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SEAT No. \_\_\_\_\_

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Sardar Patel University  
M. Sc. III Semester BOTANY Examination  
Wednesday, 24<sup>th</sup> October, 2018; Time: 2.00 to 5.00 p.m.  
Paper - PS03C BOT 22: Plant Physiology

Max. Marks: 70 (Seventy only)

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 questions:

(8 X 1 = 8)

(i) Cell becomes turgid because of

- (a) Plasmolysis (b) Exosmosis  
(c) Endosmosis (d) Diffusion

(ii) The membrane which allows passage of solvent as well as some selective solutes and prevents others is called

- (a) Permeable membrane (b) Semipermeable membrane  
(c) Selectively permeable membrane (d) Impermeable membrane

(iii) Passive, directional movement of molecules is part of the process called

- (a) Free energy (b) Brownian movement  
(c) Diffusion (d) Lysis

(iv) In seed germination, the first to occur is

- (a) Diffusion (b) Exosmosis  
(c) Endosmosis (d) Imbibition

(v) The photoperiodic stimulus perceived by

- (a) Leaves (b) Buds  
(c) Meristem (d) Flowers

(vi) Although abscisic acid is not involved in the formation of the abscission layer, it does have many roles in the life of plants. Which of the following is not a function of abscisic acid?

- (a) In times of water stress, it causes the stomata to close.  
(b) It promotes tolerance to stress.  
(c) It induces dormancy of buds.  
(d) It induces leaf and flower senescence.

(vii) \_\_\_\_\_ plants which produce flower and fruit only once in their life cycle.

- (a) Monocarpic (b) Bicarpic (c) Polycarpic (d) None of these

(viii) Precursor of Indole acetic acid (IAA) is

- (a) Glycine (b) Methionine  
(c) Isopentenyl pyrophosphate (d) Tryptophan

(1)

(PTO)

**Q2. Answer any SEVEN of the following questions briefly:** (14)

- (i) Comment upon the importance and scope of studying Plant Physiology in the present scenario of Plant Sciences research.
- (ii) "Water deficiency is a principal limiting factor in crop production worldwide". Comment.
- (iii) "Osmosis plays a very important role in some of the vital processes of the plant". Explain.
- (iv) Differentiate between acclimation and adaptation
- (v) Comment upon 'Phytochromes A and B have contrasting effects'
- (vi) Differentiate between Positive photoblastic and Negative photoblastic seeds
- (vii) Explain the physiology of fruit softening
- (viii) Differentiate between climacteric and non-climacteric fruits
- (ix) Presenting suitable examples, explain the term 'secondary metabolites'

**Answer the following questions in details:**

**Q3. (a)** Discuss the mechanism of entry of water into the xylem and of its ascent to the top of tall trees. (6)

**(b)** Write briefly on the mechanism of opening and closing of stomata, especially with reference to the involvement of ion transport. (6)

**OR**

**(b)** Why are carbon, oxygen, potassium and sulphur called macronutrients and how these nutrients affect plant growth? (6)

**Q4 (a)** Give an account of photosynthesis under the following heads: (6)

(i) Cyclic and non-cyclic photophosphorylation

(ii) Dark fixation of CO<sub>2</sub> in CAM plants and the significance of CAM

**(b)** Enumerate the salient features of photoperiodism and discuss the significance of photoperiodism from the physiological point of reproduction in plants. (6)

**OR**

**(b)** Discuss the role of light and Temperature in plant development and reproduction (6)

**Q5 (a)** Briefly discuss the physiology of senescence and abscission processes and their significance in plants (6)

**(b)** Giving an over view of seed dormancy, explain the physiology of seed germination (6)

**OR**

**(b)** What are the tropic and nastic movements? In what respect do they differ from each other? Give suitable examples (6)

**Q6 (a)** Discuss the physiological effects and mechanism of action of auxins and gibberellins (6)

**(b)** Discuss the physiological responses of plants to stress with an emphasis on temperature or water stress (6)

**OR**

**(b)** Write explanatory note on (i) Salicylic acid and (ii) brassinosteroids (6)

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