PG/IVS/ZOO-402/15

M.Sc. 4th Semester Examination, 2015

ZOOLOGY

PAPER – ZOO-402

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

Illustrate the answers wherever necessary

GROUP – A

(*Developmental Biology*)

1. Answer any *two* questions : 2 × 2

   (*a*) Which cells and their derivatives are referred as organiser by spemann ?

(*b*) Which structures are induced by vegetal cells in Xenopus ?

(*c*) What happens it the regenerating tail of a tadpole is treated with retinoic acid ?

(*d*) Name the protein molecules that help in gametic fusion in sea urchin and mammal.

2. Answer any *two* questions : 4 × 2

(*a*) What happens when Bone Morphogenesis Protein (BMP4) binds to cells in Xenopus ?

(*b*) Mention the differences of cell surface property of proximal and distal blastema.

(*c*) Describe the special features of a newt muscle cell for regeneration.

(*d*) State the functions of the diffusible proteins of the organizer II.

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

(*a*) State the role of calcium ions in activation of sea urchin oocyte.
What are the late responses of sea urchin fertilization ? $5\frac{1}{2} + 2\frac{1}{2}$

(*b*) (*i*) Explain the events for *mesoderm induction* and *organizer formation* by the interaction of β catenin and TGF-β proteins with the help of a model studied by you.

(*ii*) Comment on the role of inhibitor and activator gradient in hydra to specify positional value. $5 + 3$

GROUP –B

(*Ecotoxicology*)

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

(*i*) Metabolic pollutants.

(*ii*) Dose response curve.

(*iii*) Bioremediation Biotransformation.

(*iv*) Importance of Chelation therapy.

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

(*i*) Write down the Enzymes involved in phase I and phase II reactions of Xenobiotic metabolism.

(*ii*) Biomagnification of DDT in food chain.

(*iii*) State the route of entry, source and mechanism of action of – Corrosive pollutants/Mutagenic pollutants/ Carcinogenic pollutants.

(*iv*) How do you classify "Xenobionts" considering physical, chemical physiological and others ?

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

(*a*) Find out the LC_{50} value from the data given below with suitable illustration and

comment on your results :

(*i*) Dose and (*ii*) Duration of exposure.

Concentration of Xenobionts	Mortality at 24 hrs.	Mortality at 48 hrs.
0·1	0	1
0·2	1	3
0·3	2	3
0·4	3	4
0·5	4	5
0·6	6	7
0·7	7	7
0·8	8	9
0·9	9	10
1·0	10	10

Number of test animal—20, Experimental species *Anabas testudineous* [mm graph paper to be provided. 8

(*b*) Write any *two* of the following : 4 × 2

(*i*) Chelation therapy

(*ii*) Bioaccumulation

(*iii*) Xenobionts and DNA damage

(*iv*) Role of indicator species in Ecotoxicology.
