

2015  
ZOOLOGY — HONOURS  
Fourth Paper  
(Unit – I)  
(Developmental Biology)  
Full Marks – 50

*The figures in the margin indicate full marks*

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

Answer *Question No. 1* and *any four* questions from the rest

1. Answer *any five* : 2×5
- (a) Distinguish between Involution and Ingression.
  - (b) What is 'Gray Crescent'?
  - (c) What is discoidal cleavage? Give one example.
  - (d) Enumerate the role of CPA in cryopreservation.
  - (e) What is splanchnopleure?
  - (f) Mention the role of Hypoblast in chick gastrulation.
  - (g) Differentiate between GIFT and ZIFT.
  - (h) Compare and contrast Telolecithal and Centrolecithal eggs with examples.
  - (i) What is Koller's sickle?
2. (a) State the advantages and disadvantages of *in vitro* fertilization in human. 3
- (b) Distinguish between cytotrophoblast and syncytiotrophoblast. 2
- (c) Give an account of growth phase of oogenesis. 5
3. (a) What is meant by sperm capacitation? Mention the major molecular changes occur in mammalian sperm during capacitation. 1+4
- (b) Briefly describe egg activation in sea urchin. 3
- (c) State the characteristics of embryonic stem cells. 2

4. (a) Describe the process of development of brain in chick up to the *three vesicle stage* with proper diagrams. 5
- (b) Write down the inductive events that govern the development of brain in chick. 3
- (c) What is heteroplastic transplantation? 2
5. (a) Delineate the process of acrosome formation during spermiogenesis. 4
- (b) Name and characterize the type of placenta found in Rabbit and Dog according to the distribution of villi. 4
- (c) Discuss the role of follistatin in embryogenesis. 2
6. (a) What is meant by 'fate map'? 2
- (b) Draw and describe the fate map of a chick blastula. 3
- (c) Discuss the role of dorsal lip of blastopore during gastrulation in frog. 5
7. (a) Which is the first extra-embryonic membrane to appear in chick? What is its major function? 1+1
- (b) Describe the formation of amnion and chorion in chick. 5
- (c) Mention the different steps used in embryo transfer. 3
8. Write brief notes on :  $2\frac{1}{2} \times 4$
- (a) Regression of primitive streak in chick
- (b) Cleavage planes in frog
- (c) Cryopreservation of oocytes
- (d) Comparative account of spermatogenesis and oogenesis.