist who invented artificially pearl culture
a) H.G Khorana b) Kokichimikimoto
c) Madam curie d) Dr. Salim Ali

22) Read the following statement & choose the correct answer
A: Echiniderms are spiny skinned animals
B: Water vascular system is the chief life process of these animals
C: Water vascular system performs locomotion

a) A & B are true, C is false b) B & C are true & A is false
c) A & C are true, B is false d) A,B & C are true none is false.

23) Percentage of Co2 in atmospheric air is
a) 0.003% b) 0.3% c) 0.03% d) 3%

24) Coagulation of blood in the vessel is prevented during normal conditions by
a) Prothrombin b) Ca+ + c) fibrinogen d) heparin

25) Blood vessels which carry blood from lungs to heart are
a) pulmonary arteries b) pulmonary veins
c) cardiac arteries d) coronary veins

26) Heart beat in mammals is initialed by
a) S.A node b) A.V node
c) purkinje fibres d) carotid labrynth

27) Person's suffering from hypertension should take following precautions
a) avoid emotional disturbances & excitement
b) avoid standing c) sleep as much as possible
c) d) increase their arguing

28) Genetic code was given by
a) Watson & Crick b) Beadle & Tatun c) Nirenburg d) Bridges & Kings

29) The term gene refers
a) A portion of RNA b) A portion of DNA
c) the linkage group d) the sequence of amino acid in a proteins

30) Identify the correct statement
A. Gene mutation is caused by a change in the sequence of nitrogen bases.
B. Change in actual size of Gerne.
C. A change in structural configuration in DNA molecule
a) A is correct & B also correct
b) A is false but B&C are correct
c) A is true but B & C are false
d) A is false & B is false but C is true

31) What type of gametes are formed from a plant of genotype Tt Rr?
a) Tt & Rr b) TR & tr c) TR, Tr, tR, tr d) Tr, tr only

32) In a dihybrid cross yellow is dominant over green & round seed coat is dominant over the wrinkled. They were crossed 7 a typical Mendilean ratio 9:3:3:1 was obtained. There are 1600 members of progeny How many are likely to be wrinkled?

a) 100 b) 300 c) 400 d) 600

33) A woman sues agains a man has blood group AB and the woman contains blood group 'O' & child's blood group is O' would be the man is the father of this child or not explain?

a) Man is a father of child b) Woman & man both are couple

c) Man is not a father of that child & woman's complain is wrong d) None

34) Match the following & choose the correct answer.

A. Biogenetic law	1. August Weismann
B. Mutation	2. Darwin
C. Germplasm	3. Louis Pasteur
D. Biogenesis	4. Ernst Hackle
E. Pangenesis	5. Hugo Devries

	A	B	C	D	E
a)	4	5	3	1	2
b)	4	5	2	1	3
c)	4	5	1	3	2
d)	5	4	3	2	1

35) One of the following snake is cannabolic in nature

a) Naja-naja b) Naja hannah c) Krait d) Echis Carinata

36) Cell cycle is regulated by

a) cyclins b) Kinases c) A& B d) porphyrin

37) Match the following & choose the correct answer

A) Carcinoma	1) cancer of spleen & lymph node
B) Sarcoma	2) bone 4 muscle cancer
C) Leukemia	3) trachea, skin & brain cancer
D) Lymphoma	4) blood cancer

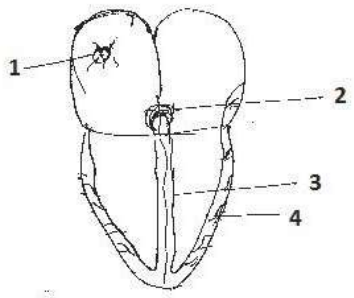
	A	B	C	D
a)	I	III	II	IV
b)	II	I	III	IV
c)	III	II	IV	I
d)	IV	III	I	II

38) ATS & AVS are example of
a) Innate Immunity b) passive immunity
c) natural acquired passive immunity d) artificially acquired passive immunity

39) Steps involved in protocol of rDNA technology are
a) Isolation of donor DNA for cloning Í isolation of vector Í formation of chimeric DNA Í uptake of chimeric DNA Í breaking of hybrid DNA
b) Isolation of donor DNA for cloning Í isolation of vector Í formation of chimeric DNA Í uptake of chimeric DNA Í selection of the cells containng chimeric DNA Í propogated & cultured.
c) Isolatiaon of vector Í isolation of donor DNA Í formation of chimeric DNA Í uptake of chimeric DNA
d) Uptake of Chimeric DNA Í isolatiaon of donor DNA Í isolation of vector

40) Domino transplantation is usually performed for
a) cystic fibriosis & blood b) heart
c) heart & lungs d) none.

