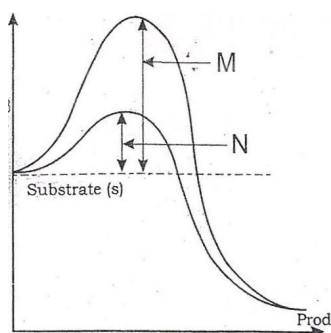


**KEY ANSWERS**

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

- The cell wall less prokaryote among the following is  
(1) Cyanobacteria (2) Mycoplasma  
(3) Bacteria (4) Blue-Green Algae
- The graph showing the concept of activation energy of enzyme is given below:  
Transition state

**Ans: (2)**



Observe the graph and choose the correct option for M and N.

- M-High temperature, High activation energy, N-Low temperature, Low activation energy
- M-High substrate, High activation energy, N-Low substrate, Low activation energy
- M-Activation energy without enzyme, N-Activation energy with enzyme
- M-Activation energy with enzyme, N-Activation energy without enzyme

**Ans: (3)**

**Solution:** M<sup>2</sup> activation energy without enzyme – N – Activation energy with enzyme.

- Match the stages of prophase I given in Column-I with their features in Column-II and choose the correct options from the choices given below:

**Column-I**

**Column-II**

- |   |  |
|---|--|
| a) Leptotene                              | i) Exchange of genetic materials between non-sister chromatids of the homologous chromosomes |
| b) Zygotene                               | ii) Chromosomes visible under light microscope   |
| c) Pachytene                              | iii) Dissolution of synaptonemal complex   |
| d) Diplotene                              | iv) Chromosomes start pairing together   |
| e) Diakinesis                             | v) Terminalisation of <i>chiasmata</i>   |
| (1) a – iv, b – i, c – ii, d – iji, e – v | (2) a – ii, b – iv, c – i, d – iii, e – v  |
| (3) a – i, b – ii, c – iii, d – iv, e – v | (4) a – v, b – iv, c – i, d – iii, e – ii  |

**Ans: (2)**

- Read the given statements and choose the correct option:

Statement I : In Calvin cycle, Carboxylation is catalysed by PEP Carboxylase

Statement II: In Hatch-Slack pathway, Carboxylation is catalysed by RuBP Carboxylase.

- Statement I is false but Statement II is true
- Both Statement I and Statement II are false
- Both Statement I and Statement II are true
- Statement I is true but Statement II is false

**Ans: (2)**

- The TCA cycle starts with the condensation of acetyl group with \_\_\_\_\_

- (1)  $\alpha$ -Ketoglutaric acid (2) Succinic acid
- (3) Oxaloacetic acid (4) Citric acid

**Ans: (3)**

6. Match the plant growth hormones of Column-I with suitable chemical derivatives present in Column-II and choose the correct option given below:

Column-I

- a) Absciscic acid
- b) Gibberellins
- c) Kinetin
- d) Auxin

Column-II

- i) Adenine derivative
- ii) Indole acetic acid
- iii) Carotenoid derivative
- iv) Terpenes

(1) a – iii, b – iv, c – i, d – ii

(2) a – iii, b – i, c – ii, d – iv

(3) a – i, b – ii, c – iii, d – iv

(4) a – iii, b – i, c – iv, d – ii

**Ans: (1)**

7. The respiratory mechanism controlled by medulla oblongata can be altered by

- (1) Both Pneumotaxic and Chem osensitive areas of pons and medulla oblongata
- (2) Corpus callosum of brain
- (3) Pneumotaxic center in the pons
- (4) Chemosensitive area in the medulla

**Ans: (1)**

8. Which among the three layers of blood vessel wall - Tunica intima, Tunica media and Tunica Externa is comparatively thin in the veins?

- (1) Tunica externa
- (2) Both tunica media and tunica externa
- (3) Tunica media
- (4) Tunica intima

**Ans: (3)**

9. In nephron, transport of substances like sodium chloride and urea is facilitated by the special arrangement called counter current mechanism that comprises of

- (1) Vasa Recta and collecting duct
- (2) Ascending limb and collecting duct
- (3) Henle's loop and *Vasa Recta*
- (4) Henle's loop and glomerulus

**Ans: (3)**

10. In the mechanism of muscle contraction or shortening of muscle, the \_\_\_\_\_ get reduced whereas the \_\_\_\_\_ retain the length.

