



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Sc (H) (BT/GE/MICRO/MOL.BIO)/SEM-1/CSD-103/2011-12**

**2011**

**CELL STRUCTURE AND DYNAMICS**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :  $10 \times 1 = 10$ 
  - i) Differences between eukaryotic and prokaryotic cells include all the following *except*
    - a) Eukaryotic cells have mitochondria
    - b) Prokaryotic cells have more complex cell walls
    - c) Eukaryotic cells have cilia and flagella with complex structures
    - d) Prokaryotic cells have no genetic material.
  - ii) Energy is stored in the ATP ( adenosine triphosphate ) molecule in its
    - a) sugar portion
    - b) adenine portion
    - c) third phosphate bond
    - d) first phosphate bond.



- iii) What are the best terms to describe the photosynthetic reactions ?
- a) Light and dark reaction
  - b) Electron transport chains
  - c) Glycolysis and Krebs' cycle
  - d) Light dependent and light independent reactions.
- iv) What kind of molecules must pass between the nucleus and the cytoplasm ?
- a) DNA
  - b) Protein
  - c) Lipids
  - d) Carbohydrates.
- v) Protoplast is a
- a) second name of cell
  - b) second name of cytoplasm
  - c) second name of nucleolus
  - d) (b) and (c).
- vi) Centriole replication is
- a) semiconservative
  - b) conservative
  - c) dispersive
  - d) all of these.
- vii) Microfilaments are composed of a contractile protein called
- a) Tubulin
  - b) Actin
  - c) Myosin
  - d) Katanin.
- viii) Tumour necrosis factor ( TNF ) is produced by cell of the
- a) pancreatic system
  - b) nervous system
  - c) immune system
  - d) renal system.
- ix) For a typical rapidly proliferating human cell with a total cycle time of 24 hours, the G1 phase might last about
- a) 8 hours
  - b) 4 hours
  - c) 11 hours
  - d) 1 hour.



- x) The genetic material present in HIV virus is
- single-stranded DNA
  - double-stranded DNA
  - double-stranded RNA
  - single-stranded RNA.

**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

- Compare and contrast gram positive and gram negative cell wall of bacteria.
- Give comparison between euchromatin and heterochromatin.
- Differentiate between active and passive transports. Write a short note on ABC transporter.  $2\frac{1}{2} + 2\frac{1}{2}$
- Write a short note on RNA world.
- Why p 53 is described as the “guardian of the genome” ?
- Write a short note on chloroplast ultrastructure.

**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

- What are the cell cycle check points ? How does the activity of MPF vary throughout the cell cycle ? Describe the role of cdc2 and cdc25 in the cell regulation. What is the role of p53 in the cell cycle ?  $3 + 3 + 5 + 4$



9. What are inclusion bodies ? How will you differentiate inclusion bodies according to the structure and storage products ? Write a short note on carboxysome, sulphur granules, glycogen and phosphate bodies ? 1 + 4 + 10
10. Describe the model of plasma membrane with a suitable diagram with special reference to membrane lipids, membrane proteins and carbohydrates. 7 + 8
11. What is apoptosis ? Differentiate between apoptosis and necrosis. Describe the two pathways of caspase activation with a suitable diagram. How does FAS control cell necrosis ? 3 + 4 + 6 + 2
12. What is the role of ribosome in protein synthesis ? What is post-translational modification of protein ? Describe the activation process of tRNA. 5 + 5 + 5
13. Describe the reductive atmosphere of the primitive earth. Explain the abiotic formation of amino acids, organic acids, purine, pyrimidine and glycerol. Write a short note on ribozyme. 5 + 5 + 5
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