Series P/PB2/1

SET 1

CLASS XII PRE-BOARD EXAMINATION – 2024-25

Q.P. Code: 044/2/1

Roll No. | | | | | | | | |

Candidate must write the Q.P. Code on the title page of the answer-book.

- Please check that this question paper contains **8** printed pages.
- Please check that this question paper contains **33** questions.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.

BIOLOGY (Theory)

Time allowed : 3 hours *Maximum Marks : 70*

General Instructions:

Read the following instructions very carefully and strictly follow them :

(i) *This question paper contains **33** questions. All questions are **compulsory**.*

(ii) *Question paper is divided into **five** sections Sections **A, B, C, D** and **E**.*

(iii) ***Section A** questions number **1 to 16** are multiple choice type questions. Each question carries **1** mark.*

(iv) ***Section B** questions number **17 to 21** are very short answer type questions. Each question carries **2** marks.*

(v) ***Section C** questions number **22 to 28** are short answer type questions. Each question carries **3** marks.*

(vi) ***Section D** questions number **29 and 30** are case-based questions. Each question carries **4** marks. Each question has subparts with internal choice in one of the subparts.*

(vii) ***Section E** questions number **31 to 33** are long answer type questions. Each question carries **5** marks.*

(viii) *There is no overall choice. However, an internal choice has been provided in Sections B, C and D of the question paper. A candidate has to write answer for only **one** of the alternatives in such questions.*

(ix) *Kindly note that there is a separate question paper for Visually Impaired candidates.*

(x) *Wherever necessary, neat and properly labelled diagrams should be drawn.*

SECTION A (16X1=16)

Questions no . 1 to 16 are multiple choice type questions carrying 1 mark each.

1. Which of the following is an example of parasitic species in which the fruit contains thousands of tiny seeds.

a. Orchids b. Orobanche c. Sriga d. both b and c

2. After Spermatogenesis, the sperm heads get embedded in which of the cells .

a. Leydig cells b. Sertoli cells

c. Germinal epithelium d. Seminal vesicle

3. Statin a blood-cholestrol lowering agent is commercially obtained from

a. Trichoderma poly sporum b. Acetobactor aceti

c. Clostridium butylicum d. Monascus purpureus

4. Which of the following steps are catalysed by Taq polymerase in a PCR.

a. Annealing of primers to template DNA

b. Denaturation of template DNA

c. Extension of primer on the template DNA.

d. All of the above.

5. Which of the following statement is incorrect.

a. Genetically engineered insulin is produced in E.coli

b. In man ,Insulin is synthesised as proinsulin.

c. Proinsulin has three peptide chain A,B and C.

d. The functional insulin has two peptide chain A and B held together by hydrogen bonds.

6. Which one of the following groups faces maximum threat of extinction?

a. Birds b. Amphibians c. Mammals d. Fishes

7. The rate of formation of new organic matter by consumers and the biomass available for consumption of herbivores as well as decomposers are referred to as :

a. Gross primary productivity and net primary productivity.

b. Net primary productivity and secondary productivity.

c. Secondary productivity and net primary productivity.

d. Secondary productivity and gross primary productivity.

8. Colostrium provides passive immunity to human infants as it contains antibody.

a. IgA b. IgM c. IgE d. IgG

9. Match the following

Column 1	Column 2
1. Oral pill	A. Semen contains no sperms
2.Copper releasing IUD	B. Prevents ovulation
3.Vasectomy	C. Prevents sperms from reaching cervix.
4.Condom	D. Decreases fertilizing capacity of the sperms.

a. 1-B 2-D 3-A 4-C

b. 1-D 2-C 3-A 4-B

c. 1-B 2-C 3-D 4-A

d. 1-D 2-B 3-A 4-C

10. In an experiment ,E.coli is grown in a medium containing

$^{14}NH4Cl$.(^{14}N is the light isotope of Nitrogen) followed by growing it for six generations in a medium having heavy isotope of nitrogen(^{15}N).After six generations, their DNA was extracted and subjected to CsCI density gradiant centrifugation. Identify the correct density (Light/Hybrid/Heavy) and ratio of the bands of DNA in CsCI density gradiant centrifugation.

