

# SAMPLE QUESTION PAPER - 9

**CLASS - 12**

**BIOLOGY**

**Maximum Marks : 70**

**Time Allowed : 3 hours**

**General Instructions : Same as in Sample Question Paper - 1**

## SECTION - A

- Answer the following questions based on the above :
- (a) Write the sequence of nucleotides in the template strand of DNA, along with its polarity, from which this mRNA has been transcribed.
- (b) If the three nucleotides shown by the arrow in the above figure are deleted, what will be the sequence of amino acids in the new polypeptide translated ?
- (c) What is the significance of the last codon X in the mRNA shown. Name two other codons of the same category.
- (d) What is special about the first codon, AUG? What is spermatogenesis? Briefly describe the process of spermatogenesis.
- Or
- What is Embryogeny? Describe the development of dicot embryo.



**Maximum Marks : 70**

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**General Instructions : Same as in Sample Question Paper - 1**

## SECTION - A

Q.1. Which condition of gynoecium (pistil) is shown below :



- (a) (i) multicarpellary apocarpous, (ii) multicarpellary syncarpous
- (b) (i) multicarpellary syncarpous, (ii) multicarpellary apocarpous
- (c) (i) bicarpellary apocarpous (ii) bicarpellary syncarpous
- (d) (i) bicarpellary syncarpous (ii) bicarpellary apocarpous

Q.2. Match the following and choose the correct options.

Column I	Column II
A. Trophoblast	(i) Embedding of blastocyst in the endometrium
B. Cleavage	(ii) Group of cells that would differentiate as embryo
C. Inner cell mass	(iii) Outer layer of blastocyst attached to the endometrium
D. Implantation	(iv) Mitotic division of zygote

- Options :
- (a) A-(ii), B-(i), C-(iii), D-(iv)
- (b) A-(iii), B-(iv), C-(ii), D-(i)
- (c) A-(iii), B-(i), C-(ii), D-(iv)
- (d) A-(ii), B-(iv), C-(iii), D-(i)

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Q.3. An IUD recommended to promote the cervix hostility to the sperms is :

- (a) Copper-T (b) Multiload-375
- (c) LNG-20 (d) Cu7

Q.4. A colour blind man marries a woman with normal sight who has no history of colour blindness in her family. What is the probability of their grandson becoming colour blind ?

- (a) 0.5 (b) 1
- (c) Nil (d) 0.25

Q.5. In the presence of allolactose, the lac repressor in the operon of *E. coli*.

- (a) binds to the operator
- (b) binds to the promoter
- (c) cannot bind to the operator
- (d) binds to the regulator

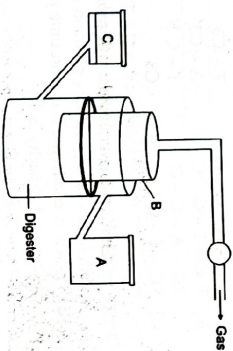
Q.6. Alec Jeffreys developed the DNA fingerprinting technique. The probe he used was :

- (a) rbozyme (b) sex chromosomes
- (c) SNP (d) VNTR

Q.7. Identify the disease which is not a sexually transmitted diseases ?

- (a) Gonorrhoea (b) Syphilis
- (c) Amoebiasis (d) Chlamydia

Q.8. The diagram given below represents a typical biogas plant. Select the correct option for A, B and C, respectively.



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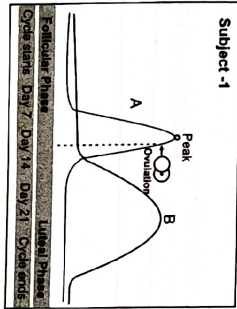
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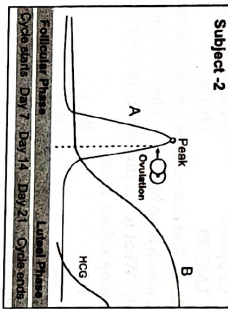
Note : Solution of this paper will be available on 15th November 2023.

- Q9. (a) A-Sludge, B-Dung + Water, C-CH<sub>4</sub> + CO<sub>2</sub>  
 (b) A-Dung + water, B-Sludge, C-CH<sub>4</sub> + CO<sub>2</sub>  
 (c) A-Sludge, B-CH<sub>4</sub> and CO<sub>2</sub>, C-Dung + water  
 (d) A-CH<sub>4</sub> + CO<sub>2</sub>, B-Dung + water, C-Sludge

Subject -1



Subject -2



The peak observed in subjects 1 and 2 is due to

- (a) oestrogen  
 (b) progesterone  
 (c) luteinizing hormone  
 (d) follicle stimulating hormone

Q10. Given below is the restriction site of a restriction endonuclease Pst I and the cleavage sites on a DNA molecule.

