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SEAT No. _____

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Sardar Patel University
M.Sc. Biochemistry, 3rd Semester
External Theory Examination
Monday, 29th October 2018, 02:00 to 05:00 P.M.
PS03EBIC24: Plant Biochemistry

Total marks: 70

N.B.: (i) Answers of all the questions (including multiple choice questions) should be written in the provided answer book only.

(ii) Figures in the right indicate marks.

Q1 Select the appropriate answer for the following multiple choice (08) questions:

- (i) Indefinite growth of plants is due to the presence of
(a) Meristematic cells (b) Parenchyma
(c) Permanent tissue (d) Vascular tissue
- (ii) The deficiency of which of the followings can inhibit absorption of ions?
(a) CO₂ (b) enzyme
(c) Oxygen (d) All
- (iii) For the process of photosynthesis all except one of the following items are essential. Point out the exception
(a) CO₂, optimum temperature (b) Glucose and oxygen
(c) Water and minerals (d) Light and chlorophyll
- (iv) The end products of respiration in plants are
(a) CO₂, H₂O and energy (b) Starch and O₂
(c) Sugar and O₂ (d) H₂O and energy
- (v) Which of the following is an alkaloid?
(a) Morphine (b) Cocaine
(c) Atropine (d) All of these
- (vi) The plant hormone gibberellins are
(a) Monoterpene (b) Diterpene
(c) Triterpene (d) None of these
- (vii) Okadaic acid is an inhibitor of
(a) Nitrate reductase (b) Nitrite reductase
(c) Nitrate reductase phosphatase (d) Nitrate reductase kinase
- (viii) _____ are prenylated derivatives of adenine
(a) Auxins (b) cytokinins
(c) Brassinosteroids (d) None of these

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(P. T. O.)

Q2. Answer any SEVEN of the following questions briefly:

- (i) Giving suitable reasons, justify "Plant Biochemistry is a basic discipline which ultimately interfaces with several other subjects of plant sciences".
- (ii) Give a brief description of characteristic features of meristematic cells
- (iii) Differentiate between transpiration and guttation
- (iv) Briefly explain the statement "many plant functions depend quite directly upon the properties of water and of substances dissolved in the water".
- (v) Explain the statement, "Respiration takes place in three stages".
- (vi) Define the term 'repressor protein'.
- (vii) Define Phytoalexins
- (viii) Differentiate between necrotrophic and biotrophic pathogens of plants
- (ix) What is the role of lectins in plant defense?

Answer the following questions in detail:

- Q3. (a) Discuss the types of vacuoles and their importance in plant life. 06
(b) With suitable illustrations explain the mechanism of opening and closing of stomata, especially with reference to the involvement of ion transport. 06
- OR
- (b) Explain the mechanism of absorption of minerals from soil 06
- Q4. (a) Trace the sequence of events that take place from the time of absorption of light energy by the photosynthetic pigments of higher plants to the utilization of this energy in the production of ATP and reduced coenzyme (NADPH). 06
(b) What do you understand by fermentation in plants? Aerobic organisms are generally much larger than anaerobic organisms. Can you suggest how this may be related to respiration? 06
- OR
- (b) Describe the photorespiratory pathway. What is the relationship between photorespiration and photosynthesis? 06
- Q5. (a) Write an explanatory note on glucosinolates 06
(b) Briefly explain the role of flavonoids in plants 06
- OR
- (b) "Phenylalanine lyase is an important enzyme in plant secondary metabolism". Explain. 06
- Q6. (a) Give an overview of nitrate assimilation 06
(b) Write an account on the role of cytokinins in plant growth 06
- OR
- (b) Write an explanatory note on Brassinosteroids 06