

**INDIAN SCHOOL SOHAR**  
**FIRST TERM EXAM-2014**  
**BIOLOGY**

18.09.14  
 STD XII

Marks:70  
 Time: 3Hrs

**General Instructions:-**

- (i) This question paper consists of four sections **A, B, C, D**. Section **A** contains **5** questions of **1** mark each, section **B** is of **5** questions of **2** marks each, section **C** is of **12** questions of **3** marks each, **1** question of **4** marks and section **D** is of **3** questions of **5** marks each.
- (ii) All questions are compulsory.
- (iii) There is no overall choice. However, an internal choice is provided in one question of **2** marks, one question of **3** marks and all questions of **5** marks weightage. Attempt only **one** of the choices in such questions.
- (iv) Questions of section **A** are to be answered in one word or **one sentence** each, section **B** in approximately **20-30** words each, section **C** in **30-50** words each and section **D** in **80-120** words each.

**SECTION-A**

1. Why is development of female gametophyte termed to be monosporic in majority of flowering plants? (1)
2. Name the property that:- (1)
  - (a) prevents a normal cell from becoming cancerous
  - (b) enable tumour cells invade and damage normal tissues.
3. Why is *Agrobacterium* mediated genetic transformation described as natural genetic engineer in plants? (1)
4. The possibility of a female becoming a haemophilic is extremely rare. Justify. (1)
5. A pregnant human female was diagnosed by her doctor that the foetus she is carrying has developed from a zygote formed by an XX egg fertilized by Y-carrying sperm. Why was she advised to undergo MTP. (1)

**SECTION-B**

6. How do the following cells serve our body? (2)
  - (a) B-lymphocytes
  - (b) Interferons.
7. DNA is a hydrophilic molecule. How can we make a bacterial cell competent to take up the DNA for transformation with recombinant DNA? (Cite two examples). (2)
8. When a red flowered *Antirrhinum* plant was crossed with a white flowered plant, the F<sub>1</sub> offspring did not resemble either of the two parents. (2)
  - (a) Mention the genotype and phenotype of the F<sub>1</sub> plant.
  - (b) Why did the flowers of F<sub>1</sub> not bear the parental colours?
9. How is Hugo-de-Vries concept of evolution different from that of Darwin? (2)

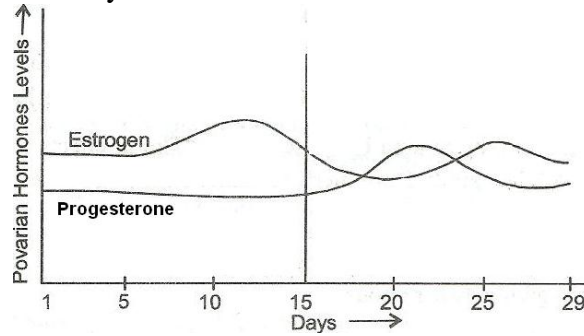
**OR**

- Account for the differences between wings of a butterfly, bat and fore limbs of man, bat in terms of evolution.
10. How would the following affect the Principle of Independent Assortment? (2)
    - (a) Linkage
    - (b) Crossing over.

**SECTION-C**

11.(a) Study the graph given below showing the level of ovarian hormones during menstruation and correlate the uterine events that take place according to the hormonal levels. (3)

(i) 6 - 15 days      (ii) 16- 25 days.



(b) Mention the principle that works behind the following contraceptive methods.

(i) Periodic abstinence      (ii) IUDs.

