

(b) Describe the major regulatory steps / stages of Meiosis.

(c) How are proteins targeted to mitochondrial matrix? What happens to protein targeting if a drug is used that abolishes mitochondrial membrane potential. (6,4,5)

6. Write short notes on the following :

(a) JAK-STAT pathway

(b) UPR pathways in ER

(c) Role of Bcl-2 family protein in apoptosis

(5×3=15)

(200)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5702

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Unique Paper Code : 2492013501

Name of the Paper : Molecular Cell Biology

Name of the Course : B.Sc. (Hons.) Biochemistry

Semester : V

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are 6 questions.
3. Attempt any 4 questions. All questions carry equal marks. Question no. 1 is compulsory.

1. (a) Explain the following statements:

(i) DNA is replicated only once during cell cycle.

(ii) Cancer patients undergoing chemotherapy become immunocompromised.

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(iii) Weel kinase mutant in fission yeast cells are smaller in size than normal daughter cells.

(iv) Estrogen binds to intracellular receptor.

(v) No inflammation occurs in apoptosis whereas necrosis leads to inflammation of nearby cells.

(vi) Glycolipids are always present on the outer leaflet of the cell membrane.

(b) Write the scientific contribution of the following scientists :

(i) George Palade

(ii) Robert Horvitz

(iii) Gunter Blobel (12,3)

2. Differentiate between the following :

(i) Protooncogenes and Tumor suppressor gene

(ii) Apoptosis and Autophagy

(iii) COP I and clathrin coated vesicles

(5×3=15)

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3. (a) Discuss how Cdk1/ Cyclin B complex initiates the onset of M phase.

(b) How the GPCR signaling will be affected if the GTPase in G protein is mutated?

(c) Explain various modifications that takes place in the proteins once it enters the ER lumen.

(d) What is the role of Cip/kip and ink-4 family of protein in cell cycle progression? (5,3,5,3)

4. (a) Discuss the mechanism by which a mitotic cell ensures the faithful segregation of chromosomes to opposite spindle poles of the cell.

(b) What is the role of second messengers in signal transduction? Briefly discuss with two examples.

(c) Describe different stages of cancer development with the help of a diagram. (5,5,5)

5. (a) Discuss the mechanism of MAPK signaling pathway and how does the dysregulation of this pathway lead to cancer?

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