

M.Sc. 1st Semester Examination, 2013

ZOOLOGY

PAPER—ZOO-102 (Group A & B)

Full Marks : 40

Time : 2 hours

Answer all questions

The figures in the right-hand margin indicate marks

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

Write the answers to questions of each Group in separate books

GROUP – A

(Cell Biology)

1. Answer any *two* questions of the following : 2×2
- (a) Write a note on ATP powered pumps.
 - (b) State the role of protein phosphatases in cell signalling.
 - (c) What is liposome ?

(Turn Over)

(2)

(d) What do you understand by 'catastrophe' in microtubular dynamics ?

2. Answer any *two* questions of the following : 4×2

(a) What is lipid raft ? How it is associated with signal transduction ? $2 + 2$

(b) Describe the structure and function of integrin in extra cellular matrix. 4

(c) Illustrate the mechanism of activation of PKC (Protein Kinase-C) with proper diagram. 4

(d) Briefly describe multiple level of regulation of CDK activity in eukaryotic cell during different stages of mitosis. 4

3. Answer *one* question of the following : 8×1

(a) (i) Elucidate the mechanism of plus end-directed and Minus end-directed microtubular motor transport in eukaryotic cell.

(3)

- (ii) State the functional differences between Uniporter, Symporter and Antiporter. 6 + 2
- (b) (i) Illustrate the mechanism of activation of monomeric switch protein upon binding of EGF.
- (ii) "CaM-Kinase-II act as molecular memory device." – Explain. 5 + 3

GROUP – B

(*Histochemistry*)

4. Answer any *two* questions of the following : 2 × 2
- (a) Name the primary fixatives. State the difference between primary fixative and fixative mixture.
- (b) Fixation of tissues brings about a change in the chemical and physical state of RNA and DNA – Why ?
- (c) Explain how bound water is eliminated for the tissue after fixation.

(4)

(d) What are the conditions of Enzyme
-histochemistry reaction ?

5. Answer any *two* questions of the following : 4×2

(a) "How formaldehyde reacts with several parts
of protein molecules ?" – Justify with
examples. 4

(b) What are Mordants ? Mention the two
methods for the use of Mordants. Briefly
state the mechanism of mordanting of any
dye you have studied. 1 + 1 + 2

(c) Briefly discuss the mechanism of Feulgen
reaction. 4

(d) " β -glycerophosphate is essential for 'Acid
Phosphatase' demonstration" – Why ? 4

6. Answer *one* question of the following : 8×1

(a) (i) Why Fluorescent labelling is essential
for immuno-histochemistry reaction ?
Cite one example.

(5)

(ii) State the stapes of chemical reaction where biotinylated horseradish peroxidase (HRP) is an essential reagent for demonstration of the 'ABC' method. 3 + 5

(b) Write notes on (any *three*) : $2\frac{1}{2} + 2\frac{1}{2} + 3$

- (i) Colloidal gold
- (ii) Electron stain
- (iii) Microwave fixation
- (iv) EC-number
- (v) Bathochromy
- (vi) Metachromatic staining.