

Roll No. _____

4E1224**4E1224****B. Tech. IV - Sem. (Main) Exam., May - 2019****BSC Electrical & Electronics Engineering****4EX2 - 01 Biology****EE, EX****Time: 2 Hours****Maximum Marks: 80**ersahilkagyan.com*Instructions to Candidates:**Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.**Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.**Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL _____

2. NIL _____

PART - A**(Answer should be given up to 25 words only)****[5×2=10]****All questions are compulsory**

- Q.1 What is the scope of studying Biology for Engineering students?
- Q.2 Give major differences between a Prokaryotic and Eukaryotic cell.
- Q.3 Write basic differences between Mitosis and Meiosis cell division.
- Q.4 Explain E. coli and D. Melanogaster as model organisms.
- Q.5 Differentiate between DNA and RNA.

PART - B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

- Q.1 Give fundamental differences between science and engineering by drawing a comparison between:
- (i) eye and camera [5]
 - (ii) bird flying and aircraft [5]
- Q.2 (a) Describe Mendel's law of segregation.
- (b) A tall homozygous pea plant (DD) is crossed with a dwarf homozygous pea plant (dd). Show the schematic representation of this cross and state phenotypic and genotypic ratio of this cross. [3+7=10]
- Q.3 (a) Discuss 'Lock and key' model displaying the mechanism of enzyme catalysis. [5]
- (b) Describe enzyme kinetics and state on what factors does this kinetics depend. [5]
- Q.4 (a) Explain briefly 'Gene mapping' and its advantages. [5]
- (b) Explain 'Epistasis' with example of one dihybrid cross, in connection with gene interaction. [5]
- Q.5 (a) Describe replication of DNA. [5]
- (b) On the basis of molecular taxonomy, explain three major kingdoms of life. [5]
- Q.6 (a) Describe microbial ecology. [5]
- (b) Explain growth kinetics of micro-organisms. [5]

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

[2×15=30]

Attempt any two questions

- Q.1 (a) Why ATP is considered as an energy currency? [5]
- (b) Explain: [5+5=10]
- (i) Glycolysis and Krebs cycle
 - (ii) Photosynthesis

Q.2 Carbohydrates and proteins are the major constituents in human nutrition. Considerir
this, discuss :

- (i) Sugars, starch and cellulose
- (ii) Amino acids and proteins

[10+5=15]

Q.3 Explain the following:

- (i) Classification of organisms based on ammonia excretion.
- (ii) Importance of enzyme catalysis.
- (iii) Single gene disorders in humans with examples.

[5+5+5=15]

