

Roll No. : _____

This question paper consists of 33 questions in 9 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. Identify whether each of the following statement is true or false and select the correct option.
 - A. The process of breakdown of detritus by detritivores is called humification.
 - B. The mass of living matter present at a trophic level of a food chain at a given time is called standing crop.
 - C. Trees occupy the top vertical strata of a forest, shrubs the second and grasses and herbs occupy the bottom layer.
 - D. In an ecological pyramid the amount of energy available at the lower trophic level is always more than at a higher trophic level.

a) A-F,B-F,C-T,D-T b) A-T,B-T,C-F,D-T c) A-F,B-T,C-F,D-T d) A-T,B-F,C-T,D-F
2. The principle of vaccination is based on the property of
 - a) specificity b) diversity c) memory d) discrimination between self and non self
3. The promotor site and the terminator site for transcription are located respectively at
 - a) 3' (downstream) and 5' (upstream) end respectively of the transcription unit
 - b) 5' (upstream) end and 3' (downstream) end respectively of the transcription unit
 - c) the 5' (upstream) end of the transcription unit
 - d) the 3' (downstream) end of the transcription unit
4. What are minisatellites?
 - a) 10-40bp sized small sequences with in the gene
 - b) short coding repetitive regions of eukaryotes
 - c) short non coding repetitive sequence forming large portion of eukaryotic genome
 - d) regions of coding strand of the DNA
5. The gene which codes for insecticidal protein that are incorporated into crops are procured from
 - a) Agrobacterium b) Meloidogyne incognita c) Bacillus thuringiensis d) Thermus aquaticus
6. Which of the following is a nitrogen fixing cyanobacterium

a) Rhizobium b) Azotobacter c) Oscillatoria d) Azospirillum

7. HIV is a retrovirus in infected human cells it produces DNA by

a) DNA dependent DNA polymerase

b) DNA dependent RNA polymerase

c) RNA dependent RNA polymerase

d) RNA dependent DNA polymerase

8. In a pond ecosystem the food chain starts with

a. Zooplanktons **b.** small insects **c.** Phyto planktons **d.** Small fishes

9. The remnant of nucellus persistent in some seeds like A is called B

a) A. Black pepper, B. Perisperm b) A. Beet, B. Endosperm

c) A. Castor, B. Perisperm d) A. Black pepper, B. Endosperm

10. Embryo with more than 16 blastomeres formed due to invitro fertilization is transferred into

a) uterus b) fallopian tube c) fimbriae d) cervix

11. Select the option that correctly represent in decreasing order, the number of species in the group of animals mentioned.

a. Fishes---Mammals---Aves---Reptiles

b. Mammals---Reptiles---Aves---Amphibians

c. Fishes---Aves---Reptiles---Amphibians

d. Mammals---Fishes---Aves---Reptiles

12. The type of antibody produced during allergic reaction is

a) IgA b) IgE c) IgG d) IgM

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** : **Lactational amenorrhea is the natural method of contraception**

Reason : It increases the phagocytosis of sperm

14. **Assertion** : A genetically modified crop contain and express one or more useful foreign genes

Reason : Genetically modified crops are generally pest resistant.

15. **Assertion** : India is one of the 12 mega diversity countries of the world.

Reason : India has only 2.4% of the total land in the world but it share global biodiversity is 8.1% .

16. **Assertion** : When the two genes in a dihybrid cross are situated on the same chromosome, the proportion of the parental gene combinations is much higher than the non parental type

Reason : **Higher** parental gene combinations can be attributed to crossing over between two genes.

SECTION – B

17. Identify the birth control method associated with Diaphragm, Saheli, CuT and Tubectomy

18. **How is humus formed?** Mention any three characteristics of humus.

19. How does the transmission of each of the following disease

OR

Name the plant source of the drug commonly called smack . How does it affect the body of the user?

20. How does fitness of a population help in evolution?

21. Why is proinsulin so called? How is insulin different from it?

SECTION- C

- 22.** Draw a diagram of L.S of embryo of grass and label any six parts.
- 23.** Prior to sports event blood and urine samples of sports person are collected for drugs tests.
- a) Why is there a need to conduct such tests?
 - b) Name the drug the authorities usually look for.
 - c) Write the generic names of two plants from which these drugs are obtained.

24. Describe the role of (a) high temperature, (b) primer and *Thermus aquaticus* in carrying the process of PCR

OR

What is the basis of technique which is used in criminal investigation and forensic science

25. **Draw a** diagram of human sperm. Label only those parts along with their function that assist the sperm to reach and gain entry into female gamete.

