

SESSION ENDING EXAMINATION (2022-23)
CLASS XI
BIOLOGY (044) THEORY

Time: 3 Hours

Maximum Marks: 70

General Instructions:

- (i) *All questions are compulsory.*
- (ii) *The question paper has five sections: Section A, Section B, Section C, Section D and Section E. There are 33 questions in the question paper.*
- (iii) *Section–A has 16 questions of 1 mark each, Section–B has 5 questions of 2 marks each. Section–C has 7 questions of 3 marks each and Section–D has 02 case-based questions of 4 marks each and Section–E has 3 questions of 5 marks each.*
- (iv) *There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.*
- (v) *Wherever necessary, neat and properly labelled diagrams should be drawn.*

Section-A

1. Species is
 - a. specific class of evolution
 - b. unit of classification
 - c. not related to evolution
 - d. Unit in the evolutionary history of a tree.
2. The practical purpose of classification of living organisms is to
 - a. name the living organisms
 - b. explain the origin of living organisms
 - c. facilitate identification of unknown organisms
 - d. trace the evolution of living organisms
3. Flowers are zygomorphic in
 - a. Mustard
 - b. Gulmohar
 - c. Hibiscus
 - d. Datura
4. Technical term used when stamens are fused into a single bundle;
 - a. Adelphous
 - b. Monoadelphous
 - c. Diadelphous
 - d. Polyadelphous
5. The longest cell in human body are-
 - a. Muscle cells
 - b. Nerve cells
 - c. Blood cells
 - d. Mast cells

6. The apical meristem of the root is present-
 - a. Only in tap roots
 - b. In all the roots
 - c. Only in adventitious roots
 - d. Only in radicals.
7. An outer covering membrane is absent in
 - a. Mitochondria
 - b. Plastids
 - c. Ribosomes
 - d. Lysosomes
8. The structure of plasma membrane fluid mosaic model is proposed by
 - a. Robert Hooke
 - b. Singer and Nicolson
 - c. M.J. Schlieden
 - d. Robert Brown
9. The food material stored in plants in the form of
 - a. Glucose
 - b. Fructose
 - c. Starch
 - d. Glycogen
10. Centromere is required for
 - a. Crossing over
 - b. Movement of chromosomes towards poles
 - c. Transcription
 - d. Cytoplasmic cleavage
11. The most abundant organic compound on the earth is
 - a. Lipid
 - b. Protein
 - c. Cellulose
 - d. Steroids
12. The 'islets of Langerhans' are found in
 - a. Alimentary canal
 - b. Stomach
 - c. Pancreas
 - d. Liver

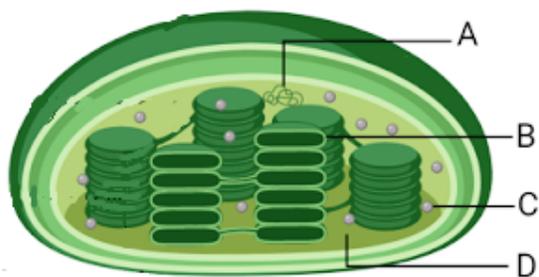
Note: Question No. 13 to 16 consists of two statements- Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below;

- a. If both A and R are true and the R is correct explanation of the A.
- b. If both A and R are true and the R is not a correct explanation of the A.
- c. If A is true but R is false.
- d. If both A and R are false.

13. Assertion (A): Photosynthetically C_4 plants are less efficient than C_3 plants.
Reason (R): The operation of C_4 pathway requires the involvement of only bundle-sheath cells.
14. Assertion (A): The 'absorption spectrum' of chlorophyll 'a' is determined in terms of the rate of production either per unit mass of green tissue or per unit weight of total chlorophyll.
Reason (R): Chlorophyll 'a' is present in both the pigment system I & II.
15. Assertion (A): Abscission zone in leaves is formed across the petiole near its junction with the stem.
Reason (R): In many compound leaves, each leaflet also forms an abscission zone.
16. Assertion (A): Plants usually bends towards the source of light.
Reason (R): Shoot apex shows positive phototropism because of differential growth caused due to unequal distribution of auxin.

Section-B

17. Label A, B, C and D in the following diagram-



Or

Write the differences between RER and SER on the basis of their structure and function.

18. Match the column I with that of column II-

Column I	Column II
Family	Tuberosum
Kingdom	Solonum
Species	Plantae
Genus	Solanaceae

19. How do you represent the following by symbols in a floral formula?
a. Bisexual
b. Actinomorphic
c. Zygomorphic
d. Superior ovary
20. Write the differences between dicot and monocot stem.
21. Explain the process of gaseous exchange in alveoli with reference to partial pressure of pCO_2 and pO_2 in alveolar air and in the blood.

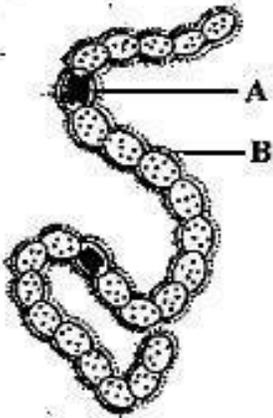
Section-C

22. Explain briefly the various stages of cell cycle with diagram.

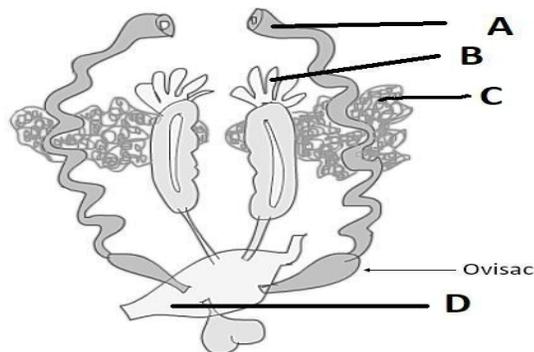
Or

In which stage of meiosis the following formed? Choose the answer from the hint point given below. (Hint: After telophase I/before meiosis II, Zygotene, Telophase I/After meiosis I, Pachytene, Diakinesis, Pachytene):

