DREAMERS EDU HUB
PRE-BOARD EXAMINATION PAPER 2025-26

CLASS 12th **BIOLOGY** **15.12.2025**

Time : **3 hrs** Max. Marks : **70**

General Instructions

1.All questions are compulsory.

2.The question paper has five sections and 33 questions. All questions are compulsory.

3.Section-A has 16 questions of 1 mark each; Section-B has 5 questions of 2 marks each; Section-C has 7 questions of 3 marks each; Section-D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.

4.There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

5.Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION A

1.Given below are the four enzymes and their activities.

Enzymes			Activities
A.	Taq DNA polymerase	1.	Stable above 86°C
B.	Exonuclease	2.	Cleaves the ends of linear DNA
C.	Protease	3.	Degeneration of proteins
D.	Chitinase	4.	Breakdown of fungal cell wall

How many of there are correctly matched?

(a) 2 (b) 1 (c) 4 (d) 3

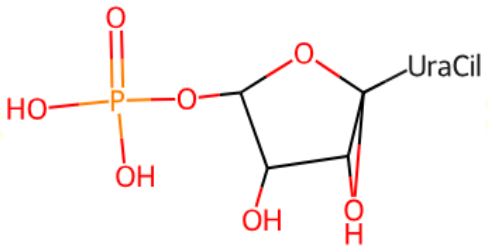
2.In humans, at the end of the first meiotic division, the male germ cells differentiate into which of the following cell division stage?

(a) Spermatogonia (b) Spermatids (c) Primary spermatocytes (d) Secondary spermatocytes

3. The number of chromosomes in female and male honeybees are

(a) 32 (b) 16 (c) 32 and 16 , respectively (d) 16 and 32, respectively

4.Identify the structure given below.



(a) Nucleoside, Uridylic acid(b) Nucleotide, Inosinic acid(c) Nucleoside, Inosinic acid(d) Nucleotide, Uridylic acid

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5.Which of the following in the table given below, will show the features of alcohol?

Drug	Act as a depressant	Damages liver
(a)	Yes	No
(b)	No	No
(c)	Yes	Yes
(d)	No	Yes

Question Nos. 6 to 10 consist of two statements, Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below.

(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion
(b) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion
(c) Assertion is true, but Reason is false
(d) Assertion is false, but Reason is true

6.Assertion (A) Amniocentesis technique is frequently used in foetal disease treatment in India.
Reason (R) This technique can be used for sex-determination of child.

7.Assertion (A) Synthesis of daughter or new strand occurs continuously along the parent strand $3' \rightarrow 5'$.
Reason (R) DNA polymerase can polymerise nucleotides in $3' \rightarrow 5'$ direction on $5' \rightarrow 3'$ strand.

8.Assertion (A) Biotechnology produces transgenic microorganisms that function as microfactories for proteins.
Reason (R) Transgenic microorganisms can be developed to produce proteins of human use like insulin.

9. Assertion (A) Sex education in schools is necessary.
Reason (R) This will provide correct information and prevent any myths

10.Assertion (A) DNA has two chains having antiparallel polarity.
Reason (R) In one chain of DNA at one end has a free phosphate moiety $5'$ end of ribose sugar and at other end the ribose has a free $3'\mathrm{OH}$ group.

11.The features of genetic code that allow bacteria to produce human insulin by recombinant DNA technology is
(a) genetic code is redundant (b) genetic code is nearly universal
(c) genetic code is specific (d) genetic code is not ambiguous

12.Given below are the phenomenon which deviates from Mendel's law of inheritance and their descriptions.

	Phenomenon		Descriptions
A.	Incomplete dominance	1.	In heterozygous organisms both alleles expresses themselves completely.
B.	Polygenic inheritance	2.	Multiple genes govern a single character.
C.	Codominance	3.	F_1-hybrid does not resemble either of its parents.
D.	Pleiotropy	4.	A single gene influences many traits.

Select how many phenomenon are correctly matched with their descriptions?
(a) 1 (b) 3 (c) 2 (d) 4

13.A biocontrol agent to be a part of an integrated pest management should be
(a) species-specific and symbiotic (b) free-living and broad spectrum
(c) narrow spectrum and symbiotic (d) species-specific and inactive on non-target organisms

14.Where will you look for the sporozoites of the malarial parasite?
(a) RBCs of humans suffering from malaria (b) Spleen of infected person
(c) Salivary glands of freshly moulted female Anopheles mosquito(d) Saliva of infected female Anopheles mosquito

15.A digestive enzyme P synthesised by organism Q is used in clarifying procedure of bottled beverages, in tannaries and detergent making, etc. Which of the following options identify P and Q, respectively?

