

APEEJAY COMMON ANNUAL EXAMINATION
SESSION 2022-23
CLASS XI SUBJECT: BIOLOGY

Maximum Marks: 70

Time: 3 hours

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (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. Selaginella, a pteridophyte shows some advances towards the seed habit. Consider the following statements. 1
 - I. Development and retention of embryo inside megasporangium.
 - II. Homospory
 - III. Formation of several megaspores within a megasporangium.
 - IV. Enhancement in the size of male gametophyte.

Choose the incorrect statements with regard to prerequisites for seed habit.

 - A. I and III
 - B. I and IV
 - C. II, III and IV
 - D. II and III only

2. How many organisms in the list given below are autotrophs? Lactobacillus, Nostoc, Chara, Nitrosomonas, Nitrobacter, Streptomyces, Saccharomyces, Trypanosoma, Porphyra, Wolffia 1
 - A. Four
 - B. Five
 - C. Six
 - D. Three

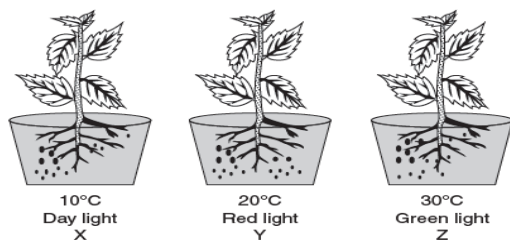
3. In which one of the following, the generic name, phylum and two characteristic features mentioned are **not** correctly matched? 1

S.No	Organism	Characteristic 1	Characteristic 2
A.	Pila	(i) Mollusca Body segmented	(ii) Mouth with radula
B.	Asterias	(i) Echinodermata Spiny skinned	(ii) Water vascular system
C.	Sycon	(i) Porifera Pore bearing	(ii) Canal system
D.	Periplaneta	(i) Arthropoda Jointed appendages	(ii) Chitinous exoskeleton

4. Fruit of *Mangifera indica* is 1
 - A. berry
 - B. drupe
 - C. capsule
 - D. siliqua

5. The diagram below shows three plants with identical leaf surface areas:

1



Assuming all other conditions were identical for all three plants, which of the plants would likely to photosynthesize slowest and fastest.

- A. Y slowest, Z fastest
- B. Z slowest, X fastest
- C. X slowest, Z fastest
- D. Z slowest, Y fastest

6. Match the Column

1

	Column I		Column II
	(Category)		(Secondary Metabolites)
a.	Pigments	a)	Concanavalin A
b.	Terpenoids	b)	Monoterpenes, Diterpenes
c.	Alkaloids	c)	Morphine, Codeine
d.	Lectins	d)	Carotenoids, Anthocyanins
e.	Toxins	e)	Abrin and Ricin
f.	Drugs	f)	Vinblastin, Curcumin

- A. a-1, b-2, c-6, d-4, e-5, f-6
- B. a-4, b-2, c-3, d-1, e-5, f-6
- C. a-3, b-4, c-6, d-5, e-1, f-2
- D. a-2, b-1, c-4, d-6, e-5, f-6

7. Fresh pancreatic tissues were incubated in isotonic medium containing radioactively labeled amino acids. Samples of pancreatic tissues were removed at regular intervals to check the site of radioactivity. Which one of the following represents the order in which radio activity appeared in the organelles?

1

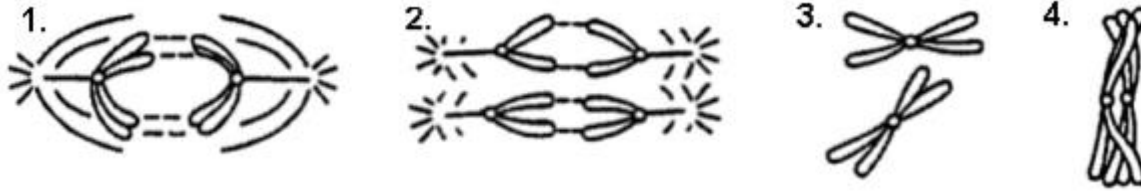
- A. Golgi apparatus, smooth endoplasmic reticulum, rough endoplasmic reticulum and secretory vesicles.
- B. Rough endoplasmic reticulum, smooth endoplasmic reticulum, Golgi complex and secretory vesicles.
- C. Rough endoplasmic reticulum, smooth endoplasmic reticulum, secretory vesicles and Golgi complex
- D. Smooth endoplasmic reticulum, rough endoplasmic reticulum, Golgi complex and secretory vesicles

