

2015

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

GROUP – A

Answer any one of the following : 12 × 1

1. (a) (i) Describe the role of tra and da gene in sex determination in *Drosophila*. 6
- (ii) State the difference between v src and c src. 2 + 2
- (iii) What is the role of ECORI ? 2

(Turn Over)

- (b) (i) Discuss the role of Y chromosome in sex determination of man. 2
- (ii) Compare and contrast prokaryotic and eukaryotic DNA polymerase. 6
- (iii) How complementation can be differentiated from recombination? How did Benzer arrive to the idea of complementation? 2 + 2
- (c) (i) How does a cell stop its progress from cell cycle stage to the next? 4
- (ii) What do you understand by positive and negative control of lac operon? 6
- (iii) Mention four applications of recombinant DNA technology. 2
- (d) (i) Write a short note on isoallele. 2
- (ii) What is Shine Dalgarno sequence? 3
- (iii) In which type of allelic interaction F_2 monohybrid ratio becomes 1 : 2 : 1? 2

- (iv) Why HPT-myeloma cells are used to form the hybridoma in monoclonal antibody technique? Mention two applications of this technique. 3 + 2
2. Answer any *three* questions : 7 × 3
- (a) (i) What is cosmid? 2
- (ii) Mention the roles of EFTu and EFTs in translation. 2 + 2
- (iii) What is central dogma? 1
- (b) (i) Explain with diagrams the sequential steps of specialised transduction. 5
- (ii) What is replicon and primosome? 1 + 1
- (c) (i) Discuss the charging of tRNA. 4
- (ii) Differentiate between normal and transformed cell. 3
- (d) (i) Write a short note on ρ dependent termination of translation. 4

(ii) How can you prove that physical contact is necessary for conjugation? What is F¹? 2 + 1

(e) (i) What is meant by cDNA library and genomic library? 2 + 2

(ii) Write a short note on special features of mitochondrial DNA. 3

3. Answer any *three* of the following : 4 × 3

(a) Discuss ABO blood group as a multiple allelic system. What is Bombay phenotype? 3 + 1

(b) (i) What is paracentric and pericentric inversion?

(ii) What is deletion loop? 2 + 2

(c) What is tautomerism? What do you understand by forbidden base pairing? 3 + 1

(d) Write a short notes on repetitive sequence. 4

(e) Write a short note on telomeric DNA and its significance. What is telomerase? 3 + 1

GROUP – B

Answer any one of the following : 12 × 1

4. (a) (i) Compare the types of enzyme inhibition with the changes in K_m and V_{max} (if any). 6
- (ii) Write notes on resolving power of a light microscopy. 2
- (iii) Mention the basic steps of glycogenesis. State the factors controlling the process. 3 + 1
- (b) (i) Distinguish between Osmoconformers and Osmoregulators. 3
- (ii) What is Saltatory conduction? Comment on the speed of it. 2 + 1
- (iii) Discuss the ultrastructure of skeletal muscle with diagram. 5 + 1
- (c) (i) Describe hormonal regulation of oestrous cycle with necessary illustrations. 6

(ii) Distinguish between glass lens and electromagnetic lens. 3

(iii) State the role of T_3 and T_4 in human system. 3

(d) (i) Differentiate between competitive and non-competitive inhibition with example. 4

(ii) Write a short note on the hormones released from posterior pituitary. 3

(iii) State the second law of thermodynamics. Discuss its significance. 2

(iv) What is urea cycle ? Describe the basic steps of urea cycle. 1 + 2

5. Answer any *three* of the following : 7 × 3

(a) Design the pathway of electron beam in TEM.
What is CPs ? 5 + 2

(b) (i) Write notes on :
excitatory and inhibitory neurotransmitters. 2 + 2

- (ii) What is renal threshold value ? The renal threshold value of glucose is 180 mg. Explain. 1 + 2
- (c) (i) Mention structural differences between glucose and fructose
- (ii) Distinguish between the following :
Reducing and non-reducing sugar, fats and oils. 3 + 2 + 2
- (d) Write a short note on hormonal regulation of calcium metabolism. What are glucogenic and ketogenic amino acids ? What is ketosis and ketonuria ? 3 + 2 + 2
- (e) Describe structure of hemoglobin. State the functions of Graffian follicle and Sertoli cell. 3 + 2 + 2
6. Answer any *three* of the following : 4 × 3
- (a) Discuss how cross bridge formation takes places during muscle contraction. 4
- (b) Mention the functions of testoterone. 4

- (c) (i) Differentiate between homopoly-saccharide and hetero polysaccharide.
- (ii) What are hydrophobic amino acids ?
Give example. 2 + 2
- (d) (i) What is PUFA ?
- (ii) Mention the functions of
Glucocorticoid hormones. 2 + 2
- (e) Write notes on temperature regulation in aquaticmammal. 4
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