

Royal Rajasthan Public School



तेजस्विनावधितमस्तु

ABU ROAD



# Question Bank

# Biology

Class:-12<sup>th</sup>

Session:-2024-25

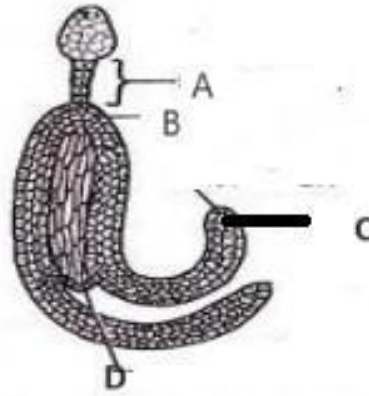
## **CHAPTER-1**

### **SEXUAL REPRODUCTION IN FLOWERING PLANTS**

1. Pollens can be preserved as fossils due to presence of
  - (a) Cellulose in intine
  - (b) Lignin in exine
  - (c) Sporopollenin in intine
  - (d) Sporopollenin in exine
  
2. Apple is false fruit while mango is true fruit as
  - (a) It develops from the ovary after fertilisation.
  - (b) It develops from thalamus after fertilisation.
  - (c) It develops from the ovary without fertilisation.
  - (d) It develops from thalamus without fertilisation.
  
3. Pollen grains intine is mainly made up of
  - (a) Cellulose
  - (b) Starch
  - (c) Glycogen
  - (d) Sporopollenin
  
4. Which statement/s is/are correct for wind pollinated flowers?
  - (i) In these flowers petals are not brightly coloured.
  - (ii) These flowers have large sticky pollen.
  - (iii) These flowers have a hairy , thick style and stigma.
  - (iv) In these flowers fragrance is absent.
  - (a) (i), (ii) and (iii)
  - (b) (i), (iii) and (iv)
  - (c) (ii), (iii) and (iv)
  - (d) (i), (ii), (iii) and (iv)
  
5. Which out of the following statements is correct about perisperm?
  - (a) It is a degenerated secondary nucleus.
  - (b) It is peripheral part of endosperm
  - (c) It is degenerated synergid
  - (d) It is remnant of nucellus
  
6. If an endosperm mother cell has 18 chromosomes, then what will be the number of chromosomes in a megaspore mother cell?
  - (a) 12
  - (b) 18
  - (c) 24
  - (d) 32
  
7. If a plant is unable to produce normal pollen grains, then which layer of microsporangium is malfunctional?
  - (a) Epidermis
  - (b) Endothecium
  - (c) Tapetum
  - (d) Middle layer

8. Which out of the following is correct for an artificial hybridisation program?
- Emasculation is done in unisexual flowers.
  - Bagging is done before emasculation.
  - Emasculation is done to prevent unwanted self-pollination and contamination.
  - Rebagging is done just after emasculation.

9. Select options A,B,C and D in the given figure of the dicot embryo.



- A – Plumule (2n), B – Suspensor (n), C – Cotyledon (2n), D – Radicle (2n)
  - A – Suspensor (2n), B – Radicle (2n), C – Cotyledon (2n), D – Plumule (2n)
  - A – Cotyledon (2n), B – Radicle (n), C – Plumule (n), D – Suspensor (n)
  - A – Plumule (2n), B – Suspensor (2n), C – Radicle (2n), D – Cotyledon (2n)
10. Castor seed is different from groundnut seed as
- Castor seed has many embryos while groundnut seed has 1 embryo
  - Castor seed is Ex albuminous while groundnut seed is albuminous.
  - Castor seed is albuminous while groundnut seed is Exalbuminous
  - Castor seed has perisperm which is absent in groundnut seed
11. Which of the following is/are outbreeding device?
- Unisexuality in plants
  - Presence of stigma and anther at different positions.
  - Self – Incompatibility
  - All of above
12. In *Hydrilla* and *Vallisneria* pollens are protected from wetting by
- Sporopollenin covering
  - Mucilaginous covering
  - Waxy coating
  - Lignin coating
13. Which of the following is a major cause of pollen allergy?
- Pistia
  - Parthenium
  - Cuscuta
  - Lentana

14. The dull coloured flowers with well exposed stamens and large feathery stigma is probably pollinated by
- (a) Water
  - (b) Insects
  - (c) Birds
  - (d) Wind
15. Exine is made of sporopollenin which is the most resistant biological substance still pollen tube comes out through pollen wall due to the presence of
- (a) Exine
  - (b) Intine
  - (c) Germ pore
  - (d) Vegetative cell
16. With respect to layers of walls of microsporangium select the one which is not related.
- (a) Epidermis
  - (b) Endothecium
  - (c) Middle layer
  - (d) Integuments
17. Read the following statements about water pollinated submerged plants and select the correct one
- (a) Flowers produce nectar.
  - (b) Petals of flowers are brightly coloured.
  - (c) The female flowers have a long stalk to reach the surface.
  - (d) All of above
18. In apomixis
- (a) Seed is produced after fertilisation
  - (b) Seed is produced without fertilisation
  - (c) Fruit is produced with fertilisation
  - (d) Fruit is produced without fertilisation
19. Anther is to pollen grain as the ovule is to .....
- (a) Stamen
  - (b) Pistil
  - (c) Embryo sac
  - (d) Ovary
20. Choose the correct statement out of the following:
- (a) Chasmogamous flowers have more chances of xenogamy
  - (b) Cleistogamous flowers always show geitonogamy.
  - (c) Cleistogamous flowers never do autogamy
  - (d) Chasmogamous flowers always do autogamy
21. A 7 celled , 8 nucleated embryo sac has
- (a) 2 antipodals, 3 synergids ,1 central cell and 1 egg cell
  - (b) 3 antipodals, 3 synergids and 1 egg cell
  - (c) 1 antipodal, 3 synergids,2 central cell and 1 egg cell
  - (d) 3 antipodals, 2 synergids, 1 central cell and 1 egg cell

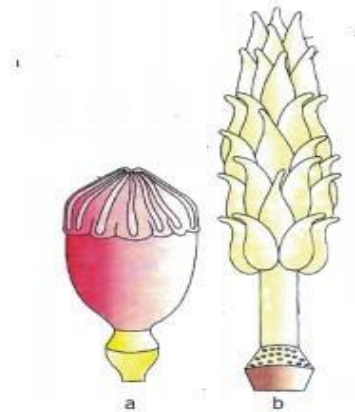
22. Choose the correct statement.

- (i) Pollen grains can be well preserved as fossils.
- (ii) Pollens can germinate on stigma of flower of any plant
- (iii) Pollens have articulated exine as per need of pollination
- (iv) Pollen grains represent male gametophyte as embryo sac represents female gametophyte.

- (a) (i), (ii), (iii)
- (b) (i), (iii), (iv)
- (c) (ii), (iii), (iv)
- (d) (i) only

23. Which terms are correct about following figures showing gynoecium of

(a) Papaver and (b) Michelia?



- (a) Multicarpellary, syncarpous and multicarpellary, apocarpous
- (b) Monocarpellary, syncarpous and multicarpellary, apocarpous
- (c) Multicarpellary, syncarpous and monocarpellary, apocarpous
- (d) Monocarpellary, syncarpous and monocarpellary, apocarpous

24. Products of triple fusion and syngamy respectively in double fertilisation are

- (a) Zygote (n), PEN (2n)
- (b) PEN (2n), Zygote (2n)
- (c) PEN (3n), syngamy (2n)
- (d) Zygote (3n), PEN (3n)

25. Which cell of the embryo sac helps the pollen tube to enter the embryo sac?

- (a) Persistent synergid
- (b) Antipodal cells
- (c) Degenerated synergid
- (d) Egg cell

26. Which out of the following are an albuminous seed and non-albuminous seed respectively?

- (a) Beans and Wheat
- (b) Ground nut and castor
- (c) Castor and Pea
- (d) Maize and Castor

27. Milky water of tender coconut is
- (a) Liquid gametes
  - (b) Liquid nucellus
  - (c) Liquid female gametophyte
  - (d) Free nuclear endosperm
28. Microsporangium is generally surrounded by four wall layers. Choose the correct names and sequence of layers from outside to inside
- (a) Endothecium, Epidermis, Tapetum and Middle layer
  - (b) Epidermis, Middle layer, Endothecium and Tapetum
  - (c) Epidermis, Endothecium, Tapetum and Middle layer
  - (d) Epidermis, Endothecium, Middle layer and Tapetum
29. Polygonum type of embryo sac is
- (a) 4 – nucleate, 3 – celled
  - (b) 8 – nucleate, 7 – celled
  - (c) 7 – nucleate, 7 – celled
  - (d) 8 – nucleate, 8 – celled
30. Which of the following is not a water pollinated plant ?
- (a) Hydrilla
  - (b) Vallisneria
  - (c) Zostera
  - (d) Lotus

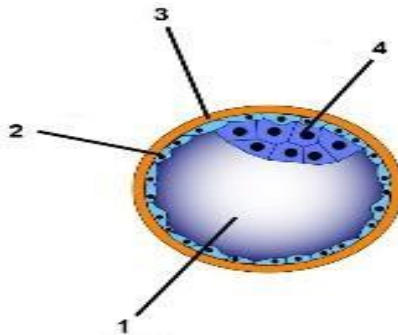
*"Through the lens of biology, we gain insights into the past, present, and future of life on our planet."*



## **CHAPTER-2**

### **HUMAN REPRODUCTION**

1. In human testis cells producing testosterone are
  - (a) Leydig cells
  - (b) Interstitial cells
  - (c) Both (a) and (b)
  - (d) Sertoli cells
  
2. If a male testis fails to slip into scrotal sacs may have infertility. Choose the possible reason behind the condition.
  - (a) Scrotal sacs have higher temperature than abdominal cavity
  - (b) Scrotal sacs have temperature 2 - 2.5 0C lesser than normal body temperature
  - (c) In scrotal sacs enough space is present for high number of sperm production
  - (d) Wall of scrotal sacs secrete hormones necessary for sperm production
  
3. The function of germinal and Sertoli cells present in testis is
  - (a) to produce sperms and to nourish developing sperms respectively
  - (b) to secrete hormones and to nourish developing sperms respectively
  - (c) both types of cells secrete different hormones
  - (d) to nourish sperms by secreting 60% and 30% seminal fluid respectively
  
4. Which statement/s is/are incorrect ?
  - (i) Urethra in human males acts as a urogenital canal.
  - (ii) In human males' testis are extra abdominal
  - (iii) The region outside seminiferous tubules is called interstitial space and contains Leydig cells
  - (iv) In human male's testis slips down into the scrotal sacs during certain breeding seasons only.
  - (a) (i), (ii) and (iii)
  - (b) (iv) only
  - (c) (ii), (iii) and (iv)
  - (d) (i), (ii), (iii) and (iv)
  
5. Which of the following is the correct pathway for transport of sperm from seminiferous tubules of testis ?
  - (a) Testis ▼ Rete testis ▼ Vasa efferentia ▼ Epididymis ▼ Vas deferens
  - (b) Rete testis ▼ Testis ▼ Vas deferens ▼ Epididymis ▼ Vasa efferentia
  - (c) Testis ▼ Vasa efferentia ▼ Testis ▼ Epididymis ▼ Rete testis
  - (d) Rete testis ▼ Epididymis ▼ Vas deferens ▼ Testis ▼ Vasa efferentia
  
6. In the figure given below the correct name and ultimate fate of part 4 mentioned is



- (a) Inner cell mass, forms embryo
- (b) Inner cell mass forms placenta
- (c) Trophoblast forms umbilical cord
- (d) Trophoblast forms embryo

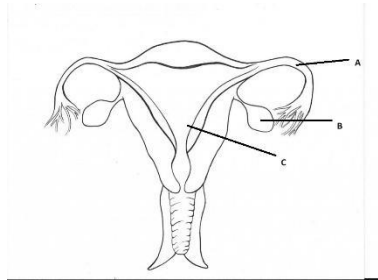
7. Due to high levels of ..... during 13<sup>th</sup> to 14<sup>th</sup> day of menstrual cycle ovulation occurs

- (a) Estrogen
- (b) Progesterone
- (c) LH
- (d) FSH

8. In human females at which stage of oogenesis, ovulation occurs?

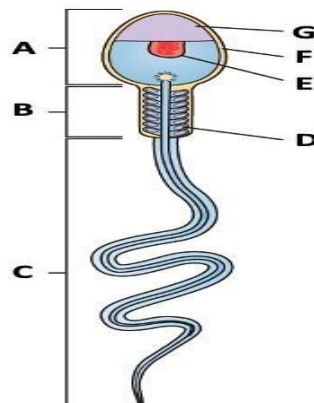
- (a) Primary oocyte
- (b) Ovum
- (c) Secondary oocyte
- (d) Oogonium

9. Which out of the following is the site of fertilisation in the human female reproductive system?



- (a) A
- (b) B
- (c) C
- (d) None of above

10. Which part of sperm provides energy for movement ?



- (a) A
- (b) B
- (c) C
- (d) E



11. What is the ploidy level of primary spermatocyte, secondary spermatocyte and spermatid?
  - (a)  $2n$ ,  $2n$ ,  $2n$
  - (b)  $2n$ ,  $3n$ ,  $n$
  - (c)  $2n$ ,  $n$ ,  $2n$
  - (d)  $2n$ ,  $n$ ,  $n$
  
12. The cells which synthesise and secrete testicular hormones called androgens are
  - (a) Leydig cells
  - (b) Germ cells
  - (c) Sertoli cells
  - (d) None of above
  
13. Which of the following hormones are secreted by placenta only during pregnancy?
  - (a) Progesterone, estrogen, FSH
  - (b) hCG, Hpl, relaxin
  - (c) Hpl, LH, Progesterone
  - (d) Progesterone, relaxin, hCG
  
14. Acrosome is filled with
  - (a) Water
  - (b) Proteins
  - (c) Oxidising enzymes
  - (d) Hydrolytic enzymes
  
15. The foetal ejection reflex triggers the release of which hormone?
  - (a) Relaxin
  - (b) Prolactin
  - (c) Oxytocin
  - (d) Estrogen
  
16. Which enzyme is secreted by sperm helps it in penetration into the ovum?
  - (a) Amylase
  - (b) Protease
  - (c) Lipase
  - (d) Hyaluronidase
  
17. At which embryonic stage implantation occurs?
  - (a) Morula
  - (b) Gastrula
  - (c) Blastula
  - (d) Zygote
  
18. During differentiation the following event occurs during spermatogenesis?
  - (a) Primary spermatocyte undergoes meiosis to produce secondary spermatocyte .
  - (b) Secondary spermatocyte undergoes meiosis to produce sperms
  - (c) Spermatogonia undergo mitosis
  - (d) Spermatids undergo modification to produce sperms
  
