

**2 0 2 5**

**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) 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*) :

$1 \times 10 = 10$

- 1.** Which of the following layers in the wall of anther nourishes the developing pollen grains?

  - (a) Endothecium
  - (b) Tapetum
  - (c) Epidermis
  - (d) Middle layer
  
- 2.** Transfer of ovum collected from a donor into the fallopian tube of another female is called

  - (a) ZIFT
  - (b) GIFT
  - (c) SUZI
  - (d) ICSI
  
- 3.** In DNA replication, the Okazaki fragments on the lagging strand are joined by

  - (a) primase
  - (b) DNA polymerase
  - (c) helicase
  - (d) DNA ligase

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**4.** Which of the following is analogous to the wing of a bird?

- (a) Hind limb of rabbit
- (b) Flipper of whale
- (c) Wing of a butterfly
- (d) Dorsal fin of a shark

**5.** The large holes in 'Swiss cheese' are due to the production of a large amount of

- (a)  $\text{CO}_2$
- (b) CO
- (c)  $\text{O}_2$
- (d)  $\text{N}_2$

**6.** The dough which is used for making bread is fermented by

- (a) *Saccharomyces bulderi*
- (b) *Saccharomyces cerevisiae*
- (c) *Saccharomyces boulardii*
- (d) *Saccharomyces cariocanus*

**7.** EcoR1 comes from

- (a) *Escherichia coli* 1
- (b) *Escherichia coli* R13
- (c) *Escherichia coli* RY13
- (d) *Escherichia coli* RX13

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**8.** Golden rice is a genetically modified crop where the incorporated gene is meant for biosynthesis of

- (a) vitamin B
- (b) vitamin A
- (c) vitamin E
- (d) vitamin C

**9.** Natality refers to

- (a) birthrate
- (b) the number of individuals leaving the habitat
- (c) death rate
- (d) the number of individuals entering the habitat

**10.** An inverted pyramid of biomass can be found in

- (a) deserts
- (b) marine
- (c) grassland
- (d) tundra

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**11.** An example of *ex-situ* conservation is

- (a) national park
- (b) zoological park
- (c) wildlife sanctuary
- (d) sacred grove

**12.** The clinical test that is used for diagnosis of typhoid is

- (a) ELISA
- (b) ESR
- (c) PCR
- (d) Widal test

#### GROUP—B

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

**13.** What is autogamy?

**14.** Define parturition.

**15.** What are homologous organs?

**16.** Expand IUCN.

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**17.** Name two diseases whose spread can be controlled by the eradication of Aedes mosquito.

**18.** What is point mutation?

**19.** Define genetic engineering.

GROUP—C

**20.** Distinguish between chasmogamous and cleistogamous flowers with examples. 2

**21.** Draw a well-labelled diagram of double-helical structure of DNA. 2

*Or*

Draw a well-labelled diagram of a human ovum.

**22.** Why is colour blindness more frequent in male than in female? 2

*Or*

What is Chromosomal Theory of Inheritance? Who proposed this theory? 1+1=2

**23.** What is gene gun method in biotechnology? 2

**24.** What are extinct organisms? Give one example. 1+1=2

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GROUP—D

Answer the following questions (any *ten*) :  $3 \times 10 = 30$

**25.** What is co-dominance? Explain with the help of a cross.  $1+2=3$

**26.** What are sacred groves? What is their role in conservation?  $1+2=3$

**27.** Name the virus that causes AIDS in humans. List any four ways of transmission of HIV in humans.  $1+2=3$

**28.** How do biofertilizers enrich the fertility of soil? 3

**29.** Explain briefly the process of *in vitro* fertilization (IVF). 3

**30.** What are restriction enzymes? How do they cut the DNA strand?  $1+2=3$

**31.** Explain the steps involved in the process of decomposition. 3

**32.** Name the type of population interaction seen in each of the following examples :  $1+1+1=3$   
(a) Cuscuta growing on hedge plants  
(b) Orchid growing as an epiphyte on a mango branch  
(c) Abingdon tortoise and goat

**33.** What is emasculation? Why is it done in artificial hybridization?  $1+2=3$

**34.** Briefly explain the stages of human evolution. 3

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**35.** Define immunity. Distinguish between active and passive immunity.  $1+2=3$

**36.** Explain pleiotropy with an example.  $2+1=3$

GROUP—E

**37.** Define spermatogenesis. Describe the process of spermatogenesis with suitable diagrams.  $1+4=5$

*Or*

Explain the application of biotechnology in agriculture.  $5$

**38.** Using a schematic diagram, explain sex determination in honeybee.  $1+4=5$

*Or*

With the help of suitable diagram, describe the process of translation.  $1+4=5$

**39.** Define biodiversity. What are the four major causes of losses of biodiversity?  $1+4=5$

*Or*

Describe the role of microbes in sewage treatment.  $5$

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