

**CLASS XI
BIOLOGY (044)**

Maximum Marks: 70

Time: 3 hours

General Instructions:

- (i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions.
(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; Section– D has 2 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

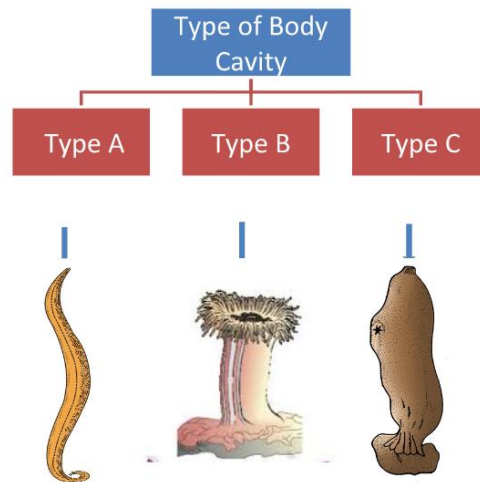
1. The stage of meiosis which involves the splitting of centromere is
(a) Anaphase I
(b) Metaphase I
(c) Metaphase II
(d) Anaphase II
2. Match the following and choose the correct option:

	Type of vascular bundle		Found in
A	Open, conjoint	i	Roots of potato
B	Closed, conjoint	ii	Roots of grass
C	Open, radial	iii	Stem of mustard
D	Closed, radial	iv	Stem of sugarcane

- (a) A-iv, B-iii, C-ii, D-i
(b) A-iii, B-iv, C-i, D-ii
(c) A-i, B-ii, C-iv, D- iii
(d) A-ii, B-i, C-iii, D-iv
3. Which of the following pairs of plants has stamens with different lengths in their flower?
(a) *Salvia* and Sweet pea
(b) Mustard and China rose
(c) *Salvia* and Mustard
(d) Mustard and Lily
4. Which one of the following options gives the correct categorisation of animals according to the type of nitrogenous wastes produced by them?

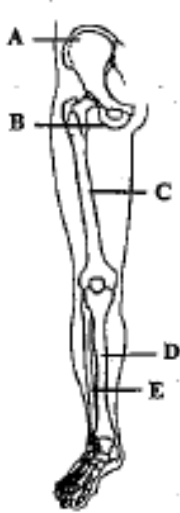
	Ammonotelic	Ureotelic	Uricotelic
(a)	Aquatic amphibians	Human, lizard	Cockroach, crow
(b)	Aquatic amphibians	Frog, horse	Grasshopper, eagle
(c)	Aquatic amphibians	Frog, human	Bat, crocodile
(d)	Aquatic amphibians	Horse, lizard	Butterfly, sparrow

5. 70S and 80S ribosomes are found respectively in
- mitochondria and bacteria
 - bacteria and cytoplasm of human cell
 - cytoplasm of plant cell and cytoplasm of human cell
 - cytoplasm of human cell and mitochondria
6. In the flow chart below, categorise the animals (A-C) based on the type of body cavity in the given examples.



- A – Acoelomate; B – Pseudocoelomate; C – True coelomate
 - A – Pseudocoelomate; B – Acoelomate; C – True coelomate
 - A – True coelomate; B – Acoelomate; C – Pseudocoelomate
 - A – Pseudocoelomate; B – True coelomate; C – Acoelomate
7. Carnivora includes:
- group of organisms belonging to related genera
 - group of organisms belonging to related species
 - group of organisms belonging to related families
 - group of organisms which are similar in all features
8. Choose the correct statement.
- Lichen is a composite organism formed by the symbiotic association of an algae and a protozoan.
 - Paramecium* and *Plasmodium* belong to the same kingdom as that of *Penicillium*.
 - Nostoc* and *Anabaena* are decomposers belonging to Kingdom Protista.
 - Euglena* belonging to Kingdom Protista acts like a predator of small organisms in the absence of light.
9. Meiotic division in pteridophytes occurs
- During gamete formation
 - After gamete formation
 - During spore formation
 - After spore formation

10. Observe the diagram given below. Parts labelled as A to E respectively indicate



- (a) A-Ilium, B- Ischium, C- Femur, D- Tibia, E- Fibula
- (b) A-Ischium, B- Ilium, C- Humerus, D- Radius, E- Ulna
- (c) A-Ilium, B- Ischium, C- Femur, D- Fibula, E- Tibia
- (d) A-Ischium, B- Ilium, C- Femur, D- Tibia, E- Fibula

