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3 (Sem-6/CBCS) ZOO HC 1

2022

ZOOLOGY

(Honours)

Paper : ZOO-HC-6016

(Developmental Biology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer of the following :
(any seven) $1 \times 7 = 7$

(a) Rolling of sheet of cells over other cells during gastrulation is called as :

(i) Involution

(ii) Ingression

(iii) Epiboly

(iv) Invagination

Contd.

- (b) Embryonic stem cells are derived from
- (i) Undifferentiated inner mass of cells of embryo
 - (ii) Differentiated inner mass of cells of embryo
 - (iii) Undifferentiated trophoblast cells
 - (iv) Differentiated trophoblast cells
- (c) The only cell that can give rise to a complete new organism is
- (i) Pluripotent
 - (ii) Multipotent
 - (iii) Totipotent
 - (iv) Corticopotent
- (d) In case of chick development, primary organizer is called
- (i) Hensen's node
 - (ii) Dorsal lip of blastopore
 - (iii) Nieuwkoop centre
 - (iv) Primitive groove

- (e) The type of regeneration found in hydra is
- (i) Morphallaxis
 - (ii) Epimorphosis
 - (iii) Regeneration
 - (iv) Healing
- (f) In developmental biology, morula is _____ cell stage
- (i) 8 cell
 - (ii) 16 cell
 - (iii) 32 cell
 - (iv) Mass of cells
- (g) In frog, cleavage is
- (i) Holoblastic and equal
 - (ii) Holoblastic and unequal
 - (iii) Meroblastic and unequal
 - (iv) Meroblastic and discoidal

(h) The incubation period in chick tastes for about

- (i) 11 days
- (ii) 21 days
- (iii) 24 days
- (iv) 31 days

(i) The type of cleavage found in insect is

- (i) Meroblastic
- (ii) Discoidal
- (iii) Superficial
- (iv) Holoblastic

(j) The process in which the *three* germ layers form is called

- (i) Cleavage
- (ii) Gastrulation
- (iii) Organogenesis
- (iv) Metamorphosis

2. Write short notes on **any four** of the following: $2 \times 4 = 8$

- (a) Stable cell interaction
- (b) Homolecithal eggs
- (c) Disco blastula
- (d) Zonary placenta
- (e) Frozen embryo
- (f) Totipotent stem cells
- (g) Meridional plane of cleavage
- (h) Primary egg membrane

3. Answer **any three** of the following: $5 \times 3 = 15$

- (a) Describe briefly the differential gene expression.
- (b) Describe the process of spermatogenesis.
- (c) Describe different types of egg with example.
- (d) What are the fate of germ layers ?
- (e) Types of placenta.

(f) Describe the metamorphic changes found in amphibians.

(g) Teratogenic agents.

(h) Biological theories of Aging.

4. Answer **any three** of the following :

10×3=30

(i) What is pattern formation ? Describe the process of patterning along the anterior-posterior axis of *Drosophila* embryo.

2+8=10

(ii) What is cytoplasmic determinant ? Describe the process of asymmetric segregation of cellular determinants.

2+8=10

(iii) Describe the mechanism of fertilization with labelled diagram.

7+3=10

(iv) Describe the process of early development of chick up to gastrulation.

10

(v) What is fate map ? Describe the fate map of a typical chordate blastula.

3+7=10

(vi) Describe the process of implantation of human embryo. 10

(vii) What is regeneration ? Describe the morphallactic regeneration found in Hydra. 2+8=10

(viii) What is IVF ? Describe the technique used in IVF. 2+8=10