

2017

ZOOLOGY

[ Honours ]

PAPER – VI

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*

[ NEW SYLLABUS ]

GROUP – A

1. Answer any *one* of the following : 12 × 1
- (a) (i) Define cell cycle. 2
- (ii) Illustrate the cytological changes that occur during eukaryotic cell cycle. 5

- (iii) Describe attenuation with proper diagram. 5
- (b) (i) What is meant by c-value paradox? 3
- (ii) Compare v-oncogene with c-oncogene citing examples. 3
- (iii) Schematically represent the basic steps of vermitechology. 6
- (c) (i) Mention the role of: 4 × 2
- Dna A
- Dna B
- Dna G
- Topoisomerase.
- (ii) Describe the formation of initiation complex in translation of prokaryotes. 4

2. Answer *three* of the following : 7 × 3

- (a) (i) What do you understand by 'selfish DNA'? 2
- (ii) Compare prokaryotic and eukaryotic RNA polymerases. 5

- (b) (i) Mention the significance of p53 gene. 3
- (ii) Describe  $EF_{TU}$  -  $EF_{TS}$  cycle indicating its significance. 4
- (c) (i) Describe positive control of lac-operon with suitable illustration. 4 + 2
- (ii) What is meant by primary cell culture? 1
- (d) (i) Describe the mechanism of base-excision repair. 4
- (ii) Write a short note on promoter. 3
- (e) (i) What is 'Shine-Dalgarno' sequence? 2
- (ii) Name the cellular compartment where gene splicing occurs. 1
- (iii) Describe how attenuation occur in tryp-operon. 4
3. Answer *three* of the following : 4 × 3
- (a) Compare cDNA and genomic DNA libraries. 4

- (b) Differentiate between carcinoma and Sarcomema. 4
- (c) What is frame shift mutation ? What are base analogues ? 2 + 2
- (d) Describe different cell cycle checkpoints with their characteristic blockages. 4
- (e) (i) What is PCR ? 2
- (ii) Characterise different exonuclease properties of DNA Pol-I. 2

GROUP – B

4. Answer any *one* of the following : 12 × 1
- (a) (i) Describe biological significance of buffer citing any physiological buffer system. 7
- (ii) Describe tertiary structure of any protein studied by you. 5
- (b) (i) Describe ultrastructure of skeletal muscle with labeled diagram. 6 + 3

- (ii) What is chloride shift ? 3
- (c) (i) Write briefly on Dowan membrane equilibrium. 3
- (ii) What is chloride shift ? 3
- (iii) Mention two properties of monosaccharide. 2
- (iv) Differentiate between parallel and antiparallel  $\beta$  pleated sheet. 4
5. Answer *three* of the following : 7  $\times$  3
- (a) (i) Compare 'regulator' with 'conformers'. 4
- (ii) How does ATP act as an allosteric effector in the mode of action of phosphofructokinase ? 3
- (b) (i) How do glucokinase and hexokinase differ in their function ? 3
- (ii) Show the significance of counter-current exchanger in thermoregulation of mammals. 4

- (c) (i) How many possible epimers of D-glucose exist ? 2
- (ii) Compare reducing sugars with non-reducing one. 4
- (iii) What are zymogens ? 1
- (d) (i) Write a short note on peptide bond. Why is it called a partial double bond ? 4 + 1
- (ii) Mention the role of troponin in muscle contraction. 2
- (e) (i) Schematically present conduction of nerve impulse-across a chemical synapse. 6
- (ii) What are podocytes ? 1
6. Answer any *three* of the following : 4 × 3
- (a) Describe schematically the structure of  $F_0-F_1$  ATPase. 4
- (b) What is blubber ? Mention two characteristic of polar bear responsible for thermoregulation. 1 + 3

- (c) (i) What is  $\Delta G_0$ ? 1
- (ii) What are LDL and VLDL? Mention their significance. 1 + 1 + 1
- (d) Describe hormonal control of menstrual cycle. 4
- (e) (i) Indicate functional significance of J-G apparatus. 2
- (ii) List the chemical bonds/interactions present in tertiary structure of protein. 2
-