19. The hormone which plays key role in parturition is
  - (a) Relaxin
  - (b) Oxytocin
  - (c) Gonadotropin
  - (d) Progesteron

20. Which is the odd one from the following?
- Fimbriae
  - Isthmus
  - Labia majora
  - Infundibulum
21. Spermiation is the process in which
- Sperms are released from seminiferous tubules
  - Sperms are released through genital opening
  - Sperms are produced in testis
  - Sperms are released from epididymis
22. Choose the correct match
- |                  |                       |
|------------------|-----------------------|
| (A) Head         | (i) Sperm motility    |
| (B) Acrosome     | (ii) Enzymes          |
| (C) Tail         | (iii) Energy source   |
| (D) Middle piece | (iv) Genetic material |
- A – (i), B – (iv), C – (iii), D – (ii)
  - A – (ii), B – (i), C – (iii), D – (iv)
  - A – (iii), B – (ii), C – (iv), D – (i)
  - A – (iv), B – (ii), C – (i), D – (iii)
23. What is the correct sequence of various layers of an ovum from outside to inside
- Corona radiata, Vitelline membrane, Zona pellucida
  - Zona pellucida, Corona radiata, Vitelline membrane
  - Corona radiata, Zona pellucida, Vitelline membrane
  - Vitelline membrane, Corona radiata, Zona pellucida
24. Choose the incorrect statement from the following
- In human female's implantation occurs after 7<sup>th</sup> day of fertilisation.
  - In bird's internal fertilisation occurs as human females
  - Colostrum is the first mother's milk which contains antibodies
  - Polyspermy is prevented by the chemical changes in egg surface.
25. During 16<sup>th</sup> to 28<sup>th</sup> day of menstrual cycle
- FSH and LH are at peak
  - Estrogen is at peak
  - Progesterone is at peak
  - Oxytocin is at peak
26. Which statement/s out of the following is / are correct?
- All copulations do not lead to fertilisation and pregnancy.
  - The Leydig cells of testis are present outside the seminiferous tubules.
  - Endometrium is a mucosal tissue made up of two layers.
  - All of above
27. The signals of parturition originate from
- Foetus only
  - Placenta only
  - Pituitary gland of mother
  - Placenta & fully developed foetus

28. Seminal vesicle produces

- (a) Sperms
- (b) 30% of seminal fluid
- (c) 60% of seminal fluid
- (d) Whole semen

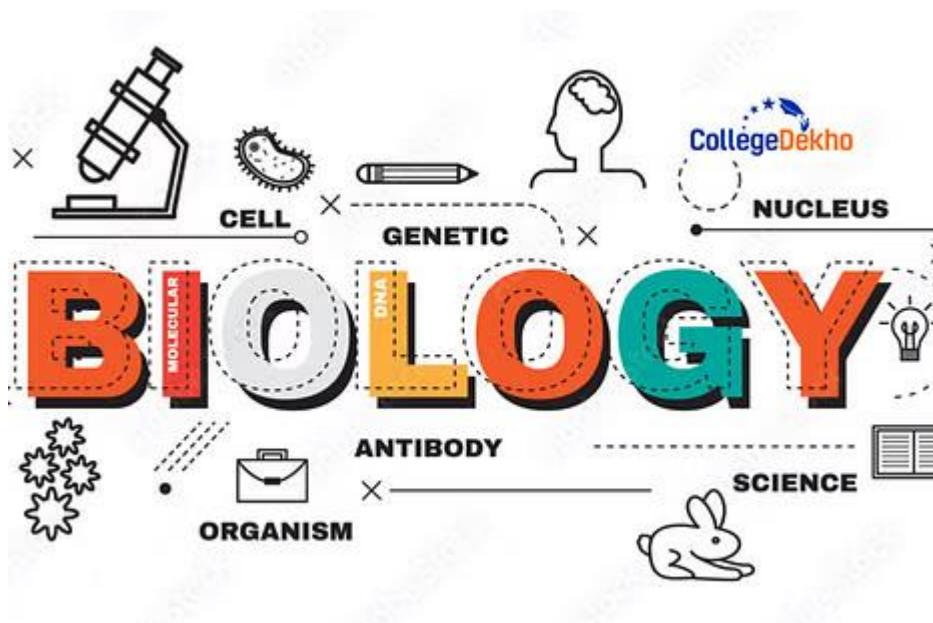
29. Primary sex organ of human female is

- (a) Fallopian tube
- (b) Ovary
- (c) Uterus
- (d) Urethra

30. Progesterone hormone is secreted by .....

- (a) Primary follicles
- (b) Corpus albicans
- (c) Graffian follicles
- (d) Corpus luteum

*"In the intricate web of life, biology serves as our guide, unravelling the mysteries of existence."*



## **CHAPTER-3**

### **REPRODUCTIVE HEALTH**

1. Which of the following is an example of a barrier method of contraception?
  - (a) Oral contraceptives
  - (b) Condoms
  - (c) Hormonal implants
  - (d) Emergency contraception
  
2. Human papillomavirus (HPV) is known to cause:
  - (a) Gonorrhoea
  - (b) Chlamydia
  - (c) Syphilis
  - (d) Genital warts
  
3. Which of the following is a common method of fertility regulation?
  - (a) Tubal ligation
  - (b) IVF (In vitro fertilization)
  - (c) Vasectomy
  - (d) Hysterectomy
  
4. The function of progesterone in the menstrual cycle is to:
  - (a) Stimulate ovulation
  - (b) Prepare the endometrium for implantation
  - (c) Inhibit the release of FSH and LH
  - (d) Trigger menstruation
  
5. The emergency contraceptive pill is most effective when taken within:
  - (a) 24 hours after unprotected intercourse
  - (b) 72 hours after unprotected intercourse
  - (c) 5 days after unprotected intercourse
  - (d) 1 week after unprotected intercourse
  
6. Which of the following is an example of a permanent method of contraception for males?
  - (a) Condom use
  - (b) Withdrawal method
  - (c) Vasectomy
  - (d) Hormonal injections
  
7. At which stage the embryo is transferred to the fallopian tube in ZIFT?
  - (a) Zygote
  - (b) Early embryo
  - (c) Both (a) and (b)
  - (d) Blastocyst
  
8. Which of the following is NOT a function of the male reproductive system?
  - (a) Production of testosterone
  - (b) Production of sperm
  - (c) Secretion of estrogen
  - (d) Delivery of sperm to the female reproductive tract

9. The copper releasing IUD
- (a) Reduce sperm motility
  - (b) Reduce fertilizing capacity
  - (c) Increase phagocytosis of sperms
  - (d) All of above
10. Which hormone is responsible for the development of secondary sexual characteristics in males?
- (a) Testosterone
  - (b) Estrogen
  - (c) Progesterone
  - (d) Prolactin
11. The diaphragm is an example of a:
- (a) Hormonal contraceptive method
  - (b) Barrier contraceptive method
  - (c) Emergency contraceptive method
  - (d) Natural contraceptive method
12. What percentage of sperm carry the Y chromosome, determining a male foetus?
- (a) 25%
  - (b) 50%
  - (c) 75%
  - (d) 100%
13. In which of the following in vivo fertilisation occurs?
- (a) ZIFT
  - (b) IVF
  - (c) GIFT
  - (d) ET
14. Which process is used to find prenatal genetic disorders of foetus but still banned due to its misuse?
- (a) Amniocentesis
  - (b) Parturition
  - (c) Produce seminal fluid
  - (d) Artificial insemination
15. Lactational amenorrhea is an effective method of contraception due to ..... hormone.
- (a) Prolactin induced inhibition of FSH
  - (b) Prolactin induced inhibition of GnRH
  - (c) Oxytocin induced inhibition of LH
  - (d) Oxytocin induced inhibition of Fsh
16. If a female is not able to produce ovum, then which ART can be suggested to her by a doctor?
- (a) ZIFT
  - (b) IUD
  - (c) GIFT
  - (d) AI

17. Which of the following sexually transmitted infections is caused by a bacterial infection?
- (a) HIV
  - (b) Gonorrhoea
  - (c) Hepatitis B
  - (d) Herpes
18. In which of the following processes sperm is directly injected into the ovum?
- (a) ICSI
  - (b) AI
  - (c) GIFT
  - (d) ZIFT
19. . The contraceptive method that involves surgical closing or blocking of the fallopian tubes is called:
- (a) IUD insertion
  - (b) Tubectomy
  - (c) Vasectomy
  - (d) Oral contraceptive pills
20. Low MMR and high IMR in a population is an indication of
- (a) Rapid increase in growth rate
  - (b) Population explosion
  - (c) No change in population size
  - (d) decline in growth rate
21. Condoms are called as one of the most popular and effective contraceptive devices as
- (a) they are effective barriers for semen
  - (b) they prevent STDs
  - (c) They do not interfere with normal coitus
  - (d) All of above
22. Which one of the following pairs includes sexually transmitted diseases caused by bacteria only
- (a) Syphilis, Gonorrhoea,
  - (b) AIDS, Chlamydiasis
  - (c) Gonorrhoea, scabies
  - (d) Scabies, Pediculosis
23. Which of the following is a common symptom of infertility in females?
- (a) Erectile dysfunction
  - (b) Irregular menstrual cycles
  - (c) Painless ejaculation
  - (d) Enlarged prostate
24. Which contraceptive method works by preventing fertilization by inhibiting ovulation, thickening cervical mucus, and altering the endometrial lining?
- (a) Condoms
  - (b) Oral contraceptives
  - (c) Intrauterine devices
  - (d) Tubal ligation

25. Which of the following is NOT a barrier method of contraception?
- (a) Male condom
  - (b) Female condom
  - (c) Diaphragm
  - (d) Oral contraceptive pills
26. By amniocentesis we can
- (a) Detect level of amino acids in body
  - (b) Correct chromosomal abnormalities of foetus
  - (c) Detect chromosomal abnormalities
  - (d) Change sex of foetus
27. Choose the correct statement about test tube baby process
- (a) In this premature baby is developed in laboratory
  - (b) Fertilisation and gestation occur outside the mother's body
  - (c) Fertilisation is in vitro but gestation is inside the mother body.
  - (d) Fertilisation is in vivo but foetus develops inside a test tube
28. The non steroid contraceptive oral pill developed by CDRI is
- (a) i Pill
  - (b) Saheli
  - (c) Mala D
  - (d) Hormonal pills
29. The term "amenorrhea" in lactational amenorrhea refers to:
- (a) Painful menstruation
  - (b) Absence of menstruation
  - (c) Heavy menstruation
  - (d) Irregular menstruation
30. Which of the following contraceptive methods is reversible and involves the release of hormones to prevent ovulation?
- (a) Condoms
  - (b) Diaphragm
  - (c) Birth control pills
  - (d) Tubectomy

***"The study of biology empowers us to better understand and appreciate the beauty and complexity of the natural world."***



## **CHAPTER-4**

### **PRINCIPLES OF INHERITANCE AND VARIATION**

Q1. Among the following, which one is not a dominating trait?

- a) Axial position of flower
- b) Green colour of pod
- c) Violet colour of flower
- d) Green colour of seed

Q2. Match Column-I with Column-II and choose the correct option from the codes given below.

Column-I		Column-II		
(A)	Axial flower	(1)	Undergone continuous self-pollination	
(B)	Terminal flower	(2)	Father of genetics	
(C)	Mendel	(3)	Dominant trait	
(D)	True-breeding line	(4)	Recessive trait	
	A	B	C	D
a	3	4	2	1
b	4	3	1	2
c	1	2	4	3
d	2	1	3	4

Q3. A woman with one gene for Haemophilia and a gene for colour blindness on one of X chromosomes marries a normal man. How will the progeny be?

- (a) All sons and daughters haemophilic and colour blind
- (b) 50% haemophilic colour blind sons and 50% normal sons
- (c) 50% haemophilic daughters and 50% colour blind daughters
- (d) Haemophilic and colour blind daughters

Q4. Which of the following truly represents a heterozygous organism?

- (a) XXyy
- (b) RRYy
- (c) xxYY
- (d) RrYy

Q5. Column A

- I. Chromosomal aberration
- II. Down's syndrome
- III. Klinefelter's syndrome
- IV. Turner's syndrome

Column B

- A. An additional sex chromosome
- B. Inversion
- C. Presence of an extra chromosome
- D. Absence of sex chromosome



The correct match is

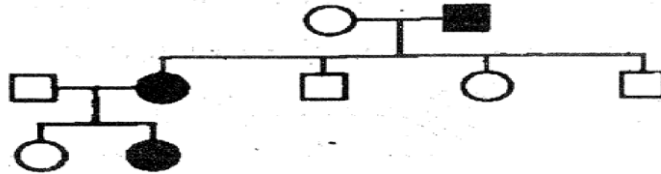
- (a) I-B, II-D, III-A, IV-C
- (b) I-B, II-D, III-C, IV-A
- (c) I-B, II-C, III-A, IV-D
- (d) I-C, II-D, III-A, IV-B

Q6. The following table shows the genotypes for ABO blood grouping and their phenotypes. In which one of the four options the components of reaction labelled as W, X, Y and Z are identified correctly?

