

**[ PART-B : Descriptive ]**

Time : 2 hrs. 40 min.

Marks : 50

[ Answer question no.1 & any four (4) from the rest ]

1. Write short notes: (Any two) 5+5=10
  - a. Assisted reproductive technology
  - b. Specification during the development of embryos.
  - c. Atresia
2. Discuss the GIFT technology and add a note on its advantages. 6+4=10
3. Discuss the ICSI technique and highlight the risks involved in the process. 6+4=10
4. Describe briefly on the vulvae development in *Caenorhabditis elegans*. Write a brief note on the use of *C. elegans* as model organism in biology. 5+5=10
5. Describe briefly on the mechanism of dorsal-ventral polarity in *Drosophila*. 5+5=10
6. What is embryo transfer? Elucidate in detail the process of embryo transfer. 2+8=10
7. What are the hormonal factors that stimulate spermatogenesis? Describe the different functions of testosterone. 3+7=10
8. Describe the development of Endometrium and implantation of blastocyst. 4+6=10

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[4]

**M. Sc. ZOOLOGY  
SECOND SEMESTER  
DEVELOPMENTAL & REPRODUCTIVE BIOLOGY  
MSZ-201**

( Use Separate Answer Scripts for Objective & Descriptive )

Duration : 3 hrs.

Full Marks : 70

**[ PART-A : Objective ]**

Time : 20 min.

Marks : 20

Choose the correct answer from the following:

1×20=20

1. The process by which developing follicles involute called
  - a. Atretic
  - b. Atresia
  - c. Involution
  - d. None of the above
2. The Principal Estrogen secreted by the ovaries
  - a.  $\beta$ -estradiole
  - b. Estrone
  - c. Estriole
  - d. Estrone & Estriole together
3. The enzyme/enzymes present in the acrosome of the spermatid is/are
  - a. Hyaluronidase
  - b. Proteolytic enzyme
  - c. Hyaluronidase & Proteolytic enzyme
  - d. Proteolytic enzyme & Hirudinidase
4. Leydig cell located in the
  - a. Seminiferous tubule
  - b. Interstitium of the testes
  - c. Epididymis
  - d. Retes testes
5. Prostaglandins secreted by
  - a. Seminal vesicle
  - b. Prostate gland
  - c. Vas deference
  - d. Leydig cell
6. At the time of implantation, the fertilized ovum is known as
  - a. Morula
  - b. Blastocyst
  - c. Gastrula
  - d. None of these
7. When the blastocyst implants in the endometrium, the continued secretion of progesterone causes the endometrial cells to swell further and to store even more nutrients. These cells are now called
  - a. Trophoblast Cell
  - b. Blastula
  - c. Stroma cell
  - d. Decidual cell
8. Intracytoplasmic sperm injection is most often used for couples who have had trouble of conceiving due to
  - a. The male infertility factor
  - b. Sterility of female
  - c. Incomplete Fertilization
  - d. Motility of Sperm

9. For GIFT to be suitable woman must have  
 a. At least one normal fallopian tube  
 c. Epididymis  
 b. A Uterus and three fallopian tube  
 d. All of the above
10. Development of egg without fertilization is  
 a. Fertilization in vitro  
 c. Egg farming  
 b. Embryogenesis  
 d. Parthenogenesis
11. The time of natural ovulation is determined by monitoring the level LH either in urine or in the blood and the ova once recovered. This approach yields  
 a. only one ovum per female cycle  
 c. Three ovum per cycle  
 b. Two ovum per cycle  
 d. nine ovum per cycle
12. Site of notochord formation is  
 a. Amphibian gray crescent, which is a centre of high metabolic activity.  
 c. Ectodermal tissue  
 b. Amphibian oocyte  
 d. None of these
13. Gamete intrafallopian transfer is not technically *in vitro* fertilisation because with GIFT, fertilisation takes place  
 a. Inside the body, not on a petri dish  
 c. On a plate of Agarose  
 b. outside the body  
 d. Inside the ovary
14. A normally fertilized Oocytes have  
 a. Two pro-nuclei and two polar bodies  
 c. Five pronuclei and Five polar bodies  
 b. Three pro-nuclei and three polar bodies  
 d. One nuclei only
15. Which of the following is the morphagen determines the ventral fates in *Dorsophila melanogaster*?  
 a. gruken mRNA  
 c. Pipe  
 b. Dorsal  
 d. Cactus.
16. Which of the following is not true for stem cell?  
 a. Pluripotent stem cells are capable to generate all the structures of the embryo  
 b. Progenitor cells are no longer stem cells.  
 c. Stem cells has the capacity to divide indefinitely and give rise to more specialized cells  
 d. Progenitor cells do not restricted their fate and capable to generate all structure of the embryo

17. Male sex of *Bonellia* is maintain by landing of larvae to  
 a. proboscis of female.  
 c. sea floor.  
 b. proboscis of male.  
 d. skin near the uterus
18. Implantation of embryo to the uterus is done by  
 a. N-cadherin  
 c. C-cadherin  
 b. P-cadherin  
 d. R-cadherin
19. Which of the following is not true for Wnt signaling?  
 a. Wnt signaling inhibits degradation of  $\beta$ -catenin.  
 b.  $\beta$ -catenin interacts with Tf lymphoid enhancer binding factor (TFC)  
 c. signaling is a caonical pathway through Frizzled to  $\beta$ -catenin.  
 d. Wnt signaling activates  $\beta$ -catenin degradation in the cytoplasm.
20. Which of the following vulval precursor cells in *Caenorhabditis elegans* adopts vulval fates?  
 a. P5.p, P6.p and P7.p  
 c. P3.p, P4.p, and P5.p  
 b. P3.p, P4.p and P8.p  
 d. Only P6.p and P7.p.