- (a) 5' C - T - G - C - A ↓ G 3'

- (b) 3' G ↑ A - C - G - T - C 5'

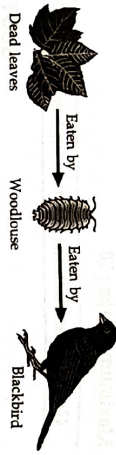
Choose the option that gives the correct resultant fragments by the action of the enzyme Pst I.

- (a) 5' C - T - G C - A - G 3'  
 3' G - A - C - G - T C 5'  
 (b) 5' C - T - G G - C - A - C 3'  
 3' G - A - C - G - T T - C 5'  
 (c) 5' C - T - G - C A - G 3'  
 3' G - A - C - G - T T - C 5'  
 (d) 5' C - T - G - C - A G 3'  
 3' G - C - A - C 5'

Q11. Which of the following equations will represent the growth in this case (Where population size is N birth rate is b, death rate is d, unit time period is t, and carrying capacity is K).

- (a)  $dn/dt = rN$   
 (b)  $dn/dt = rN(K-N/K)$   
 (c)  $DN/Dt = rN$   
 (d)  $dn/dt = rN(K+N/K)$

Q12. Identify the correct type of food chain shown below :



- (a) Grazing food chain  
 (b) Detritus food chain  
 (c) Aquatic food chain  
 (d) None of these

Question No. 13 to 16 consist of two statements—Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below :

- (a) Both A and R are true and R is the correct explanation of A.  
 (b) Both A and R are true and R is not the correct explanation of A.  
 (c) A is true but R is false.  
 (d) A is false but R is true.

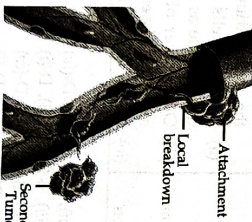
Q13. Assertion : Apomictic embryos are generally identical to the parent plant.

Reason : Apomixis is the production of seeds without fertilisation.

Q14. Assertion : Menstrual cycles are absent during pregnancy.

Reason : High levels of progesterone and estrogens during pregnancy suppress the gonadotrophins.

Q15. The figure shown below is showing the cancer cell which are breaking off from the tumour where they originated, travelling through the blood stream and getting lodged in other area. Study this figure and comment upon the appropriateness of the Assertion and Reason.



Assertion : The cancer shown above is more serious  
 Reason : This spreads from one organ to other body organs and there is increased interference with metabolic functioning.

Q16. Given below is the pond ecosystem, showing the complex interaction between biotic and abiotic factors. Study the ecosystem shown below and comment upon the appropriateness of the Assertion and Reason.  
 Assertion : The pyramid of number of the above ecosystem is upright.

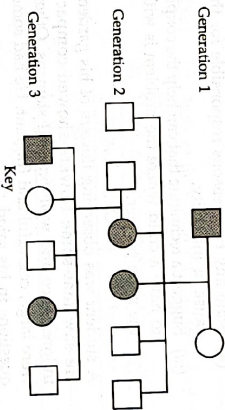


Reason : Phytoplanktons are maximum and secondary consumers are lesser in number in given ecosystem.

SECTION - B

Q17. Name the organic material extine of the pollen grain is made-up of. How is this material advantageous to pollen grain ?

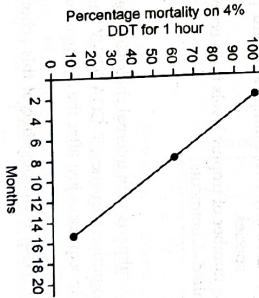
Q18. Given below is a pedigree chart showing the inheritance of certain sex-linked trait in humans.



- Key  
 Affected male (shaded square)  
 Affected female (shaded circle)  
 Unaffected male (white square)  
 Unaffected female (white circle)

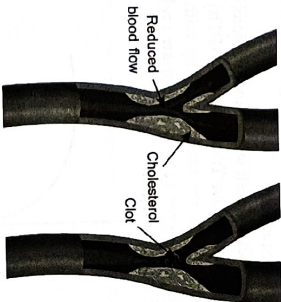
What will the trait traced in the above pedigree chart be called ?

Q19. Refer to the given graph and answer the following questions.



- (a) What does the above graph shows ?  
 (b) Why DDT has now become almost ineffective against mosquitoes ?

