Total Pages : 4

End Semester Examination of Semester–III, 2015
Subject : ZOOLOGY (PG)
Paper : ZPGT–304 (Gr A + Gr B)
(Elective : Cell & Molecular Biology)
Full Marks : 40
Time : 2 Hrs

The figures in the margin indicate the marks corresponding to the question

Candidates are requested to give their answers in their own word as far as practicable.

Illustrate the answers whenever necessary

Use separate Answer scripts for Group A and Group B

Group A (Full Marks : 20)

Answer **Question No. 1** and
any one out of **Question No. 2** and **Question No. 3**

1. Answer **any five** question: 2x5=10

   i) Briefly describe the cytological role of connexions.

   ii) Enumerate the properties of the cell population those are not terminally differentiated in an adult individual.

   iii) How is tropocollagen obtained from alpha-peptides during collagen biosynthesis?

   iv) Describe the chemical nature of glycocalyx.

v) The eggs of freshwater invertebrates and vertebrates are hypertonic to their surrounding medium. What protein is likely to be absent from their egg plasma membranes?

vi) What is inside-out and outside-in type of integrin signalling?

vii) Define Uniforters.

viii) Write the role of vacuole in plant cell.

2. a) How can cells alter the fluidity of membranes? Why is this capacity important to cellular function? $2\frac{1}{2}+2\frac{1}{2}$

b) Describe the composition of extra-cellular matrix. Differentiate between tight-junction and gap-junction. 2+3

3. a) Discuss the role of TIMP in inhibiting MMPs. 3

b) Describe steady-state dynamics of microtubules with proper diagram. $3\frac{1}{2}$

c) Describe the role played by dynein in intracellular kinesis. $3\frac{1}{2}$

Group B (Full Marks : 20)

Answer **Question No. 1** and
any one out of **Question No. 2** and **Question No. 3**

1. Answer **any five** question: 2X5=10

   i) What are snoRNAs? Where could you locate them?

   ii) Why RNA-processing enzyme complexes mostly contain their own RNA?

   iii) What mammalian cell type must retain its telomerase activity throughout? Explain why.

   iv) Identify the transcript encoded by the DNA sequence below, in which the lower strand serves as the template for mRNA synthesis.

   5' CGACCTATGATCACCTGCTCCCCGAGTGCTGTTTAGGTG 3'

   3' GCTGGATACTAGTGGACGAGGGGCTCACGACAAATCCAC 5'

   v) Why is the genetic code degenerate?

   vi) What is the utility of Cre/lox system?

   vii) What is group II self-splicing introns?

   viii) What do you mean by pleiofropy in aging?

2. a) Which steps in the double-strand break model for recombination would be inhibited if the following proteins were missing? a. RecBCD; b. RecA; c. RecG. Explain the function of each protein required for the step that is inhibited. 4

b) Describe the mechanism of trans-splicing with proper illustration. 6

3. a) State about the concept of proto-oncogens. 2

b) Enlist the hallmark features of transformed cells. 3

c) Describe schematically the mechanism of activation and action pathway of 'the guardian of gonome'. 5