26. A typical mammalian cell has 2.2 m long DNA molecule, whereas the nucleus in which it is packed measures about 10^{-6} m. Explain its possibility.

27. A cross between a normal couple resulted in a son who was haemophilic and a normal daughter. In course of time when the daughter was married to a normal man to their surprise the grandson was also haemophilic.

a) Represent this cross in the form of a pedigree chart. Give the genotype of the daughter and her husband.

b) Write the conclusion you draw about the inheritance pattern of this disease.

28. Which bacterium has been used as a clot buster? What is the mode of action?

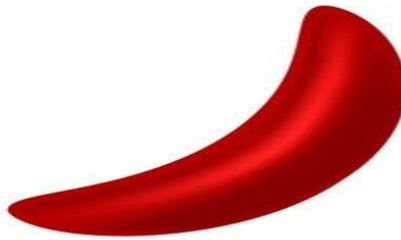
SECTION D

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

29. Sickle cell anemia is a Mendelian disorder, it is an autosomal disorder. It is controlled by a single gene with two alleles Hb^A and Hb^S . The figure given below shows red blood cells of A, a normal individual and B an individual with sickle cell anemia



NORMAL RED BLOOD CELL



SICKLE RED BLOOD CELL

- a. Why do RBCs become sickle shaped?
- b. How is it transmitted?
- c. Write the sequence of amino acids in the relevant portion of HbA (normal peptide) and HbS (sickle cell peptide)

OR

How does this disorder differ from Thalassemia

30. Each trophic level in a food chain has certain amount of living matter. It is measured in terms of biomass. Biomass is expressed in terms of fresh weight or dry weight.

- a. Why is measurement of biomass in terms of dry weight more accurate than fresh weight?
- b. Why is pyramid of energy always upright

OR

Draw an inverted pyramid of number with corresponding food chain.

c. Why is pyramid of number can be upright or inverted?

SECTION – E

31. Explain the two complexities that are observed in the process of transcription in eukaryotes and not in prokaryotes

OR

- a. Write the contributions of George Gamow, Hargobind Khorana and Marshall Nirenberg
- b. State the importance of genetic code in protein synthesis

32. Read the following passage and answer the following questions.

For effective treatment of a disease early diagnosis and understanding of its pathophysiology are important. Presence of a viral or a bacterial pathogen is normally suspected only when the disease symptom appear. Very low concentration of the pathogen when it has not produced the symptoms can be detected by molecular diagnosis.

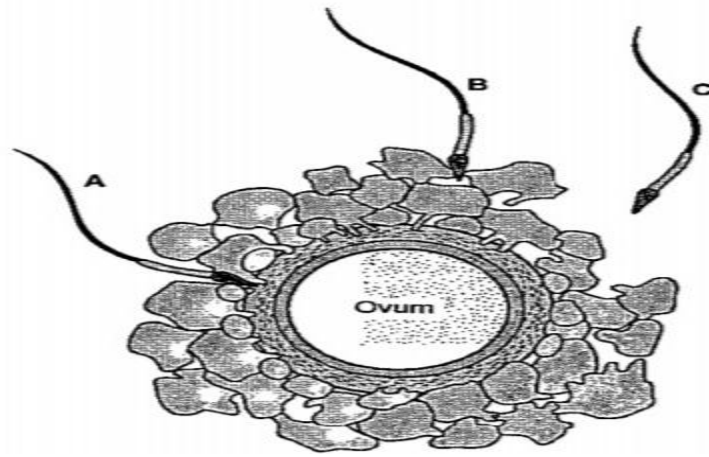
- a) Name two molecular diagnostic method used for early detection of pathogens.
- b) Expand ELISA. Mention the principle on which it works. What are the two ways in which infection by a pathogen can be detected using ELISA?
- c) How is a probe used to detect the mutated gene in suspected cancer patients.

OR

- a. B galactosidase is a better selectable marker. Justify
- b. List four steps to isolate DNA from a bacterial cell.

33. a) Plan an experiment and prepare a flow chart of the steps that you would follow to ensure that the seeds are formed only from the desired sets of pollen grains. Name the type of experiment that you carried out.

OR



- a) One of the sperms is observed to penetrate the ovum as shown in the above diagram. Name the layer which is going to penetrate by sperm (a)
- b) How is the sperm able to do so?
- c) Where exactly in the fallopian tube does this occur?
- d) Explain the events thereafter up to morula stage.



* * * * *