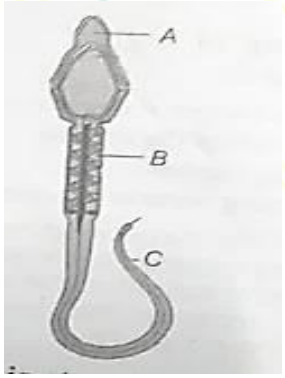
	P	***Q***
(a)	Lipase	Lipolytica
(b)	Amylase	Aspergillus oryzae
(c)	Rennet	Mucor
(d)	Protease	Bacillus subtilis

16.Genetic engineering techniques include
(a) altering genetic material(b) sequencing genetic material(c) studying genetic material (d) None of the above

SECTION B

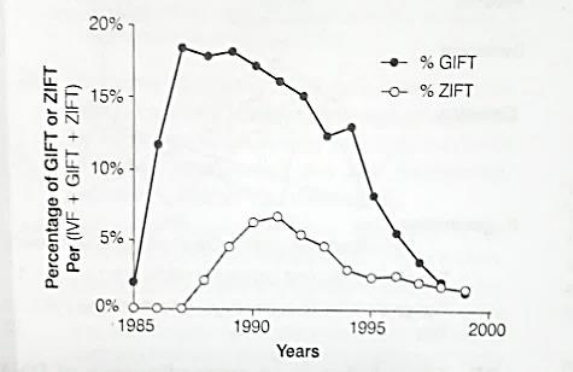
17.A true-breeding tall pea plant is crossed with a true-breeding dwarf variety of pea plant. With the help of Punnett square show the above cross and mention the results obtained with respect to genotype and phenotype in F_1-generation.

18.In the figure below, parts A, B and C are very essential for this structure and influences the process of fertilisation. Study the figure and answer the questions that follows.



(i) Name this structure, along with parts labelled $A - C$.
(ii) How does part A help in the process of achieving successful fertilisation?

19.The graph given below shows the percentage of the use of ART methods, i.e. ZIFT and GIFT in 15 years. Interpret the graph and explain how these methods are releated to the aspects of reproductive health.



20.If the sequence of nitrogen bases in the coding strand of DNA in a transcription unit is $5' - \text{A T G A A T G} - 3'$

What would be the sequences of bases in its RNA transcript? Explain the changes that occur in the transcript.

Or

Use the information provided in the table given below to answer the following questions.

Lactose	Glucose	Lac repressor	Lac operon expression level
Present	X	Inactive	Very high
Y	Present	Inactive	Medium
Absent	Absent	Active	Very low
Absent	Absent	Active	Very low

(i) Fill the gap is X and Y.
(ii) Give reason why does the lac operon shut down for same time after addition of lactose in the medium.

21.Explain the functions of the 3 layers, i.e. endothecium, middle layers and tapetum in the microsporangium of a plant.

SECTION C

22.You are given tall pea plant with yellow seeds, whose genotypes are unknown.
(i) How would you find the genotype of this plant? (ii) Explain point (iii) with the help of a cross.

23.Given below is an autoradiograph of DNA segments, obtained from gel electrophoresis.

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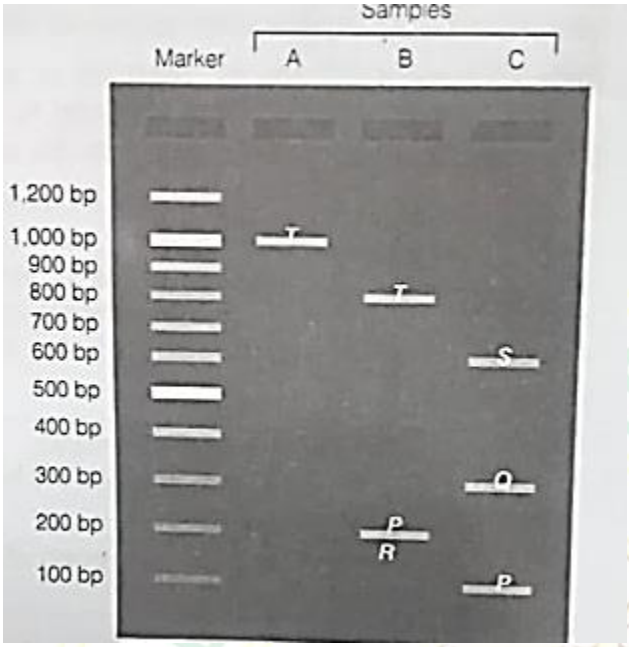

(i) In this autoradiograph, the ladder sequence measures approx. 1200 base pairs, which band will correspond to 600 bp?

(ii) On what basis the fragments get separated like this during gel electrophoresis? Mention one significance of this technique while conducting a recombinant molecule.

24.'In some children, ADA deficiency can be cured by bone marrow transplantation or by enzyme replacement therapy, but both of these approaches are not completely curative'. Justify the statement.

25.A GM or transgenic crop is a plant that has a novel combination of genetic material obtained through the use of modern biotechnology. For example, a GM crop can contain a gene that has been artificially inserted instead of the plant acquiring it through pollination. The resulting plant is said to be genetically modified although in reality all crops have been 'genetically modified' from their original wild state by domestication, selection and controlled breeding over long periods of times.
(i) What effect do eating genetically modified foods have on your genes?
(ii) Why should foods derived from genetically modified crops be tested for possible reactions in people?
(iii) Are foods derived from genetically modified crops nutritionally superior?

