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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

Contd.

(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
- (iii) cytochromes
- (iv) All of the above

2. Write briefly on any four of the following:

- (a) Sand culture 2×4=8
- (b) Difference between active and passive absorption

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(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

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Contd.

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