M.Sc.

2016

4th Semester Examination

ZOOLOGY

PAPER—ZOO–402

Full Marks : 40

Time : 2 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.

Illustrate the answers wherever necessary.

Answer *all* questions of the following.

Group–A

(*Developmental Biology*)

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

(a) In which area noggin and chordin mRNA is expressed ?

(b) Mention the axis specified by BMP gradient and wnt gradient.

(c) Name two diffusible proteins blocking wnt pathway.

(d) State the functions of Bindin in fertilization in sea urchin.

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

(a) In Xenopus why premetamorphic tadpole can regenerate their hindlimb, but the latter stages can not ?

(b) What are the gradients involved in head regeneration in hydra ?

(c) State the functions of Chordin and Noggin. 2+2

(d) Describe briefly the function of goosecoid gene in the organiser tissue.

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

(a) State briefly the possible mechanism stating the role of gamma-class of phospholipase C and Src family of protein kinase in sea urchin egg activation.

(b) Describe the model of the mechanism by which the disheveled protein stabilizes β-catenin in the dorsal portion of the amphibian egg.

Name the secrets of pharyngeal endoderm which block Wnts. 6+2

Group–B

(*Ecotoxicology*)

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

(i) Define 'Xenobiotics' with suitable examples.

(ii) Corrosive pollutants and its effects.

(iii) Chelation therapy.

(iv) Enzymes involved in Xenobiotic metabolism.

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

(i) How do you classify environmental matters with suitable examples ?

(ii) How xenobionts enters in our body ? State the possible route of entry and subsequent damage.

(iii) Bio-magnification in any food chain (aquatic/ terrestrial) — explain with suitable presentation of data.

(iv) Xenobionts and DNA damage — state the possible impact.

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

(i) Classify 'Xenobionts' with suitable examples based on physical, chemical and physiological nature.

(ii) Find out the LC_{50} value for the data given below with suitable illustration. Comment on your results. How does it changes with dose and duration of exposure ?

When,

- Number of test animals are — 20 ;
- Toxicity bioassay for 24 and 48 hours ;
- Pesticide used — Metacid 50.

Concentration of Metacid 50 (mg)	*Mortality of test animals at 24 hrs.*	*Mortality of test animals at 48 hrs.*
0·1	00	02
0·2	00	06
0·3	00	08
0·4	02	12
0·5	04	14
0·6	08	16
0·7	10	17
0·8	12	18
0·9	14	19
1·0	16	20

$\frac{A_4}{size}$ mm graph papers will be provided.