Total No. of Printed Pages—8

HS/XII/Sc/Bio/25

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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.

GROUP—A

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

1×10=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

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) CO_2

(b) CO

(c) O_2

(d) N_2

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

(a) *Saccharomyces bulderi*

(b) *Saccharomyces cerevisae*

(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

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

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*) : 1×5=5

13. What is autogamy?

14. Define parturition.

15. What are homologous organs?

16. Expand IUCN.

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

GROUP—D

Answer the following questions (any *ten*) : 3×10=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

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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