

2008

ZOOLOGY

PAPER—Z - 303

*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*

GROUP—A

*(Developmental Biology)*

1. Answer any *two* questions : 2×2

(a) Enlist different diffusible proteins of the organizer I&II.

(b) Highlight the role of  $Ca^{++}$  ions in DNA synthesis in Oocyte cytoplasm of *Arbacia* sp.

(c) State the role of glial growth factor and transferrin in newt regeneration.

(Turn Over)

(d) Mention the role of Rb protein in newt limb regeneration.

2. Answer any *two* questions : 4 × 2

(a) How does Disheveled protein stabilize  $\beta$ -catenin in the dorsal portion of the amphibian egg ?

(b) Describe briefly the Possible mechanism of sea urchin egg activation by Src proteins.

(c) What is transdifferentiation? How can you prove that transdifferentiation takes place in amphibian limb regeneration ?

(d) State the set of physiological changes by which the sperm becomes competent to fertilize the egg in mammal.

3. Answer any *one* questions : 8 × 1

(a) (i) Briefly describe the interaction between a *gradient of head inhibitor* and a *gradient of positional value* in a head regenerating hydra.

(ii) The head region of Hydra acts both as an organizing region and also as an inhibitor. Justify with grafting experiment.

(b) (i) Describe briefly the summary of events to bring about the induction of the organizer in the dorsal mesoderm in *Xenopus*.

(ii) State the function of Resact isolated from sea urchin egg. (4 + 4) + (5 + 3)

### GROUP—B

#### (*Environmental Resource and Pollution*)

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

(a) Define natural resource. Give one example of non-renewable resource.

(b) What is Ozone hole ?

(c) What do you mean by oxygen demanding wastes ?

(d) Biomagnification.

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

(a) State the differences between London type of smog and Los Angeles type of smog.

(b) Mention the causes of ecodegradation of agricultural land.

(c) Mention two important greenhouse gases. Describe in brief the effect of global warming on the environment.

(d) Write a short note on cultural eutrophication.

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

(a) Write short notes of the following :

(i) SPM

(ii) Pathways of air pollutants removal.

(b) What is acid rain ? How does it form ? Mention the environmental impact of acid rain.

(4 + 4) + (2 + 2 + 4)