3 (Sem–5/CBCS) BOT HC 2

2022

BOTANY

(Honours)

Paper : BOT–HC–5026

(Plant Physiology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer ***any seven*** from the following : 1×7=7

(a) The apoplast and symplast of a plant are :

(i) living and dead parts respectively

(ii) both living parts

(iii) both dead parts

(iv) dead and living parts respectively

(b) The sieve tubes contain several types of fibrillar proteins called

(i) G-proteins

(ii) S-proteins

(iii) P-proteins

(iv) X-proteins

(c) Foolish seedling disease of rice is caused by the fungus _____ .
(Fill in the blank)

(d) Chemically kinetin is known as _____ . *(Fill in the blank)*

(e) The two components of florigen are :

(i) kinetin and anthesin

(ii) gibberellin and anthesin

(iii) gibberellin and brasinosteroid

(iv) anthesin and ethylene

(f) Calmodulin contains

(i) calcium and magnesium

(ii) calcium and sugar

(iii) calcium and lipid

(iv) calcium and protein

(g) In water stressed plant, the cells will have

(i) relatively more negative water potential

(ii) less negative water potential

(iii) no water potential

(iv) None of the above

(h) Aquaporins are formed in cell membrane by

(i) integral membrane proteins

(ii) peripheral membrane proteins

(iii) phospholipids

(iv) None of the above

(i) Blocking of a xylem vessel or tracheid by an air bubble is called as

(i) cavitation

(ii) embolism

(iii) hydraulic discontinuity

(iv) None of the above

(j) Cohesive force of water is due to presence of

(i) hydrogen bonds between water molecules

(ii) covalent bonds between water molecules

(iii) hydrogen bonds between water and components of xylem walls

(iv) None of the above

(k) Phototropins are _____ proteins.
(Fill in the blank)

(l) Magnesium is an important component of

(i) chlorophylls

(ii) phaeophytin

(ii) cytochromes

(iv) All of the above

2. Write briefly on ***any four*** of the following : 2×4=8

(a) Sand culture

(b) Difference between active and passive absorption

(c) Cytokinin

(d) Antitranspirants

(e) Adsorption

(f) Difference between apoplast and symplast

(g) Phytochrome genes

(h) Chelating agents

3. Write short notes on ***any three*** of the following : 5×3=15

(a) Richmond and Lang effect

(b) Source - sink relationship

(c) Hydroponics

(d) Co-transport

(e) Donnan equilibrium

(f) Proton ATPase Pump

(g) Photoinductive cycle

(h) Jasmonic acid

4. Answer ***any three*** of the following : 10×3=30

(a) What is water potential ? Describe its various components. 3+7=10

(b) Discuss the mechanism of absorption of mineral salts by plants. How does it differ from absorption of water ? 6+4=10

(c) Write about the occurrence, availability, physiological role and deficiency symptoms of Nitrogen in plants. 1+1+4+4=10

(d) What is phloem transport ? Describe the pressure flow model to explain the mechanism of phloem transport. 3+7=10

(e) What is phytohormone ? Mention the different kinds of phytochrome. Describe *at least one* member of each class of phytohormone with particular reference to its structure and function. 2+2+3+3=10

(f) What is florigen concept ? Describe its role in stimulating flowering in different types of photoperiod sensitive plants. 7+3=10

(g) What are the criteria of essentiality of elements ? Narrate briefly the various functions of essential elements. 5+5=10

(h) Describe the starch-sugar hypothesis and K^+ pump theory of stomatal movement. 5+5=10
