

**KEY ANSWERS**

1	A	16	D	31	C*	46	B
2	D	17	B	32	B*	47	A
3	B	18	D	33	D*	48	B
4	B	19	B	34	D	49	C
5	C	20	B	35	C	50	B
6	D	21	C	36	D	51	B
7	D	22	A*	37	B	52	A
8	A	23	B	38	B	53	C
9	A	24	C*	39	A	54	C
10	C	25	A	40	C*	55	A
11	C	26	A*	41	B	56	D
12	C*	27	D*	42	A	57	C
13	C*	28	C	43	D	58	B
14	B*	29	D	44	A	59	C
15	D	30	B	45	C	60	A

**\*: Deleted portions**

1. Match the content of List I with List II :

List I

1. Polyembryony
2. Perisperm
3. False fruit
4. Parthenocarpy

List II

- p. Black pepper
- q. Banana
- r. Lemon
- s. Apple

Choose the correct option from the following :

- A) 1-r, 2-p, 3-s, 4-q    B) 1-p, 2-r, 3-s, 4-q    C) 1-q, 2-p, 3-s, 4-r    D) 1-r, 2-s, 3-p, 4-q    **Ans. (A)**

2. Which of the following hormones is not secreted by human placenta ?

- (A) Progesterone    (B) hCG    (C) Estrogen    (D) LH    **Ans. (D)**

**Solution:** LH is secreted by anterior pituitary

3. In human females, the endometrium of uterus consists of

- (A) Smooth muscle    (B) Glandular layer    (C) Adipose layer    (D) Cartilaginous layer    **Ans. (B)**

**Solution:** Endometrium is a Glandular layer that lines the uterine cavity

4. If two primary spermatocytes and two primary oocytes undergo meiosis simultaneously, what will be the ratio of spermatozoa and ova produced at the end of the gametogenesis?

- (A) 2:1    (B) 4:1    (C) 6:2    (D) 1:2    **Ans. (B)**

5. The role of Filiform apparatus in synergids is to

- (A) Protect the egg apparatus    (B) Endosperm formation  
(C) Guide the entry of pollen tube    (D) Prevention of gamete entry    **Ans. (C)**

6. Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called

- A) Xenogamy    B) Autogamy    C) Cleistogamy    D) Geitonogamy    **Ans. (D)**

7. Stanley Miller simulated the conditions of pre-biotic earth using spark-discharge apparatus. Which organic compounds were observed by him on analysing the end product of his experiment?

- (A) Pigments    (B) Fats    (C) Nitrogen bases    (D) Amino acids    **Ans. (D)**

**Solution:** Miller observed formation of amino acids. In similar experiments, others observed formation of sugars, nitrogen bases, pigments and fats.

8. Most ape-like ancestral primate was

- (A) Dryopithecus    (B) Ramapithecus    (C) Australopithecus    (D) Neanderthal man    **Ans. (A)**

**Solution:** About 15 mya, primates called Dryopithecus and Ramapithecus were existing. Ramapithecus was more man like, while Dryopithecus was more ape-like.

9. The principle of vaccination is based on which property of immune system?  
(A) Memory (B) Specificity (C) Diversity (D) Plasticity **Ans. (A)**

10. Genome of HIV replicates in the macrophages with the help of an enzyme called  
(A) DNA Polymerase (B) RNA Polymerase  
(C) Reverse Transcriptase (D) DNA Ligase **Ans. (C)**

**Solution:** After getting into the body of the person, the HIV virus enters the macrophages, where RNA genome of the virus replicates to form viral DNA with the help of the enzyme reverse transcriptase.

11. Read the following statements:

*Statement I:* Morphine is obtained by acetylation of Heroin.

*Statement II:* Cannabinoids are known for their effect on cardiovascular system.

Which of the following options is correct with reference to these statements?

- (A) Both Statements I and II are correct.  
(B) Statement I is correct and Statement II is incorrect.  
(C) Statement I is incorrect and Statement II is correct.  
(D) Both Statements I and II are incorrect.

**Ans. (C)**

**Solution:** Heroin is chemically diacetylmorphine which is obtained by acetylation of morphine, that is extracted from the latex of poppy plant.

\*12. Mule is the result of

- (A) Out-crossing (B) Cross-breeding  
(C) Interspecific hybridization (D) Out-breeding

**Ans. (C)**

**Solution:** Mating between male and female animals of two different species is called Interspecific hybridization. The mule is a cross between two different species, the female horse and male donkey.

