Total No. of Printed Pages—8

**HS/XII/Sc/Bio/24**

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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.** 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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