ANANDALAYA

PERIODIC TEST - 3

Class : XI

विद्या सर्वार्थ साधिका

Subject: Biology (044) MM : 40

Date : 07-01-2025 Time: 1 Hr. 30 min.

General Instructions:

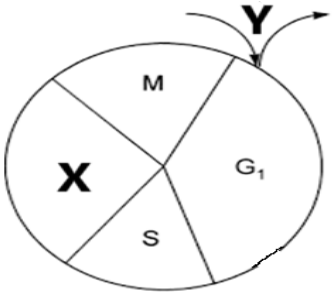
1. There are 20 questions in all. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
3. Section A consists of twelve MCQs of 1 mark each, Section B consists of two questions of 2 marks each, Section C consists of two questions of 3 marks each, Section D consists of two long questions of 5 marks each and Section E consists two case study based questions of 4 marks each.
4. There is no overall choice. However, an internal choice has been provided in section D and E. You have to attempt only one of the choices in such questions.

SECTION A

1. Which of these cells do not divide? (1)
   (A) Melanocytes (B) Osteocytes (C) Heart cells (D) Liver cells

2. The ideal stage for determining the total number of chromosomes in every species and conducting a detailed study of chromosome shape is _____. (1)
   (A) Anaphase (B) Metaphase (C) Telophase (D) Interphase

3. The given figure represents the various stages of the cell cycle. The stages X and Y are _____. (1)
   (A) X – G_2 ; Y – G_0
   (B) X – G_0 ; Y – G_2
   (C) X – S_2 ; Y – G_0
   (D) X – G_2 ; Y – S_0



4. The endomembrane system does not include which of the following? (1)
   (A) Lysosome (B) Golgi Bodies (C) Vacuole (D) Peroxisome

5. Cell theory does not apply to _____. (1)
   (A) Fungus (B) Virus (C) Algae (D) Bacteria

6. The dark reaction of photosynthesis is not totally independent of light as: (1)
   (A) The initial reactions occur in the presence of light
   (B) The reaction will be inhibited by the presence of light
   (C) It can occur during the day as well
   (D) It utilises the products of the light reaction

7. _____ produces energy in plant cells using the respiratory system (1)
   (A) Golgi complex (B) Mitochondria (C) Chloroplast (D) Ribosome

8. Which of the following statements is not correct regarding the C_4 plants? (1)
   (A) Toleration of higher temperatures (B) Response to high light intensities
   (C) Greater productivity of biomass (D) Photorespiration

9. Which of the following options matches Column I and Column II. (1)

Column I	Column II
(a) Cristae	(i) Flat membranous sacs in stroma
(b) Cisternae	(ii) Infoldings in mitochondria
(c) Thylakoids	(iii) Disc-shaped sacs in Golgi apparatus

(A) (a) - (ii); (b) – (iii) ; (c) – (i)
(B) (a) - (i); (b) – (ii) ; (c) – (iii)
(C) (a) - (ii); (b) – (i) ; (c) – (iii)
(D) (a) - (iii); (b) – (ii) ; (c) – (i)

10. Which of the following options is not correct? (1)
(A) Robert Brown discovered the cell.
(B) Schleiden and Schwann formulated the cell theory.
(C) Virchow explained that cells are formed from pre-existing cells.
(D) A unicellular organism carries out its life activities within a single cell.

For question numbers 11 and 12, two statements are given, one labelled as Assertion (A) and the other labelled as 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 Reason is the correct explanation of Assertion
(B) Both Assertion and Reason are true but Reason is NOT the correct explanation of Assertion.
(C) Assertion is true but Reason is false.
(D) Assertion is false and Reason is also false.

11. (A) : Rudolf Virchow modified the hypothesis of cell theory given by Schleiden and Schwann. (1)
(R) : Cell theory says that all cells arise from pre-existing cells.

12. (A) : Some cells undergo G_0-phase due to the inactivation of the cell cycle. (1)
(R) : Cells at this stage remain metabolically active, but no longer proliferate.

SECTION B

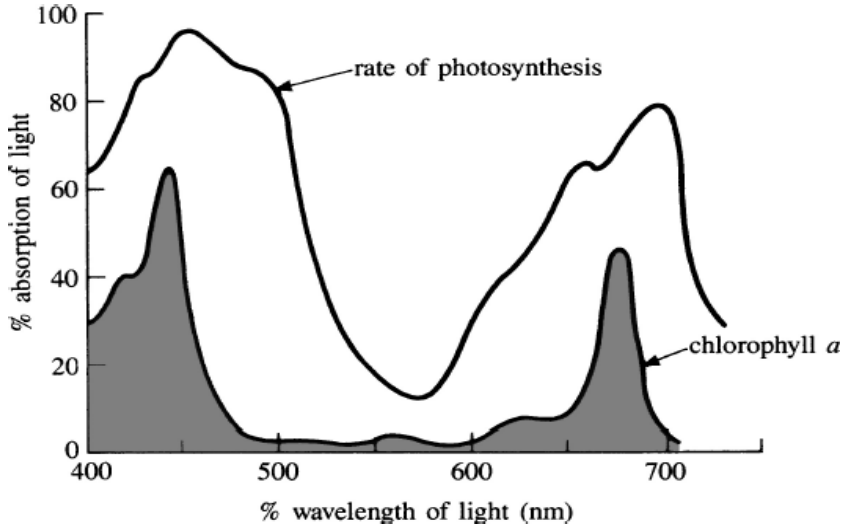
13. Both lysosomes and vacuoles are endomembrane 'structures, yet they differ in their functions. Comment on the given statement. (2)

14. How is Anaphase of Mitosis different from Anaphase-I of Meiosis? (2)

SECTION C

15. What is a centromere? Give a brief account of four different types of chromosomes with the help of diagrams. (3)

16. The graph given below, shows the absorption spectrum and the efficiency of photosynthetic activity of 'chlorophyll a' at the various wavelengths of light. (3)



(a) What do you infer from the graph? Explain.