**Remark:** This question from the Deleted syllabus (Strategies for enhancement of food production)

\*13. Identify the bacterial disease among the following:

- (A) Brown rust of wheat (B) Tobacco mosaic disease  
(C) Black rot of crucifers (D) Late blight of potato

**Ans. (C)**

**Solution:** Brown rust of wheat, Late blight of potato are caused by fungi and Tobacco mosaic disease caused by virus.

**Remark:** This question from the Deleted syllabus (Strategies for enhancement of food production)

\*14. Match the nutrients given in List I with the source in List II:

List I	List II
1. Vitamin A	p. Bitter gourd
2. Single cell	q. Beans
3. Vitamin C	r. Carrots
4. Protein	S. Spirulina spp

Choose the correct option from the following:

- (A) 1-p, 2-q, 3-r, 4-s (B) 1-r, 2-s, 3-p, 4-q (C) 1-p, 2-r, 3-s, 4-q (D) 1-q, 2-s, 3-p, 4-r **Ans. (B)**

**Remark:** This question from the Deleted syllabus (Strategies for enhancement of food production)

15. The chemical substances which are produced by some microbes which can kill or retard the growth of other microbes are known as

- (A) Statins (B) Streptokinases (C) Cyciosporins (D) Antibiotics **Ans. (D)**

16. Select the correct statement from the following:

- (A) *Methanobacterium* is an aerobic bacteria found in the rumen of cattle.  
(B) Biogas is produced by the activity of aerobic bacteria.  
(C) Biogas is pure methane.  
(D) Activated sludge in sediment tanks is a rich source of aerobic bacteria.

**Ans. (D)**

**Solution:** Biogas is not pure methane gas as it contains CO<sub>2</sub> and other gases. *Methanobacterium* is a methanogen and is anaerobic.

17. Which of these enzymes is required to cleave a plasmid?  
 (A) Ligase (B) Endonuclease (C) Exonuclease (D) Polymerase **Ans. (B)**
18. DNA polymerase of *Thermus aquaticus* is  
 (A) Thermolabile (B) Thermophobic (C) Exonuclease (D) Thermostable **Ans. (D)**
19. If a recombinant DNA bearing gene for resistance to Ampicillin is transferred into *E. coli* cells, host cells become transformed into Ampicillin resistant cells. What happens when these *E. coli* are grown on medium containing Ampicillin?  
 (A) Non-transformants will grow and transformants will die.  
 (B) Non-transformants will die and transformants will grow.  
 (C) Both non-transformants and transformants will die.  
 (D) Both non-transformants and transformants will grow. **Ans. (B)**  
**Solution:** Transformants will grow in Ampicillin containing medium, as they are resistant to antibiotic Ampicillin but non Transformants will die.
20. Which of the following is based upon the principle of antigen-antibody interaction?  
 (A) PCR (B) ELISA (C) rDNA technology (D) Gel Electrophoresis **Ans. (B)**
21. Which among the following is used to treat Emphysema?  
 (A) Human Hormone- $\alpha$ -Antitrypsin (B) Human  $\alpha$ -Interferon  
 (C) Human protein- $\alpha$ -Antitrypsin (D) Human  $\alpha$ -Lactalbumin **Ans. (C)**
- \*22. Homeostasis is a condition where the organisms  
 (A) maintain a constant internal environment in an everchanging external environment.  
 (B) do not maintain a constant internal environment.  
 (C) change their internal environment according to their external environment.  
 (D) change their internal environment when the external environment is constant. **Ans. (A)**  
**Remark:** This question from the Deleted syllabus (Organism & Population: Responses to abiotic factors)
23. Which of the following is *not* a parasitic adaptation?  
 (A) Loss of unnecessary sense organs (B) Absence of adhesive organs or suckers  
 (C) Loss of digestive system (D) High reproductive capacity **Ans. (B)**  
**Solution:** Presence of adhesive organs or suckers is a parasitic adaptation.
- \*24. Match the type of adaptation given in List I with their examples given in List II. Select the option showing correct combination
- | List I (Type of adaptation) | List II (Examples) |
|-----------------------------|--------------------|
| 1. Biochemical adaptation   | p. Desert lizards  |
| 2. Behavioural adaptation   | q. Deep sea fishes |
| 3. Physiological adaptation | r. Opuntia         |
| 4. Morphological adaptation | s. Kangaroo rats   |
- (A) 1-q, 2-r, 3-s, 4-p (B) 1-p, 2-q, 3-r, 4-s (C) 1-q, 2-p, 3-s, 4-r (D) 1-s, 2-r, 3-q, 4-p **Ans. (C)**  
**Remark:** This question from the Deleted syllabus (Organism & Population: Responses to abiotic factors)
25. The annual net primary productivity of the biosphere is approximately  
 (A) 170 billion tons (B) 55 billion tons (C) 170 million tons (D) 55 million tons **Ans. (A)**
- \*26. The natural reservoir of phosphorus is  
 (A) Rocks (B) Soil solution (C) Detritus (D) Atmosphere **Ans. (A)**  
**Remark:** This question from the Deleted syllabus (Ecosystem: Nutrient cycling)
- \*27. The sequence of communities of primary succession in water is  
 (A) Phytoplanktons  $\rightarrow$  Scrubs  $\rightarrow$  Free floating hydrophytes  $\rightarrow$  Rooted hydrophytes  
 $\rightarrow$  Grasses  $\rightarrow$  Trees.  
 (B) Phytoplanktons  $\rightarrow$  Free floating hydrophytes  $\rightarrow$  Rooted hydrophytes  $\rightarrow$  Trees  $\rightarrow$  Scrubs.  
 (C) Free floating hydrophytes  $\rightarrow$  Scrubs  $\rightarrow$  Phytoplanktons  $\rightarrow$  Rooted hydrophytes  
 $\rightarrow$  Grasses  $\rightarrow$  Trees.  
 (D) Phytoplanktons  $\rightarrow$  Rooted hydrophytes  $\rightarrow$  Free floating hydrophytes  $\rightarrow$  Reed swamps  
 $\rightarrow$  Marsh meadows  $\rightarrow$  Scrubs  $\rightarrow$  Trees. **Ans. (D)**  
**Remark:** This question from the Deleted syllabus (Ecosystem: plant succession)

