



BOARD QUESTION PAPER : JULY 2024

BIOLOGY

Time: 3 Hrs.

Max. Marks: 70

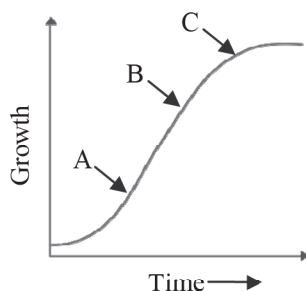
General Instructions:

The question paper is divided into **four** sections.

- (1) **Section A:** Q. No. 1 contains **Ten multiple choice** type of questions carrying one mark each. Evaluation will be done for the **first attempt** only.
Q. No. 2 Contains **Eight very short answer** type of questions carrying **one** mark each.
- (2) **Section B:** Q. No. 3 to 14 are short answer type of questions carrying **two** marks each. (Attempt **any Eight**)
- (3) **Section C:** Q. No. 15 to 26 are **short answer** type of questions carrying **three** marks each. (Attempt **any Eight**)
- (4) **Section D:** Q. No. 27 to 31 are **long answer** type of questions carrying **four** marks each. (Attempt **any Three**)
- (5) Begin the answer of each section on a new page.

SECTION – A**Q.1. Select and write the correct answer for the following multiple choice type of questions:****[10]**

- i. In monocot embryo the protective sheath of plumule is called _____.
(A) perisperm (B) scutellum (C) coleorrhiza (D) coleoptile
- ii. The synonymous term for centromere is _____.
(A) primary constriction (B) telomere
(C) secondary constriction (D) satellite
- iii. Protein digesting enzyme is _____.
(A) polymerase (B) protease (C) pectinase (D) RNAase
- iv. Spermatids get transformed into a functional spermatozoa by the process of _____.
(A) spermiogenesis (B) spermatogenesis (C) gametogenesis (D) oogenesis
- v. Industrial melanism is one of the best example of _____.
(A) geographical isolation (B) natural selection
(C) reproductive isolation (D) adaptive radiation
- vi. Value of root pressure is +1 to +2 bars which is enough to pump water to a height of _____.
(A) 50-60 meters (B) 10-20 meters (C) 30-40 meters (D) 20-30 meters
- vii. _____ cellular fragments are formed from megakaryocytes.
(A) Erythrocytes (B) Leucocytes (C) Thrombocytes (D) Monocytes
- viii. Degeneration of dopamine producing neurons in the CNS causes _____.
(A) Alzheimer's disease (B) Addison's disease
(C) Grave's disease (D) Parkinson's disease
- ix. Choose the correct name of phases A, B and C in the given figure:



- | | |
|--------------------------|--------------------------|
| (A) Stationary, Log, Lag | (B) Log, Lag, Stationary |
| (C) Log, Stationary, Lag | (D) Lag, Log, Stationary |



- x. Rivet Popper Hypothesis explains
 (A) loss of biodiversity (B) biomagnification
 (C) species area relationship (D) significance of diversity

Q.2. Answer the following questions:

[8]

- Write the ratio of methane, ammonia and hydrogen respectively in Urey and Miller's experiment.
- What are the cells of Rauber?
- Which gene is introduced in tobacco against pest like *Zabrotes subfasciatus*?
- How many haploid nuclei are present in mature female gametophyte of Angiosperms?
- Name the connection between pulmonary trunk and aortic arch representing remnant of embryonic ductus arteriosus.
- Which endocrine gland plays an important role in the development of immune system?
- Mention the type of association between sea anemone and clown fish.
- Name the pioneer species in the aquatic habitat during primary succession.

SECTION – B

Attempt any EIGHT of the following questions:

[16]

- Q.3.**
 - Why DNA replication is called semi-conservative replication?
 - Name the scientist who experimentally proved the same.
- Q.4.** Distinguish between Asexual and Sexual reproduction with reference to:
 - Cell division
 - Genetic makeup
- Q.5.** Arrange the following stages of human evolution in the order of their increasing cranial capacity:
 - Homo sapiens*
 - Neanderthal man
 - Australopithecus
 - Homo erectus*
- Q.6.** Identify chromosomal disorder caused due to non-disjunction of 21st chromosome and enlist its characteristics.
- Q.7.** What is radial and tangential translocation of food in plants?
- Q.8.** Explain any two causes of genetic variation.
- Q.9.** Identify A, B, C and D from the following table regarding respiratory system:

| Organism | Habitat | Respiratory organ |
|-----------|-------------|------------------------------|
| A | Terrestrial | Tracheal tubes and spiracles |
| Scorpions | Terrestrial | B |
| Sponges | C | Plasma membrane |
| Turtles | Underwater | D |