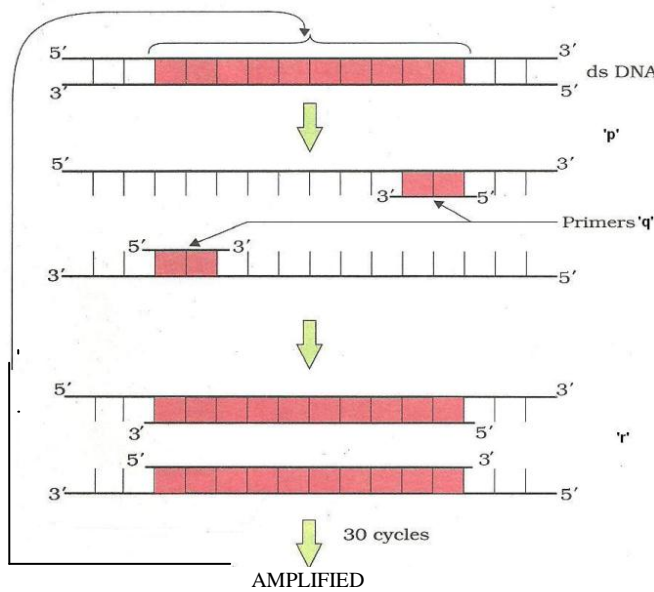
12. Schematically represent oogenesis in humans. Mention the number of chromosomes at each stage and correlate the life phases of the individual with the stage of the process. (3)

13. Pollination is defined as the transfer of pollen from an anther to the stigma. (3)

(a) Give the technical term for cross pollination and self-pollination.

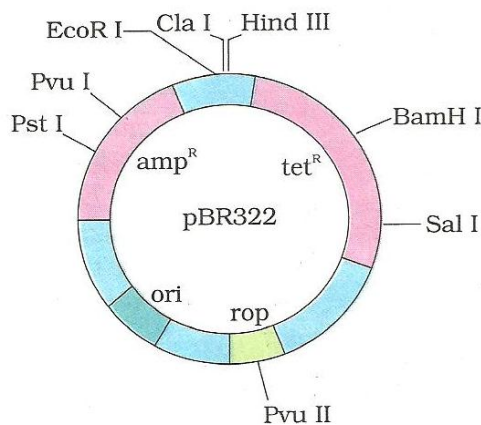
(b) Explain two factors that induce cross pollination where self-pollination otherwise would not have been possible.

14. Recombinant DNA technology involves several steps in a specific sequence. In the given figure label the parts marked (p), (q) and (r). Explain them briefly. (3)



**OR**

In the figure of *E. coli* cloning vector pBR322 shown below, explain the importance of (i) amp<sup>R</sup> (ii) ori (iii) rop.

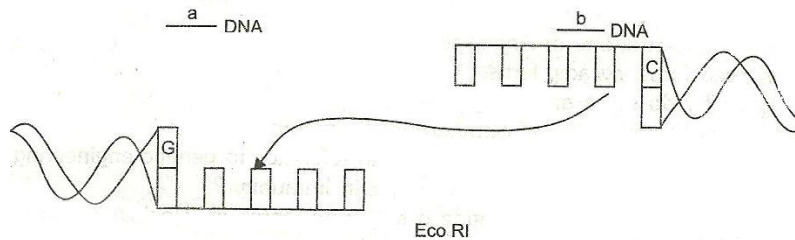


15. Fill in the gaps from P to U in the given table. (3)

| Microbe                             | Products      | Significance |
|-------------------------------------|---------------|--------------|
| <i>Monascus purpureus</i>           | P) -----      | Q) -----     |
| R) -----                            | Streptokinase | S) -----     |
| <i>Methylophilus methylotrophus</i> | T) -----      | U) -----     |

16. MOET is a technique used for successful production of hybrids. List the steps involved and two advantages of the above technique. (3)

17. The following figure depicts the linking of DNA fragments: (3)



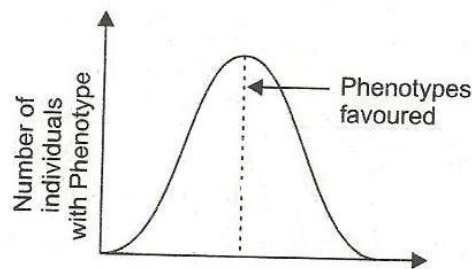
(a) Name 'a' DNA and 'b' DNA in the above figure.

