# BRAINWARE UNIVERSITY

## Term End Examination 2019 – 20

**Programme – Master of Biotechnology**

**Course Name – Cell & Developmental Biology**

**Course Code – MBT102**

(Semester – 1)

**Time allotted: 2 Hours 30 Minutes** **Full Marks: 60**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

## Group –A

(Multiple Choice Type Question) 20 x 1 = 20

1. Answer any *twenty* from the following

(i) Activation of maternal genes leads to:

a. Formation of wings
b. Development of antenna
c. Development of legs
d. Activation of bicoid gene

(ii) What is the name of cell adhesion protein?

a. E- Cadherin
b. Z- Cadherin
c. Protease
d. ATPase

(iii) What are the main functions of Placenta?

a. Nutritional, Endocrine,Immunological
b. Immunological
c. Nutritional
d. Excretion

(iv) Mutation in Homeotic genes lead to what type of developmental defect?

a. Change of segmental identity
b. Change of abdominal segments
c. transformation of thorax
d. transformation of antenna

(v) How sex is determined in mammals?

a. X/A ratio
b. Hormonal
c. XX/XY mechanism
d. Both hormonal and chromosomal

(vi) Which type of hormones is responsible for amphibian metamorphosis?

a. Pituitary hormone
b. Thyroid hormone
c. Testosterone
d. Ecdyosone

(vii) Which of the the following is tumour suppressor gene?

a. Retinoblastoma gene
b. Gap gene
c. bicoid gene
d. Hox gene

(viii) How many cleavages are completed in 16 cell stages of frog's egg?

a. 3
b. 8
c. 4
d. 12

(ix) For fertilization of the frog's egg

a. sperms of same species are essential
b. sperms do not need penetration
c. sperms of any animal can fertilize
d. only presence of male is sufficient

(x) Grey cresent is present in

a. zygote of frog
b. brain of rabbit
c. eye of frog
d. retina of cockroach

(xi) During fertilization the spermatozoa penetrate through the egg membranes with the help of

a. flagellum
b. acrosome
c. sperm lysins released from the acrosome
d. mitochondira located at the middle piece

(xii) The nervous system, epidermis and hairs and nails are derivatives of

a. endoderm
b. mesoderm
c. ectoderm
d. chordomesoderm

(xiii) Cleidoic eggs are found in

a. birds
b. mammals
c. insects
d. molluscs

(xiv) A freshly unfertilised egg of hen contains

a. one cell
b. 100 cells
c. 1000 cells
d. 10000 cells

(xv) Spermateliosis is a process by which

a. the spermatids differentiate into spermatozoa
b. primary spermatcyte is tarnsformed into a secondary spermatocyte
c. spermatogonea complete multiplication phase
d. secondary spermatocyte extrudes polar bodies

(xvi) The substance fertilizin is secreted by

a. ova
b. sperm
c. both a & d
d. primary spermatogonia

(xvii) In frog's egg the division is

a. holoblastic
b. meroblastic
c. diploblastic
d. triploblastic

(xviii) The final products of mammalian oogenesis are:

a. one primary oocyte and three polar bodies
b. one primary oocyte and one polar body
c. two primary oocytes and two polar bodies
d. four primary oocytes

(xix) Discoidal cleavage occurs in only:

a. isolecithal eggs
b. telolecithal eggs
c. mesolecithal eggs
d. disocolecithal eggs

(xx) Fate maps can be constructed using:

a. fluorescent molecules
b. pigmented cells
c. transplantation experiments
d. all of the above

(xxi) What is a stem cell?

a. A cell that can make copies of itself AND make more specialized types of cell
b. A cell that helps to fight against infections
c. A cell that is specialized
d. A cell that can produce all the cell types of the body

(xxii) A blastocyst is

a. A very early stage embryo
b. A type of stem cell
c. Part of the blood system
d. A type of brain cell

(xxiii) What are stem cell scientists investigating today?

a. When and how embryonic stem cells make decisions to produce more specialized cells
b. How stem cells work in the body
c. How stem cells might be used to treat disease
d. All of the above

(xxiv) An embryonic stem cell can be described as

a. Totipotent
b. Multipotent
c. Pluripotent
d. Unipotent

(xxv) In eggs of many species, fertilization triggers

a. calcium transients
b. lysosomal breakdown
c. rapid transcriptional activity
d. all of the above

## Group – B

(Short Answer Type Questions) 4 x 5 = 20

Answer any *four* from the following

2. What is the difference between Totipotent and Pleuripotent cells? 5

3. What is the role of hormones in mammalian sex determination? 5

4. How polyspermy is prevented in sea urchin? 5

5. Briefly explain in-vitro fertilization. 5

6. Define the process of epimorphic regeneration. Describe the characteristics of epimorphic regeneration process. 5

7. Define blastema. Define the process of Cleavage. 2+3

## Group – C

(Long Answer Type Questions) 2 x 10 = 20

Answer any *two* from the following

8. (a) Write the concept of IVF. 2
   (b) Briefly highlight the steps involve during IVF. 8

9. Explain with diagram the Gastrulation in chick. 10

10. (a) Describe the process of development of brain and eye in vertebrate. 8
    (b) State the differences between – Radial and spiral cleavage. 2

11. (a) Explain the difference between morphollactic and compensatory regeneration? 3
    (b) Explain the selection factors of model organisms for research. 7

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