



Time: 3 Hours

Total Marks: 70

General Instructions:

- i. The question paper is divided into four sections.
- ii. **Section A:** Q.No.1 contains Ten multiple choice type of questions carrying One mark each.
Q.No.2 contains Eight very short answer type of questions carrying One mark each.
- iii. **Section B:** Q.No.3 to Q.No.14 are short answer type of questions carrying Two marks each.
- iv. **Section C:** Q.No.15 to Q.No.26 contains are short answer type of questions carrying Three marks each.
- v. **Section D:** Q.No.27 to Q.No.31 are long answer type of questions carrying Four marks each.
- vi. Figures to the right indicate full marks.
- vii. For each MCQ, correct answer must be written along with its alphabet.
E.g., (A)...../(B)...../(C)...../(D)..... Only first attempt will be considered for evaluation.

SECTION A

Q.1. Select and write the correct answer:

[10]

- i. If the number of chromosomes in an endosperm of seed is 12, what will be the chromosome number in the secondary nucleus?
(A) 12 (B) 4 (C) 8 (D) 16
- ii. The endometrium is a part of _____.
(A) Urinary bladder (B) Uterus (C) Ureter (D) Urethra
- iii. Wilting in plant occurs due to increase in _____.
(A) photosynthesis (B) photoperiodism (C) transpiration (D) osmosis
- iv. Deposition of fatty substances in the lining of arteries results in _____.
(A) arteriosclerosis (B) atherosclerosis (C) hyperglycemia (D) hypotension
- v. Malaria is spread by
(A) Female *Aedes* (B) Female *Culex*
(C) Male *Anopheles* (D) Female *Anopheles*
- vi. _____ shows presence of photoreceptor cells.
(A) blind spot (B) retina (C) cochlea (D) cornea
- vii. Which of the following is the oxygen carrying respiratory pigment in humans?
(A) Haemocyanin (B) Haemoglobin (C) Chloroquinin (D) Haemoerythrin
- viii. HIV has
(A) single stranded RNA (B) double stranded RNA
(C) single stranded DNA (D) double stranded DNA
- ix. A plant cell has potential to develop into full plant. This property of the plant cell is called
(A) tissue culture (B) totipotency (C) pluripotency (D) gene cloning
- x. 'Cry' genes are present in _____.
(A) *Agrobacterium tumefaciens* (B) *Bacillus thuringiensis*
(C) *Rhizobium species* (D) *Escherichia coli*

Q.2. Answer the following:

[8]

- i. Name the bacteria which causes Gonorrhoea.
- ii. Match Column I with Column II and write the correct answer.

Column I		Column II	
i.	Alkali treatment	a.	Separation of DNA fragments on gel slab
ii.	Southern blotting	b.	Split DNA fragments into single strands
iii.	Electrophoresis	c.	DNA transferred to nitrocellulose sheet
iv.	PCR	d.	X-ray photography
v.	Autoradiography	e.	Produce fragments of different sizes
vi.	DNA treated with REN	f.	DNA amplification



- iii. Mention any 'one' skeletal difference between ape and man.
- iv. Name the four regions of a typical root.
- v. Give the significance of respiration.
- vi. What is bacteriophage?
- vii. What does the base and apex of ecological pyramid represent?
- viii. Define endangered species.

SECTION B (Attempt any Eight)

[16]

- Q.3. What is menstrual cycle? Name the hormones regulating menstrual cycle.
- Q.4. Explain the following statement: Test cross is back cross but back cross is not necessarily a test cross.
- Q.5. Give importance of DNA fingerprinting.
- Q.6. Match the columns and write the correct answer.

	Column I		Column II
i.	August Weismann	a.	Mutation theory
ii.	Hugo de Vries	b.	Germplasm theory
iii.	Charles Darwin	c.	Theory of inheritance of acquired characters
iv.	Lamarck	d.	Theory of natural selection

- Q.7. Draw a well labelled diagram of T.S. of Root showing water movement.
- Q.8. Explain the process of denitrification.
- Q.9. Describe the mechanism of action of B-lymphocytes against antigens.
- Q.10. What is artificial insemination?
- Q.11. Write a short note on plasmid vector used in plants.
- Q.12. Write a short note on sex ratio.
- Q.13. Write any four important deficiency symptoms observed in plants.
- Q.14. Write a note on adaptations of animals for desert habitats.

SECTION C (Attempt any Eight)

[24]

- Q.15. Explain any three modes of cross pollination.
- Q.16. Explain the structure of t-RNA with the help of neat and labeled diagram.
- Q.17. Explain Hardy-Weinberg's principle, with the help of Punnett square.
- Q.18. Write in detail about osmosis.
- Q.19. Write a note on Abscisic acid and its physiological effects and applications.
- Q.20. Define cardiac output. Calculate the stroke volume in a man, if the pulse rate is 62 and cardiac output is 5040 cm³.
- Q.21. Write a note on functional areas of cerebrum.
- Q.22. Explain the production of alcoholic beverages.
- Q.23. Write a short note on transgenic plants.
- Q.24. Explain pyramid of biomass with the help of schematic diagram.
- Q.25. Explain pheromones in brief.
- Q.26. Write a short note on *in situ* conservation.



SECTION D (Attempt any Three)

[24]

- Q.27. Sketch and label developmental stages of male gametophyte of angiosperms.
- Q.28. Explain human female reproductive system with the help of neat and labelled diagram. Add a note on structure of Mammary glands.
- Q.29. How will you determine whether individuals exhibiting dominant character are genotypically homozygous or heterozygous? Explain it with a suitable example.
- Q.30. Explain: Respiration in humans is under dual control.
- Q.31. With the help of a neat and labelled diagram describe the anatomy of 'human eye'.



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