41) Find out eh correct series of names.



a) A.V.node, Bundle of Hiss, Purkinje fibres & S.Anode
b) Bundle of Hiss, Purkinje fibres, A. V. node & S.Anode
c) S.Anode, A.V.node, Purkinje fibres, Bundle of Hiss
d) S.Anode, A.V.node, Bundle of Hiss, Purkinje fibres

42) Find out the correct statement
A: The GFR in a Healthy individual in approximately 125ml/minute.
B: In PCT movement of water occurs by osmosis.
C: DCT is also capable of reabsorption of HCO_3^-
a) A is true B & C are false. c) A & B are true and C is false.
b) A, B & C are false and none is false. d) A, B & C are true and none is false.

43) Assertion (A): Adolescence period is "Valuable phase"
(Reason) R: Because it is accompanied by several Biological & behavioral changes.

a) A is true, R is false and R is the correct explanation of A.
b) A is false, R is true but R is not the correct explanation of A.
c) A & R true, but R is not the correct explanation of A.
d) A & R true, R is the correct explanation of A.

44) Match the following & chose the correct Answer

	Column – I	**Column – II**
A.	Uremia	I. Kidney failure
B.	Renal Canaliculi	II. Liver failure
C.	Glomerular nephritis	III. Kidney stone
D.	RF	IV. Inflammation of Glomerulus
		V. Excess amount of Urea in Blood

	A	B	C	D
a)	I	II	III	IV
b)	V	IV	III	II
c)	V	III	IV	II
d)	V	II	IV	I

45) A man maries with a normal woman. Who is the daughter of a Hemophilic father. How many of their children genetically get affected.

a) 50% daughters are affected, 50% sons are normal
b) 50% sons are affected, 50% daughters are normal
c) 50% sons and 50% daughters are affected
d) All

KEY

1) c	2) a	3) a	4) b	5) 4	6) 3	7) b	8) b	9) 2	10) b
11) b	12) b	13) a	14) c	15) b	16) b	17) b	18) b	19) b	20) b
21) b	22) d	23) c	24) d	25) b	26) a	27) a	28) c	29) b	30) c
31) c	32) c	33) c	34) c	35) b	36) c	37) 3	38) d	39) b	40) c.
41)d	42)d	43)d	44)d	45)d					

NEET/EAMCET Zoology (Model Question Paper –VI)

1) The natural selection that acts against change in the form and keeps the population constant through the time is
a) directional b) disruptive c) not acting d) stabilizing

2) A triploblastic pseudocoelomate, bilaterally symmetrical human parasite which is oviparous and the transmission is by contact is
1) filarial worm 2) palalo worm 3) hook worm 4) tape worm

3) Identify the correct statement regarding the nuclei of vorticella
a) both macro & micro nuclei are diploid
b) Macro nucleus is diploid and micro nucleus is haploid
c) The male 4 female pronuclei are diploid
d) Both pronuclei are diploid
e) Zygote is diploid
1) a,b,c 2) b,c,e 3) a,d,e 4) a,c,e

4) Match the following with reference to pheretina

A. Spermiduccal funnels	1. 200-250
B. Ring vesssels	2. 17 & 19th segments
C. Exonephric nephridia	3. 12/13th segments
D. Accessory gland	4. 10,11,12 & 13th segments
E. Ovary	5. 10th & 11th segments

	A	B	C	D	E
I)	5	1	4	2	3
II)	5	4	1	2	3
III)	1	5	4	2	3
IV)	5	1	4	3	2

5) Abdominal ganglion in cockroach is not found in this segment
a) 2&3 b) 4 c) 5 d) 6

6) A sangivorous, ectoparasitic anadromous animal is:
1) Eel 2) Salmon 3) Leech 4) lamprey

7) Match the following
A. Ductus botalli 1. Oikopleura

B. Ductus Carotius	2. Lapidosisan
C. Neoteny	3. Lamprey
D. Anadramous	4. Lacertilia
E. Amazon	5. Ureotyphlus

	A	B	C	D	E
a)	5	4	1	3	2
b)	5	1	4	3	2
c)	5	1	4	2	3
d)	4	1	4	2	3

8) A snake is identified to be having large hexagonal vertebrals and the dorsal surface bluish narrow white streaks, it is
(1) Echis carinata (2)Bungarus Coerulus (3)Hemibungarus (4)Enhydrina

