

Total No. of printed pages = 6

63/2 (SEM-2) ZOO 201

2022

**ZOOLOGY**

(Theory paper)

Paper Code : ZOO 201

**(Reproductive and Developmental Biology)**

Full Marks – 80

Time – Three hours

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

1. Choose the correct option :  $1 \times 6 = 6$

(i) During development of an organism, if a cell is committed to a particular fate is said to be

- (a) Pluripotent
- (b) Totipotent
- (c) Determined
- (d) Differentiated

[Turn over

(ii) You are asked to identify the stage of estrous cycle in vaginal smear of a mouse containing large number of leukocytes and a very few nucleated epithelial cells. Which one of the following will be the correct stage of estrous cycle ?

- (a) Early estrus, late polystrus
- (b) Late estrus, early metestrus
- (c) Late metestrus, early diestrus
- (d) Late diestrus, early proestrus

(iii) Following statements are given for the ovarian hormones

- (a) 17 $\beta$ -estradiol, estrone and estriol are naturally occurring estrogens
- (b) They are 18C steroids which do not have methyl group at 10th positions
- (c) They are 21C steroids which have methyl group at 10th position
- (d) They are primarily synthesized by granulosa cells of the ovarian follicles
- (e) Their biosynthesis does not depend on the enzyme aromatase

Which one of the following options represents the combination of correct statements ?

- (a) (A), (B) and (C)
- (b) (A), (B) and (D)
- (c) (B), (C) and (D)
- (d) (C), (D) and (E)

(iv) What will be the consequence if the theca interna cells are destroyed in a graafian follicle ?

- (a) Decreased estrogen synthesis in the granulosa cells
- (b) Immediate formation of corpus albicans
- (c) Increased progesterone synthesis in the granulosa cells
- (d) Formation of corpus hemorrhagicum

(v) Which of the following hormone is released from the Leydig cells ?

- (a) FSH
- (b) Testosterone
- (c) LH
- (d) None of these

(vi) What is the role of estrogen during pregnancy?

- (a) Synthesis of contractile proteins in the myometrium
- (b) Decrease the contractility of the myometrium lining of the uterus
- (c) Increase the contractility of the myometrium lining of the uterus
- (d) All of the above.

2. Very short type of questions :  $2 \times 5 = 10$

- (a) Write the major causes of follicular atresia.
- (b) Write the major differences between primary and secondary amenorrhoea.
- (c) What is Fetal Alcohol Syndrome (FAS)?
- (d) Distinguish between ZIFT and GIFT.
- (e) Name the hormones produced by the placenta.

3. Answer any six of the following questions :  $5 \times 6 = 30$

- (a) Write the anatomical structure of Sertoli cell. Add a note on the endocrine control of Sertoli cell.  $2+3=5$

(b) Write brief notes on :

- (i) Pluripotent and Multipotent 3
- (ii) HSC. 2
- (c) Write about the major physical and hormonal changes during ovulatory and luteal phase of menstrual cycle in mammals with proper diagram.  $4+1=5$
- (d) What is selective affinity? Explain selective affinity with suitable example.  $3+2=5$
- (e) What is cadherin? Write the different types of cadherin present in mammals.  $2+3=5$
- (f) Distinguish between acrosomal reaction and capacitation in developmental biology.  $2\frac{1}{2}+2\frac{1}{2}=5$
- (g) What do you mean by fast block to polyspermy? 5
- (h) Describe the role of LH in spermatogenesis. 5
- (i) Write short notes on maternal gene. 5

4. Answer any *two* of the following questions :

10×2=20

(a) What are the major strategies of cell specification? How does cell specification differ from cell determination? 7+3=10

(b) What do you understand by morphogen gradient? Describe how activin acts on different mesodermal cell types in *Xenopus laevis*. 3+7=10

(c) What are teratogenic agents? Write the effects of teratogenic agents on embryonic development. 2+8=10

5. Answer any *one* from the following questions :

14×1=14

(a) Describe the role of theca and granulosa cells in the biosynthesis of ovarian steroid hormones. Mention all the necessary enzymes involved in the process. 8+6=14

(b) What is metamorphosis? What are the different metamorphic changes that take place during metamorphosis in anurans? Describe the role of Hormones in amphibian metamorphosis. 2+2+10=14