Meghalaya Board of School Education

QUESTION PAPERS

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Total No. of Printed Pages—8

HS/XII/Sc/Bio/24

2 0 2 4

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. Development of fruit without fertilization is called

(a) polyembryony

(b) parthenocarpy

(c) parthenogenesis

(d) apomixis

2. Formation of mRNA from DNA is called

(a) transcription

(b) translation

(c) replication

(d) duplication

3. The protein which is secreted by virus-infected cells to protect non-infected cells is called

(a) antigen

(b) antibody

(c) antibiotic

(d) interferon

4. Which microbe is involved in the production of curd from milk?

(a) *Lactobacillus bulgaricus*

(b) *Lactobacillus acidophilus*

(c) *Lactobacillus thermophilus*

(d) *Streptococcus thermophilus*

5. *Archaeopteryx* is the missing link between

(a) man and apes

(b) birds and mammals

(c) amphibians and reptiles

(d) reptiles and birds

6. In recombinant DNA technology, the enzyme used for cutting DNA is

(a) DNA polymerase

(b) DNA ligase

(c) RNA polymerase

(d) restriction endonuclease

7. Tubectomy, a method of population control, is performed on

(a) both males and females

(b) males only

(c) females only

(d) pregnant females only

8. Which of the following is an *in-situ* method of conservation of biodivesity?

(a) Sacred Groves

(b) Zoological Parks

(c) Botanical Gardens

(d) Wildlife Safari Parks

9. Trisomy of the 21st chromosome causes

(a) Klinefelters syndrome

(b) Turner's syndrome

(c) Sickle cell anaemia

(d) Down's syndrome

10. Pollination by snail is called

(a) myrmecophily

(b) entomophily

(c) ormithophily

(d) malacophily

11. Bacteria and fungi are

(a) producers

(b) primary consumers

(c) scavengers

(d) decomposers

12. Unauthorised use of bioresources of one country by another country without proper consent is referred to as

(a) biopiracy

(b) biopatent

(c) biowar

(d) biocontrol

GROUP—B

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

13. What is emasculation?

14. Write the full form of IUDs.

15. Define polyploidy.

16. Define population.

17. What do you understand by the term 'biotechnology'?

18. Name two primary lymphoid organs.

19. What is Red Data Book?

GROUP—C

20. Differentiate between Antigens and Antibodies. 2

21. Draw a labelled diagram of a female reproductive system of human beings. 2

Or

Draw a diagrammatic representation of various events during menstrual cycle.

22. Differentiate between leading and lagging strand of DNA. 2

Or

Define convergent evolution with an example.

23. Define transcription unit with the help of a simple diagram. 1+1=2

24. Define mutualism with an example. 1+1=2

GROUP—D

Answer the following questions (any *ten*) : 3×10=30

25. What is double fertilization? Write the importance of double fertilization. 1+2=3

26. State and explain Mendel's Law of Independent Assortment with an example. 1+2=3

27. Explain the role of microbes in energy production. 3

28. Write a brief note on the application of genetic engineering in medicine. 3

29. State Hardy-Weinberg Principle. Write two factors which affect this principle. 2+1=3

30. Explain the development of nuclear and cellular type of endosperm. 1½+1½=3

31. What is DNA fingerprinting? Write the applications of DNA fingerprinting. 1+2=3

32. Describe briefly the process of energy flow in an ecosystem. 3

33. Work out a cross showing marriage between a haemophilic man and a carrier woman. Write the phenotype of their children. 2+1=3

34. What is primary productivity? Differentiate between primary and secondary productivity. 1+2=3

35. Define linkage. Write the differences between complete linkage and incomplete linkage. 1+2=3

36. How are gene of interest amplified in genetic engineering? 3

GROUP—E

37. Define fertilization. Where does this process take place in a female body? Describe the process of fertilization in humans. 1+1+3=5

Or

What is an operon? Explain the regulation of gene expression in lac operon with suitable diagrams. 1+3+1=5

38. What are ecological pyramids? Draw and explain the ecological pyramids of number and energy. 1+1+3=5

Or

What is DNA replication? Explain the process of DNA replication with suitable diagrams. 1+3+1=5

39. Define Human Genome Project (HGP). Write the salient features of the Human Genome Project. Write two applications of HGP. 1+3+1=5

Or

What is cancer? Name the different types of cancer. Differentiate between Benign tumour and Malignant tumour. 1+2+2=5

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