9) The water soluble protein associated with silk thread is:
(1) Fibroin (2)Serecin (3) Chitin (4) Mucin

10) The cranial nerve that goes to the external rectus muscle is:
(1) II (2) III (3) VII (4) VI

11) The following are the branches of dorsal aorta :
I. Intercostal II. Phranic III. Coeliac IV. Anterior mesentric V. Posterior mesenteric of these which set of arteries supply the blood to the glands of digestive system
(1) I and II (2) III + IV (3) IV + V (4) II +III

12) Phallomeres in male periplaneta arise from:
(1) 8+9th sterna (2) 7th sternum (3) 8th sternum (4)9th sternum

13) Identify the correct pair of birds with a raft like keel and lacking preen gland and syrynx:
(1) Tinamus & Aptery (2) Rhea & Dromeous (3) Cassowary & Struthi (4) Kiwi & Rhea

14) Match the following :

A. Vant Hoff's rule	1. Body size
B. Bergmann's rule	2. Metabolic rate
C. Allen's rule	3. Development
D. Jordan's rule	4. Organ size

	A	B	C	D
1)	1	2	4	3
2)	3	4	2	1
3)	2	1	3	4
4)	2	1	4	3

15) Note the following
a) Dentition is heterodont b) Canines are poorly developed
c) Incisors are chisel like and poorly developed.
d) Herbivores and diastema is present e) Dental formula is 2/1, 0, 3/2, 3/3.
Which of the above are true for oryctolagus.
(1) a, b and d 2) a, d and e (3) a, b, d +e (4) c, d, + e.

16) Release of vaso active mediators during hypersensitivity is associated with :
(1) Type I (2) Type II (3) Type III (4) Type IV

17) A bald headed (Bb) man marries a non bold woman (Bb), their progeny if all are females, the probable bald to non-bald ratio in their progeny would be:
(1) 1:1 (2) 3:1 (3) 1:3 (4) 2:1

18) The total number of progeny obtained from a dihybrid cross is 1280 in F2 generation. How many of them are Recombinant.
(1) 240 (2) 360 (3) 480 (4) 720

19) If the blood group of a child is 'A' and that its mother is 'B' then the genotype of mother and father may be.
(1) BBxAA (2) ABxAB (3) BOxOO (4)BOxAO

20) The juice containing sodium glycocholate is released under the influence of :
(1) secretin (2) Chole cystokinin (3) Enteorgasterone (4) Enterokinin

21) Match the following :

A. Scylla trangui barica	1. Silver carp
B. Qidiuon albicans	2. Agar
C. Gracellaria	3. Green crab
D. Anaeones	4.Thrush
E. Hypopthalmichthyes moltrix	5. Mediterranean bird

	A	B	C	D	E
1)	3	4	2	1	5
2)	4	3	2	5	1
3)	3	5	2	4	1
4)	3	4	2	5	1

22) The anaphase promoting complex is avtivated by
(1) Mcdk cyclin (2) G, cdk cyclin (3) scdk cyclin (4) Transcription factor

23) The sclerite that covers the top of the head and the space between the two compound eyes in periplaneta is
(1) Clypens (2) Labrum (3) Vertex (4) Genae

24) The type of mouth parts found in the insect that is known to spread myiasis is :
(1) Sponging + Sucking (2) Piercing & sucking
(3)Biting + Chewing (4) Siphoning

25) Carolus Linnaens, a Swedish botanist, popularized the binomial nomenclature and described this system in which edition of the book.
(1)11th edition (2) 1oth edition (3) 12th edition (4) 9th Edition

26) In Giardia strong bilateral symmetry is due to this reason.
(1) 2 pairs of eyes +4 pairs of flagella (2) only 4 pairs of flagella
(3) only 2 pairs of eyes (4) 5 pairs of flayella +10 eyes

27) These cells form movable spines or bristles, which are covered by cuticle with their basis buried in sockets.
(1) Tormogen cells (2) Oenocytes (3) Epidermal cells (4) Trichogen cells

28. In this insect the reduced forewings called hemiehytra and stinkglands are present at the base of the legs:
1) Mucea 2) Aedes 3) Cime 4) Cockroach

29. Read the following:
A: Precystic stage of Ent. Histolytica stores glycogen granules and one to two rod shaped chromatoid bodies.
B: Chromatoid bodies are ribonucleo protein in nature.
a. A & B are true, B is correctep lanation to A.
b. Both A & B are incorrect
c. Both A & B are correct
d. A is correct and B is false.

