

Ph. D. IN BIOCHEMISTRY (PHDBC)

Term-End Examination

December, 2024

RBC-006 : MOLECULAR CELL BIOLOGY

Time : 3 Hours

Maximum Marks : 100

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt any **four** questions from Q. No. 2 to Q. No. 8.*

1. (a) Explain the concept of *trp* operon. 5
(b) Differentiate between open reading frame and blocked reading frame of genetic code. 5
(c) How genetic defect in kinesins and dyneins would affect the cell ? 5
(d) Define the term 'second messenger'. Name any *four* of them and state *one* function of each. 5
2. What are microtubules ? Describe their structure, assembly and functions. 20

3. (a) Compare the mechanism of transcription in prokaryotes and eukaryotes. 10
(b) What is genetic code ? Discuss its characteristics. 10
4. (a) Discuss post-translational modification of proteins in eukaryotes. 10
(b) What are Okazaki fragments ? Explain the formation of replication fork. 10
5. Describe the epigenetic modifications of DNA in human cells, and explain its effect on gene expression. 20
6. (a) Discuss the role of attenuation in eukaryotic gene regulation. 10
(b) Describe the salient features of malignant cancer cells. 10
7. (a) What is the role of adenyl cyclase in cellular signal transduction ? Explain. 10
(b) Write a detailed note on RNA splicing. 10
8. Write short notes on any *two* of the following :
10×2=20
 - (a) Endomembrane system
 - (b) Cell cycle
 - (c) RNA interference

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