Or

At the murder spot of Rishabh, police investigating team found a small spot of blood. They called the forensic team to collect the blood sample. Forensic team performed the PCR and police with the help of the PCR report cracked this case.
(i) What is PCR and a primer?
(ii) What is the denaturation process?
(iii) Name the bacteria from where thermostable DNA polymerase isolated.

26.List the different parts of human oviduct through which the ovum travels till it meets the sperm for fertilisation. Also comment on the location and function of seminal vesicle.

27.Explain the role of restriction endonucleases, gel electrophoresis, selectable marker in pBR322 in biotechnology.

28.Microbes can be used to decrease the use of chemical fertilisers and pesticides. Explain how this can be accomplished.

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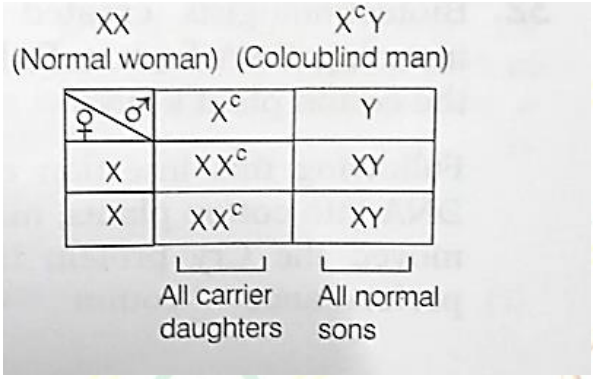
SECTION D

Q. Nos. 29 and 30 are case-based questions. Each question has 3 subparts with internal choice in one subpart.

29.Study the inheritance chart for colour blindness in a couple, where no history of this disease is present in the female partner.



(i) What is the probability of their grand children being colourblind in case?
(a) Carrier daughter marries a normal man.
(b) Carrier daughter marries a colourblind man.

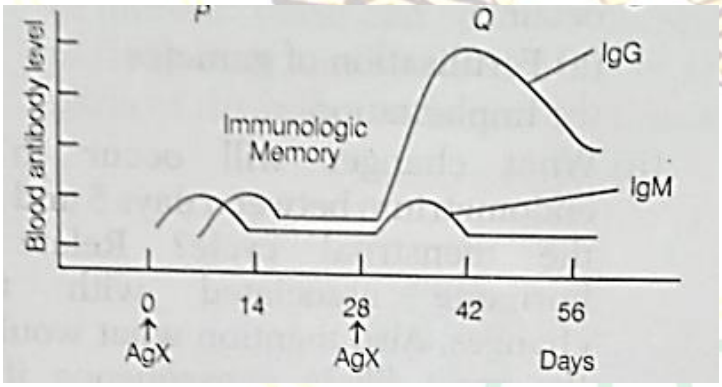
(ii) What would happen to children of all their sons?

Or

(ii) The gene for colour blindness is present on X-chromosome. How does this affect its inheritance?

(iii) Briefly explain another genetic disorder showing similar trait.

30.The data below shows the function of immune system towards an antigen X?



(i) With reference to the above graph, explain the response generated by our immune system at P ?
(ii) Evaluate the efficacy of Q towards antigen X.

(iii) Our immune system helps to protect us against virus and bacteria. Which cells of the immune system that helps in this function?

Or

(iii) Our environment contains a huge range of pathogenic microbes and toxic substances that challenge the host by a very broad selection of pathogenic mechanisms. It is not surprising therefore, that the immune system uses a complex

array of protective mechanisms to control an usually eliminate these organisms and toxins. Which general feature of the immune system is responsible for such targeted action?

SECTION E

31. (a) Explain the monosporic development of embryo sac in the ovule of an angiosperm.
(b) Draw a diagram of the mature embryo sac of an angiospermic ovule and label any four parts in it.

Or

(a) Explain the formation of placenta after the implantation in a human female.
(b) Draw a diagram showing human foetus within the uterus and label any four parts in it.

32. Name and describe the steps involved in the technique widely used in forensics that serves as the basis of paternity testing in case of disputes.

Or

It is sometimes observed that the F_1 progeny has a phenotype that does not resemble either of the two parents and has intermediate phenotype. Explain by taking a suitable example and working out the cross upto F_2 - progeny.

33. Bioreactors are the containment vehicles of any biotechnology-based production process. For large scale production and for economic reasons the final success of biotechnological process depends on the efficiency of the bioreactor: Answer the following questions with respect to the given paragraph.
(a) List the operational guidelines that must be adhered to so as to achieve optimisation of the bioreactor system. Enlist any four.
(b) Mention the phase of the growth we refer to in the statement "Optimisation of growth and metabolic activity of the cells".
(c) Is the biological product formed in the bioreactor suitable for the intended use immediate? Give reason in support of your answer.

Or

(a) 'EcoRI' has played very significant role in rDNA technology.
(i) Explain the convention for naming EcoRI.
(ii) Write the recognition site and the cleavage sites of this restriction endonuclease.
(b) What are the protruding and hanging stretches of DNA produced by these restriction enzymes called ? Describe their role in formation of rDNA.