



## MODEL QUESTION PAPERS FOR PRACTICE

### General Instructions :

- (i) All questions are compulsory.
- (ii) The question paper consists of five sections A, B, C, D and E. Section A contains 5 questions of 1 mark each, Section B is of 5 questions of 2 marks each, Section C has 12 questions of 3 marks each whereas Section D is of 1 question of 4 marks and Section E of 3 questions of 5 marks each.
- (iii) There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks and all the three questions of 5 marks weightage. A student has to attempt only one of the alternatives in such questions.
- (iv) Wherever necessary, the diagrams drawn should be neat and properly labelled.

### MODEL QUESTION PAPER—1

#### BIOLOGY CLASS—XII

Time Allowed: 3 Hours]

[Maximum Marks: 70

#### SECTION—A

1. Retroviruses evolve rapidly. Why? (Mention any one reason)
2. An elephant is better at thermoregulation than a mouse. Justify giving only one reason.
3. The gene I that controls the ABO blood grouping in human beings has three alleles  $I^A$ ,  $I^B$  and I.
  - (a) How many different genotypes are likely to be present in the human population?
  - (b) Also, how many phenotypes are possibly present?
4. Keeping plasmid in mind, mention
  - (a) Its chemical nature.
  - (b) Its mode of replication.
5. Even when conditions are optimal, there is no vegetative internodal propagation in sugarcane. Why ?

#### SECTION—B

6. What is the role of promoter in a transcription unit.
7. Write about the discovery of first antibiotic. Name the scientists who were awarded Nobel Prize for this discovery.
8. How does Mycorrhiza serve as biofertilizer?
9. Write down the type and equation of the population growth curve under these two conditions :

- (i) When responses are not limiting the growth.
- (ii) When responses are limiting the growth.

**Or**

What does the term biodiversity refer to? Mention any two factors which pose threat to biodiversity.

10. (i) What is the difference between natality and mortality.
- (ii) Differentiate: Immigration and Emigration.

#### SECTION—C

11. Excess use of herbicide, pesticide, etc., has resulted in selection of resistant varieties in a short time scale. Justify.
12. Draw the labelled structure of an antibody molecule.

**Or**

Where would you put the following drugs in the categories of opioids and cannabinoids? Morphine, Hashish, Heroin, Marijuana.

13. Which strategy in animal breeding is applied to produce a pureline in any animal? What are the disadvantages of it?
14. Write short notes on
  - (i) Klinefelter's syndrome
  - (ii) Turner's syndrome.



15. Give the salient features of genetic code.
16. Explain the different types of natural selection.
17. A couple is finding trouble in conceiving. On diagnosis, it was found that the female is not capable of producing ovum. Which technique under assisted reproductive technologies (ART) will be beneficial for the couple?
18. Name any two cloning vectors? Describe the features required to facilitate cloning using a vector.
19. Define the term single cell protein. Name two microbes that give us the same benefits of single cell protein. State any such benefit.
20. Differentiate follicular phase and luteal phase.
21. What do you mean by *ex-situ* conservation.
22. How does DNA interference help in developing resistance in tobacco plant against nematode infection?

#### SECTION-D

- VBQ** 23. The total human population is over 6 billion. Population of India is 1.21 billion. The number of individuals per unit area is known as **population density**. Population density of India was 178/km<sup>2</sup> in 1971, 216/km<sup>2</sup> in 1981 and 260/km<sup>2</sup> in 1991. Bangladesh, Japan and Netherland are the most thickly populated countries with density of population being 617/km<sup>2</sup> in Bangladesh and 319/km<sup>2</sup> Netherland.

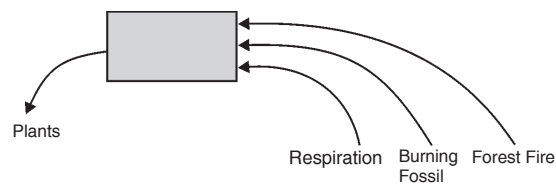
#### Answer the questions.

- (i) What are consequences of over-population in India?

- (ii) List any four measures to avoid pregnancy.
- (iii) What are side effects of use of steroidal pills as contraceptives?

#### SECTION-E

24. The along side diagram shows a simplified biogeochemical cycle
  - (i) Name the compound whose cycle is depicted.
  - (ii) In what way do vehicles add this compound to the atmosphere?



- (iii) What adverse effect does its excess have on the environment?
- (iv) Cite an event which depicts this effect in the modern times.
- (v) Suggest two ways of reducing this effect.

**Or**

Explain various methods of control of air pollution.

25. Explain the process by which the male gametes of seed plants are brought to the egg by a pollen tube.

**Or**

Give an account of menstrual cycle in human.

