2016

ZOOLOGY

ZOO 201
REPRODUCTIVE AND DEVELOPMENTAL BIOLOGY

Full Mark : 80
Time : 3 Hrs

Figures in the right hand margin indicate full marks for the question

1) Answer the following : (any eight) 1 x 8=8

i) Cadherins are calcium dependent adhesion molecules that interact with other cadherins on adjacent cells. Which of the following statement is incorrect ?

a) The cadherins are anchored inside the cell by a complex of proteins called catenin.

b) Blocking cadherins function or can prevent the formation of epithelial tissues and cause the cells to disaggregate.

c) E-cadherin is expressed on all early mammalian embryonic cells, even at zygote stage.

d) N-cadherin is not expressed in on the cells of the developing central nervous system.

ii) The kidney and heart are formed from the germ layers respectively

a) Lateral plate mesoderm and mesoderm

b) mesoderm and lateral plate mesoderm

c) endoderm and ectoderm

d) mesoderm and somites

iii) The active form of testosterone is

a) DHT b) DHEA c) 3β - HSD

d) Androstenediol

iv) ICSI is

a) an in vitro fertilization procedure in which a single sperm is injected directly into an egg.

b) This procedure is most commonly used to overcome male infertility problems, although it may also be used where eggs cannot easily be penetrated by sperm, and occasionally in addition to sperm donation.

c) It can be used in teratozoospermia, because once the egg is fertilized, abnormal sperm morphology does not appear to influence blastocyst development or blastocyst morphology.

d) All the above.

v) Morula is a mass of dividing cells during developmental stage, which has

a) 16 celled stage

b) 18-celled stage

c) 8 celled stage and

d) 64 celled stage

vi) Antrum is a characteristic feature of

a) Secondary follicles

b) Primary follicle

c) Secondary and Graafian follicles

d) Primordial follicle.

vii) The hormone that acts on leying cells and the main hormone released by the corpus luteum are respectively

a) LH and progesterone

b) LH and FSH

c) Progesterone and LH

d) testosterone and proesterone

viii) The stem cell with regard to the function of adult tissue and organ is

a) Stem cells are embryonic cells that persist in the adult and can give rise to all of the cell types in the body

b) Stem cells are undifferentiated cells that divide asymmetrically giving rise to one daughter that remains a stem cell, one daughter cell that will differentiate to replace damaged and worn out cells in the adult tissue or organ.

c) Stem cells are determined cells that reside in fully differentiated tissues and when needed differentiated to supply new cells for growth of the tissue.

d) Stem cells are differentiated cells that have yet to express the genes and proteins characteristics of their differentiated state and do so when needed for repair of tissues and organs.

ix) Which of the following hormone is the product of human placenta

a) Protactin

b) hCG

c) estrogen

d) Progesterone

2. Answer all the following *(Any five)* : 2 x 5 = 10

a) How and why embryo transfer is done in IVF technique?

b) How does a sperm get energy and can penetrate the ovum nucleus?

c) What are the candidate molecules involved in fertilization and mention their role?

d) How polyspermy is prevented during fertilization process?

e) What is stem cell? What are its characteristics?

f) What are GIFT and ZIFT?

3. Answer the following (Any Four) : 5 x 4 = 20

a) What is decidualization? Write about the physiological and hormonal changes during the process of implantation.

b) Why placenta is regarded as temporary endocrine gland? Mention placental hormones with their functions found in mammals.

c) How parturition is governed by hormones in mammals? What are hormonal induction of lactation in mammals?

d) Why capacitation is necessary before reaching to fertilization? What are the molecular changes during its course of mechanism?

e) What are the properties of pluripotecy? How pluripotency is useful in the field of medicine research?

4. Answer the following (Any two) 9 x 2 = 18

a) How does acrosomal reaction help the sperm to attach with the zona pellucida? Explain the pre and post fertilization event with necessary diagram. 1+6+2=9

b) Describe the role of maternal contribution in early embryonic development in drosophila. 9

c) What is morphogenesis? Describe the different types of morphogenetic processed during the development of living organism. 4+5=9

5. Answer any following (any two)

a) Describe the principle of teratogenesis, causes and contribution of teratology to the inborn and foetal disease. 5+3+4=12

b) How does estrous cycle differ from menstrual cycle in repect of physiological change? Describe the different stages of the menstrual cycle and its hormonal regulation. 2+5+5 = 12

c) What do you mean by steroidogenesis? Give a detailed note on the steroidogenesis of male and its hormonal regulation. 2+5+5=12

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