PG/IVS/Z-402/11

M.Sc. 4th Semester Examination, 2011

ZOOLOGY

PAPER—Z-402

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks

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

GROUP – A

(*Developmental Biology*)

1. Answer any *two* questions : 2 × 2

(*a*) Name the protein molecules helping the gametic fusion in sea urchin and mammal.

(*b*) Mention the role of Rb protein in newt muscle regeneration.

(*c*) What are the functions of bindin protein ?

(*d*) What is the role of bone morphogenesis factor 7 ?

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

(*a*) Briefly mention the process of sperm capacitation with a recent hypothetical model.

(*b*) Summarize the events which bring about the goosecoid gene expression in organiser formation (give diagram).

(*c*) What do you mean by chimeric receptor ? State its significance in regeneration.

(*d*) What are the gradients involved in head regeneration of *Hydra* ? Name the signalling molecule and genes involved in this process.

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

(*a*) State the role of γ-class of PLC (Phospholipase C) and Src family of proteins kinase in sea urchin egg activation. Mention all the possible mechanisms.

Or

(*b*) Explain the role of Vg-1, BMP_4, Noggin and Wnt proteins during mesoderm induction in *Xenopus*.

GROUP – B

(*Ecotoxicology*)

4. Write *two* from the following : 2 × 2

(*a*) Classify environmental pollutants/toxicants.

(*b*) What are different phases of toxic action/ reaction (schematic).

(*c*) Differentiate between acute and chronic toxicity.

(*d*) Enlist the factors affecting environmental concentration of chemicals.

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

(*a*) Distinguish between LC_{50} and LD_{50}.

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

(*c*) Explain how exposure, and chemicals influences toxicity.

(*d*) Differentiate between bioaccumulation and biomagnification with suitable examples.

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

(*a*) Define biotransformation. Discuss the mechanism of biotransformation (Phase II reaction). 2 + 6

(*b*) Name one each corrosive, metabolic and neurotoxic 'xenobionts'. Mention their route of entry and mechanism of action. 8