

Roll No: \_\_\_\_\_

This question paper consists of 33 questions in 7 printed pages.

**D.A.V. INSTITUTIONS, CHHATTISGARH**

**SAMPLE QUESTION PAPER – 2023-24**

**CLASS – XII**

**TIME: 03.00 Hrs.**

**SUBJECT – BIOLOGY**

**M.M.: 70**

**General Instructions:**

- There are 33 questions in this question paper. All questions are compulsory.
- Section - A Consist of 16 questions of 1 mark each.
- Section - B Consist of 5 questions of 2 marks each.
- Section - C Consist of 7 questions of 3 marks each.
- Section - D Consist of 2 case based questions of 4 marks each
- Section - E Consist of 3 questions of 5 marks each
- There are no overall choices. However internal choice has been provided in some questions. Student has to attempt only one of the alternatives in such questions.

## SECTION - A

1. If a double stranded DNA contain 20% cytosine what will be the percentage of adenine?  
a) 20%    b) 40%    c) 30%    d) 60%
2. Hardy Weinberg equilibrium affected by  
a) evolution, saltation and drift  
b) natural selection, saltation and reproductive isolation  
c) genetic recombination, natural selection, mutation, genetic drift
3. If most of the individuals in a population are young why is the population likely to grow rapidly in the future?  
a) Many individuals will begin to reproduce soon  
b) Death rate will be low  
c) Immigration and emigration can be ignored  
d) all of these
4. The diagnostic test that confirms typhoid is  
a) ELISA    b) Widal    c) MRI    d) Amniocentesis
5. Plasmid used to construct the first rDNA was isolated from  
a) Agrobacterium    b) E. coli    c) Salmonella typhimurium    d) Thermus aquaticus
6. If a plasmid vector is digested with Eco RI at a single site then  
a) one sticky end will be produced.  
b) two sticky ends will be produced  
c) four sticky ends will be produced  
d) six sticky ends will be produced
7. Which enzyme is used to remove oil stains from clothes?  
a) streptokinase    b) trypsin    c) lipase    d) amylase

8. PEN is a product of

- a) 2 polar nuclei and 1 synergid
- b) 1 polar nucleus, 1 antipodal and 1 synergid
- c) 2 polar nuclei and one male gamete
- d) 2 polar nuclei and 1 secondary nucleus

9. Gel electrophoresis is used for

- a) construction of rDNA
- b) isolation of DNA
- c) cutting of DNA fragments
- d) separation of DNA fragments

10. The primate which existed 15mya was

- a) Homo habilis
- b) Australopithecus
- c) Rama pithecus
- d) Homo erectus

11. The total number individuals of a species per unit area and per unit time is called

- a) population size
- b) population density
- c) population dynamics
- d) population attributes

12. During transcription the site of DNA molecule at which RNA polymerase binds is

- a) receptor
- b) enhancer
- c) regulator
- d) none of these

13.

**For question numbers 13, 14, 15 and 16 two statements are given - one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.**

- a. Both assertion and reason are true and the reason is the correct explanation of the assertion.
- b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- c. Assertion is true but reason is false.
- d. Assertion is false but reason is true.

13. **Assertion** : The amount of energy decreases at successive trophic levels

Reason: : Energy does not remain trapped permanently in any organism

14. **Assertion** : In *Mirabilis* the pink colored flowers appear in F1 generation

**Reason** : Pink color is observed due complete suppression of white color alleles in one of the parental flowers by red color allele

**15. Assertion** : GM plants are made tolerant to abiotic stress

**Reason** : Golden rice is rich in carotenes.

**16. Assertion** : Myometrium is an important component of uterus

**Reason** : Myometrium contract during parturition

### SECTION – B

**17.** How are desirable DNA sequences cut?

**18.** Construct an ideal pyramid of energy when 1000000 J sunlight is available. Label all trophic levels

**19.** How does a geneticist need to carry a test cross? How is it carried?

**OR**

Explain the reason for skin color gradations in man

**20.** Different species of Trichoderma are useful to humans as well as plants. Justify their roles by giving one instance of each.

**21.** List any three methods used by ecologists to measure population size?

### SECTION- C

**22.** Given below is a strand of DNA

3' TACGTACGTACGTAC 5'

- a) Write its complementary strand.
- b) Write the possible RNA strand transcribed from it.
- c) Mark promoter, terminator, template and coding strand for the given segment.

23. What are bio patents? Mention their significance.

24. Describe the mutual relationship between fig tree and wasp and comment on the phenomenon that operates in their relationship.

**OR**

- a) Explain the birth and death rate in the population with the help of an example each.
- b) What is age pyramid? Draw an age pyramid for a declining population.

25. How is apomixis different from parthenocarpy? Describe any two methods by which such seeds are produced? How is it significant in agriculture?

26. Double fertilization is reported in Castor and Ground nut. However mature seed of ground nut is non albuminous and castor is albuminous. Explain the post fertilization events responsible for it.

27. Schematically represent oogenesis.

28. Differentiate between mutualism and parasitism.

#### SECTION D

Q no. 29 and 30 are case based questions. Each question has 3 sub parts with internal choice in one



- a. Name the compound obtained from the given plant.
- b. What is the chemical nature of the compound obtained from this plant?
- c. What are the major effects of the plant obtained from the given plant?

OR

Write the chemical name draw the chemical structure of the compound formed from it.

30. In a dihybrid cross white eyed yellow bodied female *Drosophila* is crossed with red eyed, brown bodied male fly. 98.7% progeny with parental combinations were produced in F<sub>2</sub>.

- a) What would be the probable reason for deviation from Mendel's ratio?
- b) who conducted the cross for the first time?
- c) How does physical distance between genes works in such crosses?

OR

If the number of offspring obtained in the above case is 847 then what will be the number of recombinants?

#### SECTION – E

31. State a method of cellular defense which works in all eukaryotes? How does this help in pest resistance in plants

OR

Write the steps you would suggest to be undertaken to obtain a foreign gene product.

32. a) At the time of independence the population of India was 350 million which exploded to over 1 billion by may 2000. List any 2 reasons for this rise in population and any 2 steps taken by the government to check this explosion.

b) Why there is a statutory ban on amniocentesis?

c) Why is this technique called so called?

OR

- a. When and how does placenta develop in human female?
- b. How is the placenta connected to the embryo?
- c. Placenta act as an endocrine gland. Explain.

33. a) A tall pea plant bearing violet flowers is given with its unknown genotype. Explain by working out the crosses how would you find the correct genotype with respect to two traits mentioned only by selfing the given plants.

OR

Disease X is a disorder due to autosomal aneuploidy. Children with this syndrome suffer from severe mental retardation, furrowed tongue, open mouth etc.

- a) Name the disease X.
- b) How many number of chromosomes are present in the child?
- c) What will be the sex chromosomal complement in males suffering from this disease.
- d) State the cause of disease X



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