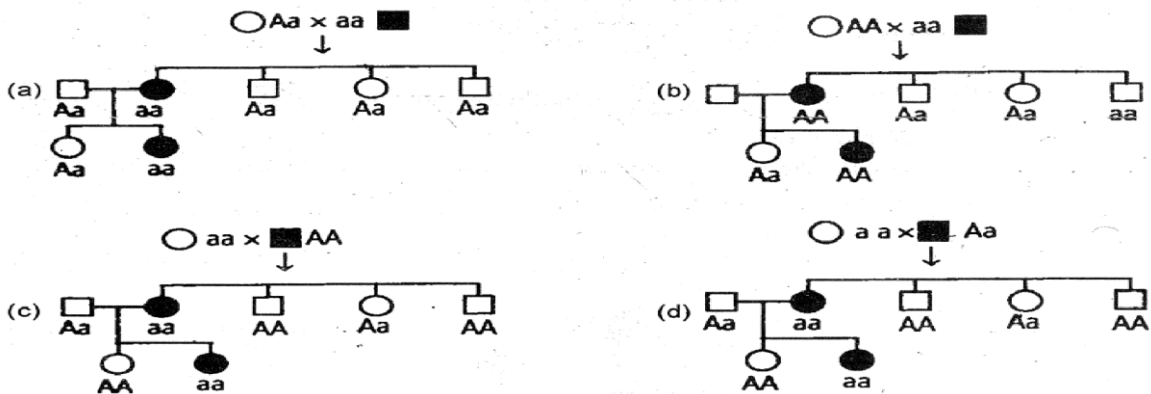
S. No.	Genotype	Blood Group
1	$I^A I^A$	A
2	W	A
3	$I^B I^B$	B
4	X	B
5	$I^A I^B$	Y
6	Z	O

- |     | W       | X       | Y  | Z  |
|-----|---------|---------|----|----|
| (a) | $I^A i$ | $I^B i$ | AB | ii |
| (b) | $I^B i$ | $I^A i$ | B  | ii |
| (c) | $I^B i$ | $I^B i$ | A  | ii |
| (d) | $I^A i$ | $I^A i$ | O  | ii |

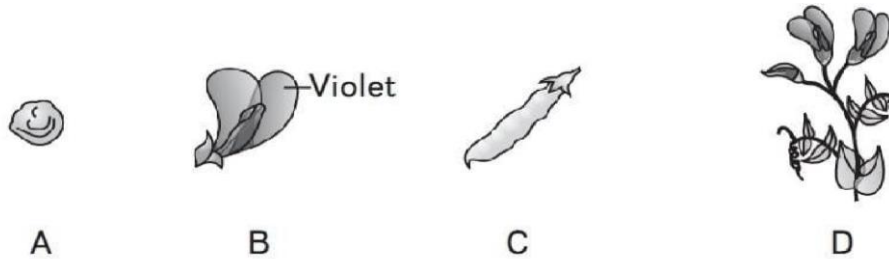
Q7. The daughter was married to a normal person and their daughter had the trait.



It can be explained as

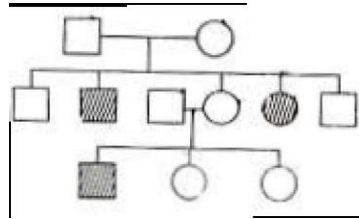


Q8. Refer to the given figures (A–D) showing traits of pea plant studied by Mendel. Among these, choose the dominant trait.



- a) B      b) A      c) D      d) C

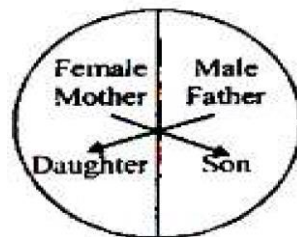
Q9. Study the pedigree chart given below:



What does it show?

- a) The pedigree chart is wrong as this is not possible.
- b) Inheritance of a recessive sex-linked disease like Haemophilia
- c) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria
- d) Inheritance of a condition like phenylketonuria as an autosomal recessive trait

Q10. Represented below is the inheritance pattern of a certain type of traits in humans. Which one of the following conditions be an example of this pattern?



- a) Haemophilia
- b) Thalassemia
- c) Phenylketonuria
- d) Sickle cell anaemia

Q11. A test cross is carried out to:

- a) Assess the number of alleles of a gene
- b) Determine whether two species or varieties will breed successfully
- c) Determine the genotype of a plant at F<sub>2</sub>
- d) Predict whether two traits are linked

Q12. A man whose father was colour blind married a woman who had a colour blind mother and normal father. What percentage of male children of the couple will be colour blind?

- a) 75%
- b) 25%
- c) 0%
- d) 50%

Q13. In a population of 1000 individuals 360 belong to genotype AA 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is:

- a) 0.7
- b) 0.4
- c) 0.5
- d) 0.6

Q14. Match the terms in Column I with their description in Column II and choose the correct option:

Column I	Column II
a) Dominance	(i) Many genes govern a single character
b) Co dominance	(ii) In a heterozygous organism only one allele expresses itself
c) Pleiotropy	(iii) In a heterozygous organism both alleles express themselves fully.
d) Polygenic inheritance	(iv) A single gene influences many characters

Code: (a) (b) (c) (d)

- a) (ii) (iii) (iv) (i)
- b) (iv) (i) (ii) (iii)
- c) (iv) (iii) (i) (ii)
- d) (ii) (i) (iv) (iii)

Q15. Pick out the correct statements:

- (i) Haemophilia is a sex-linked recessive disease.
- (ii) Down's syndrome is due to aneuploidy.
- (iii) Phenylketonuria is an autosomal recessive gene disorder
- (iv) Sickle cell anaemia is an X-linked recessive gene disorder

- a) (ii) & (iv) are correct
- b) (i), (iii) and (iv) are correct
- c) (i), (ii) and (iii) are correct
- d) (i) and (iv) are correct

Q16. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by

- a)  $p^2$
- b)  $2pq$
- c)  $pq$
- d)  $q^2$

Q17. The genotypes of a Husband and Wife are IAIB and IAi. Among the blood types of their children, how many different genotypes and phenotypes are possible?

- a) 3 genotypes ; 3 phenotypes
- b) 3 genotypes ; 4 phenotypes
- c) 4 genotypes ; 3 phenotypes
- d) 4 genotypes ; 4 phenotypes

Q18.A gene locus has two alleles A, a. If the frequency of dominant allele A is 0.4, Then what will be the frequency of homozygous dominant, heterozygous and homozygous

recessive individuals in the population?

- a) 0.36(AA); 0.48(Aa); 0.16(aa)
- b) 0.16(AA); 0.24(Aa); 0.36(aa)
- c) 0.16(AA); 0.48(Aa); 0.36(aa)
- d) 0.16(AA); 0.36(Aa); 0.48(aa)

Q19.Match the items of column I with column II

column I	column II
A) XX-XO method of sex determination	i) Turner's syndrome
B) XX-XY method of sex determination	ii) Female heterogametic
C) Karyotype-45	iii) Grasshopper
D) ZW-ZZ method of sex determination	iv) Female homogametic

Select the correct option from the following:

- a) A-ii, B-iv, C-i, D-iii
- b) A-i, B-iv, C-ii, D-iii
- c) A-iii, B-iv, C-i, D-ii
- d) A-iv, B-ii, C-i, D-iii

Q20. In a marriage between male with blood group A and female with blood group B, the progeny had either blood group AB or B. What could be the possible genotype of parents?

- a) IAi (Male) : IBIB (Female)
- b) IAIA (Male) : IBIB (Female)
- c) IAIA (Male) : IBi (Female)
- d) IAi (Male) : IBi (Female)

Q21.In Antirrhinum (Snapdragon), a red flower was crossed with a white flower and in F<sub>1</sub> generation, pink flowers were obtained. When pink flowers were selfed, the F<sub>2</sub> generation showed white, red and pink flowers. Choose the incorrect statement from the following.

- a) The experiment does not follow the principle of dominance.
- b) Pink colour in F<sub>1</sub> is due to incomplete dominance.
- c) Ratio of F<sub>2</sub> is 1/4 (Red): 2/4 (Pink): 1/4 (white).
- d) Law of segregation does not apply in this experiment.

Q22. Assertion: The pink flower of the dog plant shows incomplete dominance.

Reason: In pink flowers, both alleles are expressed equally.

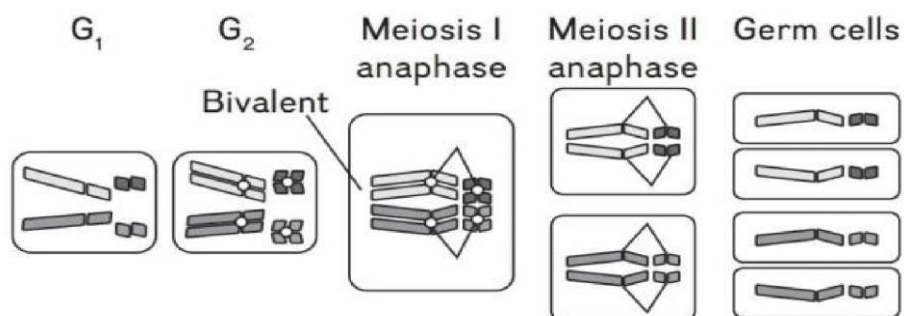
- a) Both assertion and reason are true and reason is the correct explanation of assertion.
- b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- c) Assertion is true, but reason is false.
- d) Both assertion and reason are false.

Q23. Assertion: A person having IAIB genotype has AB blood group.

Reason: IA and IB alleles are co-dominant

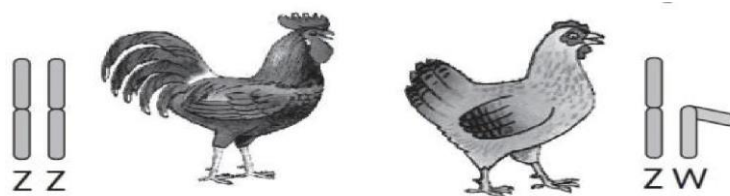
- Both assertion and reason are true and reason is the correct explanation of assertion.
- Both assertion and reason are true but reason is not the correct explanation of assertion.
- Assertion is true, but reason is false.
- Both assertion and reason are false.

Q24. Refer to the given figure showing meiosis and germ cell formation in a cell with four chromosomes. Which law of Mendel can be effectively explained by this figure?



- Law of dominance
- Law of segregation
- Law of independent assortment
- All of these

Q25. Refer to the given figure which is followed by few statements. Choose the incorrect statement about it.



- It shows male heterogamity.
- Both possess same types of autosomes.
- The sex of progeny is determined by females.
- This type of sex determination is different from humans.

Q26. Assertion: Grasshoppers show male heterogamity.

Reason: Male grasshoppers produce two types of gametes.

- Both assertion and reason are true and the reason is the correct explanation of assertion.
- Both assertion and reason are true but the reason is not the correct explanation of assertion.
- Assertion is true but reason is false.
- Both assertion and reason are false.

Q27. Assertion: In fruitfly, sex of progeny is decided by females.

Reason: Females produce two types of gametes.

- a) Both assertion and reason are true and the reason is the correct explanation of assertion.
- b) Both assertion and reason are true but the reason is not the correct explanation of assertion.
- c) Assertion is true but reason is false.
- d) Both assertion and reason are false.

Q28. Assertion: Birds show female heterogamety.

Reason: In birds, the sex of progeny is determined by males.

- a) Both assertion and reason are true and the reason is the correct explanation of assertion.
- b) Both assertion and reason are true but the reason is not the correct explanation of assertion.
- c) Assertion is true but reason is false.
- d) Both assertion and reason are false.

Q29...Match Column-I with Column-II and choose the correct option from the codes given below.

Column-I		Column-II	
(A)	Aneuploidy	(1)	An increase in whole set of chromosomes
(B)	Polyploidy	(2)	$2n + 1$
(C)	Trisomy	(3)	Gain or loss of a chromosome
(D)	Monosomy	(4)	$2n - 1$

Codes-

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

Q30. Refer to the given figure. It is showing the characteristic features of



- a) Down's syndrome
- b) Turner's syndrome
- c) Klinefelter's syndrome
- d) None of these

*"Biology is the key to unlocking the secrets of health, disease, and the mechanisms of life itself."*



## CHAPTER-5 MOLECULAR BASIS OF INHERITANCE

1. Which of the following is not a part of Chargaff's rules?

- a.  $A = T$  and  $G = C$
- b.  $A + G = T + C$
- c. Purines = Pyrimidines
- d.  $\%A = \%G$  and  $\%T = \%C$

2. Length of DNA is usually defined as-

- a) Number of nucleotides present in it
- b) Number of pair of nucleotides present in it
- c) Number of base pairs present in it
- d) All of these

3. Match the length of DNA with the correct organisms –

	A		B
I	$\Phi \times 174$	1	$4.6 \times 10^6$ bp (base pairs)
II	Bacteriophage	2	$3.3 \times 10^9$ bp
III	E. coli	3	48502 bp
IV	Human DNA (haploid)	4	5386 nucleotides

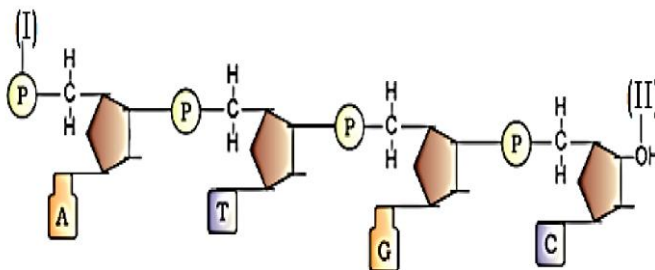
I II III IV      I II III IV      I II III IV      I II III IV

- a) 4 3 1 2
- b) 3 4 2 1
- c) 4 3 2 1
- d) 3 4 1 2

4. Phosphate group is linked to which carbon of pentose sugar 5' end.

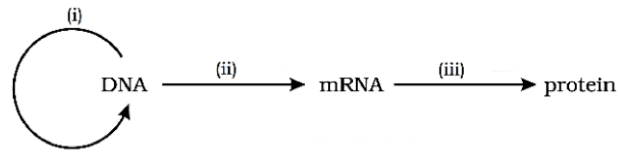
- a) 1'C
- b) 2'C
- c) 3'C
- d) 5'C

5. Identify the free ends of given polynucleotides chain –



	I		II
a	3' phosphate		5' hydroxyl
b	5' hydroxyl		3' phosphate
c	5' phosphate		3' hydroxyl
d	3' hydroxyl		5' phosphate

6. Identify correct labels –



	I	II	III
a	<b>Replication</b>	<b>Translation</b>	<b>Transcription</b>
b	<b>Replication</b>	<b>Transcription</b>	<b>Tanslation</b>
c	<b>Transcription</b>	<b>Replication</b>	<b>Tanslation</b>
d	<b>Translation</b>	<b>Replication</b>	<b>Transcription</b>

7. Assertion : In E. coli, DNA is scattered throughout the cell

Reason : In E. coli, there is no defined nucleus

- a) Both Assertion & Reason are correct & Reason is correct explanation for Assertion
- b) Both Assertion & Reason are correct but Reason is not correct explanation for Assertion
- c) Assertion is correct and Reason is incorrect
- d) Reason is correct and Assertion is incorrect

8. Histones proteins in nucleosomes are –

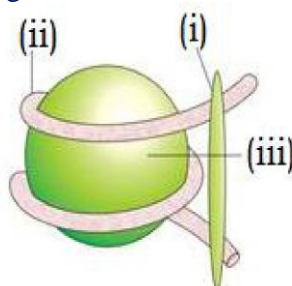
- a) Positive and acidic in eukaryotes
- b) Positive and acidic in prokaryotes
- c) Positive and basic in eukaryotes
- d) Positive and basic in prokaryotes

