(Candidates are allowed an additional 15 minutes for only reading the paper. They must NOT start writing during this time.) This paper is divided into four sections-A, B, C and D. Answer all questions. Section –A consists of one question of one mark/two marks each. Section –B consists of seven questions of two marks each. Section -C consists of seven questions of three marks each.Section –D consists of three questions of five marks each.Internal choices have been provided in one question each in Section B, Section C and Section D. The intended marks for questions or parts of questions are given in brackets [].

## **SECTION A -20 MARKS**

## **Question 1**

Answer the following questions briefly:

- [1] (i) Gita was doing tissue culture experiments. While preparing the nutrient medium for the culture she added coconut milk to the medium. Why?
- **(ii)** [1] A phytohormone when applied on cucumber plants helped to increase the number of fruits. Name the hormone and write the reason for the positive effect mentioned above.
- [1] (iii) Observe the relation between the first two words and then fill in the fourth word. Rancidity : Butyric acid fermentation :: Production of vinegar : -----.

(iv) Expand the following abbreviations: (a) RUBISCO (b) PQ [1]

[1] **(v)** Given below are two statements marked Assertion and Reason. Read both the statements carefully and choose the correct option.

Assertion (A): Viruses multiply within their host cells and use host's metabolic machinery.

**Reason** (B): Viruses have their own genetic material and can do metabolic activities in host cell.

(a) Both Assertion and Reason are true and Reason is the correct explanation for Assertion.

(b) Both Assertion and Reason are true but Reason is not the correct explanation for Assertion.

(c) Assertion is true and Reason is false. (d) Both Assertion and Reason are false.

- **(vi)** Give a reason for each of the following:
  - **(a)** The diagram given below represents a bacteriophage which was done by a student for an exhibition, but the model was rejected by the teacher.



**(b)** It is advantageous to give vernalisation treatment to Triticale. (vii) The diagram given below represents a specific stage in bacteria. Identify the stage. [1]



- (viii) A somatic cell contains two sets of chromosomes represents ------ condition. [1]
  (a) Haploid (b) Monoploid (c) Diploid (d) Polyploid
  - (ix) Human cranium has small protuberance(s) at the posterior end called ---- and --- in [1] number that articulates with first vertebra (atlas vertebra):
    - (a) Foramen magnum, 6 (b) Occipital condyle, 2
    - (c) Occipital condyle, 3 (d) Foramen magnum, 4
  - (x) Match the following and mark the correct option:

**Column I Column II** Hinge joint I. Between humerus and pectoral girdle (a) Pivot joint II.Between carpals and metacarperls (b) Gliding joint **III.Between carpals** (c) (d) Saddle joint IV.Between atlas and axis Ball and socket joint V. Knee joint (e) a-V, b-IV, c-III, d-II,e-I (a) (b) a-I,b-II,c-III,d-V,e-IV (c) a- I, b-III,c-II,d-V,e-IV (d) a-v,b-III,c-IV, d-I,e-II [1] (xi) Hypophysectomy leads to stunted growth. Give reason. (xii) [1] Name the 'milk letdown' hormone. (xiii) [1] Expand T4 and T3. [2] (xiv) Answer the following questions briefly: **(a)** Bacterial cultures in microbiology rely on nutrient medium for growth. Identify the main component of this medium and its source. **(b)** Which age-related bone disorder, often caused by estrogen deficiency, leads to decreased bone mass and increased risk of fractures? [1] (xv) Write two applications of GA. [1] (xvi) Study the picture given below and answer the following questions: (a) What is the primary constituent of the exoskeleton shown in the figure? (b) What are its monomeric building blocks? [1] (xvii) Cardiac muscles are immune to fatigue. Give reason.

(**xviii**) A 30-year-old individual was taken to the emergency department with excessive [1]

[1]

sweating and a heart rate of 120 beats per minute. What is the likely medical condition, and what could be a possible underlying cause?

# **SECTION B - 14 MARKS**

## **Question 2**

Given below is the image of a chromosome. Study the same and answer the following [2] questions:



(i) Identify the type of chromosome with respect to the label marked 'A'.

(ii) Write one significant feature of (i).

(ii) Redraw the diagram and label the parts A and B.