11. Which of the following regions of the brain is incorrectly paired with its function?

- (a) Medulla oblongata- controls respiration and cardiovascular reflexes
- (b) Limbic system- regulates sexual behaviour and expression of emotional reactions
- (c) Hypothalamus- produces releasing hormones and regulates temperature, hunger and thirst
- (d) Cerebellum- maintains posture, regulates intersensory association and communication

12. The condition of erythroblastosis foetalis occurs only when

- (a) both father and mother are Rh-
- (b) father is Rh- and mother is Rh+
- (c) mother is Rh+ and foetus is Rh-
- (d) mother is Rh- and foetus is Rh+

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

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true and R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is false but R is true.

13. Assertion: Body tissues obtain O_2 from oxyhaemoglobin.

Reason: Dissociation of oxyhaemoglobin is caused by high O_2 and low CO_2 concentration.

14. Assertion: Binomial nomenclature is system of providing name with two components.

Reason: The first component represents the specific epithet and the second component represents the generic name.

15. Assertion: Trichomes may be branched or unbranched and soft or stiff.

Reason: Trichomes help in preventing water loss due to transpiration.

16. Assertion: Sunflower plant has long internodes with leaves far apart.

Reason: Sunflower produces sufficient amount of gibberellins during its growing period.

SECTION B

17. Differentiate between *Spirogyra* and *Gelidium* on the basis of:

- (i) Pigment composition
- (ii) Stored food

18. Complete the following table relating the protein with its function

Protein	Function
(a) _____	Intercellular ground substance
Trypsin	_____ (b) _____
(c) _____	Hormone
GLUT-4	(d) _____

19. State a difference between each of the following:

- (i) Inspiratory capacity and expiratory capacity
- (ii) Cortical and juxtamedullary nephrons

OR

Compare the transmission of nerve impulse across motor end plate and chemical synapse.

20. Compare the structure of the causative agents of potato spindle tuber disease and tobacco mosaic disease.

21. (a) Which of the following plants show photorespiration?

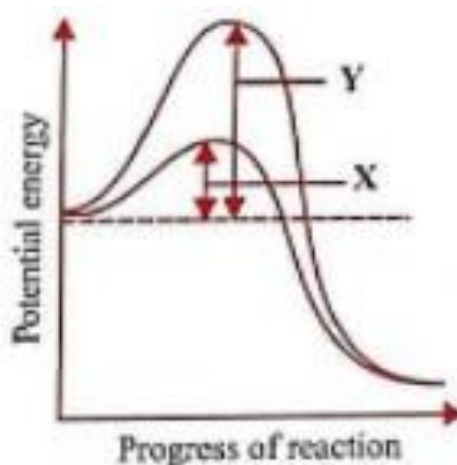
Cotton, Maize, Peanut, Sorghum

(b) Which enzyme can act as both a carboxylase and oxygenase?

SECTION C

22. 'The axonal membrane is said to be polarised even at rest.' Explain.

23. Study the graph and answer the following questions:



(a) Which among X and Y shows activation energy in the presence of enzyme?

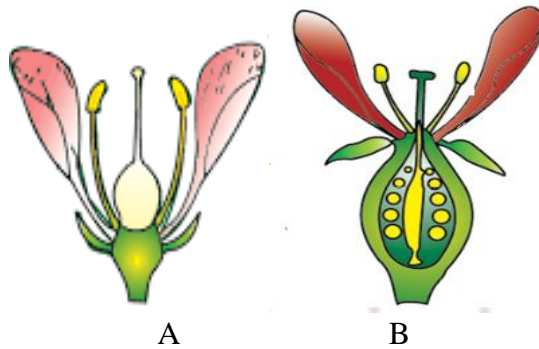
(b) How does the presence of enzymes affect the rate of reaction?

(c) Is the reaction shown above exothermic or endothermic? On what basis did you conclude this?

24. Mention the steps involved in the sexual reproduction in fungi.

25. (a) Why is dicot leaf called dorsiventral and monocot leaf isobilateral?

(b) Identify the types of flowers A and B on the basis of the position of floral parts on thalamus.



26. Give reasons for the following:

- (a) Tea plants are decapitated in tea gardens.
- (b) Ethephon is applied on cucumber plants.
- (c) Gibberellins are applied to apple trees.