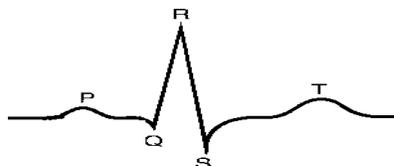
- a. Synaptonemal complex
 - b. Recombination nodules
 - c. Appearance/activation of enzyme recombinase
 - d. Terminalisation of chiasmata
 - e. Interkinesis
 - f. Formation of dyad cells
23. Briefly describe the Calvin cycle with the help of suitable diagram.
24. Name the phyla to which following cells/characters/system belong:
- a. Jointed appendages, b. Calcareous shell, c. Pneumatic bones, d. Flame cells, e. Nephridia, f. External ears
25. Identify the given diagram:



- a. What do A and B denote?
 - b. Give the role of A and B.
 - c. Give to more examples of this type of organism.
26. Name the types of joints between the following:
- a. Atlas & axis
 - b. Carpel & metacarpal of thumb
 - c. Between phalanges
 - d. Femur & acetabulam
 - e. Between cranial bones
 - f. Between pubic bones in the pelvic girdle.
27. Identify the system shown and label the parts shown by A, B , C, D. Write the function of any three parts.



28. In the following figure ECG of a normal person is shown:



- What do P wave and T wave represent?
- Mention any one medical application of this technique.

Section-D

Note: Read the given passage in question no 28 and 29 and answer any four questions that follow

29. Proteins are polypeptide chains made up of amino acids. There are 20 types of amino acids joined together by peptide bond between amino and carboxylic group. There are two kinds of amino acids, essential and non essential amino acids. The primary structure of protein is the linear sequence of amino acids in a polypeptide chain. The first amino acid of sequence is called N-terminal amino acid and the last amino acid of peptide chain is called C-terminal amino acids. The secondary structure proteins form helix. There are three types of secondary structure: α -helix, β -pleated and collagen helix. In tertiary structure long protein chain is folded upon itself like a hollow woollen ball to give three-dimensional view of protein. In quaternary structure each polypeptide develops its own tertiary structure and function as sub unit of protein.

- Glycine and Alanine are different with respect to one substituent on the alpha carbon. What are the other common substituent group?
 - NH_2 , COOH and H
 - NH_2 & H
 - COOH & NH_2
 - COOH & H
- The tertiary structure of protein contains:
 - H Bond
 - Peptide Bond
 - Ionic Bond & S- Linkage
 - All of the above
- The smallest amino acid is:

- i. Phenol
 - ii. Formic acid
 - iii. Glycine
 - iv. Methane
- d. There is extensive diversity of protein molecule is due to:
- i. NH_2 -Group
 - ii. R – Group
 - iii. COOH - Group
 - iv. Sequence of amino acid
- e. Assertion (A): Amino acids are monomer of nucleic acid.
Reason (R): In proteins, amino acids have unlimited variety.
- i. Both A and R are true R is correct explanation of A.
 - ii. Both A and R are true but R is not the correct explanation of A.
 - iii. Both A and R are true.
 - iv. Both A and R are false.

30. ABO grouping is based on the presence or absence of two surface antigens on the RBCs viz. A and B. Antigens are chemicals which can induce immune response. The plasma also contains two natural antibodies. Antibodies are proteins produced in response to antigens.

Importance of Blood Group: During blood transfusion, the donor blood need to be carefully matched with the blood of the recipient. Transfusion of unmatched blood can lead to severe problems of clumping, i.e. destruction of RBC.

Blood Groups and Donor Compatibility			
Blood Groups	Antigen on RBC	Antibodies in Plasma	Donor's Group
A	A	Anti-B	A, O
B	B	Anti-A	B, O
AB	AB	Nil	AB, O
O	Nil	Anti-A & Anti-B	O

- a. Which blood group is universal blood donor?
- i. A
 - ii. B
 - iii. AB
 - iv. O
- b. Which blood group is universal recipient?
- i. A
 - ii. B
 - iii. AB
 - iv. O
- c. Blood Grouping is based on:
- i. Presence of antigen

- ii. Absence of antigen
 - iii. Presence or absence of antigen on RBC.
 - iv. None of the above
- d. Which blood group can develop antibody-A?
- i. A, AB
 - ii. B, O
 - iii. AB, O
 - iv. O, A
- e. The chemical nature of Antigens and antibodies is:
- i. Carbohydrate
 - ii. Lipid
 - iii. Proteins
 - iv. Steroids

Section-E

31. Name the three groups of plants that bear Archegonia. Briefly describe the life cycle of any one of them.

Or

- a. What are chordates? Differentiates between Chordates and non-chordates. (Any four points)
 - b. All vertebrates are chordates but all the chordates are not vertebrates. Justify the statements.
32. a. Describe the EMP pathway with the help of flow chart.
- b..Define Respiration Quotient (R.Q.). What is its value for Proteins and Carbohydrates?

Or

Name two plants showing Kranz Anatomy? How the said anatomical feature does help to minimize photosynthetic losses due to photorespiration? Explain in details with the help of flow charts.

33. a. Explain the transmission of a nerve impulse across a chemical synapse process.
- b..Differentiate between ammonotelism and ureotelism.

Or

- a. Which Endocrine gland is considered as the Master Gland and why? Explain the role of any four hormones produced by it.
- b. Name the male and female hormones and describe their functions.