26. Briefly explain semiconservative mode of supplication.

**Or**

State and explain 'Law of Independent Assortment'.



## MODEL QUESTION PAPER—2

### BIOLOGY CLASS—XII

Time Allowed: 3 Hours]

[Maximum Marks: 70

General Instructions : Same as in Model Question Paper-1.

#### SECTION-A

- Which of the following are haploid and diploid?
  - Sepal
  - Egg
  - Male gamete
  - Zygote.
- Why was RNA unstable?
- The allele for axial flowers in peas is dominant to the allele for flower borne terminally. What phenotypic ratios would you expect among the offspring of a cross between a known heterozygous axial-flowered plant and one whose flowers were terminal?
- Name the kind of T-cells.
- How many PCR cycles are adequate for proper amplification of DNA segment ?

#### SECTION-B

- Suggest two features of plants that will prevent insect and pest infestation.
- It has been recorded that the temperature of the earth's atmosphere has increased by 0.6° C. What has caused this increase ?

Or

Differentiate between competition and predation.

- What is meant by
  - Parbhani kranti
  - Hisardale.
- Why cannot both the strands of DNA be transcribed ?
- Reptiles and frogs are oviparous; yet they differ in certain aspects of reproduction. Bring out the differences.

#### SECTION-C

- The terms homozygous and heterozygous are applicable only to females with reference to sex-linked traits. Why ? What term is used in the case of males ?
- State the principle underlying gel electrophoresis and mention two applications of this technique in biotechnology.

- Give the sex-chromosome complement of each of the following :
  - Female fowl
  - Male honeybee
  - Human male
  - Female fruitfly.
- How has the bacterium *Bacillus thuringiensis* helped us in controlling caterpillars of insect pests ?
- Mention any four methods of control and prevention of alcohol/drug abuse.

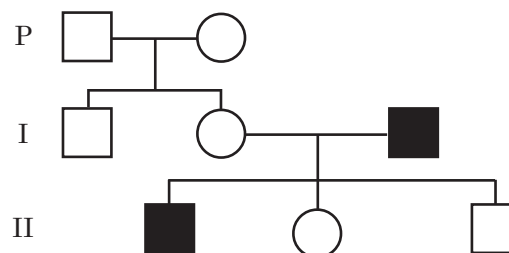
Or

Give four reasons why the intake of cannabinoids is banned.

- Represent schematically a sedimentary cycle that is operating in nature.
- Describe Industrial melanism with reference to natural selection.
- Represent diagrammatically in proper sequence the three steps in polymerase chain reaction.
- Write the medicinal use of:
  - Streptokinase
  - Cyclosporin A and
  - Statins.
- A mother of one year old daughter wanted to space her second child. Her doctor suggested CuT.
  - Explain the contraceptive action.
  - What is the negative impact of use of CuT?
- What is the significance of the slope of regression in a species – area relationship?
- Differentiate leading strand and lagging strand.

#### SECTION-D

VBQ 23. Observe the pedigree given below :



Answer the following questions with reference to the above pedigree :

- (i) Is the trait sex-linked autosomal recessive or autosomal dominant? Justify your answer.
- (ii) Give the genotypes of the parents.
- (iii) Write the genotype of the daughter in the first generation and that of the sons in the second generation.
- (iv) What is the significance of pedigree analysis?

**SECTION-E**

- 24. (i) Define insertional inactivation. How is it advantageous over simultaneous plating on two plates with different antibiotics ?
  - (ii) How does silencing of specific mRNA prevent parasitic infestation in plants ?
- Or**
- (i) List four advantages of genetically modified plants over the normal ones.
  - (ii) What is gene cloning?
- 25. (i) Why do the mammalian/human testes descend into scrotum ? What will be the consequence, if they fail to do so?
  - (ii) After successful *in vitro* fertilisation, the fertilised egg begins to divide. Where is this egg transferred before it becomes 8-celled and what is the technique termed as?

- (iii) How is the use of progestogens as implants more advantageous than using them as oral pills?

**Or**

- (a) Fill in the blanks 1, 2, 3 and 4 in the following table pertaining to the technical terms and parts of seeds.

Terms	Parts of seeds
1	Protective sheath of radicle in grasses
Scutellum	2
Perisperm	3
4	Outer layer of seed coat

- (b) Why are pollen grains well preserved as fossils?
- 26. Describe the experiment of Frederick Griffith on bacterial transformation. Name the scientists who showed that DNA is the transforming principle. How did they prove it?
- Or**
- (i) Using a punnet square, trace through two generations, the details of a dihybrid cross between homozygous round, yellow and wrinkled, green seed varieties of pea plant.
  - (ii) Give the phenotypic ratio of the F<sub>2</sub> generation.
  - (iii) Identify the Mendelian principle which this ratio refers to.



