

NEW
Part-III 3-Tier
2019
ZOOLOGY
(Honours)
PAPER—VI

Full Marks : 90

Time : 4 Hours

The figures in the right-hand margin indicate full marks.

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

Group—A

1. Answer any one question : 1×12
- (a) (i) Schematically represent basic steps of Vermitechnology. 6
- (ii) Describe the Holiday model of homologous recombination. 6
- (b) (i) How will you prove that DNA replication is semi-conservative and neither dispersive nor conservative. 8
- (ii) Discuss the role of ribosome in translation. 4

(Turn Over)

- (c) What are CAAT box and GC box ? What are their consensus sequence ? State the role of RNase H. How does lagging strand synthesis occur ? (2+2)+3+3+2

2. Answer any *three* questions : 3×7

- (a) (i) What are $tRNA_{fmet}$, $tRNA_i met$ and $tRNA^{met}$?

3

- (ii) 'Codon is always triplet'—justify.

4

- (b) What is C value ? Why it is called a paradox ? Write a short account on selfish DNA.

2+3+2

- (c) What are cosmids ? State the role of ligase in recombinant DNA synthesis. What are the characteristic of plasmid ?

2+2+3

- (d) What are BACs and state its characteristics ? How are restriction enzymes designated ?

2+3+2

- (e) What is the role of PCR in molecular biology ? How does DNA foot printing differs from DNA fingerprinting ? Mention three advantages of biotechnology.

2+2+3

3. Answer any *three* questions : 3×4

- (a) Differentiate genomic library and cDNA library. 4

- (b) What is Shine-Dalgarno sequence ? State the principle of DNA fingerprinting.

2+2

- (c) Write short note on mitochondrial DNA. 4
- (d) How proto-oncogenes are activated ? State role of p53. 2+2
- (e) Define oncogene. How DNA repair processes and cell cycle checkpoints are intimately linked with cancer ? 2+2

Group—B

4. Answer any *one* question : 1×12
- (a) What is Resting potential ? How action potential is developed through depolarisation and repolarisation ? What is saltatory transmission ? Comment on synaptic transmission ? 3+4+2+3
- (b) Define Donan equilibrium and state its biological significance. What is Vant Hoff's Law of Osmotic pressure ? What is Tonicity ? 2+3+4+3
- (c) How does glucose 6 phosphate formed from lactate ? What is TCA cycle and state why it is amphibolic in nature ? Explain glycogenolysis. 3+3+2+4
5. Answer any *three* questions : 3×7
- (a) Describe β -oxidation of unsaturated fatty acid. What is the role of bile salts in absorption of fatty acid from intestine. Why glycerol is not metabolized in adipose tissue ? 3+2+2

- (b) Name two amylolytic enzymes. What are synthetase and oxidoreductases. Describe the effect of pH on enzyme activity. 2+2+2+1
- (c) What is Gibbs free energy ? Explain enthalpy and entropy in this context. 1+3+3
- (d) Give an account of counter current mechanism through loop of Henle. 7
- (e) Describe the ultrastructure of a skeletal muscle with labelled sketches. 4+3
6. Answer any *three* questions : 3×4
- (a) Explain chloride shift. 4
- (b) What are the problems of freshwater and marine teleost ? How the problem is overcome by a freshwater teleost ? 2+2
- (c) Distinguish between oestrous and menstrual cycle.
- (d) Write a short account on ovulation. 4
- (e) What are the mechanisms of thermogenesis ? How does it differ from thermolysis ? 2+2
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