UG/I/BIOT/H/I/18

2018

BIOTECHNOLOGY

[Honours]

PAPER – I

Full Marks : 90

Time : 4 hours

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

GROUP – A

(*Biochemistry*)

Answer any **two** questions : 15 × 2

1. (*a*) Describe different forms of DNA. 6

   (*b*) Derive the Michaelis-Menten equation for the enzyme-substrate relationship. 7

(*c*) Name any two sulphur containing amino acids. 2

2. (*a*) Describe the clover leaf model of the t-RNA with a suitable diagram. 6

(*b*) Describe the mode of hormonal actions emphasizing on the release of various transcription factors with a suitable diagram. 7

(*c*) Define micelles. 2

3. (*a*) Describe the relation between estrogen and progesterone levels meant for LH surge. 7

(*b*) Explain the functions of ACTH. 6

(*c*) Define oxidative phosphorylation. 2

4. (*a*) Describe the role of insulin in the maintainance of the blood sugar level. 6

(*b*) Outline the TCA cycle with special emphasis on the rate limiting steps. 7

(*Continued*)

(*c*) Differentiate between saturated and unsaturated fatty acids. 2

GROUP – B

(*Cell Biology*)

Answer any **five** questions : 6 × 5

5. State the differences between passive, carrier-mediated and active transport. 6

6. What do you mean by cell cycle check points ? Write the main character of each check point. 2 + 4

7. State the role of leader peptide in protein transportation. 6

8. What do you mean by membrane fluidity ? Explain the role of phospholipids in it. 2 + 4

9. Differentiate between apoptosis and necrosis. 6

10. Describe the process of mitosis with a suitable diagram. 6

11. Classify tissue with a characteristic of each type. 6

12. Describe the structure of plasma membrane with a suitable diagram. 6

GROUP – C

(*Molecular Biology*)

Answer any **five** questions : 6 × 5

13. Describe the role of Histone protein in DNA Packaging. 6

14. Describe the port transcriptional modification of the transcript. 6

15. Describe the role of lactose as the induce of the lac operon. 6

16. Describe the regulation of the trp-operon with a suitable diagram. 6

17. What are the basic differences in the DNA repair systems of Prokaryotes and Eukaryotes ? 6

18. Write short notes on : 3 + 3

(*i*) Genetic code

(*ii*) Wobble hypothesis.

19. Draw and describe the sugar phosphate backbone of a DNA strand. 6

20. How does the processes of transcription and translation differ in Prokaryotes and Eukaryotes ? 6