28. A strict protection of biodiversity hotspots could reduce the ongoing mass extinction by almost  
 (A) 20% (B) 25% (C) 30% (D) 35% **Ans. (C)**

29. Identify the *incorrect* match with respect to recently extinct animals and their place of extinction according to IUCN Red List.  
 (A) Dodo - Mauritius (B) Quagga - Africa  
 (C) Thylacine - Australia (D) Steller's Sea Cow - North America **Ans. (D)**  
**Solution:** Steller's Sea Cow - Russia

30. According to the hypothesis proposed by environmental biologists, a relatively constant environment in tropics promotes  
 (A) Niche specialization and lesser species diversity.  
 (B) Niche specialization and greater species diversity.  
 (C) Niche diversity and lesser species specialization.  
 (D) Niche diversity and greater species specialization. **Ans. (B)**

**Solution:** Tropical environments unlike temperate ones, are less seasonal, relatively more constant and predictable. Such constant environments promote Niche specialization and lead to greater species diversity.

\*31. In the prevention of air pollution, the role of scrubber is to remove  
 (A) Particulate SO<sub>2</sub> (B) Liquid SO<sub>2</sub> (C) Gaseous SO<sub>2</sub> (D) Liquid SO<sub>3</sub> **Ans. (C)**

**Remark:** This question from the Deleted syllabus (Environmental issues)

\*32. Match List I with List II and choose the correct answer

List I	List II
1. Nitrogen rich fertilizers	p. Ozone depletion
2. Carbon dioxide	q. Eutrophication
3. Carbon monoxide	r. Greenhouse effect
4. CFCs	s. Air pollutant

(A) 1-p, 2-q, 3-r, 4-s (B) 1-q, 2-r, 3-s, 4-p (C) 1-r, 2-s, 3-p, 4-q (D) 1-s, 2-p, 3-q, 4-r **Ans. (B)**

**Remark:** This question from the Deleted syllabus (Environmental issues)

\*33. Which of the following exhibits haplodiplontic lifecycle?  
 (A) *Fucus* (B) *Chlamydomonas* (C) *Gelidium* (D) *Ectocarpus* **Ans. (D)**