- (1) Z line, I bands
- (2) A bands, Z line
- (3) A bands, I bands
- (4) I bands, A bands

**Ans: (4)**

11. Identify the correct sequence of action potential as it arrives at the axon terminal from the choices given below:

- 1) Axon terminal → Post-synaptic membrane → Synaptic cleft → Synaptic vesicles → Post -synaptic neuron
- 2) Axon terminal → Synaptic vesicles → Post-synaptic membrane → Synaptic cleft → Post -synaptic neuron
- 3) Axon terminal → Synaptic vesicles → Synaptic cleft → Post-synaptic membrane → Post-synaptic neuron
- (4) Axon terminal → Synaptic cleft → Synaptic vesicles → Post-synaptic neuron → Post-synaptic membrane

**Ans: (3)**

12. Identify the statement/s given below that does not correspond to the functions of cortisol

- i) Maintains cardiovascular system and kidney functions
- ii) Produces anti-inflammatory reactions
- iii) Maintains electrolyte balance, osmosis and blood pressure
- iv) Suppresses immune response
- v) Stimulates RBC production

(1) iii only

(2) iv only

(3) i and ii only

(4) iii and v only

**Ans: (1)**

**Solution:** Aldosterone which is the main mineralocorticoid helps in the maintenance of electrolyts, body fluid volume, osmotic pressure and blood pressure.

13. When pollen grains of a flower of a plant pollinate the stigma of flower of another plant, it is called \_\_\_\_

- (1) Dichogamy
- (2) Geitonogamy
- (3) Xenogamy
- (4) Autogamy

**Ans: (3)**

**Solution:** Dichogamy is a condition seen in self pollinated flowers when male and female flowers mature at different time.

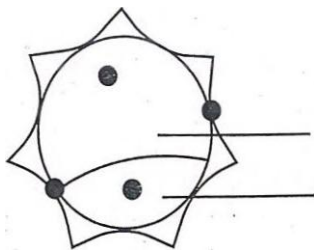
14. Fusion of a male gamete with the central cell in the embryo sac of an angiosperm is called \_\_\_\_\_

- (1) Syngamy
- (2) Apomixis
- (3) Double fertilization
- (4) Triple fusion

**Ans: (4)**

**Solution:** It is called triple fusion because male gamete (n) fuses with the two polar nuclei (n + n) of central cell. Since it involves the fusion of three haploid nuclei. It is called triple fusion.

15.



Which of these options is true in the context of the above diagram of pollen grain?

- (1) 'A' is a generative cell which gives rise to pollen tube and 'B' is a vegetative cell which forms male gametes
- (2) 'A' is a vegetative cell with abundant food reserve and 'B' is a generative cell which forms male gametes
- (3) 'A' is a generative cell which forms male gametes and 'B' is a vegetative cell which produces pollen tube
- (4) 'A' is a vegetative cell which gives rise to male gametes and 'B' is a generative cell which produces pollen tube

**Ans: (2)**

16. Match the hormone with its site of production:

Hormone	Site of production
a) hCG and hPL	i) Ovary
b) Progesterone	ii) Placenta
c) Androgens	iii) Corpus luteum
d) Relaxin	iv) Leydig cells

(1) a – iv, b – i, c – ii, d – iii

(2) a – i, b – ii, c – iv, d – iii

(3) a – ii, b – iii, c – iv, d – i

(4) a – iii, b – i, c – iv, d – ii

**Ans: (3)**

17. Choose the correct sequence of sperm transport during ejaculation

- (1) Seminiferous tubules → vasa efferentia → rete testis → epididymis → vas deferens → ejaculatory duct
- (2) Seminiferous tubules → rete testis → epididymis → vas deferens → vasa efferentia → ejaculatory duct
- (3) Seminiferous tubules → rete testis → vasa efferentia → epididymis → vas deferens → ejaculatory duct
- (4) Seminiferous tubules → rete testis → epididymis → vasa efferentia → vas deferens → ejaculatory duct

**Ans: (3)**

18. Select the mismatched pair:

- a) First month of pregnancy - Formation of heart
- b) Second month of pregnancy - Movement of foetus
- c) Third month of pregnancy - Formation of most of the major organ systems
- d) Sixth month of pregnancy - Eye lids separate and eye lashes are formed