(b) Why do the graphs of the absorption spectrum and the photosynthetic activity of 'chlorophyll a' do not overlap?

SECTION D

17. Name the double membranous cell organelle present in the animal cell. Explain the structural characteristics of the organelle with the help of diagrams. State any two of its functions. (5)

OR

(a) "Cell is the basic unit of life. " Justify the given statement by stating two scientific reasons.

(b) Describe the structure of the nucleus with the help of labelled diagrams.

18. (a) What special anatomical features are displayed by the leaves of C_4 plants? Explain it with the help of a diagram. (5)

(b) How do C_4 plants provide the advantages over the structure of C_3 plants?

SECTION E

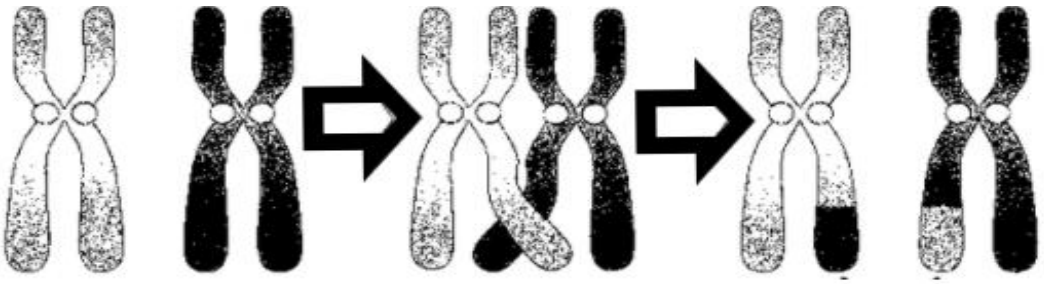
Questions 19 and 20 are Case Study Based questions and are compulsory.

19. Sexual reproduction involves the fusion of two gametes, each with a complete haploid set of chromosomes. In animals, gametes are formed from specialised diploid cells. Meiosis ensures the production of the haploid phase in the life cycle of sexually reproducing organisms and fertilisation restores the diploid phase.

(a) Mention any two key features of meiosis. (1)

(b) Why does the chromosome number of the cells reduce during meiosis? (1)

(c) Study the stages of meiosis I in the given figure and answer the questions that follow: (2)

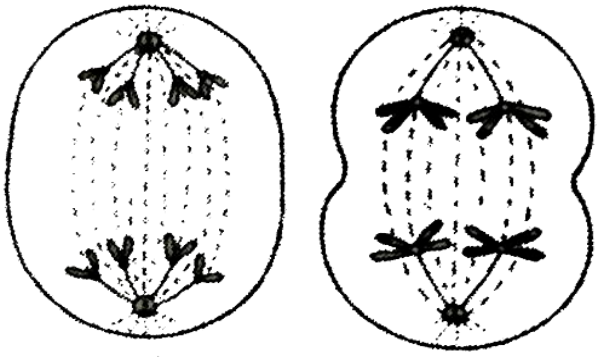


(i) Identify the phase that resulted in the formation of recombinant chromatids.

(ii) Write the significance of these stages that occur during meiosis.

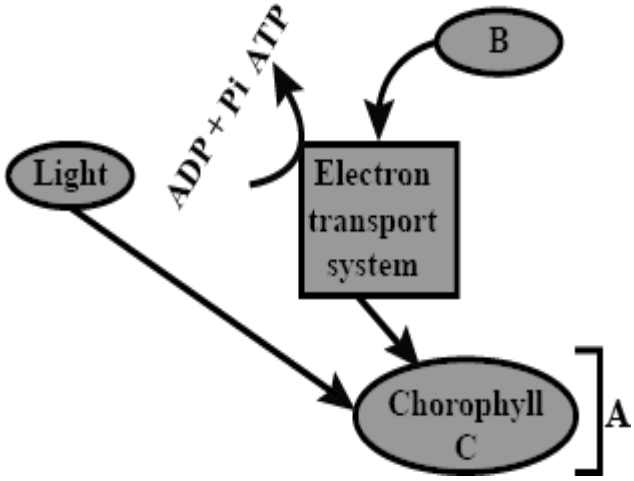
OR

(d) The given figures represent stages that occur during meiosis. Identify the stages and compare them to write one difference between them.



A **B**

20. Light reactions or the 'Photochemical' phase include light absorption, water splitting, oxygen release, and the formation of high-energy chemical intermediates. Several complexes are involved in the process. The pigments are organised into two discrete photochemical light-harvesting complexes (LHC) within Photosystems I and II (PS I and II). The figure given below depicts the cyclic photophosphorylation of photochemical reactions.



(a) The process shown in the figure takes place in _____. (1)

(b) Which photosystem is involved in cyclic photophosphorylation? Why? (1)

(c) Explain the structure and significance of the part labelled as 'A' in the figure. (2)

OR

(d) Explain under which conditions cyclic photophosphorylation would perform non-cyclic photophosphorylation.