**Solution:** *Fucus* is an alga showing diplontic life cycle. *Chlamydomonas* and *Gelidium* show haplontic life cycle.

**Remark:** This question from the Deleted syllabus (Plant Kingdom: Life cycles)

34. Identify the phylum which shows the following characteristics:  
 1. Animals are exclusively marine, radially symmetrical and diploblastic.  
 2. Body bears eight external rows of ciliated comb plates which help in locomotion.  
 3. Digestion is both extracellular and intracellular.  
 4. Reproduction only by sexual modes.  
 (A) Coelenterata (B) Mollusca (C) Arthropoda (D) Ctenophora **Ans. (D)**

35. When a flower has both stamens and carpels it is described as  
 (A) Asexual (B) Unisexual (C) Bisexual (D) Dioecious **Ans. (C)**

36. Ciliated epithelial cells are present in  
 (A) Kidneys (B) Intestines (C) Blood Vessels (D) Bronchioles **Ans. (D)**

37. Which of the following statements is correct with reference to vacuoles?  
 (A) It is membrane bound and contains storage proteins and lipids.  
 (B) It is membrane bound and contains water and excretory substances.  
 (C) It lacks membrane and contains air.  
 (D) It lacks membrane and contains water and excretory substances. **Ans. (B)**

**Solution:** Vacuole is bound by a single membrane called tonoplast. It contains water, sap, excretory products and other materials.

38. Exoskeleton of Arthropods is made up of unique complex polysaccharide known as  
 (A) Hyaluronic Acid (B) Chitin (C) Waxes (D) Cellulose **Ans. (B)**

39. The enzyme Recombinase is required at which stage of Meiosis I?  
 (A) Pachytene (B) Zygotene (C) Diplotene (D) Diakinesis **Ans. (A)**  
**Solution:** During Pachytene crossing over takes place which is an enzyme mediated process and the enzyme involved is recombinase.
- \*40. The water potential of pure water is  
 (A) One (B) More than one (C) Zero (D) Less than zero **Ans. (C)**  
**Remark:** This question from the Deleted syllabus (Transport in plants)
41. Match the pigments given in List I with their colour in chromatogram given in List II.
- | List I(Pigments)   | List II(Colour in chromatogram) |
|--------------------|---------------------------------|
| 1. Chlorophyll 'b' | p. Yellow orange                |
| 2. Carotenoids     | q. Orange red                   |
| 3. Chlorophyll 'a' | r. Yellow                       |
| 4. Xanthophylls    | s. Blue green                   |
|                    | t. Yellow green                 |
- Choose the correct option from the following:  
 (A) 1-s, 2-t, 3-r, 4-q (B) 1-t, 2-p, 3-s, 4-r (C) 1-p, 2-q, 3-r, 4-t (D) 1-t, 2-p, 3-r, 4-s **Ans. (B)**
42. Which is the intermediate compound that links the end product of Glycolysis with TCA Cycle?  
 (A) Acetyl CoA (B) Pyruvic Acid (C) OAA (D) Citric Acid **Ans. (A)**
43. Auxins: Apical dominance:: Gibberellins:  
 (A) Adventitious shoot formation (B) Accelerates abscission  
 (C) Closure of stomata (D) Bolting **Ans. (D)**  
**Solution:** Gibberellins promote bolting (intermodal elongation just prior to flowering).
44. The term Uremia refers to  
 (A) Accumulation of Urea in blood. (B) Presence of Glucose in the urine.  
 (C) Accumulation of Uric acid in blood. (D) Accumulation of Uric acid in kidneys **Ans. (A)**
45. The Government of India legalised MTP with some strict regulations in the year  
 (A) 1951 (B) 1961 (C) 1971 (D) 2001 **Ans. (C)**
46. The process in which a small part of the vas deferens is removed or tied up through a small incision, is called  
 (A) MTP (B) Vasectomy (C) Tubectomy (D) GIFT **Ans. (B)**
47. Test cross in Pea plant is  
 (A) A cross between  $F_2$  tall plant and recessive parent.  
 (B) A cross between  $F_2$  dwarf plant and recessive parent.  
 (C) A cross between  $F_2$  tall plant with dominant parent.  
 (D) A cross between two  $F_1$  plants. **Ans. (A)**  
**Solution:** Test cross is a cross between dominant phenotype with recessive parent.
48. The genotype ratio of incomplete dominance is  
 (A) 3:1 (B) 1:2:1 (C) 1:1:2 (D) 9:3:3:1 **Ans. (B)**
49. Find the *incorrect* statement among the following:  
 (A) In sex linked recessive traits the gene is transmitted from unaffected carrier female to some of male progeny.  
 (B) Accumulation of phenylpyruvic acid in brain results in mental retardation.  
 (C) Individuals affected by Down's Syndrome will have congenital heart defect and are more intelligent.  
 (D) Turner's Syndrome is caused due to the absence of one X-chromosome. **Ans. (C)**  
**Solution:** Individuals affected by Down's Syndrome are mentally retarded.
50. In a dihybrid cross between a true breeding round yellow seeded and true breeding wrinkled green seeded pea plant, the ratio of segregation of round and wrinkled seed traits in  $F_2$  is  
 (A) 9:1 (B) 3:1 (C) 9:3 (D) 3:3 **Ans. (B)**