27. Name the phylum in which the following structures are found. Write the functions of these structures.

- (i) Water vascular system
- (ii) Radula
- (iii) Parapodia

28. (a) Which organelles constitute the endomembrane system of a eukaryotic cell?

(b) Why are these considered as the endomembrane system?

SECTION D

Q.No 29 and 30 are case-based questions. Each question has subparts with internal choice in one subpart.

29. Anjali observed a flower and drew the following floral diagram. Based on the diagram, answer the following questions:



(a) Identify the type of placentation shown.

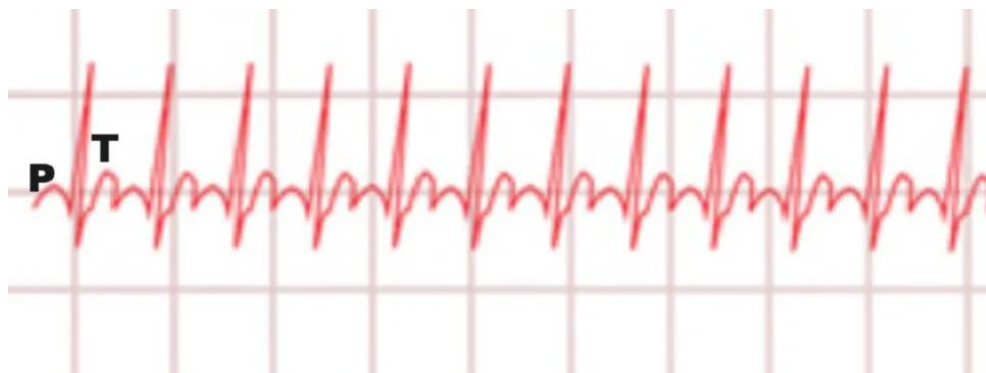
(b) Which type of aestivation is shown in the calyx of the flower?

OR

Name the type of stamens on the basis of their attachment.

(c) Write the floral formula for the given flower.

30. Given below is the ECG of a person recorded for six seconds. Examine it and answer the questions that follow:



- (a) Which tissue is responsible for the electrical activity of the heart?
(b) What does the P- wave represent?

OR

What does the T- wave represent?

- (c) How is the heart beat rate determined based on ECG? Calculate the heart beat rate of the individual whose ECG is given above.

SECTION E

31. (a) Name the monomeric proteins which constitute the anisotropic band in a muscle fibre.
(b) Draw the structure of the filament which is responsible for shortening of the I band during muscle contraction.
(c) State the role of the following in muscle contraction:
(i) Ca^{2+}
(ii) ATP

OR

- (a) Name the two iodothyronine hormones.
(b) Give a diagrammatic representation of the mechanism of action of iodothyronine hormones.
(c) If a pregnant lady takes an iodine-deficient diet, how will it affect her and the developing foetus?

32. (a) Which pathway is common in both aerobic and anaerobic respiration in plants?
(b) Give the schematic representation of the above pathway.

OR

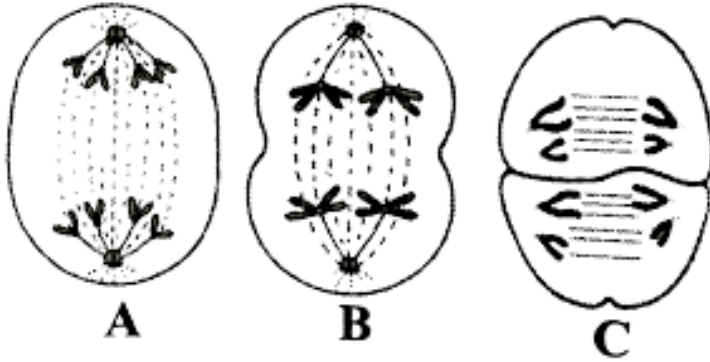
- (a) Which photosynthetic pathway is common to both C₃ and C₄ plants? Mention the location of occurrence of this pathway in both C₃ and C₄ plants.
(b) Give the schematic representation of the above pathway.

33. (a) 'The events taking place during prophase are opposite to those taking place in telophase.' Justify.

(b) If a tissue has at a given time 256 cells, how many cycles of mitosis had the original parental single cell undergone?

OR

(a) Identify the mitotic and meiotic division stages depicted in the diagrams A, B and C. Give reason in support of your answer.



(b) State the ploidy and number of chromosomes in daughter cells formed in A and B.