## MODEL QUESTION PAPER—3

### BIOLOGY CLASS—XII

Time Allowed : 3 Hours]

[Max. Marks : 70

General Instructions : Same as in Model Question Paper-1.

#### SECTION-A

1. A bilobed, ditheous anther has 100 microspore mother cell per microsporangium. How many male gametophytes this anther can produce?
2. Mention two functions of the codon AUG.
3. Name the scientist who disproved spontaneous generation theory?
4. What is it that prevents a child to suffer from a disease he/she is vaccinated against ? Give one reason.
5. Why is the enzyme cellulase used for isolating genetic material from plant cells but not from animal cells?

#### SECTION-B

6. A moss plant produces always number of antherozoids but relatively only a few egg cells. Why ?
7. Mention the reasons far difference in ploidy of zygote and primary endosperm nucleus in an angiosperm.
8. How does an electrostatic precipitator work to remove particulate pollutants released from the thermal power plants.
9. Name the type of food chains responsible for the flow of large fraction of energy in an aquatic and a terrestrial ecosystem respectively. Mention one difference between the two food chains.
10. Honey collection improves when beehives are kept in crop-fields during flowering season. Explain.

Or

How does addition of a small amount of curd to fresh milk help formation of curd ? Mention a nutritional quality that gets added to the curd.

#### SECTION-C

11. How does a test cross help in identifying the genotype of the organism ? Explain.

12. Name the host and the site where the following occur in the life cycle of a malarial parasite.
  - (a) Formation of gametocytes
  - (b) Fusion of gametocytes
13. Why is the introduction of genetically engineered lymphocytes into a ADA deficiency patient not a permanent cure ? Suggest a possible permanent cure.
14. How does the floral pattern of Mediterranean orchid ophrys guarantee cross pollination?
15. Describe the initiation process of transcription in bacteria.
16. Draw a longitudinal section of a post-pollinated pistil showing entry of pollen tube into a mature embryo sac. Label filiform apparatus, chalazal end, hilum, antipodals, male gametes and secondary nucleus.

Or

Draw a labelled sectional view of seminiferous tubule of a human male.

17. During his studies on genes in *Drosophila* that were sex linked T.H. Morgan found  $F_2$  population phenotypic ratios deviated from expected 9 : 3 : 3 : 1. Explain the conclusion he arrived at.
18. Explain convergent and divergent evolution with the help of one example of each.
19. Name the type of human cell HIV attacks on its entry into the body. Explain the events that occur in the cell which further lead to cause immunodeficiency syndrome.
20. Explain the efforts which must be put in to improve health/hygiene and milk yield of cattle in a dairy farm.
21. Identify a,b,c,d,e, and f in the table given below.

	Organism	Bioactive molecule	Use
1.	<i>Monoascus perpurens</i> (yeast)	a	b
2.	c	d	antibiotic A
3.	c	cyclosporin	A





22. Eco RI is used to cut a segment of foreign DNA and that of a vector DNA to form a recombinant DNA. Show with the help of schematic diagrams.

- (i) The set of palindromic nucleotide sequence of base pairs the Eco RI will recognise in both the DNA segments. Mark the site at which Eco RI will act and cut both the segments.
- (ii) Sticky ends formed on both the segments where the two DNA segments will join later to form a recombinant DNA.

#### SECTION-D

23. Sanctuaries are tracts of land where animals are protected from all types of exploitation. Private ownership is permitted. Collection of minor forest products are allowed.

- (i) How many sanctuaries are present in India?
- (ii) How much land area they cover?
- (iii) Name any three sanctuaries.
- (iv) List any three human activities which are allowed in sanctuaries.

#### SECTION-E

24. (a) How does a chromosomal disorder differ from a Mendelian disorder ?  
(b) Name any two chromosomal aberration associated disorders.

(c) List the characteristics of the disorders mentioned above that help in their diagnosis.

*Or*

Fitness is the end result of the ability to adapt and get selected by nature. Explain with suitable examples.

25. When and where are primary oocytes formed in human female ? Trace the development of these oocytes till ovulation (in menstrual cycle). How do gonadotropins influence this developmental process ?

(a) Explain the events taking place at the time of fertilization of an ovum in a human female.

(b) Trace the development of the zygote upto its implantation in the uterus.

(c) Name and draw a labelled sectional view of the embryonic stage that gets implanted.

26. Draw and explain a logistic curve for a population of density (N) at time (t) whose intrinsic rate of natural increase is (r) and carrying capacity is (k).

*Or*

Describe the process of decomposition of detritus under the following heads Fragmentation; Leaching; Catabolism; Humification and Mineralization.