a. Hybrid : Heavy, 1:16

b. Light : Heavy, 1:31

c. Hybrid : Heavy, 1:31

d. Light : Heavy, 1:05

11. A population of cats can be either black or white; the black allele(B) has complete dominance over the white allele (b).Given the population of 1000 cats,840 black and 160 white, calculate the number of heterozygous individuals.

a.480 b.360 c.840 d.680

12. A women with normal vision has a colour blind father she marries a colour blind man. What proportion of their children will be colour blind.

a.0% b.25% c.50% d.100%

For Questions number 13 to 16 two statements are given-one labelled as Assertion (A) and the other labelled as Reason(R).Select the correct answer to these questions from the codes (A),(B),(C) and (D) as given below.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

D) Assertion (A) is false, but Reason (R) is true.

13. (A): A patient of ADA deficiency undergoing treatment for gene therapy required periodic infusion of genetically engineered lymphocytes.

(R):Lymphocytes are immortal.

14. (A) : Endosperm is not completely consumed during the development of embryo in ex-albuminous seeds.

(R) :Pea and Beans are examples of ex-albuminous seeds.

15.(A) : Pyramid of energy is always upright in any ecosystem.

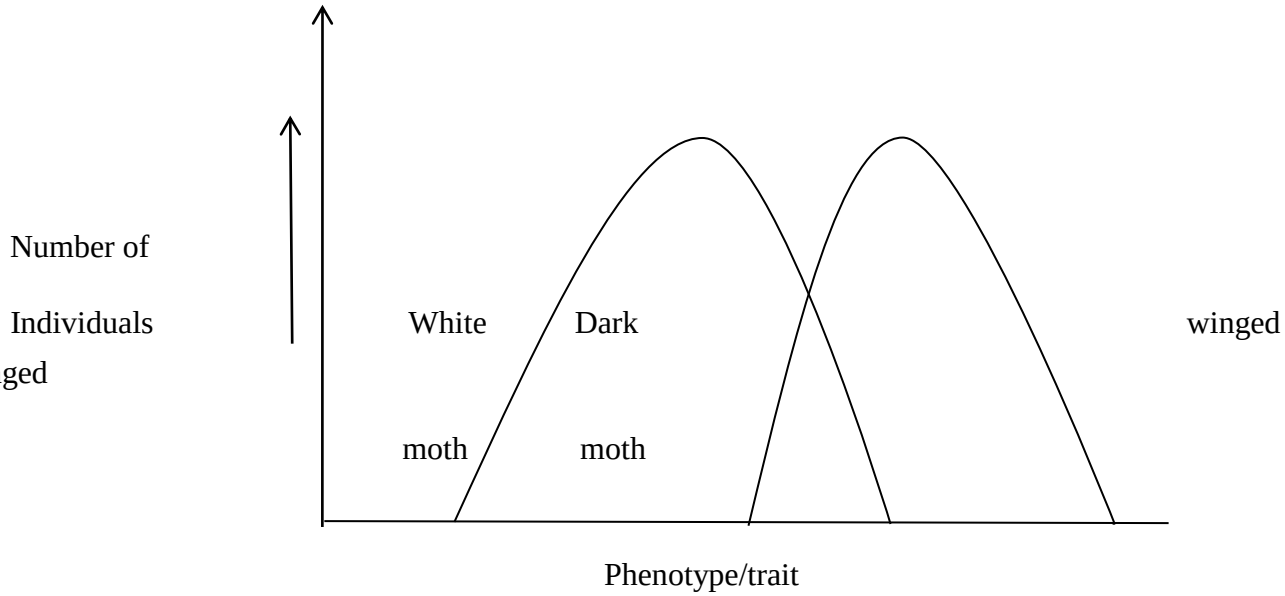
(R) : Producers capture the solar energy and only 10% of energy is passed on from one trophic level to the next higher trophic level.

16. (A): A high biochemical oxygen demand (BOD) indicates the presence of large number of decomposers microbes in the water body.

(R):BOD is the measure of oxygen utilised by the microbes to decompose the organic matter waste in the water body.

