6/12/19 E

This question paper contains 4+2 printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **8290**

Unique Paper Code : **32165301** **J**

Name of the Paper : **Plant Physiology and Metabolism**

Name of the Course : **Generic Elective – Botany**

Semester : **III**

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer *five* questions in all including

Question No. **1** which is compulsory.

Attempt all parts of a question together.

1. Answer the following :

(A) Fill in the blanks with appropriate answer (any *five*) : 1×5=5

(*i*) In yeast, the pyruvate is converted to.....

(*ii*) Roots nodules of legumes contain.....a pigment with high affinity for oxygen.

P.T.O.

(*iii*) First stable product of Calvin cycle is .....

(*iv*) .....is a hormone involved in fruit ripening.

(*v*) Kranz anatomy is associated with .....

(*vi*) .....is a mineral element essential for nitrogen metabolism.

(*vii*) ..... is an inhibitor of cytochrome oxidase.

(B) Briefly describe any *five* of the following terms : 2×5=10

(*i*) Water Potential

(*ii*) Guttation

(*iii*) Root Pressure

(*iv*) Hydroponics

(*v*) Photoperiod

(*vi*) Biological Nitrogen fixation

(*vii*) Substrate level phosphorylation

(*viii*) Absorption spectrum of photosynthetic pigments

2. Write short account on Phytochromes under the following heads : 5+5+5=15

(*a*) Phytochrome discovery and structure

(*b*) Photo-reversibility of phytochromes

(*c*) Physiological responses of phytochrome

3. Answer the following : 5×3=15

(*a*) Role of Antenna pigments and reaction center

(*b*) Photosystem I and Photosystem II

(*c*) Draw a well labelled diagram of Z scheme of photosynthetic electron transport

4. Schematically represent any *three* of the following : 5×3=15

(*a*) Glycolysis

(*b*) Citric acid cycle

(*c*) Calvin Cycle

(*d*) Crassulacean Acid Metabolism

8+7=15

5. Answer the following :

(*a*) Illustrate the mitochondrial electron transport chain and explain the chemiosmotic mechanism of oxidative phosphorylation.

(*b*) Compare the ecological advantage of C4 plants over C3 plants and discuss the factors affecting rate of photosynthesis.

5×3=15

6. Write brief account on any *three* :

(*a*) Phloem loading and unloading

(*b*) Process of nodulation in legumes.

(*c*) Anaerobic Respiration

(*d*) Mechanism of ascent of water in tall trees

5×3=15

7. Attempt any *three* :

(*a*) Describe Physiological role of ethylene

(*b*) Mention the role and deficiency symptoms of any *two* macronutrients

(*c*) Factors affecting the rate of transpiration

(*d*) Describe the physiological roles of auxins

(*e*) Vernalization

8. Answer part A and B :

(A) Give precise cellular location and the complete biochemical reaction catalyzed by the following Enzymes (any *five*) : 5×2=10

(*i*) RuBP carboxylase

(*ii*) PEP carboxylase

(*iii*) Nitrate reductase

(*iv*) Nitrite reductase

(*v*) Hexokinase

(*vi*) Phosphofructokinase

(*vii*) Citrate synthase

(*viii*) Malate dehydrogenase

(*ix*) Succinic dehydrogenase

(*x*) Glutamate synthetase

(B) Give one specific example of each of the following : 5×1=5

(*i*) A competitive inhibitor of an enzyme

(*ii*) A Coenzyme

(*iii*) A Cofactor

(*iv*) An irreversible inhibitor of an enzyme

(*v*) A non-proteinaceous enzyme

(*vi*) Enzyme responsible for biological nitrogen fixation