9. Assertion – Histones are positively charged

Reason – Histones are rich in basic amino acid residues lysine and arginine

- a) Both Assertion & Reason are correct & Reason is correct explanation for Assertion
- b) Both Assertion & Reason are correct but Reason is not correct explanation for Assertion
- c) Assertion is correct and Reason is incorrect
- d) Reason is correct and Assertion is incorrect

10. Identify the correct label for given figure





	i	ii	iii
a	H2 histone	DNA	Histone Octamer
b	H1 histone	Histone Octamer	DNA
c	H2 histone	Histone Octamer	DNA
d	H1 histone	DNA	Histone Octamer

11. In a typical nucleus, euchromatin & hetero chromatin are present. Choose the correct set of characters for heterochromatin –

- i) Loosely packed    ii) Densely packed    iii) Light stain  
 iv) Dark stain    v) Inactive chromatin    vi) Active chromatin
- a) i, iii, v  
 b) ii, iv, vi  
 c) i, iii, vi  
 d) ii, iv, v

12. In Griffith experiment

- a) R-strain transformed to S-strain and became virulent  
 b) R-strain transformed to S-strain and lost virulence  
 c) S-strain transformed to R-strain and became virulent  
 d) S-strain transformed to R-strain and lost virulence

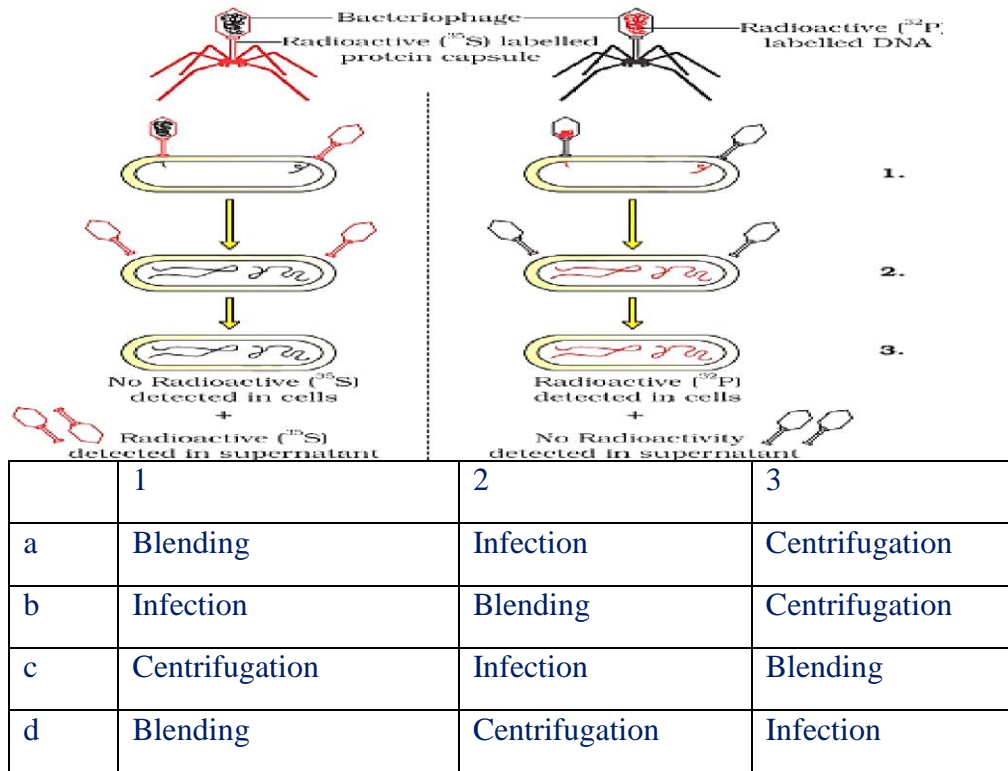
13. Avery, Macleod & McCarty discovered that-

- a) DNA caused transformation  
 b) RNA caused transformation  
 c) Protein caused transformation  
 d) Lipid caused transformation

14. Study the following table:

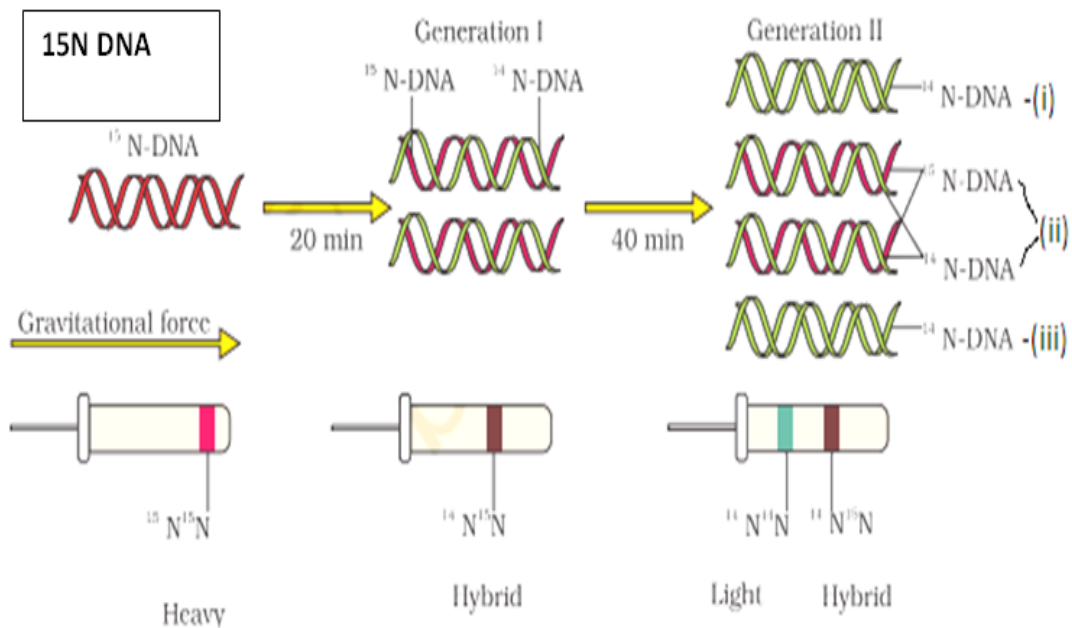
Column I	Column II
a. t RNA	i. Ribonuclease
b. Okazaki fragments	ii. RNA Polymerase III
c. RNA Splicing	iii. Amino acyl t RNA synthetase
d. Translation	iv. DNA ligase
	v. RNA polymerase

- a. a-i, b-v, c- iv, d-ii  
 b. a-ii, b-iv, c- i, d-iii  
 c. a-iv, b-iii, c- i, d-ii  
 d. a-ii, b-iv, c- iii, d-v



16. The bacteria were grown in medium containing-
- a)  $^{15}\text{NH}_4\text{Cl}$  –  $^{15}\text{N}$  is heavy isotope of nitrogen
  - b)  $^{14}\text{NH}_4\text{Cl}$  –  $^{14}\text{N}$  is heavy isotope of nitrogen
  - c)  $^{15}\text{NH}_4\text{Cl}$  –  $^{15}\text{N}$  is normal isotope of nitrogen
  - d)  $^{14}\text{NH}_4\text{Cl}$  –  $^{14}\text{N}$  is normal isotope of nitrogen

17. Identify (i) , (ii) and (iii)



	i	ii	iii
a	Light	Heavy	Hybrid
b	Heavy	Hybrid	Light
c	Light	Hybrid	Light
d	Heavy	Hybrid	Heavy

18. In one strand of DNA the sequence of bases is AAATGGCCCTT, then the complementary sequence of bases on the other side of the strand would be

- (a) ATATGGCCCCA
- (b) TTTACCGGGAA
- (c) TTTTGGCCAM
- (d) TTTTGGCCCAA

19. If in a DNA molecule cytosine is 18%, the percentage of adenine would be

- (a) 18%
- (b) 32%
- (c) 36%
- (d) 64%

20.

Column I

- I. Operator site
- II. Promoter site
- III. Structural gene
- IV. Regulator gene

Column II

- (A) Binding site for RNA polymerase
- (B) Binding site for repressor molecule
- (C) Codes for enzyme protein
- (D) Code for repressor molecules

The correct match is

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

21.

Column I

- I. mRNA
- II. Anticodon
- III. Semiconservative mode of DNA Replication
- IV. Griffith Stahl

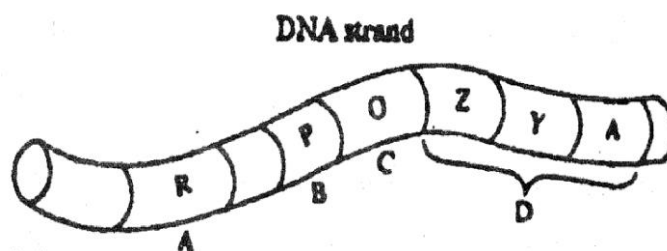
Column II

- (A) tRNA
- (B) Codon
- (C) Transformation
- (D) Meselson &

The correct match is

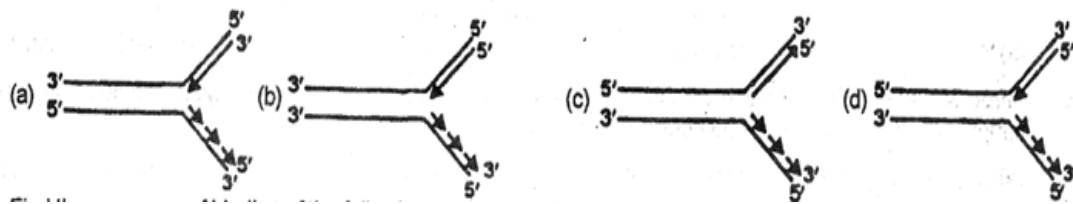
- (a) I- D II- B III-A IV-C
- (b) I-B II-A III-D IV-C
- (c) I-D II-C III-A, IV-B
- (d) I-B II-C III-A IV-D

22. The diagram of the lac operon from *E. coli* is shown below. Each letter indicates its components may be used more. Which of the following option is correct in respect of the letters and their functions –

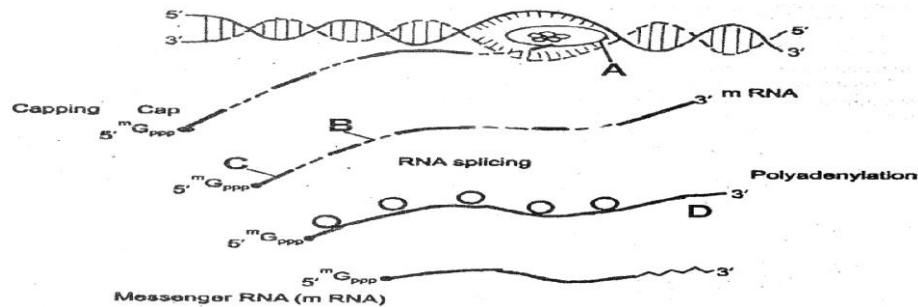


- (a) C - the binding site for the repressor protein, B - the binding site for RNA polymerase, D - the structural genes, A - the gene that codes for the repressor protein.
- (b) A- the binding site for the repressor protein, B - the binding site for RNA polymerase, C - the structural genes, D - the gene that codes for the repressor protein.
- (c) A- the binding site for the repressor protein, D - the binding site for RNA polymerase, B - the structural genes, C - the gene that codes for the repressor protein.
- (d) D - the binding site for the repressor protein, C - the binding site for RNA polymerase, B - the structural genes, A - the gene that codes for the repressor protein.

23. Which one of the following correctly represents the manner of replication of DNA?



24. The following diagram refers to the process of transcription in Eukaryotes. Identify A, B, C and D –



Messenger RNA (mRNA)

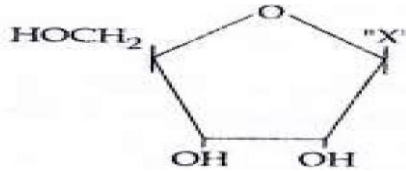
- (a) A - RNA polymerase II, B - Exon, C - Intron, D - Poly A tail
- (b) A- DNA polymerase II, B - Intron, C - Exon, D - Poly A tail
- (c) A - RNA polymerase II, B - Intron, C - Exon, D - Poly A tail
- (d) A- RNA polymerase II, B - Intron, C - Exon, D - Poly G tail

25. The following diagram refers to Griffith's demonstration of transformation in pneumococcus. A, B, C and D indicate the fates of mice after they are injected with specific bacteria. Identify these fate of mice.

<b>S strain</b>	→	Inject into mice	→	.....A.....
<b>R strain</b>	→	Inject into mice	→	.....B.....
<b>S strain (heat killed)</b>	→	Injected into mice	→	.....C.....
<b>S strain (heat-killed) + R strain</b>	→	Inject into mice	→	.....D.....

- (a) A - dies, B-dies, C-lives, D-lives
- (b) A - lives, B -lives, C - dies, D -dies
- (c) A - dies, B - lives, C - lives, D - dies
- (d) A - lives, B - dies, C - dies, D - lives

Q26. Given below is the diagrammatic representation of one of the categories of small molecular weight organic compounds in the living tissues. Identify the category shown and the one blank component "X" in it.



	Category	Component
a	Amino acid	NH <sub>2</sub>
b	Nucleotide	Adenine
c	Nucleoside	Uracil
d	Cholesterol	Guanin

Q27. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of:

- a) hn RNA
- b) m RNA
- c) r RNA
- d) t RNA

Q28. What will be the sequence of mRNA produced by the following stretch of DNA?