- Q.10.** Give the function of Nebenkern and Zona pellucida.
- Q.11.** Give location of corpus callosum and arbor vitae of human brain.
- Q.12.** Match cells of immune system in column-I and their functions in column-II and rewrite it.

| | Column-I | | Column-II |
|------|--------------------------|-----|------------------------------|
| i. | Cytotoxic T cells | (a) | Activation of helper T cells |
| ii. | Plasma cells | (b) | Blood group antigens |
| iii. | Antigen presenting cells | (c) | Secretion of perforins |
| iv. | Red blood cells | (d) | Antibody production |



Q.13. Give any two examples of commercially exploited products of transgenic plants.

Q.14. Write causative agent, two symptoms and mode of transmission of typhoid.

SECTION – C

Attempt any EIGHT of the following questions:

[24]

Q.15. Suggest the specific term for the following:

- Both male and female reproductive organs present in same organism.
- Y-linked gene
- Unfertilised egg develops into haploid male bee.

Q.16. Explain the role of diazotrophs in nitrification.

Q.17. Explain the following events of cardiac cycle with respect to type of valves and duration:

- atrial systole
- ventricular systole
- joint diastole

Q.18. What is reflex action? Explain with one example each of the types of reflex actions based on previous experiences.

Q.19. Select and fill in the boxes (a) to (f) from given list of options.

List of options –

Sickle cell anaemia, Widow's peak, Flower colour of *Mirabilis*, Human blood groups, Coat colour of cattle, Klinefelter's syndrome.

| | Genetic trait | | Example |
|------|--------------------------|----|----------------------|
| i. | Incomplete dominance | a. | <input type="text"/> |
| ii. | Pleiotropy | b. | <input type="text"/> |
| iii. | Codominance | c. | <input type="text"/> |
| iv. | Multiple allelism | d. | <input type="text"/> |
| v. | Sex chromosomal disorder | e. | <input type="text"/> |
| vi. | Autosomal disorder | f. | <input type="text"/> |

Q.20. Give the role of following mycoherbicides

- Phytophthora*
- Alternaria*
- Fusarium*

Q.21. Explain the following terms with respect to survival of an organism in a changed environment.

- Regulate
- Conform
- Migrate

Q.22. Describe any three causes for loss of biodiversity.

Q.23. Give physiological effects and applications of cytokinin.

Q.24. What is mycorrhiza? Name its types and state any two benefits of mycorrhiza.

Q.25. i. Explain the following:

- Leaching
 - Humification and mineralisation
- ii. What is humus?

Q.26. i. What is hematocrit?

ii. Mention the term with respect to –

- Temporary increase in number of WBCs
- Decrease in number of RBCs



SECTION – D

Attempt any **THREE** of the following questions:

[12]

Q.27. Describe mechanism of opening and closing of stomata with reference to:

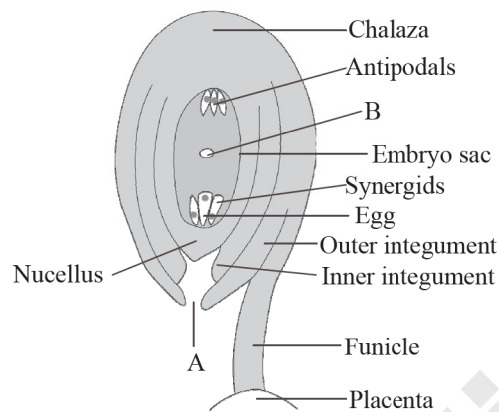
- Starch-sugar interconversion theory
- Proton transport theory

Q.28. i. Define hormone.

ii. Enlist any two properties of hormones.

iii. Give diagrammatic representation of mode of hormone action through membrane bound receptors.

Q.29. With respect to diagram, answer the following:



- Which type of ovule is given in the figure?
- Name the first cell of embryo sac.
- Identify and write the function of 'A' and 'B'.

Q.30. How transgenic pigs and cattle are commercially beneficial?

Q.31. With the help of a suitable diagram describe histology of testis.