

Code: 19BS1404

**II B.Tech - II Semester – Regular Examinations – AUGUST 2021**

**LIFE SCIENCES FOR ENGINEERS**

**(Common to IT, ECE, EEE)**

Duration: 3 hours

Max. Marks: 70

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- Note: 1. This question paper contains two Parts A and B.  
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.  
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.  
4. All parts of Question paper must be answered in one place
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**PART – A**

1. a) Write any two points of comparison between any one biological and one man-made system studied.
- b) Mention the specific amino acid difference between a normal and a sickle-cell haemoglobin.
- c) What do you understand by ‘Photosynthesis’? Give the chemical equation for it.
- d) What is genetic code?
- e) State briefly about vector recombinant vaccines with an example.

**PART – B**

**UNIT – I**

2. a) Enumerate any six major differences between pro and eukaryotes. 6 M

- b) Discuss the electron microscopic structure of a bacterial cell with a neat, labeled illustration. 6 M

OR

3. a) Identify any 3 organizational similarities in the structures of a flying bird and an air craft. 6 M
- b) Discuss the four classes of organisms with examples, based on their carbon and energy utilization. 6 M

### **UNIT – II**

4. a) Describe the structure and functions of a typical tRNA molecule. 6 M
- b) Differentiate between DNA and RNA with respect to any six structural and functional features. 6 M

OR

5. a) What are Antibodies? Elucidate the structure of an IgG molecule with a neat, labeled figure. 6 M
- b) Explain the role of haemoglobin in the transport of respiratory gases in humans. 6 M

### **UNIT-III**

6. a) What is bioenergetics? State its significance. Discuss the steps of glycolysis with a note on its energetics. 6 M
- b) Differentiate between Oxidative phosphorylation and Photosynthesis. 6 M

OR

7. a) Describe the structure of mitochondria depicting the arrangement of the complexes of electron transport chain. 6 M
- b) With the aid of arrangement of complexes in the mitochondria, justify the generation of 3 ATPs for one NADH and only 2 ATPs for one FADH<sub>2</sub>. 6 M

#### UNIT – IV

8. a) State the principles of ‘Dominance’ and ‘Segregation’ with a suitable example and depict the monohybrid phenotypic and genotypic ratios. 6 M
- b) Discuss the steps of Meiosis I in detail with their salient features. What is the significance of meiotic cell division? 6 M

OR

9. a) What is Sickle cell anaemia? Depict the marriage between two carrier male and female individuals of sickle cell anaemia and the off-springs born. Interpret the results. 6 M
- b) Explain the concept of Epistasis in detail. 6 M

#### UNIT – V

10. a) What are recombinant vaccines? How do you classify the COVAXIN and the COVISHIELD that are being widely administered in Indian population during the current pandemic? 6 M

- b) Explain the technology of 'Biochips'. State any two applications of them in biomedical technology. 6 M

OR

11. a) What are transgenic plants? Explain the steps in their production and the benefits obtained citing any one example. 6 M
- b) Explain the working principle and applications of Biosensors. 6 M