SECTION-B (5X2=10)

17.



i) Identify the type of natural selection depicted in the graph above.

ii) In England after industrialisation, the population of dark winged moth were more favoured than white winged moth. Explain.

18. The energy flow in the ecosystem follows the second law of thermodynamics .Explain.

19. Your teacher gave you a violet flowered garden pea plant and asked you to find whether the plant is homozygous violet or heterozygous violet.

i) How will you proceed to find the genotype of the given plant?

ii) Show the result with the help of crosses.

OR

Why are human females rarely haemophilic? How do haemophilic patients suffer?

20. i) A bilobed dithecus anther has hundred microspore mother cells per microsporangium. How many male gametophytes can this anther produce.

ii) How many haploid cells are present in a mature female gametophyte of a flowering plant? Name them.

21. When and where did Australopithecus live. Mention their characteristics.

SECTION-C (7X3=21)

22. Explain the processing of heterogeneous nuclear RNA(hnRNA) into a fully functional mRNA in eukaryotes. Where does this processing occur in the cell?

23. Consider the following three possible diagnosis for infertility and answer the trailing questions.

i) Inability to produce a normal egg.

ii)Low count of sperm.

iii)Blocked Fallopian tube.

a) Suggest different methods of ART based on clinical. examination for the above three cases.

b) Briefly explain the method of ART for the third case.

24. Draw a sectional view of seminiferous tubule of human.Label the following cells in the seminiferous tubule.

1.Cells that divide by mitosis to increase their number.

2.Cells that undergo meiosis I.

3.Cells that undergo meiosis II.

4.Cells that help in the process of Spermiogenesis.

25. Certain attributes of innate immunity are given in the table below. Identify ABCDE and F respectively in it.

Slno.	Type of barrier	Example of barrier	Function
1	A	B	Prevent microbial growth
2	C	Polymorphonuclear lymphocytes	D
3	Cytokine	E	F

26. Name the group of cells the HIV attacks after gaining entry into the human body and write various events that occur within the cell.

Write the expanded form of the diagnostic test used for detecting AIDS.

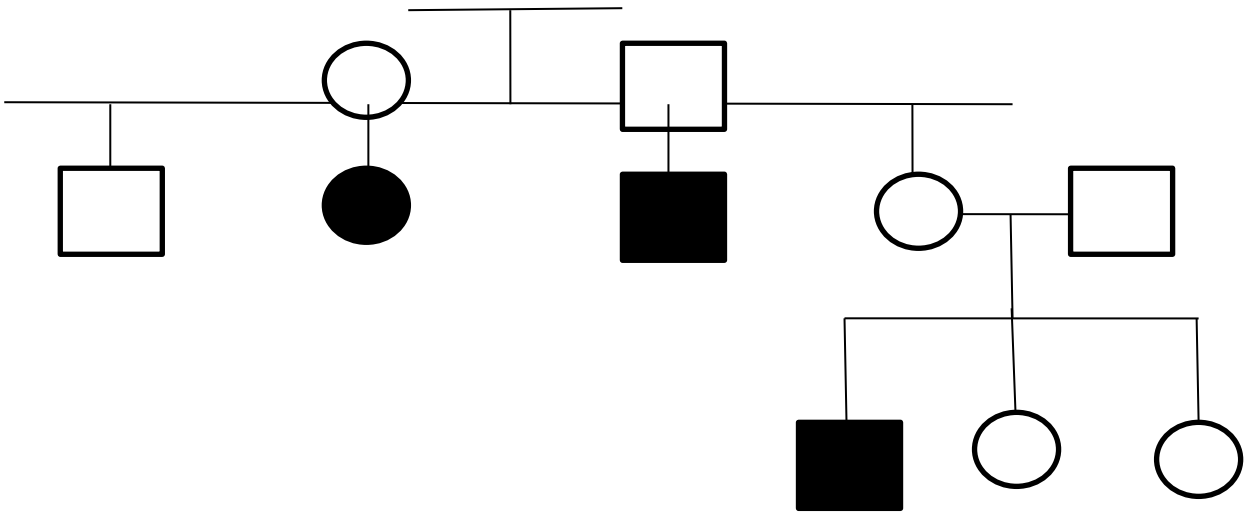
OR

How are malignant tumours different from benign tumours.