51. Following representations P, Q and R denote few steps of Griffith Experiment. Identify the correct one(s).

P. R strain → Inject into mice → Mice die

Q. S strain (Heat killed) → Inject into mice → Mice die

R. R strain → Inject into mice → Mice live

(A) P only (B) R only (C) P and R (D) Q and R **Ans. (B)**

**Solution:** S strain bacteria is capsulated and virulent and R strain is non capsulated and nonvirulent.

52. In tRNA the region that binds with mRNA is

(A) Anticodon loop of tRNA. (B) Amino acid acceptor end of tRNA.

(C) Amino acyl synthetase loop of tRNA. (D) Ribosomal binding loop of tRNA. **Ans. (A)**

**Solution:** Anticodon loop of tRNA consists of anticodons which bind with codon of mRNA.

53. The mRNA has Untranslated Regions (UTRs)

(A) At 3'-end beyond Terminator codon.

(B) At 5'-end before AUG.

(C) At both 3'-end and 5'-end beyond Terminator codon and before AUG respectively.

(D) AUG and Terminator codon flanks the UTR. **Ans. (C)**

54. In Structural gene, the template DNA strand has nucleotide sequences 3'-ATGCATGCATGCATGC-5'. Find the correct and complimentary nucleotide sequence on coding strand.

(A) 5'-ATGCATGCATGCATGC-3' (B) 3'-GCATGCATGCATGCAT-5'

(C) 5'-TACGTACGTACGTACG-3' (D) 3'-TACGTACGTACGTACG-5' **Ans. (C)**

55. Read the following statements:

*Statement I:* All vertebrates develop a row of vestigial gill slits during embryonic stage.

*Statement II:* Embryos always pass through the adult stages of other animals.

Which of the following options is correct with reference to these statements?

(A) Statement I is correct, Statement II is incorrect.

(B) Statement I is incorrect, Statement II is correct.

(C) Both Statements I and II are correct.

(D) Both Statements I and II are incorrect **Ans. (A)**

**Solution:** Statement I is correct but Statement II is wrong because embryos never pass through the adult stages of other animals.

56. Match the parts of the brain given in List I with their functions given in List II.

List I(Parts of the brain)	List II(Functions)
1. Medulla oblongata	p. Body temperature
2. Hypothalamus	q. Olfaction
3. Cerebral cortex	r. Respiration
4. Limbic system	s. Motor function

Choose the correct option from the following:

(A) 1-p, 2-r, 3-s, 4-q (B) 1-q, 2-s, 3-r, 4-p (C) 1-s, 2-p, 3-q, 4-r (D) 1-r, 2-p, 3-s, 4-q **Ans. (D)**

57. Hydra reproduces asexually by producing

(A) Zoospores (B) Conidia (C) Buds (D) Gemmule **Ans. (C)**

58. When male and female gametes are morphologically distinct, the condition is known as

(A) Homogametes (B) Heterogametes (C) Hermaphrodites (D) Sexual Dimorphism **Ans. (B)**

59. The typical 'lub-dub' sounds heard during heartbeat are produced due to

(A) Closure of semilunar valves

(B) Closure of bicuspid and tricuspid valves

(C) Closure of bicuspid and tricuspid valves followed by semilunar valves

(D) Opening of bicuspid and tricuspid valves followed by semilunar valves **Ans. (C)**

60. The functional unit of contraction is a

(A) Portion of myofibril between two successive Z-lines

(B) Portion of myofibril between two successive M-lines

(C) Centre of the H-zone

(D) Centre of the I-band **Ans. (A)**

**Solution:** The functional unit of contraction is sarcomere, which is the portion of myofibril between two successive Z-lines.