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6 SEM TDC BOT M 1

2020

BOTANY

(Major)

Course : 601

(Plant Physiology)

Full Marks : 48

Pass Marks : 19/14

Time : 2 hours

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

1. (a) Fill in the blanks with appropriate word : 1×5=5
- (i) The first stable product of photosynthesis in C_4 plants is _____.
- (ii) The hormone _____ signals the closure of stomata during severe drought.
- (iii) Mass flow or pressure flow hypothesis was first put forward by _____.

(iv) The shrinkage of protoplasm due to osmosis of water from the cell is known as _____.

(v) The movement of specific molecules down a concentration gradient, passing through the membrane via a specific carrier protein is known as _____.

(b) Write short notes on the following : $3 \times 3 = 9$

(i) Vernalization

(ii) Significance of osmosis

(iii) Role of nitrogen and iron in plant nutrition

2. What is transpiration? Write about the mechanism of opening and closing of stomata. How plants adapt itself to check excessive transpiration?

$2+5+4=11$

Or

Describe with example, the process of nodule formation in leguminous plants. Mention the ecological significance of biological nitrogen fixation.

$6+5=11$

3. What is Dark Reaction in photosynthesis?

How does it take place in C_3 plants? $2+9=11$

Or

Discuss the various steps of pentose phosphate pathway. What is its significance?

$9+2=11$

4. Write explanatory notes on any *three* of the following : 4×3=12

- (a) Seismonastic movement of *Mimosa pudica*
- (b) Grand period of growth
- (c) Crassulacean acid metabolism
- (d) Physiology of seed germination
- (e) Water holding and wilting co-efficient

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6 SEM TDC BOT M 3

2020

BOTANY

(Major)

Course : 603

(Molecular Biology and Immunology)

Full Marks : 48

Pass Marks : 19/14

Time : 2 hours

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

1. (a) Fill in the blanks : 1×3=3

(i) The major steps of central dogma consist of transcription → _____ → protein.

(ii) _____ cell is a hybrid of B-lymphocyte and myeloma cells.

(iii) The ability to resist diseases is called _____.

(Turn Over)

(b) Express in one word : $1 \times 2 = 2$

(i) Mobile fragment of DNA that moves from one part of genome to another part

(ii) The fragment of DNA that synthesized on lagging strand during replication

(c) Write short accounts on the following : $3 \times 3 = 9$

(i) Wobble hypothesis

(ii) Different types of RNA

(iii) Bacterial conjugation

2. What is transcription? Describe with diagram on biosynthesis of proteins in prokaryotes.

$2 + 9 = 11$

Or

What are the basic differences between RNA and DNA? With diagram, describe the molecular mechanism of DNA replication in prokaryotes.

$2 + 9 = 11$

3. What is B-cell? Mention the role of IgG, IgM and IgA.

$2 + (3 + 3 + 3) = 11$

(3)

Or

What is R gene? Describe the different types of R genes for resistance of plant diseases. Also write briefly about plant-fungi interactions.

2+6+3=11

4. Write explanatory notes on the following (any three) :

4×3=12

- (a) Antigen and antibody
- (b) Breeding for disease resistance
- (c) Plasmids
- (d) Transduction
- (e) Genome organization in prokaryotes

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6 SEM TDC BOT M 4

2020

BOTANY

(Major)

Course : 604

(Biophysics and Bioinformatics)

Full Marks : 48

Pass Marks : 19/14

Time : 2 hours

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

1. (a) Choose the correct answer of the following : 1×3=3

(i) SWISS-PROT is a database of

- (1) nucleic acid
- (2) protein sequences
- (3) structures
- (4) None of the above

(ii) NMR spectroscopy is

- (1) absorption
- (2) diffraction
- (3) radiation
- (4) emission

(iii) Which protocol is used to access data using WWW?

- (1) HTTP
- (2) HTML
- (3) FTP
- (4) SMTP

(b) Fill in the blanks : 1×2=2

(i) High performance liquid chromatography (HPLC) is basically a highly improved form of _____ chromatography.

(ii) The full form of NCBI is _____.

(c) Write short notes on the following : 3×3=9

- (i) Mitochondrial bioenergetics
- (ii) Second law of thermodynamics
- (iii) Basic concept of NMR

2. What is crystallography? Give an account of the principle, application and scope of X-ray crystallography.

2+(2+4+3)=11

(3)

Or

What is buffer solution? How does it work? Write a note on the importance of buffer solution in biological studies. $2+4+5=11$

3. What is sequence alignment? Define pairwise and multiple sequence alignments. Discuss the DOT-PLOT method of sequence alignment. $2+4+5=11$

Or

What is bioinformatics? Write elaborately on the scope and applications of bioinformatics. $2+(4+5)=11$

4. Write short notes on any *three* of the following : $4 \times 3 = 12$

- (a) Internet
- (b) Primary and secondary databases
- (c) Ultrasound
- (d) BLAST
- (e) Data mining
- (f) Phylogenetic tree

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2020

BOTANY

(Major)

Course : 606

(Agrotechnology and Sustainable
Utilization of Plants)

Full Marks : 48

Pass Marks : 19/14

Time : 2 hours

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

1. (a) Fill in the blanks : 1×5=5

(i) The scientific name of cotton is _____.

(ii) The useful part of vetiver is _____.

(iii) Black pepper is the dried _____ of
Piper nigrum.

(iv) Ginger is native to _____.

(v) Mycorrhizal fungi are used as _____
solubilizer.

(b) Write short accounts of the following :

$3 \times 3 = 9$

(i) Sarpagandha

(ii) Petrocrops as future fuel

(iii) Importance of indigenous knowledge system

2. What is organic farming? Why this method is more sustainable? Discuss the importance of biopesticides.

$3 + 4 + 4 = 11$

Or

Give a brief account on the cultivation/plantation and economic utilization of tea or coffee.

$8 + 3 = 11$

3. What are the different uses of wood? Write the scientific names along with their families of teak, sissoo, sal, ajar and nahor.

$3\frac{1}{2} + 5 + 2\frac{1}{2} = 11$

Or

Write notes on the following (any two) :

$5\frac{1}{2} \times 2 = 11$

(a) Origin of cultivated plants

(b) Useful aspect of Lichen

(c) Gene library and gene bank

(3)

4. Write the botanical names along with their families of the following plants and give short accounts on their economic utilization of different useful parts (any *four*) : $(1+1+1) \times 4 = 12$

- (a) Groundnut
- (b) Turmeric
- (c) Citronella
- (d) Arjuna
- (e) Bhut Jolokia
- (f) Cabbage
