

Biology

PR – XI (A-I-AP3) (26)

۱۔ ہر سوال کے سامنے چار دائرے دیئے گئے ہیں۔ صرف صحیح جواب والا دائرہ بھر دیں۔

۲۔ دائروں کو شیڈ (بھرنے) کے لیے نیلے یا کالے رنگ کا پن استعمال کریں۔

۳۔ جواب میں ایک سے زائد دائرے بھرنے سے جواب غلط تصور ہو گا۔

Time: 20 Min

SECTION-A

Marks: 18

- 1) Transduction in bacteria is the:
☐ Transfer via conjugation tube ☒ Uptake of free DNA
☐ DNA transmitted via bacteriophage
☐ Fusion of two cells
- 2) Tuber melanosporum is commonly known as:
☒ Truffle ☐ Mushroom ☐ Yeast ☐ Lichen
- 3) A botanist observes an inflorescence where the main axis stops growing after forming a flower, and further growth continues through lateral branches. This pattern indicates:
☐ Racemose inflorescence ☐ Umbel
☐ Panicle ☒ Cymose inflorescence
- 4) If a mammal shows internal development of embryo in uterus with nourishment through a placenta, it is classified under:
☐ Prototheria ☐ Metatheria
☒ Eutheria ☐ Marsupialia
- 5) Sclerenchyma cells are divided into two groups called:
☐ Parenchyma & collenchymas ☒ Fibers and sclereids
☐ Streaks and bundles ☐ Primary and secondary
- 6) Primary macronutrients are usually less in soil because:
☐ They evaporate quickly ☐ They are washed away by rain
☒ Plants use these in large amounts
☐ Animals consume them
- 7) According to the recent research the major cause of peptic ulcers is:
☐ An over production of gastrin
☒ The spread of Helicobacter pylori bacteria
☐ Excessive secretion of HCl alone
☐ The erosion of the mucus lining by gastric acids
- 8) During an ECG reading, the heart is in a phase where atria and

ventricles are relaxed and blood flows into atria from veins. The part of ECG representing this phase is:

- ☐ P wave ☐ RS interval ☒ TP interval ☐ ST segment

9) The process describing the attraction of neutrophils to the site of infection is:

- ☒ Chemotaxis ☐ Apoptosis ☐ Phagocytosis ☐ Necrosis

10) During cell fractionation, grinding the tissue in a liquid medium mainly helps to:

- ☐ Increase enzyme activity
☐ Increase the density of organelles
☐ Separate proteins from lipids
☒ Break the cell membrane and release organelles

11) A cluster of ribosomes attached to a single mRNA molecule is called:

- ☐ Nucleosome ☒ Polysome
☐ Centrosome ☐ Lysosome

12) The nitrogenous base present in RNA but absent in DNA is:

- ☐ Adenine ☐ Cytosine ☒ Uracil ☐ Guanine

13) A researcher studying energy metabolism notices a rapid increase in ADP concentration in a cell. This observation most likely indicates that:

- ☒ ATP is being actively used for cellular work
☐ Energy is being stored in the cell
☐ DNA replication is stopping
☐ Protein synthesis is inhibited

14) In enzyme catalyzed reactions, the substrate molecule fits into the active site of the enzyme in a manner similar to:

- ☐ Plug in socket ☐ Gear in machine
☐ Coin in slot ☒ Key in lock

15) Chlorophyll "c" and "d" are mainly found in:

- ☒ Algae ☐ Higher plants
☐ Bacteria only ☐ Bryophytes

16) Substance released as a byproduct when glycine is converted into serine in mitochondria during photorespiration is:

☐ Oxygen ☐ RuBP ☒ CO₂ ☐ Water

17) Lysogenic cycle switches to lytic cycle when prophage:

☐ Enters dormant state

☒ Separates from chromosome and reactivates

☐ Encounters another phage

☐ Gets digested by host

18) A bacterium with a thin peptidoglycan layer and an outer layer of lipopolysaccharides is classified as:

☐ Gram-positive

☐ Cocci

☐ Mycoplasma

☒ Gram-negative

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Note: Time allowed for Section-B and Section-C is 2 Hours and 40 minutes.

SECTION-B

Q2: Answer any TEN parts. Each part carries FOUR marks.

1. Distinguish nucleolus from nucleoplasm. State two reasons why nucleus is regarded as an important organelle?
2. Define lipids and discuss about saturated and unsaturated fatty acids.
3. State an optimum pH value for most enzymes. List any three enzymes along with their optimum pH. Relate the effect of variation in pH to changes in enzyme structure.
4. Analyze the role of water molecules in the non-cyclic electron transport chain, referring specifically to the process of photolysis. Justify why is the transport of electrons in the first pathway described as "non-cyclic electron transport".
5. What is poliomyelitis? Compare the two forms of polio infection (paralytic and abortive).
6. Define tuberculosis and state causes and symptoms of tuberculosis.
7. Describe three characteristics of oomycote and distinguish them from true fungi.
8. Compare gymnosperms and angiosperms in terms of their habitat, features and examples.
9. Outline the excretory system of platyhelminthes. Compare the body cavity organization (coelom status) across platyhelminthes, aschelminthes (nematodes), and annelids.

10. Describe phytohormones. List any four major plant growth hormones.
11. Name the four major food poisoning agents. List symptoms caused by *Clostridium botulinum*.
12. Describe the lifestyle modifications and preventive measures recommended for managing hypertension. What dietary changes are specifically suggested? Also state medical treatment of hypertension.
13. Define antibodies. Describe the structural model of an antibody highlighting its main components and their arrangement.

SECTION-C

Note: Attempt any THREE questions. All questions carry equal marks.

- Q3 (a) Define dipeptide and polypeptide. Explain how the sequence of amino acids affects protein structure. Also outline the consequences of an incorrect sequence.
(b) Compare and contrast the structure and functions of mitochondria and chloroplasts.
- Q4 (a) Explain bacterial soft rot. List its causative agents, symptoms and parts affected.
(b) Describe any four major classes of enzymes with examples.
- Q5 (a) Explain how the reproductive strategy of reptiles eliminates the need for a larval stage. What evidences suggest that reptiles are more adapted to dry environments than amphibians?
(b) Trace the conversion of PGAL into pyruvic acid in four steps.
- Q6 (a) Explain thigmotropism and chemotropism by stating their mechanism, examples and importance.
(b) Define lymph nodes. Describe the position of lymph nodes and list any four areas where lymph nodes are concentrated.