(1) c

(2) d

(3) a

(4) b

**Ans: (4)**

**Solution:** First movement of foetus is usually observed during the fifth month.

19. Out of the following options, identify which one is NOT a natural method of contraception?

- (1) Lactational amenorrhea
- (2) Periodic abstinence
- (3) Coitus interruptus
- (4) Implants

**Ans: (4)**

20. In zygote intrafallopian tube transfer, the embryo upto \_\_\_\_\_ stage is transferred into the fallopian tube

- (1) 8 blastomeres
- (2) 32 blastomeres
- (3) 2 blastomeres
- (4) 16 blastomeres

**Ans: (1)**

21. Read the following statements:

Statement I: MTP is to get rid of unwanted pregnancies due to causal unprotected intercourse or failure of contraceptives used during coitus or rapes

Statement II: MTPs are performed legally by qualified doctors by giving proper medical justification

Choose the correct answer from the options given below:

- (1) Statement I is correct but Statement II is incorrect
- (2) Statement I is incorrect but Statement II is correct
- (3) Statements I and II are correct
- (4) Statements I and II are incorrect

**Ans: (3)**

22. How many types of gametes will be formed by a parent with genotype 'AaBbCc'?

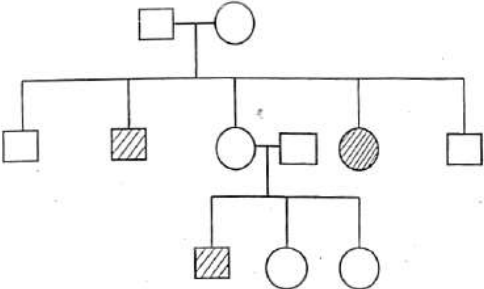
- (1) 8
- (2) 12
- (3) 6
- (4) 4

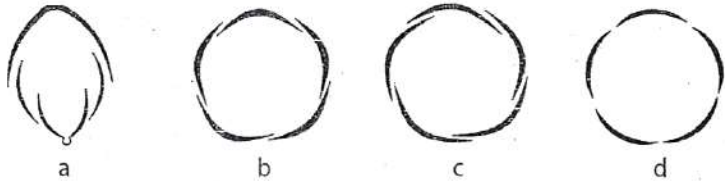
**Ans: (1)**

**Solution:** Total number of gametes formed will be  $2^n$  where n is number of heterozygous pairs. So  $2^3 = 2 \times 2 \times 2 = 8$

