

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: BE  
BRANCH: ALL

SEMESTER : III  
SESSION : MO/18

SUBJECT: BT3021 BIOLOGICAL SCIENCE

TIME: 3 HOURS

FULL MARKS: 60

**INSTRUCTIONS:**

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
  2. Candidates may attempt any 5 questions maximum of 60 marks.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Give an overview on the various driving conditions and forces for origin of life. [2]  
Q.1(b) Briefly explain any five characteristic features of life or living things. [4]  
Q.1(c) Write a note on the Whittaker's Five Kingdom classification. [6]
- Q.2(a) Briefly explain the secondary structure of protein. [2]  
Q.2(b) What are vitamins? Explain its function and types of vitamins. [4]  
Q.2(c) Write a note on the structure and function of nucleic acid. [6]
- Q.3(a) Briefly explain the process of activation of fatty acid before the beta-oxidation. [2]  
Q.3(b) What is First law of thermodynamics? [4]  
Q.3(c) What is the significance of ETC? Explain the various steps. [6]
- Q.4(a) Write a short note on the structure and function of mitochondria. [2]  
Q.4(b) Mention the name and application of any four organelles present in the eukaryotic cell. [4]  
Q.4(c) What is cell division? Explain the various steps of cell division in somatic cells. [6]
- Q.5(a) What are Transcription factors? Give an example. [2]  
Q.5(b) What are the major types of RNA? Mention the name with their function. [4]  
Q.5(c) What is DNA replication? Explain the process in brief. [6]
- Q.6(a) Write any four applications of enzymes with examples. [2]  
Q.6(b) What is Lineweaver-Burk Plot? Explain briefly. [4]  
Q.6(c) What is enzyme inhibition? Give a comparative overview of competitive, Uncompetitive and Non-competitive inhibition of enzymes. [6]
- Q.7(a) Write a short note on mobile and stationary phase in chromatography. [2]  
Q.7(b) What is Paper chromatography? Explain briefly. [4]  
Q.7(c) What is electrophoresis? Explain the Agarose gel electrophoresis in brief. [6]

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