

**2 0 2 3**

**BIOLOGY**

**( Theory )**

*Full Marks : 70*

*Time : 3 hours*

*General Instructions :*

- (i) Write all the answers in the Answer Script.
- (ii) Attempt all parts of a Group serially in one place.
- (iii) *All* questions are compulsory.
- (iv) The figures in the margin indicate full marks for the questions.
- (v) This question paper consists of 5 (five) Groups—A, B, C, D and E.

Group—A consists of 12 questions (multiple-choice type) of which 10 questions are to be answered. Each question (Q. Nos. **1–12**) carries 1 mark.

Group—B consists of 7 questions (very short-answer type—I) of which 5 questions are to be answered. Each question (Q. Nos. **13–19**) carries 1 mark and to be answered in one word/sentence.

Group—C consists of 5 questions (short-answer type—I). Each question (Q. Nos. **20–24**) carries 2 marks with alternatives to be answered in 20–30 words.

Group—D consists of 12 questions (short-answer type—II) of which 10 questions are to be answered. Each question (Q. Nos. **25–36**) carries 3 marks and to be answered in 30–40 words.

Group—E consists of 3 questions (long-answer type). Each question (Q. Nos. **37–39**) carries 5 marks with alternatives to be answered in 60–80 words.

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GROUP—A

Choose and write the correct answer of the following (any *ten*) :

1×10=10

1. Which of the following is released from the ovary at the time of ovulation?
  - (a) Primary oocyte
  - (b) Oogonium
  - (c) Secondary oocyte
  - (d) Ovum
  
2. The first phase of embryonic development is
  - (a) cleavage
  - (b) blastulation
  - (c) gastrulation
  - (d) placentation
  
3. Amoebic dysentery is a disease caused by
  - (a) *Plasmodium vivax*
  - (b) *Entamoeba histolytica*
  - (c) *Ascaris lumbricoides*
  - (d) *Wuchereria bancrofti*

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4. A process of transfer of genetic information is
- (a) transversion
  - (b) transcription
  - (c) translation
  - (d) translocation
5. In angiosperms, triple fusion is required for the formation of
- (a) embryo
  - (b) endosperm
  - (c) fruit
  - (d) seed
6. The hard outer layer of pollen grain is called
- (a) intine
  - (b) germ pore
  - (c) exine
  - (d) tapetum
7. A transgenic plant which may help in solving the problem of night blindness is
- (a) BT cotton
  - (b) golden rice
  - (c) Flavr Savr tomato
  - (d) starlink maize

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**8.** Ecosystem has two components. They are

- (a) plants and animals
- (b) amphibians and reptiles
- (c) biotic and abiotic
- (d) weeds and trees

**9.** The organism which causes disease in plants and animals is called

- (a) vector
- (b) pathogen
- (c) insect
- (d) worm

**10.** The loss of individual due to the death in a population is called

- (a) natality
- (b) mortality
- (c) emigration
- (d) immigration

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**11.** Fungal association with the roots of higher plants in mycorrhiza is

- (a) mutualism
- (b) commensalism
- (c) parasitism
- (d) predation

**12.** Galapagos islands were associated with

- (a) Jean Lamarck
- (b) Charles Darwin
- (c) Alfred Wallace
- (d) Hugo de Vries

GROUP—B

Answer the following questions in one word/sentence each  
(any *five*) : 1×5=5

**13.** Define xenogamy.

**14.** Expand GIFT.

**15.** Define ecosystem.

**16.** What is a plasmid?

**17.** What are Okazaki fragments?

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**18.** What is dihybrid cross?

**19.** What is crossing over?

GROUP—C

**20.** Distinguish between self-pollination and cross-pollination. 2

**21.** How is sex determined in human beings? 2

*Or*

Explain the law of segregation with the help of an example.

**22.** Draw a well-labelled diagram of an antibody molecule. 2

*Or*

Draw a well-labelled diagram of human sperm.

**23.** Explain biopatent. 2

**24.** Differentiate between 'food chain' and 'food web'. 2

GROUP—D

Answer the following questions (any *ten*) :

**25.** Where are Leydig cells found? What are their functions? 1+2=3

**26.** Define alcohol addiction. Write the damaging effects of alcohol addiction. 1+2=3

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- 27.** What is menstrual cycle? Name the hormones and their functions which regulate menstrual cycle. 1+2=3
- 28.** Explain gene therapy with an example. 3
- 29.** Mention the significant characteristics of plants pollinated by water. 3
- 30.** Briefly explain the role of microbes in sewage treatment. 3
- 31.** Differentiate between incomplete dominance and co-dominance with examples. 3
- 32.** What is BT cotton plant? Explain how this cotton plant is able to resist the infestation by bollworms. 1+2=3
- 33.** Define predation. How does prey-predator relationship maintain a balance in the ecosystem? 1+2=3
- 34.** What is immunity? Distinguish between active immunity and passive immunity. 1+2=3
- 35.** Who discovered the first antibiotic and from where it was extracted? Name the microbes from which cyclosporin-A is extracted. 1+1+1=3
- 36.** Explain briefly how comparative anatomy supports biological evolution. 3

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GROUP—E

- 37.** Explain chromosomal theory of inheritance. Who proposed this theory? 4+1=5

*Or*

What is oogenesis? Explain the major events involved in oogenesis. 1+4=5

- 38.** A man with blood group 'A' married a woman with blood group 'B'. They have a son with AB blood group and a daughter with blood group 'O'. Work out the cross and write the phenotype and genotype of the siblings. 3+2=5

*Or*

Explain the mechanism of translation with the help of a diagram. 4+1=5

- 39.** Explain the steps involved in decomposition process. 5

*Or*

What is biodiversity? Describe the strategies involved in biodiversity conservation. 1+4=5

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