23. When a single gene exhibits multiple phenotypic expression, the phenomenon is called  
(1) Pleiotropy (2) Co-dominance (3) Polygenic inheritance (4) Incomplete dominance **Ans: (1)**
24. A colourblind man marries a carrier woman. The percentage of their colourblind progeny in the next generation will be \_\_\_\_\_  
(1) 75% (2) 100% (3) 25% (4) 50% **Ans: (4)**
25. Identify which one of the given pair of options is correct with respect to Down's syndrome and Turner's syndrome.
- | Option | Down's syndrome symptoms                             | Turner's syndrome symptoms               |
|--------|--|--|
| a)     | Short-statured individual                            | Gynaecomastia in man                     |
| b)     | Round head, partially open mouth                     | Overall masculine development            |
| c)     | Broad palm, physical and mental development retarded | Sterile females with rudimentary ovaries |
| d)     | Additional copy of an X-chromosome                   | Absence of an X-chromosome               |
- (1) c (2) d (3) a (4) b **Ans: (1)**
26. RNA polymerase II is responsible for the transcription of \_\_\_\_\_  
(1) hnRNA (2) snRNA (3) tRNA (4) rRNA **Ans: (1)**
27. Which of the following enzymes increases the permeability of the bacterial cell to lactose?  
(1) Transacetylase (2) Amylase (3) -galactosidase (4) Permease **Ans: (4)**
28. Which of the following statements are correct with reference to prokaryotic genome?  
a) Monocistronic structural genes  
b) Introns absent in structural genes  
c) Transcription and translation are coupled processes  
d) Primary transcript undergoes splicing  
e) Only one RNA polymerase is present  
(1) Only a, d and e are correct (2) Only a, b and c are correct  
(3) Only a, b and d are correct (4) Only b, c and e are correct **Ans: (4)**
29. When a change in the gene frequency of a population occurs by chance, it is called \_\_\_\_\_  
(1) Genetic recombination (2) Genetic drift  
(3) Founder effect (4) Gene migration **Ans: (2)**
30. Darwin's finches represent one of the best examples of \_\_\_\_\_  
(1) Chemical evolution (2) Genetic equilibrium  
(3) Seasonal migration (4) Adaptive radiation **Ans: (4)**
31. Choose the correct statements from the following:  
a) Charles Darwin travelled around the world in a ship called HMS Beagle  
b) There has been gradual evolution of life forms  
c) According to Darwin, fitness refers to physical fitness only  
d) Fossils are remains of hard parts of life forms found in rocks  
e) Hugo De Vries, a naturalist worked in Malay Archipelago.  
(1) a, b and d are correct (2) a, c and d are correct  
(3) a, b and e are correct (4) a, c and e are correct **Ans: (1)**  
**Solution:** a, b and d are correct  
(c) is wrong because fitness refers to reproductive fitness only  
(e) is wrong because Alfred Wallace worked in Malay Archipelago.
32. In which of the following, HIV replicates and produces its progeny viruses?  
(1) Killer T-lymphocytes (2) Suppressor T-lymphocytes  
(3) Helper T-lymphocytes (4) Memory T-lymphocytes **Ans: (3)**
33. Which of the following are the techniques for detection of cancer of internal organs?  
a) Radiography, MRI b) MRI, computed tomography  
c) Widal test, radiography d) MRI, widal test  
(1) b and c (2) b and d (3) a and b (4) a and c **Ans: (3)**
34. Malignant malaria is caused by  
(1) *Plasmodium falciparum* (2) *Plasmodium rubrum*  
(3) *Plasmodium malariae* (4) *Plasmodium vivax* **Ans: (1)**

35. The drug prescribed to the patients who have undergone organ transplant is \_\_\_\_\_ and is produced by \_\_\_\_\_
- 1) Cyclosporin-A, *Trichoderma polysporum*      2) Statin, *Trichoderma polysporum*  
3) Cyclosporin-A, *Monascus purpureus*      4) Statin, *Monascus purpureus*      **Ans. (1)**

46. Choose the correct sequence of steps involved in decomposition  
 (1) Fragmentation → Mineralisation → Humification → Leaching → Catabolism  
 (2) Fragmentation → Leaching → Catabolism → Humification → Mineralisation.  
 (3) Fragmentation → Catabolism → Leaching → Humification → Mineralisation  
 (4) Fragmentation → Leaching → Catabolism → Mineralisation → Humification **Ans. (2)**
47. With respect to limitation of Ecological pyramids, which of the following statements are correct?  
 a) It does not take into account the same species belonging to two or more trophic levels.  
 b) It assumes a simple food chain, something that almost never existed in nature.  
 c) It accommodates saprophytes.  
 d) It does not accommodate a food web  
 Choose the correct answer from the options given below.  
 (1) c and d (2) a, b and d (3) a and b (4) b and c **Ans. (2)**
48. The 'Sixth Extinction' of species, presently in progress, is \_\_\_\_ times faster than the previous five episodes of mass extinctions.  
 (1) 1000 to 10000 (2) 1 to 10 (3) 10 to 100 (4) 100 to 1000 **Ans. (4)**
49. Species diversity \_\_\_\_ as we move away from the \_\_\_\_ towards \_\_\_\_  
 1) Decreases, Poles, Equator 2) Stable, Equator, Poles  
 3) Increases, Equator, Poles 4) Decreases, Equator, Poles **Ans. (4)**
50. In a practical examination, the following pedigree chart was given as a spotter for identification. The students identify the given pedigree chart as
- 
- (1) Sex-linked dominant (2) Sex-linked recessive  
 (3) Autosomal dominant (4) Autosomal recessive **Ans. (4)**
51. A student observed the T.S. of a plant organ slide under microscope. He observed the vascular bundles in the stelar region as conjoint collateral and open. Based on these features of vascular bundle, identify the correct option from below.  
 1) Monocot Root 2) Monocot Stem 3) Dicot Root 4) Dicot Stem **Ans. (4)**
52. A student observed the slide of mitosis under the microscope and observed that the chromosomes were placed at the opposite poles. Which stage was the student observing?  
 (1) Metaphase (2) Telophase (3) Prophase 4) Anaphase **Ans. (2)**
53. Identify the incorrect statement with respect to the rules of Binomial Nomenclature.  
 (1) Biological names are underlined separately when handwritten  
 (2) Biological names are printed in Italics to indicate their non-Latin origin.  
 (3) The first word represents the genus while second component denotes the specific epithet  
 (4) Biological names are generally in Latin or Latinised irrespective of their origin **Ans. (4)**  
**Solution:** Biological names are printed in Italics to indicate their non-Latin origin (Incorrect).  
 Correct statement is Biological names are printed in Italics to indicate their Latin origin.
54. Match Column I with Column II and choose the correct option given below :
- | Column I     | Column II        |
|--------------|------------------|
| a) Coccus    | i) Rod-shaped    |
| b) Bacillus  | ii) Spiral       |
| c) Vibrium   | iii) Spherical   |
| d) Spirillum | iv) Comma-shaped |
- (1) a - iii, b - ii, c-iv, d - i (2) a - iv, b - iii, c - ii, d - i  
 (3) a- iv, b-i, c- ii, d-iii (4) a-iii, b-i, c- iv, d-ii **Ans. (4)**
55. Read the given statements and choose the correct option:  
 Statement I : Gemmae are green, unicellular, sexual buds which develop in receptacles called gemma cups.  
 Statement II: Protonema develops directly from a spore  
 (1) Statement I is false but Statement II is true  
 (2) Both Statement I and Statement II are false  
 (3) Both Statement I and Statement II are true  
 (4) Statement I is true but Statement II is false **Ans. (1)**  
**Solution :** Statement-I is false but statement -II is true. Statement –I is false because, Gammae are green, multicellular, asexual buds.