8. Which of the following is not a feature that distinguishes a male frog from a female frog?

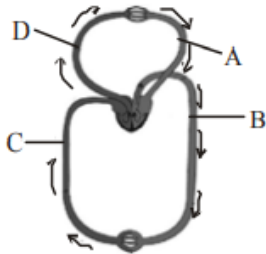
1

- A : Narrow abdomen
- B : Copulatory pad
- C : Vocal sacs
- D : Moist, slippery skin

9. The diagrams shown below are the depiction of various stages of meiosis I and II division of a single pair of homologous chromosome. Which of the following combinations is the correct sequence for meiosis? 1



- A. 4, 3, 1, 2
 B. 2, 3, 4, 1
 C. 3, 4, 1, 2
 D. 4, 3, 2, 1
10. Vincristine is a drug use in chemotherapy to treat cancer, which prevents spindle formation during cell division. Which one of these events **cannot** occur? 1
- A. DNA replication
 B. chromosome coiling
 C. sister chromatids becoming visible
 D. sister chromatid separation
11. A somatic cell that has just completed the S phase of its cell cycle, If compared with the gamete of the same species the cell will have 1
- A. twice the number of chromosomes and four times the amount of DNA
 B. four times the number of chromosomes and twice the amount of DNA
 C. twice the number of chromosomes and twice the amount of DNA
 D. same number of chromosomes but twice the amount of DNA
12. The figure shows blood circulation in humans with labels A to D. Select the option which gives correct identification of label and functions of the part. 1



- A-Pulmonary vein-takes impure blood from body parts, $PO_2=60$ mm Hg
 B-Pulmonary artery – takes blood from heart to lungs, $PO_2=90$ mm Hg
 C-Vena Cava-takes blood from body parts to right auricle, $PCO_2=45$ mm Hg
 D-Dorsal aorta – takes blood from heart to body parts, $PO_2=95$ mm Hg

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

- A. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 B. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 C. If Assertion is true but Reason is false.
 D. If both Assertion and Reason are false.

13. **Assertion** : Auxins help to prevent fruit and leaf drop at early stages. 1
Reason : Auxins promote the abscission of older mature leaves and fruits
14. **Assertion**: Mechanism of muscle contraction is explained by sliding-filament theory. 1
Reason: Contraction of muscle fiber takes place by the sliding of thick filaments over the thin filaments
15. **Assertion**: Insulin stimulates glycogenolysis and gluconeogenesis resulting in hyperglycemia. 1
Reason: Prolonged hyperglycemia leads to complex disorder called diabetes insipidus.
16. **Assertion** : Symptoms of emphysema develops when a person living on plains ascends and stays on a 1
mountain.
Reason : Air pressure and partial pressure of oxygen falls with the rise in altitude.

SECTION – B

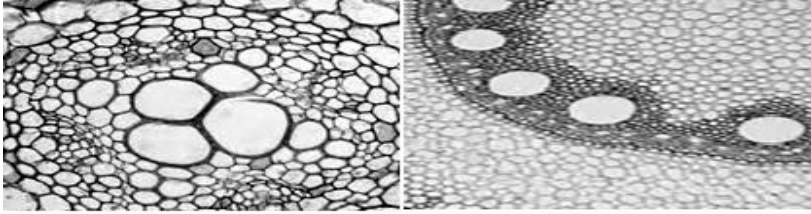
17. What would be the consequence, if mitotically dividing cells undergo each of the following irregularities 2
during division?
a) Duplication of DNA does not occur.
b) Cytokinesis does not occur.
c) Kinetochores are absent at the primary constriction in certain chromatids.
d) Condensation and coiling of chromosomes becomes defective.
18. How is the use of Ethephon advantageous? Mention any two crops and the benefit derived when 2
ethephon is used constructively.
19. Support your answer with appropriate reasons 2
a) Frogs cannot be easily spotted in any surrounding.
b) Frogs do not drink water
c) We do not find Frogs during extreme summer seasons
d) Frogs are beneficial for mankind.
20. Cite two examples each and the reason behind as to why reproduction and growth cannot be an all- 2
inclusive defining characteristic of living organisms
21. Diagrammatically represent the electrical potential difference across the plasma membrane at the site of 2
the action potential, during and after conduction of nerve impulse through an axon.

