

(3)
3 (Sem-2) BOT M 1

2016

BOTANY

(Major)

Paper : 2:1

(Gymnosperm, Paleobotany and Plant Anatomy)

Full Marks : 60

Time : 3 hours

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

1. Answer the following : 1×7=7

(a) Name the fossil order of pteridophytes you have studied from Paleozoic era.

(b) Name the renowned Indian paleobotanist and the premier institute of paleobotany in India.

(c) What are sacci and where are they found?

(d) Write the systematic position of *Cryptomeria japonica*.

- (e) What is velamen?
- (f) Give the names of two plants of monocotyledons where secondary growth takes place.
- (g) What is inulin?

2. Answer the following : 2×4=8

- (a) What are stromatolites?
- (b) What are the functions of collenchyma?
- (c) What is the difference between pycnoxylic wood and manoxylic wood? Where are they found?
- (d) Write the main differences between Cycadales and Bennettitales.

3. Answer any *three* from the following : 5×3=15

- (a) Write the general characteristic features of meristematic tissue. Are there any exception to these? Draw a diagram of shoot apex of pteridophytes. 3+1+1=5
- (b) What are the characters used in classification of gymnosperms? Give an outline of a modern classification as proposed by an Indian botanist. 3+2=5

(c) Write about different types of stomata giving diagram as found in Dicot leaves.
What are water stomata? $4+1=5$

(d) Describe briefly the male fructification of *Cordaites* giving diagram. $3+2=5$

(e) Draw and describe the anatomy of pine needle as observed in transverse section. $3+2=5$

4. Answer the following questions : $10 \times 3 = 30$

(a) Give an illustrated account of male and female gametophytes of *Ginkgo*. $5+5=10$

Or

Trace the angiospermic characters in *Gnetum*. Why is it included in gymnosperm? $5+5=10$

(b) What is periderm? With the help of diagram, describe how it is formed.
What are lenticels? $1+7+2=10$

Or

Draw and describe the tissues found in a transverse section of a Dicotyledonous root. How does secondary growth take place in such root? $5+5=10$

(c) Describe the external vegetative structures of *Sphenophyllum* and a strobilus found in actual association with vegetative *Sphenophyllum*. Illustrate your answer with diagram.

5+5=10

Or

Describe the external vegetative structures of *Lyginopteris oldhamia* and the ovular structure associated with it. Illustrate your answer with diagram.

5+5=10

2016

BOTANY

(Major)

Paper - 2

(Theory)

(Cell Biology)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following :

1×7=7

(a) Why are the DNA strands antiparallel?

(b) What are proteasomes?

(c) Differentiate between mitotic chromosomes and interphase chromosomes.

(d) What are the stages of cell signaling?

(e) What do you understand by apoptosis?

(f) What is the basic structural unit of all biological membranes?

(g) What is the function of peroxisomes?

2. Answer the following :

2×4=8

- (a) State the differences between plant cytokinesis and animal cytokinesis.
- (b) What is spliceosome?
- (c) What is ligand-gated ion channel?
- (d) Distinguish between heterochromatin and euchromatin.

3. Answer any *three* of the following :

5×3=15

- (a) "The transport of macromolecules is controlled by the nuclear pore complexes in a nucleus." Explain.
- (b) Discuss on the receptor-mediated endocytosis.
- (c) Enumerate the differences between Z-DNA and B-DNA.
- (d) Briefly describe the structure and function of Golgi apparatus.
- (e) What is the role of signal recognition particle and its receptor in protein trafficking in eukaryotes?

4. Answer any *three* of the following :

- (a) Define non-genetic RNA. Discuss the structure and synthesis of mRNA. 2+8=10

(3)

- (b) What are the stages of cell cycle? Describe the molecular basis of the control mechanism in the cell cycle. 2+8=10
- (c) What are integral transmembrane proteins? Explain the RTK signal transduction pathway. 2+8=10
- (d) What are the different classes of ion pumps? Discuss the mechanism involved in P-class ion pumps. 2+8=10
- (e) With the help of neat level sketches, discuss the different stages that occurs in meiotic cell division and also state its significance. 8+2=10
- (f) Describe the structure and function of salivary gland chromosomes. 10