56. During a field trip, a student observed a marine organism with worm-like body. The cylindrical body was divisible into proboscis, collar and a long trunk. The organism may be \_\_\_\_\_  
 (1) *Pterophyllum* (2) *Trygon* (3) *Balanoglossus* (4) *Ophiura* **Ans. (3)**  
**Solution:** It belongs to invertebrate phylum : Hemichordata
57. Identify the types of aestivation in corolla labelled as 'a', 'b', 'c' and 'd'
- 
- 1) a - Vexillary, b - Imbricate, c - Twisted, d - Valvate  
 2) a - Vexillary, b - Imbricate, c - Valvate, d - Twisted  
 3) a - Vexillary, b - Twisted, c - Imbricate, d - Valvate  
 4) a - Imbricate, b - Valvate, c - Vexillary, d - Twisted **Ans. (1)**
58. Match the Column-I with Column-II and choose the correct option:
- | Column-I<br>(Characteristics of vascular bundle)                           | Column-II<br>(Transverse section) |
|--|-----------------------------------|
| a) Radial, tetrarch, cambial ring between xylem and phloem at later stages | i) T.S. of monocot stem           |
| b) Conjoint, open and endarch  | ii) T.S. of dicot root            |
| c) Radial, polyarch, large pith without cambial ring                       | iii) T.S. of monocot root         |
| d) Conjoint, closed with sclerenchymatous bundle sheath                    | iv) T.S. of dicot stem            |
- (1) a-ii, b- iv, c-iii, d-i (2) a- iii, b- iv, c-i, d-ii  
 (3) a-i, b- ii, c-iii, d-iv (4) a - ii, b - iii, c - iv, d – i **Ans. (1)**
59. Which of the following statements are correct with respect to Frogs?  
 a) Bidder's canals are present in male Frogs  
 b) Copulatory pads are present in female Frogs  
 c) Sound producing vocal sacs are present in male Frogs  
 d) Cloaca is present in male Frog only.  
 Choose the most appropriate answer from the options given below:  
 (1) a and c (2) b and d (3) a and d (4) a and b **Ans. (1)**
60. The reserve material in prokaryotic cells are stored in the cytoplasm in the form of  
 (1) Exclusion and inclusion bodies (2) Fat bodies  
 (3) Exclusion bodies (4) Inclusion bodies **Ans. (4)**