Q20. A patient suffered from myocardial infarction was admitted in ICU. The condition of coronary artery is depicted in the image below. Name two bioactive agents and their mode of action that can improve this condition.



Q21. Fill in the blanks :

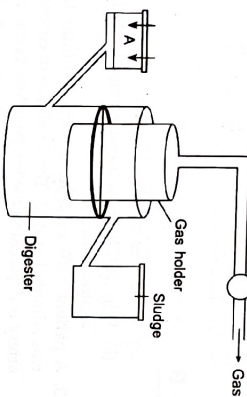
Species A	Species B	Type of Interaction	Example
+	-	_____	_____
+	+	_____	_____
+	_____	Commensalism	_____

Or  
 Apart from being part of the food chain, predators play other important roles. Mention any two such roles supported by examples.

**SECTION - C**

Q.22. Study the picture of biogas plant given below and answer the questions that follows.

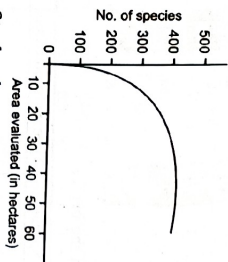
- (a) Name the components gaining entry from A into the chamber.
- (b) Mention the group of bacteria and the condition in which they act on the component that entered A in the digester.
- (c) Name the components that get collected in gas holder.



Q.23.

(a) What are such sequences called? Name the enzyme used that recognises such nucleotide sequences.

- Q.24. All Reproductive Tract Infections (RTIs) are STDs, but all STDs are not RTIs. Justify with example.
- Q.25. The given graph shows species-area relationship of a certain region.



(i) Study the graph and explain what it represents.

**SECTION - D**

Question No. 29 and 30 are case-based questions. Each Question has 3 subparts with internal choice in one subpart. Q.29. Some restriction enzymes break a phosphodiester bond on both the DNA strands, such that only one end of each molecule is cut and these ends have regions of single-stranded DNA. BamHI is one such restriction enzyme which binds at the

(ii) After a while, a small area was taken for constructing a road which divided the region into two. Write the impact of this construction would have on species richness of the region.

Q.26.

- (a) Name the two growth model that represent population growth and draw the respective growth curves they represent.
- (b) State the basis for the difference in the shape of these curves.
- (c) Which one of the curves represents the human population growth at present? Do you think such a curve is sustainable? Give reason in support of your answer.

Q.27.

A large number of married couples the world over are childless. It is shocking to know that in India the female partner is often blamed for the couple being childless.

- (i) Why is your opinion the female partner is often blamed for such situations in India.
- (ii) State any two reasons responsible for the cause of infertility.
- (iii) Suggest a technique that can help the couple to have a child where the problem is with the male partner.

Or

A student was observing flowers of his garden. He saw that some flowers showed compact inflorescence and well exposed stamens. Other were large, colourful and fragrant. He had some questions in his mind.

- (a) Which pollinating agent is used in the flowers showing compact inflorescence and well exposed stamens?
  - (b) Large, colourful and fragrant flowers are pollinated by which medium?
  - (c) Give any two examples of wind pollinated species.
  - (d) Salvia is pollinated by which agent?
  - (e) Give any two examples of bird pollinated species.
- Q.28. The number of trophic levels in an ecosystem are limited. Comments.

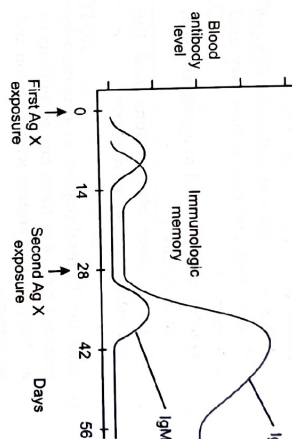
(ii) Explain how the gene of interest is introduced into a vector.

(iii) You are given the DNA shown below.  
 5' ATTTGAGGCAATCCGTAATGTCCT 3'  
 3' TAAAACTCCTAGGCATTACAGCA 5'  
 If this DNA was cut with BamHI, how many DNA fragments would you expect? Write the sequence of these double-stranded DNA fragments with their respective polarity.

Or

A gene M was introduced into *E. coli* cloning vector pRR322 at BamHI site. What will be its impact on the recombinant plasmids? Give a possible way by which you could differentiate non-recombinant to recombinant plasmids.

Q.30. Refer to the graph given below, answer the questions that follows:  
 (a) With the reference of the above graph, give two differences between primary and secondary immune response.



IgG antibody level is higher in secondary response. Comment.