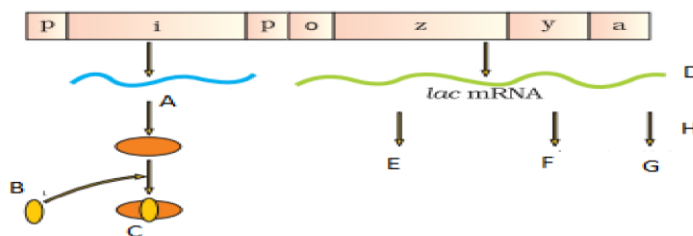
3'ATGCATGCATGCATG5'

TEMPLATE STRAND

5' TACGTACGTACGTAC3' CODING STRAND

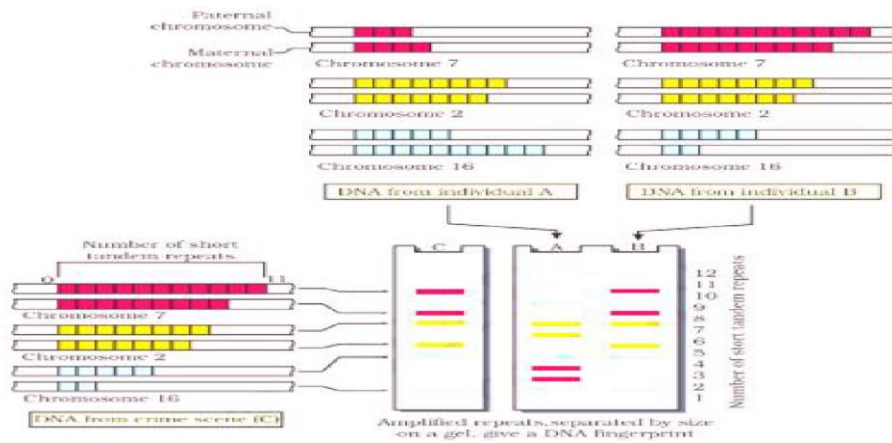
- a) 3'AUGCAUGCAUGCAUG5'
- b) 5'UACGUACGUACGUAC 3'
- c) 3'UACGUACGUACGUAC 5'
- d) 5' AUGCAUGCAUGCAUG 3'

29. Select correct statement -



- a) The given diagram is in presence of lactose
- b) The given diagram is in absence of lactose
- c) The given diagram is of gene off
- d) D and H is same process

30.



In the given figure if 'C' is the DNA collected from crime site and 'A' & 'B' are samples from suspects, than who is the criminal?

- a) B
- b) A
- c) Both A and B
- d) None of these

*"Biology is not just a subject; it's a journey of discovery, revealing the intricacies of life's design"*

## **CHAPTER-6** **EVOLUTION**

Q1. Which of the following phenomenon lends credibility to Darwin's theory of natural selection in biological evolution?

- a. Development of transgenic animals
- b. Production of "Dolly" the sheep by cloning.
- c. Prevalence of pesticide resistant insects.
- d. Development of organs from 'stem cells' for organ transplantation.

Q2. The brain capacity of *Homo erectus* was about

- a. 650 cc
- b. 900 cc
- c. 1500 cc
- d. 1400 cc

Q3. The Hardy-Weinberg Principle cannot operate if

- a. The population is very large
- b. Frequent mutations occur in the population
- c. The population has no chance of interaction with other populations.
- d. Free interbreeding occurs among all the members of the population.

Q4. At a particular locus, frequency of allele 'A' is 0.6 and that of allele 'a' is 0.4. What would be the frequency of heterozygotes in a random mating population of equilibrium?

- a. 0.36
- b. 0.16
- c. 0.24
- d. 0.48

Q5. Which one of the following in birds indicates their reptilian ancestry?

- a. Scales on their hind limbs
- b. Eggs with a calcareous shell
- c. Four chambered hearts
- d. Both a and b

Q6. One of the important consequences of geographical isolation is:

- a. Preventing speciation
- b. Speciation through reproductive isolation
- c. Random creation of new species
- d. No change in the isolated fauna

Q7. What is common to whale, seal, and shark?

- a. Thick subcutaneous fat
- b. Homeothermy
- c. Convergent Evolution
- d. Seasonal Migration

Q8. Presence of temporary gill pouches in embryos of snakes, birds and mammals indicates that

- a. These embryos need the pouches for breathing
- b. Common ancestors of these animals have gill pouches
- c. Lungs evolved from gills
- d. Fluid medium in which these embryos develop require gill pouches for breathing

Q9. The Miller-Urey abiotic synthesis Experimentally proved ( and other subsequent, similar experiments) showed that.....

- a. Simple organic molecules can form spontaneously under condition like those thought to prevail early in the earth's History.
- b. The earliest life forms introduced large oxygen to the atmosphere
- c. Life can be created in a test tube
- d. Long chains of DNA can form under abiotic conditions.

Q10. *Archaeopteryx* is a connecting link between

- a. Reptiles and Birds
- b. Reptiles and Mammals
- c. Fishes and Reptiles
- d. Chordates and Non-chordates

Q11. The change of light-coloured variety of peppered moth (*Biston betularia*) to its darker variety (*Biston carbonaria*) is due to

- a. Mutation
- b. Regeneration
- c. Genetic Isolation
- d. Natural Selection

Q12. Adaptive radiation is

- a. Evolution of different species from a common ancestor
- b. Migration of members of a species to different geographical areas
- c. Power of adaptation in an individual to a variety of environments.
- d. Adaptations due to geographical isolation

Q13. According to Oparin, which of the following was *not* present in the primitive atmosphere of the earth?

- a. Oxygen
- b. Methane
- c. Hydrogen
- d. Water Vapour

Q14. What was the most significance trend in evolution of modern man (*Homo sapiens*) from his ancestors?

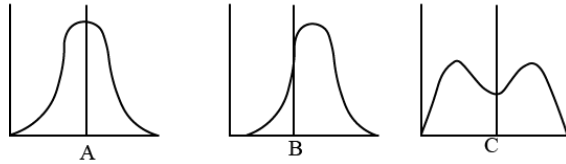
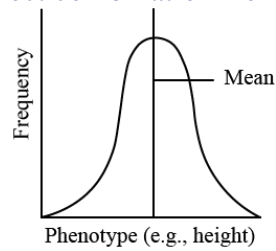
- a. Upright posture
- b. Shortening of jaws
- c. Binocular vision
- d. Increasing Brain capacity

Q15. *Tasmanian Wolf* is a marsupial while a wolf is a placental mammal. This shows

- a. Convergent Evolution
- b. Divergent Evolution
- c. Inheritance of acquired characters
- d. None of these

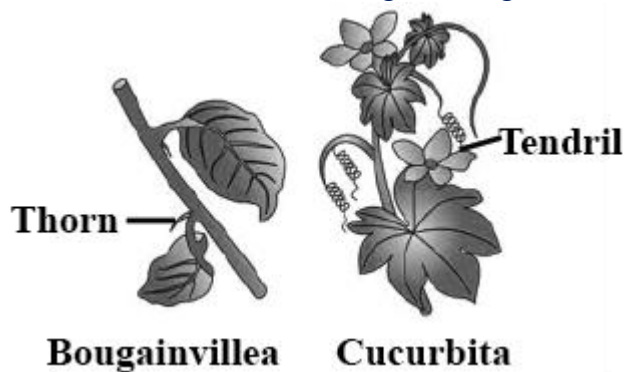


Q16. The three types of natural selection are shown in the given diagram as A, B, and C. Select the correct combination from the following



- A- Disruptive, B- Stabilizing, C- Directional
- A- Directional, B- Disruptive, C- Stabilizing
- A- Directional, B-Stabilizing, C- Disruptive
- A- Stabilizing, B- Directional, C- Disruptive

Q17. The structure shown in the given diagrams are....



- Vestigial
- Homologous
- Analogous
- Extinct

Q18. Which set of statements are correct

- Hugo deVries worked on evening Primrose
  - Single step large mutation is Saltation
  - Long neck of Giraffes support Lamarckism
  - Natural selection does not affect Hardy-Weinberg Principle
- i , ii and iv
  - ii, iii and iv
  - i, ii and iii
  - only iv

Q19. Choose the incorrect statement/s among the followings

- Lobefins evolved into the first amphibians
- Dryopithecus was more man-like
- Neanderthal man have brain size of 650 cc
- Agriculture came around 10,000 years back

- a. i, and ii
- b. i, and iii
- c. ii and iv
- d. ii and iii

Q20. Theory of inheritance of acquired characters was given by

- a. Alfred Wallace
- b. Darwin
- c. Lamarck
- d. De Vries

Q21. Which group of animals supported Adaptive Radiation?

- a. Koala, Marsupial mole, Wombat and Bobcat
- b. Tiger cat, Tasmanian wolf, Sugar glider and Marsupial rat
- c. Kangaroo, Anteater, Lemur and Wolf
- d. Numbat, Marsupial mole, flying phalanger and Flying squirrel

Q22. Choose the incorrect statement about the origin of life

- a. Earth was supposed to form 4.5 billion years back
- b. Universe is 20 billion years old
- c. Life originated 500 million years ago
- d. Life originated 4 billion years back

Q23. Which of the following is correct match of the table A and B

A	B
I- Oparin and Haldane	i. First life came from non-living matter
II- Louis Pasteur	ii. Experimental proof of chemical evolution.
III- Urey and Miller	iii. Disproved spontaneous generation of life

- a. I-i, II- ii and III- iii
- b. I- i, II- iii and III- ii
- c. I-ii, II-iii and III-i
- d. I-iii, II-i, and III-ii

Q24. Select the correct evidences of evolution

- i. Embryological evidences
  - ii. Fossils
  - iii. Homologous and Analogous Organs
  - iv. Artificial Selection
- a. All are correct
  - b. i, ii and iv
  - c. i, ii and iii
  - d. i, iii and iv

Q25. Who disapproved the concept - Ontogeny repeats Phylogeny?

- a. Ernst Haeckel
- b. Alfred Wallace
- c. Charles Darwin
- d. Karl Ernst Von Baer

Q26. Which of the following is/ are correct statements?

- i. Sweet Potato and Potato are Homologous Organs
  - ii. Flippers of Penguins and Dolphins are Analogous Organs
  - iii. Wings of Butterfly and Wings of birds are Analogous organs
  - iv. Fore limbs of vertebrates are analogous organs
- a. i, ii and iv
  - b. ii, iii and iv
  - c. i, ii and iii
  - d. ii and iii

Q27. First cellular life form appeared

- a. 2000 mya
- b. 500 mya
- c. 2500 mya
- d. 1100 mya

Q28. The correct equation for two alleles P and p with frequencies 'a' and 'b' in a population to support Hardy-Weinberg equation

- a.  $P^2+p^2+Pp$
- b.  $p^2+q^2+2pq$
- c.  $a^2+ b^2+ ab$
- d.  $a^2+b^2+2ab$

Q29. Select the incorrect statement about the Human evolution.

- a. *Australopithecines* used stone weapons for hunting
- b. *Homo erectus* ate meat
- c. *Neanderthal* man buried their dead
- d. *Ramapithecus* was ape-like

Q30. Which land reptiles went back in water and evolve as fish like reptiles?

- a. Tyrannosaurus rex
- b. Ichthyosaurus
- c. Pelycosaurs
- d. Stegosaurus

***"Biology is the science of life, offering us a deeper understanding of ourselves and the world around us."***

## **CHAPTER-7**

### **HUMAN HEALTH AND DISEASES**

Q1. Which among the following is correct set of bacterial disease?

- (a) Pneumonia, Malaria, Typhoid
- (b) Typhoid, Diphtheria, Pneumonia
- (c) Ascariasis, Elephantiasis, Amoebiasis
- (d) Amoebiasis, Malaria, Pneumonia

Q2. Select the correct match of Antibody and Their function.

Antibody	Function
i. Ig A	Released during allergic reactions
ii. Ig E	Present in Colostrum to provide immunity to infants
iii. Ig G	Can Pass through placenta

- a) All are correct
- b) i and iii
- c) Only iii
- d) Only i

Q3. What is correct about the allergic reactions.

- i. During allergic reactions Antibody Ig-E is released.
  - ii. Drugs like histamine reduces the symptoms of allergy.
  - iii. Serotonin is released during allergic reactions from mast cells.
  - iv. Symptoms of allergy includes loss of appetite, constipation, Headache etc.
- a. i,ii and iii
  - b. i,iii
  - c. ii,iv
  - d. ii,iii and iv

Q4. Where are the receptors of Opioids found?

- a. Cardiovascular System
- b. Brain
- c. Intestine
- d. CNS and gastrointestinal tract

Q5. The genetic material of HIV virus is ....

- a. Single stranded RNA
- b. Double stranded RNA
- c. Double stranded DNA
- d. Single Stranded DNA

Q6. A person who is likely to develop tetanus is immunized by administering

- a. Performed antibodies
- b. Wide spectrum antibiotics
- c. Weakened germs
- d. Dead germs

- Q7. The common cold is caused by
- Streptococcus pneumoniae*
  - Salmonella typhimurium*
  - Rhino virus*
  - Plasmodium vivax*
- Q8 The primary lymphoid organs are
- Spleen and thymus
  - Bone marrow and thymus
  - Bone marrow and lymph node
  - Thymus and Malt
- Q9. Which of the following approach/es is/are used for the treatment of cancer?
- Gene therapy and Immunotherapy
  - Surgery
  - Radiotherapy and Chemotherapy
  - Surgery, Radiation therapy, Immunotherapy, Chemotherapy
- Q10. The drug which is being excessively taken by some sports persons nowadays..
- Opioids
  - Barbiturates
  - Cannabinoids
  - LSD
- Q11. Polio vaccination program is an example of
- Auto-immunization
  - Passive Immunization
  - Active Immunization
  - Simple Immunization
- Q12. The treatment of snake-bite by antivenom is an example of
- Artificially acquired active Immunity
  - Artificially acquired passive Immunity
  - Naturally acquired passive Immunity
  - Specific Natural Immunity
- Q13. Select the correct combination of diagnostic test/detection test and the disease
- Widal Test- Malaria
  - ELISA Test- Tetanus
  - Biopsy- Cancer
  - Widal Test- Dengue
- Q14. Find the correct match between disease and symptoms
- Pneumonia- fever, chills, cough and headache.
  - Cancer- Chill and recurring high fever
  - AIDS- increased number of RBCs
  - Ascariasis- Inflammation of lymph nodes in lower limbs

Q15. Where does the fertilization takes place of malarial parasite?

- a. Gut of Humans
- b. Salivary glands of Mosquito
- c. Gut of female anopheles
- d. RBCs of Humans

Q16. Appearance of dry, scaly lesions on various parts of the body are symptoms of

- a. Ringworm
- b. Amoebiasis
- c. Allergy
- d. Small Pox

Q17. Mucous coating of the epithelium lining of the respiratory, gastrointestinal and urogenital tracts are ....

- a. Physical Barriers
- b. Physiological Barriers
- c. Cellular Barriers
- d. Cytokine barriers

Q18. The Correct Match for the following

A-Poppy Plant	i. Hallucinogenic property
B- <i>Erythroxylum coca</i>	ii. Resin is used to make hashish
C- <i>Cannabis sativa</i>	iii. Produces sense of Euphoria
D-Datura	iv. Latex is used to make heroin

- a. A-i,B-ii,C-iv,D-iii
- b. A-iii,B-iv,C-i,D-ii
- c. A-iv,-B-ii,C-i,D-iii
- d. A-iv,B-iii,C-iv,D-i

Q19. An example of biological response modifier

- a. Cocaine
- b.  $\alpha$ -Interferon
- c-Histamine
- d. Colostrum

Q20. Which fish is added to ponds to control the population of mosquitoes?