List any four common approaches for the treatment of cancer.

27.The release of municipal waste water and industrial waste into our natural water bodies is causing disastrous effects to the aquatic life. Explain the biological treatment that should be given to it before releasing into the natural water bodies.

28. Study the given pedigree chart and answer the following questions.



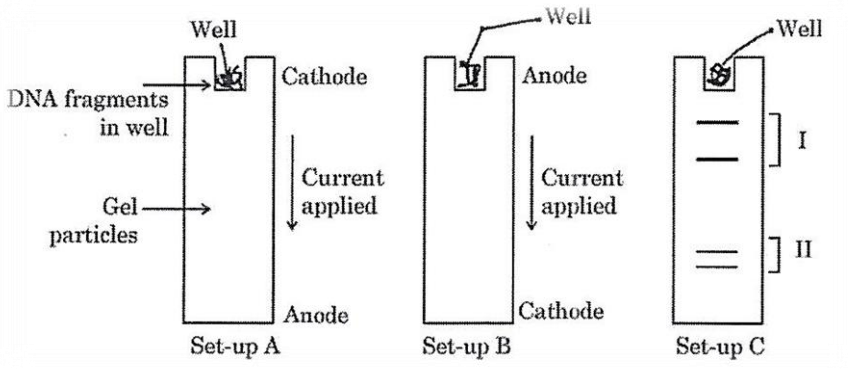
a). Is the trait recessive or dominant

b). Is the trait sex-linked or autosomal.

c). Give the genotypes of the parents shown in generation I and of their 3rd and 4th child in generation II.

SECTION-D (2X4=8)

29. With reference to the set-ups(A<B and C) given below of the electrophoretic separation of a mixture of DNA fragments of varied lengths ,answer the questions that follow:



a) In which one of the two set-ups, A or B would you see the DNA fragments separated.

b) In set-up C ,which one of the two ,I/II are the bands of longer fragments of DNA?

c) Name the commonly used matrix and mention its source.

d) How are separated bands visualised?

OR

Write any two ways the DNA isolated by this techniques can be used.

30. Read the following passage and answer the questions that follow.

As the ovules transform into seeds the ovary develops into fruit after fertilization in angiosperm; these two processes occur simultaneously. The fruit may be fleshy fruits or dry fruits. The fruit may be true fruits or false fruits while some others may be partheno carpic fruits.

Seedless fruits can be induced to develop by the application of hormones.

a. Give an example of a fleshy fruit and a dry fruit .

b. What is common among strawberry, apple and cashew with respect to their fruits.

c. What does the ovary wall develop into in a fruit.

d. Give the technical term for the ovule.

OR

d. Give the technical term is given to the development of ovary into a fruit without fertilisation.

SECTION-E (3X5=15)

31.

1. State the central dogma as proposed by Francis Crick. Are there any exceptions to it. Support your answer with a reason and an example.

2. Explain how the biochemical characteristics of transforming principle was determined, which was not defined from Griffithis experiments.

OR

Describe the dihybrid cross upto F2 generation as conducted by Gregor Mendel using pure lines of garden pea for characters seed shape and seed colour.

32.

1. Why and how can bacteria be made 'competent'?

2.In a E.coli cloning vector pBR322 state role of the following genes.

a. Ori gene b. antibiotic resistance gene c. rop gene

OR

1. Write the characteristics of "stem cells".

2. From where can one obtain stem cells in human.

3. Mention two objectives of setting up GEAC by our government.

4. Name the first transgenic cow developed.

33. 1.What is amensalism? Write an example.

2.Name the two growth models that represent population growth and draw the respective growth curves they represent. Write the formula of both growth curves.

3.State the basis of for the difference in the shape of these curves.

OR

1. Why are certain regions of the earth called hotspots? Name two hotspots in India.

2. Mention the main objectives of the Ramsar convention. Name any two sites in India that are important in the Ramsar Convention.