30. The crythrocytic cycle in Plasmodium viva is completed in
1) 40 hrs 2) 38 hrs 3) 48 hrs 4) 45 hrs

31. Except this poriferan, remaining are marine form's
1) Euspongia 2) Hippospongia 3) Spongilla 4) Euplectella

32. Power of regeneration is Ecellently developed in these following individuals.
1) Poriferans, cnidarians, turbellarians 2) Cnidarians, trematodes, Protozoans
3) Arthropods, Molluscans, Annedids 4) Analids, turbellerian, Molluscans

33. The process of self amputation in echinoderms, when captured by a predator is:
1) Anatomy 2) Autotomy 3) Autonomy 4) Toutotony

34. For every 10 meters increase in depth of oceanssf deep lakes, pressure increasse by
1) 2 atmospheres 2) 3 atmospheres 3) 1 atmosphere 4) 100 atmospheres.

35. In karnataka one of the famous lake which attracts migratory birds every year is:
1)Ranganna Theethu 2) Kolleru 3) Indravathi 4) Bharatpur bird snatuary

36. Of all the septalwalls one of the septal wall is thinnest and lies between the segments:
1) 3\4 seg 2) 4/5 seg 3) 5/6 seg 4) 10/11

37. Which of the following tissues have plenty of blood and nerve supply & give the body its contour or outline:
1) Muscular tissue 2) connective tissue 3) Nervous 4) Epithelial tissue

38. This acts as the actual "Middle man" between the blood & tissues.
1) Blood 2) Extra cellular fluid 3) Intra cellularfluid 4)Plasma

39. Life span of neutrophills is from:
1) 2 to 4 days 2) 3 to 5 days 3) 1 to 2 days 4) Only 1 day

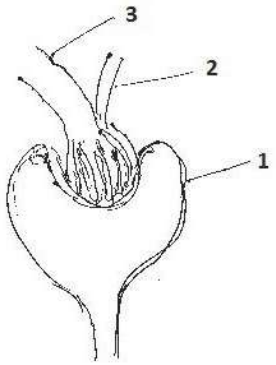
40. Vertebrates are craniates these are acraniates
1) Urochoradates & cyclostomes 2) Protochordates
3) 1 & 2 4) Cephalochordates

41) One of the following muscular tissue is involution in function
1) Striated 2) Smooth 3) Cardiac 4) 2 & 3

42) Indicate the correct statement
A: Liver is the first check post in the body which detoxify the toxins.
B: In Alcoholic person fungal toxins causes liver cirrhosis
C: Aflatoxins are not metabolized in to some other Nontoxic substances during Healthy
or General condition
1) A is true, B & C are false
2) B & C are true & D is false
3) A, B & C are true, none is false
4) A & B are true and C is false

43) Reason (A): Mammary Glands are lectational Glands
Reason (R): Mammary Glands are modified sweat Glands.
1) A is true, R is false
2) A & R are true & but R is not the correct explanation of A.
3) A & R are false, but R is the correct explanation of A.
4) A is true, R is false, but R is the correct explanation of A.

44) Find out the correct series of Names



1) Afferent Arteriole, Efferent Arteriole, Bowman's Capsule.
2) Efferent Arteriole, Afferent Arteriole, Bowman's Capsule.
3) Bowman's Capsule, Efferent Arteriole, Afferent Arteriole
4) Bowman's Capsule, Afferent Arteriole, Efferent Arteriole

45) Theory of Abiogenesis is believed by the Scientists are
1) Aristotle, Thales 2) Plato & Von Helment
3) Darvin & Katelvell 4) 1 & 2.

Key

1.4	11.2	21.4	31.3
2.3	12.4	22.1	32.1
3.4	13.3	23.3	33.2
4.2	14.4	24.1	34.3
5.3	15.2	25.2	35.1
6.4	16.1	26.2	36.2
7.1	17.3	27.4	37.2
8.2	18.3	28.3	38.2
9.2	19.4	29.3	39.1
10.4	20.2	30.3	40.2
41.4	42.4	43.2	44.3
45.4			