OR

Diagrammatically represent and label the parts of a sarcomere.

SECTION – C

22. Identify the histological features of a typical angiosperm plant part and distinguish between A and B with 3
appropriate comments.

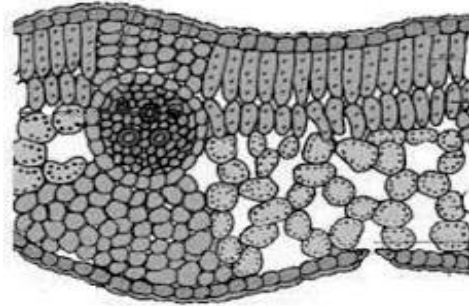


A

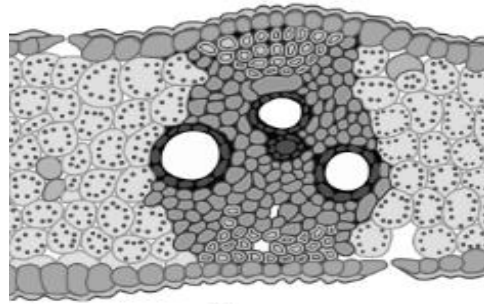
B

OR

Identify the histological features of a typical angiospermic plant part. Distinguish between A and B with appropriate comments.

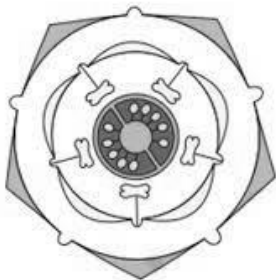


A



B

23. Mention the characteristic features of ascomycetes and basidiomycetes of kingdom Fungi on the basis of their (i) Mycelium, (ii) Types of asexual spores and (iii) Type of fruiting body. 3
24. a) If you observe the vertical section of Maize leaves under the microscope what are the structural features that will be visible? 3
 b) Why C₄ plants are considered special?
 c) Why photorespiration does not occur in C₄ plants
25. 'Human beings have significant ability to maintain and moderate the respiratory rhythm with the help of neural system'. Explain the methods of its control. 3
26. Describe the characteristics of Calyx or Corolla, Androecium and Gynoecium with the help of the floral diagram shown below 3



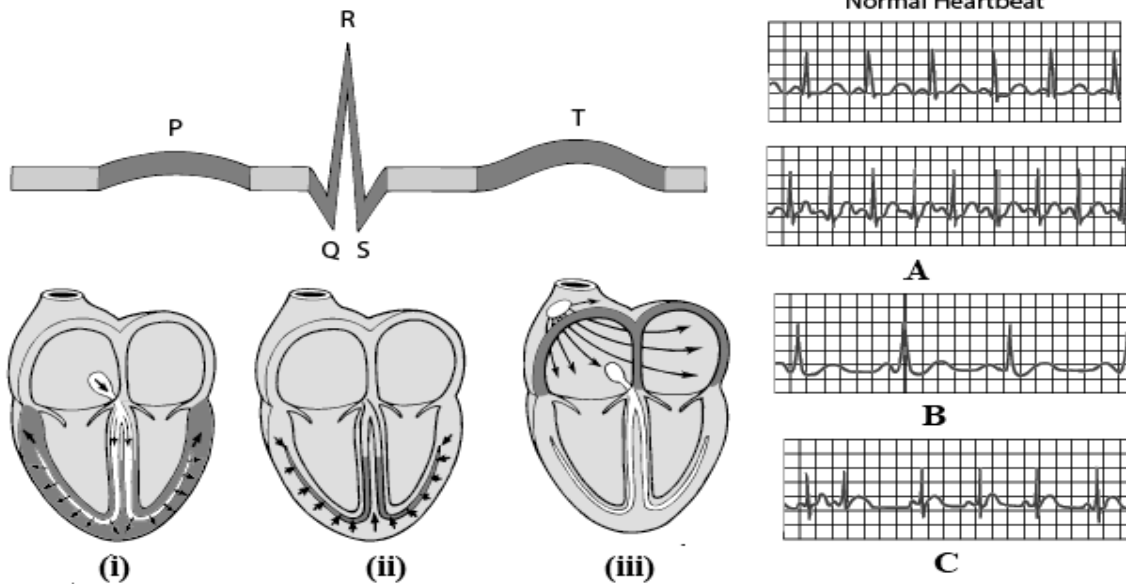
27. a) Name the predominant stage in the life cycle of Moss and Fern that is formed immediately after spore formation. Write any two distinguishing features of each of them. 3
 b) Why are Mosses known as pioneers of ecological succession?
28. Elaborate on the three types of cofactors that are bound to the enzyme that makes it catalytically active. Support it with appropriate examples. 3