- a. *Gambusia*
- b. *Rohu*
- c. *African Catfish*
- d. *Cichlid*

Q21. The toxin released during rupturing of RBCs in malaria is

- a. Haemozoin
- b. sporozoan
- c. merozoin
- d. heparin

Q22. Which among the following is not a vector borne disease?

- a. Malaria
- b. Dengue
- c. Chikungunya
- d. Cancer

Q23. What is incorrect about spleen?

- a. Spleen is a reservoir of RBCs
- b. It is a bean shaped structure
- c. It produces WBCs
- d. It filters the blood by trapping blood borne micro-organisms

Q24. Choose the Odd one out

- a. Rabies, Influenza, AIDS
- b. Amoebiasis, Giardiasis, Trypanosomiasis
- c. Taeniasis, Ascariasis, Elephantiasis
- d. Cancer, Tuberculosis, Tetanus

Q25. The drug used to increase energy effects in human beings is

- a. Cocaine
- b. Barbiturate
- c. Benzodiazepine
- d. Insulin

Q26. Antibodies in our body are complex

- a. Steroids
- b. prostaglandins
- c. glycoprotein
- d. lipoprotein

Q27. Select the incorrect statement in respect of cancer

- a. Benign tumors are normally confined to the original.
- b. UV rays cause DNA damage leading to neoplastic transformation.
- c. During metastasis cancerous cells die and form normal cells.
- d. Oncogenic virus causes cancer

Q28. When are interferon secreted?

- a. During antigen antibody interaction.
- b. When serotonin is released.
- c. When lymphocytes become active
- d. When our body cells are infected by virus then that cell secrete interferon

Q29. In which of the following diseases prepared antibodies are injected?

- a. Small pox
- b. Chicken pox
- c. T.B.
- d. Rabies

Q30. If regular dose of a drug or alcohol is abruptly discontinued then the person develops....

- a. Down's syndrome
- b. Withdrawal Syndrome
- c. Turner's Syndrome
- d. Klinefelter's Syndrome

***"Biology is the key to unlocking solutions to pressing global challenges, from health to conservation."***

## **CHAPTER-8**

### **Microbes in Human Welfare**

- Q1. Who established full potential of *Penicillin*?
- Watson & Crick
  - Ernst Chain and Howard Florey
  - Alexander Fleming
  - Hargovind Khurana
- Q2. *Monascus purpureus* is a yeast used commercially in the production of
- Ethanol
  - Citric acid
  - Blood cholesterol lowering agent
  - Streptokinase for removing clots from the blood vessels.
- Q3. A common bacterial biocontrol agent for the control of plant disease by spraying its spores on leaves is -
- Baculovirus*
  - Glomus*
  - Trichoderma*
  - Bacillus thuringiensis*
- Q4. Human insulin is being commercially produced from a transgenic species of
- Escherichia*
  - Mycobacterium*
  - Rhizobium*
  - Saccharomyces*
- Q5. The purpose of biological treatment of waste water is to
- Reduce BOD
  - Increase BOD
  - Reduce Sedimentation
  - Increase sedimentation
- Q6. Organic farming does not include
- Green manures
  - Chemical fertilisers
  - Farmyard manures
  - Compost
- Q7. The symbiotic association between fungi and roots of higher plants is referred as
- Lichen
  - Mycorrhiza
  - Biofertilizer
  - Biocontrol agent
- Q8. Statins, a bioactive molecule, inhibiting the enzyme responsible for the synthesis of
- Carbohydrate
  - Protein
  - Vitamins
  - Cholesterol



Q9. Which one of the following is incorrect match of a microbe and its industrial product?

- a. Yeast- Statins
- b. *Acetobacter aceti*- acetic acid
- c. *Clostridium butylicum*- lactic acid
- d. *Aspergillus niger*- citric acid

Q10. Which among the following is not an example of Biocontrol method?

- a. Ladybird is used to get rid off aphids
- b. Dragonflies are used to get rid off mosquito larvae
- c. *Bt* is used to control butterfly caterpillars
- d. Wasp pollinating fig inflorescence

Q11. Which of the following is not a beneficial use of microbes in human welfare?

- a Production of antibiotics
- b Biofertilizers
- c Production of alcoholic beverages
- d Cause of infectious diseases

Q12. Which microorganism is used in the production of antibiotics like penicillin?

- a *Escherichia coli*
- b *Saccharomyces cerevisiae*
- c *Streptococcus*
- d *Penicillium*

Q13. Choose the incorrect statement/s

- i. Azotobacter is free living nitrogen fixing soil bacteria
  - ii. In paddy fields cyanobacteria serve as an important biofertilizers.
  - iii. Baculovirus attack fungal pathogens
  - iv. IARI provides technology for alcohol production
- a. i and ii
  - b. ii and iv
  - c. iii and iv
  - d. only i

Q14. Which organism is responsible for converting milk into curd?

- a. *Aspergillus niger*
- b. Yeast
- c. *Clostridium butylicum*
- d. *Lactobacillus*

Q15. Which among the following plays a crucial role in making biogas?

- a. Methanogen
- b. Yeast
- c. *Rhizobium*
- d. *Nitrosomonas*

Q16. Which among the following is not an importance use of biogas as a fuel?

- a. Reduction of air pollution
- b. Generating of organic manure
- c. Release of greenhouse gases
- d. Utilization of organic waste

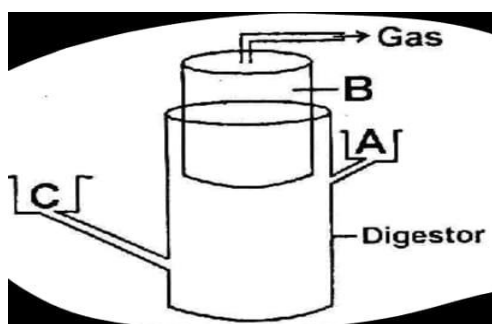
Q17. What is the primary purpose of using microbes in sewage treatment plants?

- a. Increase in pathogenic bacteria
- b. Reduction of water pollution
- c. Generation of suspended solids
- d. Production of toxic gases

Q18. Which of the following is not a by-product of anaerobic digestion of sewage sludge?

- a. Methane gas
- b. Hydrogen gas
- c. Carbon di oxide
- d. Oxygen gas

Q19. The diagram below shows a typical biogas plant. With few structures labelled as A, B and c. Identify A, B and C.



- a. A-Sludge, B-Methane, Oxygen C- Dung, water
- b. A- Sludge, B- Methane, Carbon-dioxide, C-Dung, water
- c. A- sludge, B- Ethylene, Carbon dioxide, C-Dung, water
- d. A-Sludge, B- Methane, Carbon-dioxide, C-Sewage

Q20. The type or quality of alcohol depends on

- a. Type of raw material
- b. Type of process used
- c. Type of micro-organism used.
- d. Both on raw material and process of distillation used or not

Q21. Which one of the following alcoholic drinks is produced without distillation?

- a. Wine
- b. Whisky
- c. Rum
- d. Brandy

Q22. Mycorrhiza does not help the host plant in

- a. enhancing its phosphorus uptake capacity
- b. increasing its tolerance to drought
- c. enhancing its resistance to root pathogens
- d. increasing its resistance to insects.

Q23. Which of the following bioactive molecule can be used as clot buster?

- a. Statins
- b. Cyclosporin A
- c. Streptokinase
- d. Lipases

Q24. Traditional drink Toddy is obtained by fermentation of

- a. Coconut water
- b. Grape juice
- c. Sap of palm
- d. Sugarcane juice

Q25. The curd is nutritionally balanced than milk. Name the vitamin present in curd.

- a. Vitamin C
- b. Vitamin B<sub>12</sub>
- c. Vitamin K
- d. Vitamin D

Q26. How the bottled juices made clearer?

- a. Use of proteases only
- b. Use of pectinases and Proteases
- c. Use of lipases
- d. Use of Pectinases only

Q27. Select the incorrect pair

- a. KVIC- Khadi and Village Industries
- b. IARI- Indian Agricultural Research Institute
- c. STP- Sewage Treatment Plant
- d. BOD- Biological Oxygen Demand

Q28. Big holes in Swiss cheese are made by

- a. a machine
- b. a bacterium that produces methane gas
- c. a bacterium producing a large amount of carbon dioxide
- d. a fungus that releases a lot of gases during its metabolic activities

Q29. Which of these is/are symbiotic N<sub>2</sub> fixing organisms?

- i. Rhizobium ii. Clostridium iii. Azotobacter iv. Azospirillum
- a. i,ii,iii
- b. ii,iii, iv
- c. i,iv
- d. i,ii,iv

Q30. Which among the following is not a fungus?

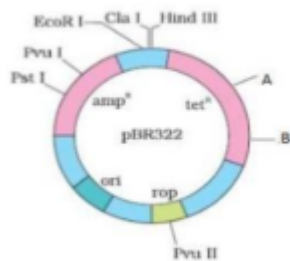
- a. *Monascus purpureus*
- b. *Saccharomyces cerevisiae*
- c. *Trichoderma polysporum*
- d. *Streptococcus*

***"Biology empowers us to comprehend the past, interpret the present, and shape the future of life on Earth."***

## **CHAPTER-9**

### **BIOTECHNOLOGY: PRINCIPLES AND PROCESSES**

1. The most important feature in a plasmid to be used as a vector is:
  - a. Origin of replication (ori)
  - b. Presence of a selectable marker
  - c. Presence of sites for restriction endonuclease
  - d. Its size
2. Restriction endonuclease
  - a. synthesizes DNA
  - b. cuts the DNA molecules randomly
  - c. cuts the DNA molecule at specific sites
  - d. restricts the synthesis of DNA inside the nucleuse
3. A and B in the pBR 322, shown in the diagram given below, respectively represent recognition sequences of



- a. BamH I and Sma I
  - b. Hind II and Sma I
  - c. BamH I and SaI I
  - d. SaI I and Hind II
4. A host cell normally does not take up a foreign DNA until it has been made competent to do so. This is because:
  - a. DNA is a hydrophilic molecule
  - b. DNA is a very large molecule
  - c. there are no receptors for DNA on the cell membrane
  - d. DNA is an inert molecule
5. A foreign DNA and plasmid DNA cut by the restriction endonuclease can be joined to form a recombinant plasmid using \_\_\_\_\_
  - a. Eco RI 1
  - b. Taq polymerase
  - c. Ligase
  - d. Polymerase II
6. A cloning vector has two antibiotic resistance genes- for tetracycline and ampicillin. A foreign DNA was inserted into the tetracycline gene. Non-recombinants would survive on the medium containing
  - a. ampicillin but not tetracycline
  - b. tetracycline but not ampicillin
  - c. both tetracycline and ampicillin
  - d. neither tetracycline nor ampicillin

7. The technique not used for transformation of plant cells in recombinant procedures is:
  - a. Biolistic
  - b. Agrobacterium mediation
  - c. Use of viruses
  - d. Micro-injection
  
8. Microinjection is suitable for
  - a. Injecting an ovum into the sperm in IVF
  - b. Transforming animal cells
  - c. Injecting very small sized drug particles into neurons
  - d. Conferring antibiotic resistance to a certain strain of bacteria
  
9. A gene, whose expression helps to identify transformed cells is known as
  - a. selectable marker
  - b. vector
  - c. plasmid
  - d. structural gene
  
10. The DNA molecule to which the gene of interest is integrated for cloning is called
  - a. Transformer
  - b. Vector
  - c. Template
  - d. Carrier
  
11. The colonies of recombinant bacteria appear white in contrast to blue colonies of non-recombinant bacteria on Chromogenic Substrate is because of
  - a. Non-recombinant bacteria containing  $\beta$  galactosidase
  - b. Insertional inactivation of  $\alpha$ -galactosidase in non-recombinant bacteria
  - c. Insertional inactivation of  $\beta$ -galactosidase in recombinant bacteria
  - d. Inactivation of glycosidase enzyme in recombinant bacteria.
  
12. Suggest a technique to a researcher who needs to separate fragments of DNA?
  - a. PCR
  - b. Gel electrophoresis.
  - c. Centrifugation
  - d. X-ray diffraction.
  
13. Which of the given statements is correct in the context of observing DNA separated by agarose gel electrophoresis?
  - a. DNA can be seen in visible light
  - b. DNA can be seen without staining in visible light
  - c. Ethidium bromide-stained DNA can be seen in visible light
  - d. Ethidium bromide-stained DNA can be seen under exposure to UV light.
  
