

**2016**

**BOTANY**

**( Major )**

**Paper : 2.2**

**( 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

- (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

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