(b) Name the restriction enzyme that (i) can recognize a pallindrome, (ii) links these two DNA fragments.

(c) How do restriction enzymes act on the DNA to form recombinant molecules?

18. With the advent of recombinant DNA technology a powerful tool is available for paternity testing, in case of disputes or in identifying a criminal. Name this tool and list the steps involved. (3)

19. The given graph represents the operation of natural selection favoring medium sized individuals. (3)



(a) Which type of natural selection would operate if :

(i) two peaks are formed (ii) the peak gets narrow and higher.

(b) What could be the likely reasons of new variations arising in the population?

20.(a) Write any four salient features of the genetic code. (3)

(b) Given below is the sequence of the nucleotides on the mRNA segment and the amino acid sequence in the polypeptide chain.

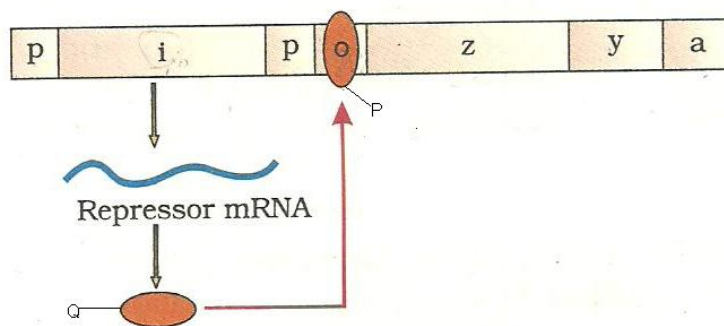
5'- AUGUUUAUGCCUGUUUAA-3', Polypeptide: 'X'-phe-met-proline-serine-'Y'

(i) Write the nucleotide sequence of the DNA from which this mRNA was transcribed.

(ii) What does the first(X) and the last codon(Y) on the mRNA stand for?

21. Given below is a schematic representation of the Lac Operon.

(3)



- (a) Name the parts labeled 'P' and 'Q' produced by the 'i' gene.  
(b) Explain, the mechanism involved in the Operon concept when the operator switch is 'on'.
22. A Thallemic child needed repeated blood transfusions got infected by HIV. (3)  
(a) Use a diagrammatic sketch to show how the virus increased in number.  
(b) Why did the increased number deteriorate the child's immunity?
23. Dependence is the tendency of the body to manifest a characteristic and unpleasant syndrome if regular dose of drugs or alcohol is abruptly discontinued. Dependence leads the patient to ignore all social norms in order to get sufficient funds to satisfy his needs. These result in many social adjustment problems. (4)  
(a) Why is that once a person starts taking alcohol or drugs, it becomes difficult for him to get rid of this habit?  
(b) What are the symptoms shown in such situations?  
(c) Mention the social adjustment problems that arise due to dependence on drugs or alcohol?

#### SECTION-D

24. DNA separated from one cell, when introduced in another cell is able to bestow some of the properties of the latter. (5)  
(a) Describe the experimental evidences which led to the discovery of the above phenomenon. Give the technical term for the above change.  
(b) How was the biochemical nature of the above principle characterized?
- (a) Explain, the process of transcription in bacteria with a schematic diagram. Why is transcription more complex in eukaryotes?  
(b) Why are both the strands of DNA not copied during transcription?
25. How do microbes play a dual role when used for sewage treatment as they not only help to retrieve usable water but also generate fuel. (5)

#### OR

- (a) Plant breeding programmes are carried out in a systematic way worldwide. How are new genetic varieties of crop created?  
(b) Cite an example each to understand the role played by microbes as (i) biocontrol agents and (ii) biofertilisers.
26. (a) Trace the development of embryo and its structure after syngamy in a dicot plant with neat diagrams. (5)  
(b) Endosperm development precedes embryo development. Justify.
- (a) Explain the stages, the zygote passes through after fertilization till pregnancy. Draw a neat diagram.  
(b) Why does all copulations not lead to fertilization and pregnancy?

\*\*\*\*\*THE END\*\*\*\*\*