# **Question 3**

How will you connect the end product of glycolysis to the TCA cycle?

## **Question 4**

The table given below shows the name of some hormones and their function. Fill in [2] the blanks A to D.

Hormone	Function
Prolactin	А
В	Stimulates contraction of muscles of uterus during parturition
Thymus	С
D	Regulate female characteristics

## **Question 5**

Redraw the flowchart given below and answer the following questions:

[2]

[2]



- (a) Identify and label the parts A, B, C and D.
- (b) Mention the role of A and B in calcium homeostasis.

## **Question 6**

Study the diagram given below and answer the following questions:

[2]



- (a) Identify and label the parts a, b, c and d.
- (b) Construct a flow chart representing a simple reflex action.

#### **Question 7** [2] **(i)** What do you mean by positive feedback mechanism? Give an example. OR **(ii)** Schematically represent the non-cyclic photophosphorylation. **Question 8** [2] Explain enzyme inhibition with examples. **SECTION C -21 MARKS Question 9** [3] **(i)** Draw a neat labelled diagram of structure of nucleus. OR **(ii)** Draw a neat labelled diagram of ultra structure of a eukaryotic chromosome. **Question 10** [3] Write short notes on: (i) Anaerobic respiration (ii) Photorespiration (iii) Bolting **Question 11** With the help of graphic representation explain the reactions of Hatch and Slack cycle. **Question 12** [3] Differentiate between the following:(i) Virus and Virioid (ii) Carotenes and Carotenols (iii) Geotropism and Phototropism. **Question 13**

Study the given graph and answer the following questions: [3]



- (a) Describe each step in the action potential labelled A-D.
- (b) What is the significance of resting potential?

## **Question 14**

Explain the mechanism of action of peptide hormones.

## **Question 15**

Given below is the structure of an important molecule in our living system. Study the [3] same and answer the following questions:



(a) Identify the diagram given above and write its importance in the living system.

- (b) Explian the pecularities of its primary structure.
- (c) In higher temperatures enzymes are denatured. Give reason.
- (d) Explain the quaternary structure with an example.

### **SECTION D -15 MARKS**

## **Question 16**

(i)Given below is the diagram of longitudinal section of a flower. Study the same and [5] then answer the following questions:



Redraw the diagram and label the following parts as per the description given:

- (a) Accessory whorls which are not involved in sexual reproduction
- (b) The swollen end of pedicel
- (c) The long stalk of the male reproductive structure
- (d) The structure that forms seed after fertilization.

(ii) Complete the following using the terms given in the box.Please note: use the term only one time.

Centrosome, Svedberg units, Pachytene, Fe<sup>3+,</sup>Euchromatin, Preleptotene, Heterochromatin, PAN

- (a) The sedimentation coefficient of ribosomes is expressed in terms of -----.
- (b) ----- is the metabolically and genetically inactive part of chromatin.
- (c) The stage of meiosis at which the interchange of chromatid segments takes place is called ------ stage.
- (d) ----- is an inhibitor of Hill reaction.
- (iii) Write the scientific contribution of the following scientists:
  - (a) Joseph Priestley (b) Frederick Griffith

#### **Question 17**

(i) Given below is a part of plant. Study the same and then answer the questions that [5]

follow:



(a) Name the parts labelled A, B, C and D

(b) What is the function of calyptra?

(ii) Expand TMV. Draw a neat labelled diagram of TMV.

# **Question 18**

(i) Given below is the vertical section of the retina. Study the same and answer the [5] following questions:



(a) Redraw and label the following parts: (1) Pigment layer (2) Amacrine cells (3)Ganglion cells (4) Direction of light (5) Bipolar cells

(b) What are the different types of photo sensitive proteins in cone cells?

(c) Name the vitamin whose defficiency leads to night blindness.

(c) Which is the visual area of the brain?

(d) Prepare a flow chart to explain the physiology of vision.

# OR

(ii) Study the graph given below and answer the following questions:



(a) Explain Michaelis constant.

(b) What happens to the reaction rate when the substrate concentration is continuously increased?

- (c) Compare apoenzyme and holoenzyme.
- (d) Comment on the role of pH in enzyme activity.(e) What are zwitter ions?

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