

**ample Paper – 2012**  
**Class – XII**  
**Subject – Biology**

**Time :- 3 h**

**Max Marks :- 70**

*General Instructions:-*

1. This question paper consists of four sections A, B, C and D. Section A consists of 8 questions of one mark each. Section B consists of 10 questions of 2 marks each. Section C consists of 9 questions of 3 marks each. Section D consists of 3 questions of 5 marks each
2. Draw diagram wherever required, with Pencil only

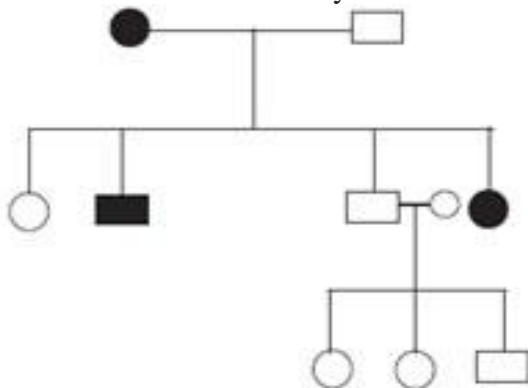
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**Section A**

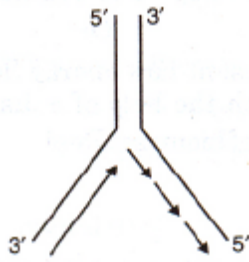
1. Which end does the tRNA join with m RNA during the translation?
2. What are Homologous organs?
3. Why is Human Genome Project called a mega project?
4. In human genome which one of the chromosomes has the most genes and which one has the fewest?
5. If the sequence of coding strand in a transcription unit is written as follows :  
5'- ATGCATGCATGCATGC-3'                      Write the sequence of mRNA
6. What is Adaptive radiation ?
7. What is the function of Enzyme Ligase?
8. Expand YAC and BAC.

**Section B**

9. What are restriction enzymes? Name one restriction enzyme and one enzyme used for joining alien DNA and vector DNA.
10. How did Griffith explain the transformation of R strain (non-virulent) bacterial into S strain (virulent)?
11. Briefly mention the contribution of T.H. Morgan in genetics
12. Explain briefly the Mendel's Back Cross and Test Cross?
13. Why is genetic code termed as Degenerate?
14. Which strand is termed as coding strand for transcription and Why?
15. State any one reason to explain why RNA viruses mutate and evolve faster than other viruses
16. In the following pedigree chart, state if the trait is autosomal dominant, autosomal recessive or sex linked. Give a reason for your answer.



17. Which one is the leading strand and why is so termed?



18. What are the three types of RNAs? Which one of the three has shape of clover leaf in 2D structure?

### Section C

19. If a double stranded DNA has 10% of cytosines, calculate the percent of adenine in the DNA.

- Who 1st proposed semi-conservative replication of DNA ?
- Which organism is used in this experiment?
- What is the result of 2nd and 3rd generation?

20. What is meant by R-cells and S-cells with which Frederick Griffith carried out this experiments on *Diplococcus pneumoniae*? What did he prove from these experiments.

21. Where do transcription and translation occur inside a living cell? Briefly describe the three

steps involved in the process of translations.

22. According to Hardy-Weinberg's principle the allele frequency of a population remains constant. If frequency of dominant allele is 0.6 than give frequency of heterozygous population.

23. In the medium where *E. coli* was growing, lactose was added, which induced the lac-operon. But why does lac-operon shut down after sometime after, addition of lactose in the medium?

24. State any one reason to explain why RNA viruses mutate and evolve faster than other viruses. When a red flowered *Antirrhinum* plant was crossed with a white flowered *Antirrhinum* plant, the F1 – offspring had pink flowers. Mention (a) the genotype of F1 plant and (b) the reason why it did not bear the parental red or white flower colours?

25. Draw schematically a single polynucleotide strand (with at least three nucleotides). Provide labels and directions.

26. Choose and rearrange any four of the following groups of plants in an ascending evolutionary scale. Cycads; Gnetales; Monocotyledons; Rhynia-like plants; Chlorophyta ancestors; Dicotyledons; and Seed ferns.

27. Trace the evolution of Homo Sapiens.

### Section D

28. T.H. Morgan while going on a walk, found a fruit covered with flies. He took the flies to their laboratory. He along with his students performed experiment for several generations. They surprised to see some of characters do not obey Mendelian principal of independent assortment.

- Write common name of the flies and also its scientific name.
- The tendency of two characters to remain inherited together for different generations is called as.
- Tendency of two characters to stay separately for different generation is.....
- Draw the diagram of physical basis of this type of inheritance.

**OR**

Colour blindness is a sex linked disease. It is due to X-chromosome. Normal parents have three daughter, all normal and one son colour blind. What is the reason for it. Show the inheritance of a sex linked recessive case of human being.

29. Give answers to the following questions

(i) Why does continuous replication occur on the template with 3'-5' polarity? Name the enzyme which helps in the process.

(ii) Why discontinuous replication occurs on the template with 5'-3' polarity? Mention the enzyme which

helps in joining the small strands of nucleotides.

(iii) What is replication fork? Explain.

**OR**

An mRNA strand has a series of codons out of which three are given below:

(i) AUG (ii) UUU (iii) UAG

(a) What will these DNA codons be translated into?

(b) What are the DNA codons that would have transcribed these RNA codons?

30. When a cross is made between tall plant with yellow seeds (TtYy) and tall plant with green seeds (Tt yy), what proportions of phenotype in the offspring could be expected to be

(a) tall and green (b) dwarf and green

**OR**

The gene I that controls the ABO blood grouping in human beings has three alleles IA, IB and i .

(a) How many different genotypes are likely to be present in the human population?

(b) Also, how many phenotypes are possibly present?