14. Which of the following statements is accurate for the PCR – polymerase chain reaction?
  - a. Automated PCR machines are called thermal cyclers
  - b. A thermostable DNA polymerase is required
  - c. Millions to billions of desired DNA copies can be produced from microgram quantities of DNA
  - d. All of the above

15. Which of the following steps are catalysed by Taq polymerase in a PCR reaction?
- Denaturation of template DNA
  - Annealing of primers to template DNA
  - Extension of primer end on the template DNA
  - All of the above .
16. How many DNA duplexes are obtained from one DNA duplex after 4 cycles of PCR?
- 8
  - 4
  - 32
  - 16
17. Reverse transcription PCR uses \_\_\_\_\_.
- RNA as a template to form DNA
  - mRNA as a template to form cDNA
  - DNA as a template to form ssDNA
  - All of the above
18. Recombinant proteins are
- proteins synthesized in animals
  - proteins synthesized by transgene in host cell by rDNA technology
  - proteins synthesised in cells that are produced by protoplast fusion
  - proteins synthesized in mutated cell lines
19. How the plasmid clones be screened?
- By selectable markers
  - By bacterial resistance gene
  - For restriction site
  - By ARS sequence
20. What does continuous culture mean?
- Where DNA and protein get expressed continuously.
  - Where the used medium is drained out while fresh medium is added from another side.
  - Where cells are producing protein for one week continuously.
  - Where the production of recombinant DNA is continuing without interference.
21. Continuous culture has cells in
- their physically active phase
  - Lag phase
  - Exponential phase
  - Both a and b.
22. The cylindrical or curved base of a bioreactor actually facilitates:
- The handling and maintenance of bioreactor.
  - Mixing
  - Better oxygen transport
  - More accumulation of product
23. A selectable marker is used to:
- help in eliminating the non-transformants so that the transformants can be regenerated.
  - Identify the gene for a desired trait in an alien organism.
  - Select a suitable vector for transformation in a specific crop.
  - mark a gene on a chromosome for isolation using restriction enzyme

24. Which of the following should be chosen for best yield if one were to produce a recombinant protein in large amounts?
- A continuous culture system
  - A stirred-tank bioreactor without in-lets and out-lets
  - Laboratory flask of the largest capacity
  - None of the above
25. Construction of recombinant DNA involves:
- cleaving and joining of DNA segments with endonuclease
  - cleaving DNA segments with endonuclease and re-joining with ligase
  - cleaving and re-joining DNA segments with ligase
  - cleaving DNA segments with ligase and re-joining with endonuclease
26. Micro-organisms can be grown in the bioreactors by
- Support growth system
  - Agitated growth system
  - Suspended. growth system
  - Both (a) and (c)
27. The components of a bioreactor are:
- An agitator system
  - An oxygen delivery system
  - A foam control system
  - All of these
28. Sparger in stirred tank bioreactor helps in:
- Proper gas distribution
  - Proper mixing of medium
  - Measuring temperature of medium
  - Better sterility
29. Which of the following is incorrectly matched?
- RNA-Ribonuclease
  - Proteins –Protease
  - Fungus-Chitinase
  - Plants –Lysozyme
30. Significance of ‘heat shock’ method in bacterial transformation is to facilitate
- binding of DNA to the cell wall
  - uptake of DNA through membrane transport proteins
  - uptake of DNA through transient pores in the bacterial cell wall.
  - expression of antibiotic resistance gene

*"From the smallest cell to the grandeur of ecosystems, biology teaches us the interconnectedness of all living things."*

## **CHAPTER-10**

### **BIOTECHNOLOGY & ITS APPLICATIONS**

1. Which kind of therapy was given in 1990 to a four year old girl with adenosine deaminase (ADA) deficiency ?
  - (a) Gene therapy
  - (b) Chemotherapy
  - (c) Immunotherapy
  - (d) Radiation therapy
  
2. The two polypeptides of human insulin are linked together by
  - a. covalent bond
  - b. disulphide bridges
  - c. hydrogen bonds
  - d. phosphodiester bond
  
3. *Bacillus thuringiensis* forms protein crystals which contain insecticidal protein. This protein:
  - a. Binds with epithelial cells of mid gut of the insect pest ultimately killing it
  - b. Is coded by several genes including the gene cry
  - c. Is activated by the acid pH of the foregut of the insect pest
  - d. Does not kill the carrier bacterium which is itself resistant to this toxin
  
4. Human insulin is being commercially produced from a transgenic species of
  - a. *Rhizobium*
  - b. *Saccharomyces*
  - c. *Escherichia*
  - d. *Agrobacterium*
  
5. Cry I endotoxins obtained from *Bacillus thuringiensis* are effective against
  - a. nematodes
  - b. bollworms
  - c. mosquitoes
  - d. flies
  
6. Which one of the following is commonly used in transfer of foreign DNA into crop plants?
  - a. *Meloidogyne incognita*
  - b. *Agrobacterium tumefaciens*
  - c. *Penicillium expansum*
  - d. *Trichoderma harzianum*
  
7. What is true about Bt toxin?
  - a. Bt protein exists as active toxin in the Bacillus.
  - b. The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication.
  - c. The concerned Bacillus has antitoxins.
  - d. The inactive protoxin gets converted into active form in the insect gut.



8. Tobacco plants resistant to a nematode have been developed by the introduction of DNA that produces (in the host cells)
  - a. both sense and antisense RNA
  - b. a particular hormone
  - c. an antifeedant
  - d. a toxic protein.
  
9. RNA interference involves
  - a. Synthesis of cDNA and RNA using reverse transcriptase
  - b. Silencing of specific mRNA due to complementary RNA
  - c. Interference of RNA in synthesis of DNA
  - d. Synthesis of mRNA from DNA
  
10. Genetic engineering has been successfully used for producing
  - a. Transgenic models for studying new treatments for certain disease
  - b. Transgenic mice for testing safety of polio vaccine before use in humans
  - c. Animals like bulls for farm work as they have super power
  - d. Transgenic cow Rosie which produces high fat milk for making ghee
  
11. Transgenic plants are the ones
  - a. generated by introducing foreign DNA into a cell and regenerating a plant from that cell
  - b. produced after protoplast fusion in artificial medium
  - c. grown in artificial medium after hybridization in the field
  - d. produced by a somatic embryo in artificial medium.
  
12. Production of a human protein in bacteria by genetic engineering is possible because
  - a. the human chromosome can replicate in bacterial cell
  - b. the mechanism of gene regulation is identical in humans and bacteria
  - c. bacterial cell can carry out the RNA splicing reactions
  - d. the genetic code is universal
  
13. The illegal and unlawful development of biomaterials without payment to the inhabitants of their origin is called
  - a. bio patent
  - b. bio war
  - c. bio piracy
  - d. biotechnology
  
14. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of
  - a. vitamin E
  - b. vitamin K
  - c. vitamin D
  - d. vitamin A
  
15. The process of RNA interference (RNAi) has been used in the development of plants resistant to
  - a. nematodes
  - b. fungi
  - c. viruses
  - d. insects.

16. In gene therapy, the gene defects are cured in a child in ..... stage.
- adulthood
  - adolescent
  - old age
  - embryonic
17. .... is an alternative method to cure ADA deficiency
- Cloning
  - Bone marrow transplantation
  - Hybridization
  - Southern blotting
18. What kind of disease can be cured with the help of gene therapy?
- acute diseases
  - physiological diseases
  - hereditary diseases
  - infectious diseases
19. A probe which is a molecule used to locate homologous sequences in a mixture of DNA or RNA molecules could be:
- ssRNA
  - ssDNA
  - either ss RNA or DNA
  - can be ssDNA but not ssRNA
20. Choose the correct option regarding retrovirus.
- An RNA virus that synthesises DNA during infection
  - A DNA virus that synthesises RNA during infection
  - A ssDNA virus
  - A dsRNA virus
21. The site of production of ADA in the body is
- erythrocytes
  - lymphocytes
  - blood plasma
  - osteocytes
22. In RNAi, genes are silenced using
- ssDNA
  - dsDNA
  - dsRNA
  - ssRNA
23. During the processing of 'proinsulin' into mature 'insulin'
- A – chain is removed
  - C – chain is removed
  - B – chain is removed
  - No peptide chain is removed

24. A transgenic food crop which may help in solving the problem of night blindness in developing countries is \_\_\_\_\_
- Golden Rice
  - Flavr Savr tomatoes
  - BT soybean
  - Starlink maize
25. Which of the following is not used as a biopesticide?
- Xanthomonas campestris
  - Bacillus thuringiensis
  - Trichoderma harzianum
  - Nuclear Polyhedrosis Virus
26. The maximum number of existing transgenic animals is of \_\_\_\_\_
- Fish
  - Mice
  - Cow
  - Pig
27. An important objective of biotechnology in the area of agriculture is \_\_\_\_\_
- to decrease seed number
  - to produce pest-resistant varieties of plants
  - to increase phosphorous, nitrogen production
  - to reduce the number of plants
28. The Indian Patents Bill takes issues such as \_\_\_\_\_ into consideration.
- biology
  - biodegradation
  - patent terms
  - vaccination
29. A collection of methods that allows correction of a defective gene that has been diagnosed in child/embryo is called \_\_\_\_\_
- cloning
  - gene therapy
  - chemotherapy
  - dialysis
30. The transgenic plant 'Flavr savr' tomato carries an artificial gene for \_\_\_\_\_
- delaying ripening process
  - added flavours
  - both delaying ripening process and added flavours
  - insect resistance

***"In the study of biology, we glimpse the wonders of evolution, adaptation, and biodiversity."***

## **CHAPTER-11**

### **ORGANISM AND POPULATION**

1. A biologist studied the population of mice in a particular area. He found that the average natality was 500, average mortality 480, immigration 40 and emigration 60. The net increase in population is

- (a) 10
- (b) 30
- (c) 0
- (d) 20

2. Select the type of biotic interactions with an example, in which one of the interacting species is benefited while the other remains unaffected.

- (a) Commensalism- Epiphyte on mango branch
- (b) Mutualism- Orchid Ophrys and bee
- (c) Amensalism- Balanus and Chthamalus
- (d) Parasitism – Ticks on dogs

3. Which of the following is the correct example of positive interaction in a population?

- (a) Adamsia – Hermit crab
- (b) Plasmodium – Mosquito
- (c) Sacculina – Crab
- (d) Wuchereria – Man

4. Which of the following shows Verhulst-Pearl logistic growth?

- (a)  $dN/dt = rN(K-N)/K$
- (b)  $dN/dt = rN$
- (c)  $N_t = N_0 e^{rt}$
- (d)  $rN K-N/K$

5. In which of the following types of interactions both the interacting organisms are harmed?

- (a) Parasitism
- (b) Proto cooperation
- (c) Mutualism
- (d) Competition

6. In the exponential growth equation  $N_t = N_0 e^{rt}$ , e represents

- (a) the base of geometric logarithms
- (b) the base of number logarithms
- (c) the base of exponential logarithms
- (d) the base of natural logarithms.

7. In spite of interspecific competition in nature, which mechanism the competing species might have evolved for their survival?

- (a) Predation
- (b) Resource partitioning
- (c) Competitive release
- (d) Mutualism

8. The density of a population in a given habitat will be decreased by the following :
- Natality  $>$  mortality
  - Immigration  $>$  emigration
  - Mortality and emigration
  - Natality  $<$  immigration
9. What would be the status of the population after some years if a population has more young individuals compared to the older individuals?
- It will decline
  - It will stabilise
  - It will increase
  - It will first decline and then stabilise
10. A protozoan reproduces by binary fission. What will be the number of protozoans in its population after four generations?
- 16
  - 32
  - 64
  - 8
11. What is a group of individuals belonging to the same species within an ecosystem called?
- Species
  - Population
  - Biomes
  - Manipulation
12. . What is a relationship in which larval development of one organism occurs inside or on the surface of another organism resulting in the death of the host called?
- Symbiont
  - Parasitoid
  - Commensalism
  - Mutualism
14. Cuscuta is an example of
- ectoparasitism
  - brood parasitism
  - predation
  - endoparasitism
15. A sedentary sea anemone gets attached to the shell lining of hermit crab. The association is
- commensalism
  - amensalism
  - ectoparasitism
  - symbiosis
16. Which of the following is the most accurate comment on Earth's carrying capacity (K)?
- K is smaller now than it was a thousand years ago.
  - The human population is still a long way from K.
  - Our technology has allowed us to keep increasing K.
  - When it comes to humans, the concept of K is irrelevant.

17. Amensalism is an association between two species where

- (a) one species is harmed and other is benefitted
- (b) one species is harmed and other is unaffected
- (c) one species is benefitted and other is unaffected
- (d) both the species are harmed.

18. Lichens are association of

- (a) bacteria and fungus
- (b) alga and bacterium
- (c) fungus and alga
- (d) fungus and virus

19. Which of the following is a partial root parasite?

- (a) Sandalwood
- (b) Mistletoe
- (c) Orobanche
- (d) Ganoderma

20. According to population scientists, one of the factors responsible for limiting population is the

- (a) availability of food.
- (b) daily variation of environmental temperature.
- (c) time required for ecological succession.
- (d) life span of members of the population.

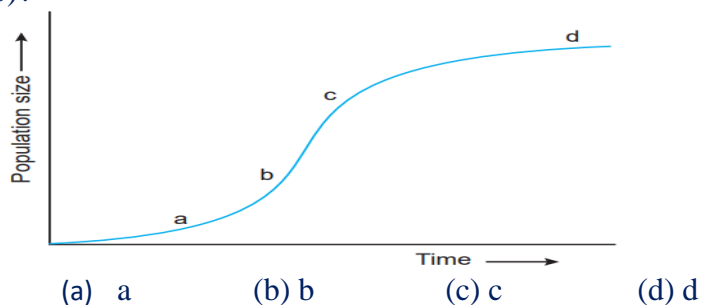
21. If a population of 50 Paramecium present in a pool increases to 150 after an hour, what would be the growth rate of population?

- (a) 50 per hour
- (b) 200 per hour
- (c) 5 per hour
- (d) 100 per hour

22. What would be the percent growth or birth rate per individual per hour for the same population mentioned in the previous question (Question 21)

- (a) 100
- (b) 200
- (c) 50
- (d) 150

23. At which point in the graph shown below would there be zero population growth ( $DN/Dt = 0$ )?



24. What is the name of the interaction between species when one's fitness dominates the other's existence and fitness?

- (a) Competition
- (b) Mutualism
- (c) Parasitism
- (d) Commensalism

25. Where does direct rivalry between individuals arise when there is interference?

- (a) Two species share a similar predator
- (b) One person limits the reproduction of others
- (c) Organisms struggle for space
- (d) Two different species compete for the same resources and habitat

26. Mutualism is what form of interaction?

- (a) Positive Intraspecific,
- (b) Negative Interspecific,
- (c) Positive Interspecific
- (d) Negative intraspecific

27. A population that exhibits birth rates that are identical to the death rate implies:

- (a) Initial growth
- (b) Plateau phase
- (c) Acceleration Phase
- (d) None of the above

28. A group of individuals from different species living in the same habitat and exhibiting functional interactions is called:

- (a) Biotic community
- (b) Population
- (c) Ecosystem
- (d) None of the above

29. In which of the following phases, the maximum growth rate occurs?

- (a) Lag phase
- (b) Exponential phase
- (c) Stationary phase
- (d) Senescent phase

30. Mycorrhiza is an example to:

- (a) Decomposers
- (b) Endoparasitism
- (c) Symbiotic relationship
- (d) Ectoparasitism

***"From the smallest cell to the grandeur of ecosystems, biology teaches us the interconnectedness of all living things."***

## **CHAPTER-12** **ECOSYSTEM**

1. Which of the following is the correct statement for the food chain?
  - a) Every chain formed by nutritional relations, is used to understand energy flow.
  - b) Energy component of the food chain forms a trophic level.
  - c) Inter- relation amongst different food chain forms a food web.
  - d) All of the given
  
2. Which of the following uses maximum energy?
  - a) Primary consumer
  - b) Secondary consumer
  - c) Decomposer
  - d) Primary Producers
  
3. Through which of the following, energy enters an ecosystem? a)
  - a) Herbivores
  - b) Producer
  - c) Decomposer
  - d) Primary producers
  
4. Why is algae placed in the first place of the food chain ?
  - a) Every living organism can utilize food.
  - b) Algae is first to consume food.
  - c) Algae is first to synthesize food.
  - d) None of the given.
  