**SECTION - E**

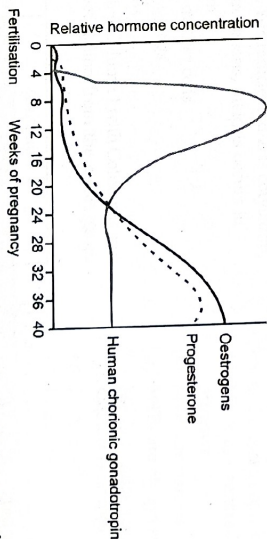
Q.31.

- (a) Arrange the following hormones in a sequence of their secretions in a pregnant woman. hCG, LH, FSH, Relaxin.
- (b) Mention their source and the function they perform.

Criteria	Hormone	Hormone	Hormone
Source			
Function			

Or

The graph given below is showing the levels of hCG, oestrogen and progesterone during pregnancy. Observe the graph carefully and answer the questions that follows.



- (i) What are the sources of these three hormones during the first 7-8 weeks of pregnancy?
- (ii) A part from the above three hormones shown in the above graph. What are the other hormones present in the female body? Also, write their functions.
- (iii) Explain the trend followed by hCG in the above graph.
- (iv) Which of the above given hormones checked for the confirmation of pregnancy?

# SAMPLE QUESTION PAPER - 10

**CLASS - 12**  
**BIOLOGY**

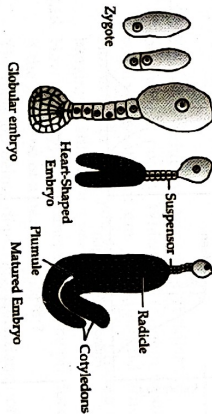
Maximum Marks : 70

Time Allowed : 3 hours

General Instructions : Same as in Sample Question Paper - 1

### SECTION - A

**Q.1.** Choose the correct labelling for the part X, Y and Z in the given figure of the stages in embryo development of dicot :



- Codes**
- (a) A - 1, B - 2, C - 3, D - 4  
 (b) A - 3, B - 2, C - 1, D - 4  
 (c) A - 4, B - 3, C - 2, D - 1  
 (d) A - 4, B - 2, C - 3, D - 1

**Q.4.** An infertile couple was advised to undergo invitro fertilisation by the doctor. Out of the options given below, select the correct stage for transfer to the fallopian tube for successful results ?

- (a) Zygote only  
 (b) Zygote or early embryo upto 8 blastomeres  
 (c) Embryos with more than 8 blastomeres  
 (d) Blastocyst stage

**Q.5.** DNA molecule is 160 base pairs long. If it has 20% adenine, how many cytosine bases are present in this DNA molecule ?

- (a) 48  
 (b) 64  
 (c) 96  
 (d) 192

**Q.6.** Following statements are given regarding MTP. Choose the correct options given below :

- (i) MTPs are generally advised during first trimester  
 (ii) MTPs are used as a contraceptive method  
 (iii) MTPs are always surgical  
 (iv) MTPs require the assistance of qualified medical personnel
- (a) (i) and (iii)  
 (b) (i) and (ii)  
 (c) (i) and (iv)  
 (d) (ii) and (iii)

**Q.7.** Interferons are most effective in making non-infected cells resistant against the spread of which of the following diseases in human ?

- (a) Ascariasis  
 (b) Ringworm  
 (c) Amoebiasis  
 (d) AIDS

- (b) Explain how the biochemical characterization (nature) of "Transforming Principle" was determined, which was not defined from Griffith's experiments.  
**Q.33.** (i) Explain monohybrid cross taking seed coat colour as a trait in *Pisum sativum*. Work out the cross up to F<sub>2</sub>-generation.  
 (ii) State the law of inheritance that can be derived from such a cross.  
 (iii) How is the phenotypic ratio of F<sub>2</sub>-generation different in a dihybrid cross ?
- Or
- Thalassaemia and Haemophilia are both Mendelian disorders related to blood. Write the symptoms of the disease. Explain with the help of crosses the difference in the inheritance pattern of the two diseases.

- Q.32.** (a) State the reasons for which Hershey and Chase carried out their experiments.  
 (b) Answer the following questions based on the experiments of Hershey and Chase :  
 (i) Name the different radioactive isotopes they used, and explain how they used them.  
 (ii) Why did they need to agitate and spin their culture ?  
 (iii) Write their observations and the conclusions they arrived at.
- Or
- (a) State the 'Central dogma' as proposed by Francis Crick. Are there any exceptions to it ? Support your answer with a reason and an example.



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