SECTION – D

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

29. Observe the diagram given below

4



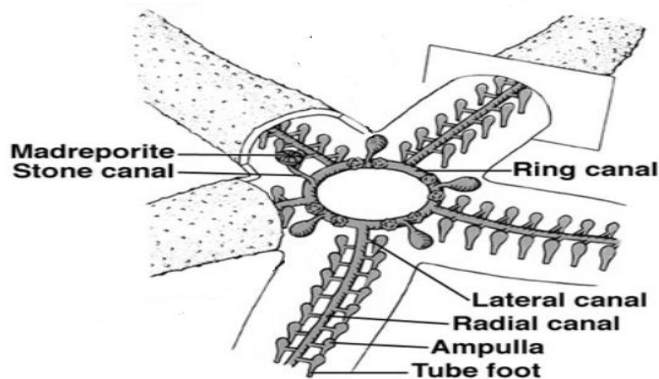
- Correlate and name the processes occurring in the depictions labelled as (i), (ii) and (iii) with the diagrammatic representation of a standard ECG. What does an ECG depict?
- Observe the electrocardiogram which shows the normal heartbeat and find out which among A,B, and C shows increased heartbeat. Justify your answer
- Observe the electrocardiogram which shows the normal heartbeat and find out which among A,B, and C shows irregular heartbeat Justify your answer

OR

Why study of ECG is of a great clinical significance ?

30. Observe the diagram given below: It depicts unique water vascular system of Echinoderms(Star fish).It has an extensive network of canals lined by ciliated epithelium, which is derived entirely from the coelom. The canals are filled with watery fluid along with certain corpuscles. Tube feet are muscular extensions of these canals, and they are having suckers at one end. They are used for attachment and locomotion

4



- What would be pathway taken by water in water vascular system to carry out locomotion?
- Echinoderms have organ-system level of organisation. Which organ system is absent due to well-developed water vascular system? Give reason.
- How is the canal system different from water vascular system?

OR

What is the driving force that allows water to enter and exit in the Poriferans?

SECTION - E

- What are some of the assumptions we make in the respiratory balance sheet? Are these valid enough to be applied to living systems? State comparisons between aerobic respiration and fermentation corresponding to respiration. 5

OR

Explain Glycolysis. State its end products in anaerobic respiration, determine the fate of these products.

- How functioning of the kidneys is efficiently monitored and regulated by hormonal feedback mechanisms involving the hypothalamus, JGA and heart? 5

OR

a) Mention any two symptoms and the hormonal deficiency that leads to the following diseases:

(i) Addison's disease (ii) Grave's disease (iii) Acromegaly

b) Name and mention the role of four major peptide hormone secreted in different parts of the gastrointestinal tract

- Explain the how chromatin material is structurally modified during different stages of cell division structure 5
 - Explain the structure and function of nucleolus.
 - Name the organelles that do not show during cell division when viewed under the microscope.
 - What is the significance of the nuclear envelope being interrupted at various places?

OR

a. How are proteins classified on the basis of ease of extraction on the membrane?

b. How are neutral solutes and polar molecules transported across the membranes?

c. Mention the features that are common in Chloroplasts, Mitochondria, and prokaryotic cells.