5. In which of the following categories seed eating birds belong ?
  - a) Decomposer
  - b) Primary consumer.
  - c) primary producers
  - d) secondary consumer.
  
6. which of the following is one of the above laced in the upper most (highest) level of ecological pyramids.
  - a) Herbivores
  - b) Carnivores
  - c) Primary and Secondary Producers
  - d) None of the above
  
7. Study the four statements (a–d) given below and select the two correct ones out of them:
  - (a) A lion eating a deer and a sparrow feeding on grain are ecologically similar in being consumers
  - (b) Predator starfish *Pisaster* helps in maintaining species diversity of some invertebrates
  - (c) Predators ultimately lead to the extinction of prey species
  - (d) Production of chemicals such as nicotine, strychnine by the plants are metabolic disorders



The two correct statements are:

- (a) (a) and (b)
- (b) (b) and (c)
- (c) (c) and (d)
- (d) (d)

8. A boy says that in marine food chains where the pyramid of biomass is inverted, the 10% rule of energy transfer is not applicable. Is he CORRECT and why?

- (a) No, because every level still gets 10% of the energy from the lower level.
- (b) Yes, because there are more consumers and so more energy is transferred.
- (c) No, because the pyramid of biomass can never be inverted for any food chain.
- (d) Yes, because there is lower biomass of producers in these food chains so less energy is transferred.

9. Which one of the following represents the man-made terrestrial ecosystem?

- (a) Botanical gardens
- (b) Grasslands
- (c) Rivers
- (d) Forests

10. Alexander von Humboldt described for the first time

- (a) ecological biodiversity
- (b) law of limiting factor
- (c) species area relationships
- (d) population growth equation

11. Which plant has lost its chlorophyll and leaves in the course of evolution?

- (a) Mango
- (b) Cactus
- (c) Neem
- (d) *Cuscuta*

12. What kind of interaction does an ecosystem involve?

- (a) Individual
- (b) Population
- (c) Biotic factors
- (d) Communities and their physical environment

13. Which one of the following has the largest population in a food chain?

- (a) Producers
- (b) Primary consumers
- (c) Secondary consumers
- (d) Decomposers

14. Secondary producers are

- (a) Herbivores
- (b) Producers
- (c) Carnivores
- (d) None of the above

15. Which of the following ecosystem is most productive in terms of net primary production?
- (a) Tropical Rain forests
  - (b) Oceans
  - (c) Estuaries
  - (d) Deserts
16. Which of the following type of ecosystem is expected in an area where evaporation exceeds precipitation, and mean annual rainfall is below 100 mm?
- (a) Grassland
  - (b) Shrubby forest
  - (c) Desert
  - (d) Mangrove
17. The zone at the edge of a lake or ocean which is alternatively exposed to air and immersed in water is called:
- (a) pelagic zone
  - (b) benthic zone
  - (c) lentic one
  - (d) littoral zone
18. Edaphic factor refers to:
- (a) water
  - (b) soil
  - (c) relative humidity
  - (d) altitude
19. Which of the following is an ecosystem service provided by a natural ecosystem?
- (a) Cycling of nutrients
  - (b) Prevention of soil
  - (c) Pollutant absorption and reduction of the threat of global warming
  - (d) All of the above
20. A succession of communities on barren land, is known as
- (a) Secondary succession
  - (b) primary succession
  - (c) tertiary succession
  - (d) none of these
21. The reservoir for the gaseous type of biogeochemical cycle exists in
- (a) stratosphere
  - (b) atmosphere
  - (c) ionosphere
  - (d) lithosphere
22. If the carbon atoms fixed by producers already have passed through three species, the trophic level of the last species would be:
- (a) scavenger
  - (b) tertiary producer
  - (c) tertiary consumer
  - (d) secondary consumer

23. Humans benefit from ecosystems because ecosystems provide
- (a) buffers from natural disasters such as floods.
  - (b) maintenance of a clean water supply.
  - (c) climate moderation.
  - (d) All of the above
24. The Upright pyramid of number is absent in
- (a) Pond
  - (b) Forest
  - (c) Grassland
  - (d) lake
25. Which of the following is an ecosystem service provided by a natural ecosystem
- (a) Cycling of nutrients
  - (b) Prevention of soil erosion
  - (c) Pollutant absorption and reduction of the threat of global warming
  - (d) All of the above
26. Pyramid of numbers is
- (a) always upright
  - (b) always inverted
  - (c) either upright or inverted
  - (d) neither upright nor inverted
27. Of the total amount of energy that passes from one trophic level to another, about 10% is
- (a) respired and becomes heat
  - (b) passed out as faeces or urine
  - (c) stored as body tissue
  - (d) recycled to autotrophs
28. Which organism is said to be a farmer's friend?
- a) Rat
  - b) Earthworm
  - c) Bat
  - d) Leopard
29. Which of the following is an example of detritivore?
- a) Monkey
  - b) Termites
  - c) Elephant
  - d) Flat-worm
30. What is the process of secretion of digestive enzymes by decomposers to convert insoluble complex organic molecules into simple soluble organic and inorganic molecules called ?
- a) Fragmentation
  - b) Decomposition
  - c) Humification
  - d) Catabolism

***"In biology, we find the blueprint of life, unravelling the mysteries of existence."***

## **CHAPTER-13**

### **BIODIVERSITY AND ITS CONSERVATION**

1. Find the wrongly matched pair
  - a) Endemism-species confined to a region and not found anywhere else
  - b) Hotspots- Western ghats
  - c) Sacred groove – Jaintia hills of Rajasthan
  - d) Alien species to India- Water hyacinth
  
2. In which condition the prey might become extinct?
  - a) When the predator is less
  - b) When the prey is overexploited
  - c) When the prey is less
  - d) When the predator is overexploited
  
3. Which one of the following is a chemical produced by plants against grazers and browsers?
  - a) Sap
  - b) Opium
  - c) Water
  - d) Agar
  
4. It is observed that, the species diversity decreases as we
  - a) move away from equator to poles
  - b) move towards equator from poles
  - c) move along the equator
  - d) move from deserts to rain-forests.
  
5. The hotspots of biodiversity conservation are characterized by:
  - a) High endemism and high threat of extinction
  - b) Low endemism and high threat of extinction
  - c) High endemism and low threat of extinction
  - d) Low endemism and low threat of extinction
  
6. According to Robert May, the global species diversity is about:
  - a) 20 million
  - b) 50 million
  - c) 7 million
  - d) 1.5 million
  
7. What is common to the techniques
  - (i) in vitro fertilisation,
  - (ii) Cryo preservation and
  - (iii) tissue culture?
    - a) All are in situ conservation methods.
    - b) All are ex situ conservation methods.
    - c) All require ultra-modern equipment and large space
    - d) All are methods of conservation of extinct organisms.

8. Which one of the following is related to Ex-situ conservation of threatened animals and plants?

- a) Wildlife Safari parks
- b) Biodiversity hotspots
- c) Amazon rainforest
- d) Himalayan region

9. Loss of biodiversity may lead to all except:

- a) decline in plant production
- b) increased resistance to environmental perturbation
- c) increased variability in water use and increased variability in pest and disease cycle
- d) all of the above

10. The main difference between "Sixth Extinction" and the previous five extinctions is that the sixth extinction:

- a) is mainly occurring on islands
- b) is mainly affecting plants
- c) is occurring at a faster rate
- d) does not involve human activities

11. The relation between species richness and area for a wide variety of taxa on a logarithmic scale is a:

- a) rectangular hyperbola
- b) straight line
- c) sigmoid curve
- d) sine curve

12. Which of the following is considered a hot-spot of biodiversity in India ?

- a) Western ghats
- b) Indo-Gangetic plain
- c) Eastern ghats
- d) Aravali hills

13. Sacred forests are those which..

- a) have rich growth of plants Used for worship by the people in the region
- b) are protected by tribal communities due to religious sanctity accorded to them
- c) have not been discovered humans
- d) none of the above

14. Which one of the following pairs of organisms are exotic species introduced in India?

- (a) Lantana camara, water hyacinth
- (b) Water hyacinth, Prosopis cineraria
- (c) Nile perch, Ficus religiosa
- (d) Ficus religiosa, Lantana camara

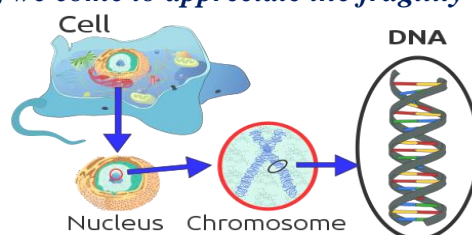
15. Which one of the following is not observed in biodiversity hot spots?

- (a) Lesser inter-specific competition
- (b) Species richness
- (c) Endemism
- (d) Accelerated species loss

16. Which one of the following is an example of ex situ conservation?
- (a) Wildlife sanctuary
  - (b) Seed bank
  - (c) Sacred groves
  - (d) National Park
17. Which one of the following is the correct expanded form of the following acronyms?
- (a) IPCC = International Panel for Climate Change
  - (b) UNEP = United Nations Environmental Policy
  - (c) EPA = Environmental Pollution Agency
  - (d) IUCN = International Union for Conservation of Nature and Natural Resources
18. A collection of plants and seed having diverse alleles of all the genes of a crop is called
- (a) herbarium
  - (b) germplasm
  - (c) gene library
  - (d) genome
19. Biodiversity of a geographical region represents
- (a) endangered species found in the region
  - (b) the diversity in the organisms living in the region
  - (c) genetic diversity in the dominant species of the region
  - (d) species endemic to the region
20. Which of the following countries has the highest biodiversity?
- (a) South America
  - (b) South Africa
  - (c) Russia
  - (d) India
21. Which of the following is not a cause for loss of biodiversity?
- (a) Destruction of habitat
  - (b) Invasion by alien species
  - (c) Keeping animals in zoological parks
  - (d) Over-exploitation of natural resources
22. Which of the following is not an invasive alien species in the Indian context?
- (a) Lantana
  - (b) Cynodon
  - (c) Parthenium
  - (d) Eichhornia
23. Where among the following will you find a pitcher plant?
- (a) Rain forest of North-East India
  - (b) Sunderbans
  - (c) Thar Desert
  - (d) Western Ghats

24. Which one of the following is not a major characteristic feature of biodiversity hot spots?
- Large number of species
  - Abundance of endemic species
  - Mostly located in the tropics
  - Mostly located in the polar regions
25. Keystone species deserve protection because these
- are capable of surviving in harsh environmental condition
  - indicate the presence of certain minerals in the soil.
  - have become rare due to overexploitation.
  - play an important role in supporting other species.
26. Which of the following statements is correct?
- Parthenium is an endemic species of our country.
  - African catfish are not a threat to indigenous catfishes.
  - Steller's sea cow is an extinct animal.
  - Lantana is popularly known as carrot grass.
27. Among the ecosystems mentioned below, where can one find maximum biodiversity?
- Mangroves
  - Desert
  - Coral reefs
  - Alpine meadows
28. Genetic diversity in agricultural crops is threatened by
- intensive use of pesticides
  - extensive intercropping
  - intensive use of fertilisers
  - introduction of high yielding varieties.
29. Which of the following forests is known as the 'lungs of the planet Earth'?
- Taiga forest
  - Tundra forest
  - Amazon rainforest
  - Rainforests of North East India
30. The active chemical drug reserpine is obtained from:
- Datura
  - Rauwolfia
  - Atropa
  - Papaver

*"In understanding biology, we come to appreciate the fragility and resilience of life itself."*



### Answer Key- Chapter 1

#### Sexual Reproduction In flowering plants

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
d	b	a	b	d	a	c	c	b	c
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
d	b	b	d	c	d	c	b	c	a
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
d	b	a	c	c	c	d	d	b	d

### Answer Key- Chapter 2

#### Human Reproduction

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
c	b	a	b	a	a	c	c	a	d
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
d	a	b	d	c	d	c	d	b	c
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
a	d	c	d	c	d	d	c	b	d

### Answer Key- Chapter 3

#### Reproductive Health

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
b	d	c	b	b	c	c	c	d	a
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
b	d	c	a	b	c	b	a	b	d
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
d	a	b	b	d	c	c	b	b	c

### Answer Key- Chapter 4

#### Principles of Inheritance and Variation

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
d	a	b	d	c	a	a	a	d	a
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
c	d	d	a	c	b	c	c	c	a
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
d	c	a	d	a	a	d	c	b	a



## Answer Key- Chapter 5

### Molecular Basis of Inheritance

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
d	c	d	d	c	b	d	c	a	d
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
d	a	a	b	b	a	c	b	b	a
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
b	a	d	c	c	c	d	b	a	a

## Answer Key- Chapter 6

### Evolution

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
c	b	b	d	d	b	c	b	a	a
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
a	a	a	d	a	d	b	c	d	c
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
b	c	b	c	d	d	a	d	d	b

## Answer Key- Chapter 7

### Human Health and Diseases

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
b	c	b	d	a	a	c	b	d	c
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
c	b	c	a	c	a	b	d	b	a
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
a	d	c	d	b	c	c	d	d	b

### **Answer Key- Chapter 8**

#### **Microbes in Human Welfare**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
b	c	d	a	a	b	b	d	c	d
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
d	d	c	d	a	c	b	d	b	d
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
a	d	c	c	b	b	d	c	c	d

### **Answer Key , Chapter no - 9**

#### **Biotechnology : Principles and Processes**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
a	c	c	a	c	c	a	b	a	b
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
C	B	D	D	C	D	B	B	A	B
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
C	B	A	A	B	D	D	A	D	C

### **Answer Key , Chapter no- 10**

#### **Biotechnology and its application**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
a	b	a	c	b	b	d	a	b	b
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
a	d	c	d	a	d	b	c	c	a
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
b	c	b	a	a	b	b	c	b	c

**Answer Key, Chapter no 11**

**Organisms and Populations**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
c	a	a	a	d	d	b	c	c	D
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
b	b		a	a	c	B	c	a	A
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
d	b	d	a	b	c	b	a	b	C

**Answer Key, Chapter no 12**

**Ecosystem**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
d	a	b	c	b	b	a&b	d	a	C
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
d	d	a	c	a	c	d	b	d	B
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
b	c	d	b	d	c	c	b	b	D

**Answer Key, Chapter no.13**

**Biodiversity and Conservation**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
c	b	b	a	a	c	b	a	d	C
Q11.	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
c	a	b	a	a	b	d	b	b	A
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
c	b	a	c	d	c	c	d	c	B

**BEST OF LUCK**