Reg.No.									

INTERNATIONAL CENTRE FOR APPLIED SCIENCES

(Manipal University)

IV SEMESTER B.S. DEGREE EXAMINATION – APRIL / MAY 2017

SUBJECT: CELL AND MOLECULAR BIOLOGY (BT 242)

(BRANCH: BIOTECHNOLOGY)

Thursday, 4 May 2017

Time: 3 Hours **Max. Marks: 100**

- ✓ **Answer ANY FIVE full Questions.**
- ✓ **Missing data, if any, may be suitably assumed**

1A. Elaborate on the role of cyclins and cyclin-dependent kinases in cell cycle?

1B. Elaborate on semi-conservative model of DNA replication.

[10+10]

2A. What are the techniques by which the complete replacement of entire mitochondrial DNA can be achieved? Elaborate.

2B. If Meselson and Stahl had first grown the cells in 14N-containing medium and then moved them into 15N-containing medium before taking samples, what would have been the result?

2C. Describe the differences between heterochromatin and euchromatin.

[10+5+5]

3A. Why is proper chromosome condensation important for mitosis? Elaborate on the proteins involved in chromosome condensation.

3B. Microtubules play a major role in the stability of the spindle structure. In what way does the kinetochore microtubules differ from the interpolar microtubules?

[10+10]

4A. Specific DNA sequences within eukaryotic chromosomes are involved in controlling gene expression. Describe how the following two DNA elements operate and their influence on the transcriptional process.

i) enhancer elements and

ii) promoters

4B. What are point mutations? Elaborate on any two types of point mutations?

4C. What is meant by reactive oxygen species?

[10+5+5]

5A. What are base analogs? Explain with an example how they give rise to mutations?

5B. Elaborate on endoplasmic reticulum and golgi bodies.

5C. What are the various functions of RNA?

[10+5+5]

6A. What was the reason behind using ^{35}S and ^{32}P in the Hershey-Chase experiment?

6B. What is meant by histone modification?

6C. How does the eukaryotic primary RNA transcript differ from a mature RNA?

[10+5+5]

7A. Elaborate on the mechanism of Nucleotide Excision Repair.

7B. What decides the number of times a cell is able to divide before it perishes? How can you provide a neuron infinite division potential? Elaborate.

[10+10]

8A. What is the need for post-translational modification of proteins? Elaborate on 3 such modifications.

8B. What are chaperones?

8C. How are the various histone proteins organized in a nucleosome?

[10+5+5]