

M.Sc. ZOOLOGY
Second Semester
DEVELOPMENTAL & REPRODUCTIVE BIOLOGY
MSZ – 201

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

Answer any four from Question no. 2 to 7
Question no. 1 is compulsory.

1. 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)
2. Describe briefly on the mechanism of dorsal-ventral polarity in *Drosophila*. (10)
3. Write a brief note on the different mode of commitment during development stages of an embryo. (10)
4. Discuss the ICSI technique and highlight the risks involved in the process. (10)
5. In the light of the modern concept describe the process of IVF. (10)
6. Discuss the process of embryonic induction citing suitable examples. (10)
7. Describe the Luteal Phase of the Ovarian Cycle. (10)

Or

Describe the process of transport of ovum from ovary to the uterus through the Fallopian tube. (10)

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Duration: 20 minutes

Marks – 20

(PART A - Objective Type)

I. Choose the correct answer:

1×20=20

1. Which of the following is the cephalisation morphagen during the development of *Drosophila melanogaster*?
(a) *gruven* mRNA
(b) *bicoid* mRNA
(c) *nanos* mRNA
(d) *oscar* mRNA
2. 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 cell has the capacity to divide indefinitely and give rise to more specialized cell.
(d) Progenitor cells do not restricted their fate and capable to generate all structure of the embryo.
3. Male sex of *Bonellia* is maintain by landing of larvae to:
(a) Proboscis of female.
(b) Proboscis of male.
(c) Sea floor.
(d) Skin near the uterus.
4. Implantation of embryo to the uterus is done by:
(a) N-cadherin
(b) P-cadherin
(c) C-cadherin
(d) R-cadherin
5. For GIFT to be suitable woman must have:
(a) At least one normal fallopian tube.
(b) A Uterus and three fallopian tubes.
(c) Epididymis.
(d) All of the above.
6. Development of egg without fertilization is:
(a) Fertilization in vitro.
(b) Embryogenesis.
(c) Egg farming.
(d) Parthenogenesis.

7. Human chorionic gonadotropin (HCG) is administered:
(a) To prevent the inhibition of LH surge by HMG.
(b) To prevent fertilization.
(c) For ovulation.
(d) To increase fertility.
8. The ovum with single layer of granulosa cells called:
(a) Primary follicle
(b) Primordial follicle
(c) Theca
(d) Antrum
9. The process by which developing follicles involute called:
(a) Atretic
(b) Atresia
(c) Involution
(d) None of the above
10. The psychological manifestation of heat in female brought about by:
(a) Estrogen
(b) Progesterone
(c) FSH
(d) LH
11. Estrogen secreted by:
(a) Primordial follicle
(b) Primary follicle
(c) Theca interna
(d) Theca externa
12. The Principal Estrogen secreted by the ovaries:
(a) β -estradiole
(b) Estrone
(c) Estriole
(d) Estrone & Estriole together
13. Leidig cell produce testosterone in the presence of:
(a) FSH
(b) LH
(c) Anterior pituitary
(d) Seminiferous tubule
14. Prostaglandin secreted from:
(a) Prostrate gland
(b) Seminal vesicle
(c) Leidig cell
(d) Hypothalamus

15. The stage of fertilized egg in human entered from fallopian tube to the uterus is:
- 16-cell stage
 - 32-cell stage
 - morula stage
 - blastocyst stage
16. Intracytoplasmic sperm injection is most often used for couples who have had trouble of conceiving due to:
- The male infertility factor
 - Sterility of female
 - Incomplete Fertilization
 - Motility of Sperm
17. Embryo transfer refers to a step in the process of assisted reproduction in which embryos are placed into the:
- Uterus of a female with the intent to establish a pregnancy.
 - Corpus luteum of female to establish a pregnancy.
 - Ovary.
 - All of the above.
18. The technique of selecting only one embryo to transfer to the woman is called:
- Elective-Single Embryo transfer.
 - Elective-Single double diffusion transfer.
 - Elective and single embryo transfer.
 - None of the above.
19. Which of the following is not related to Nanos in anterior-posterior patterning of *Drosophila*?
- Hunchback translation is repressed by Nanos.
 - Caudal translation is induced.
 - Hunchback translation is induced.
 - Bicoid activation is inhibited in posterior region.
20. The entire genome sequence of *Caenorhabditis elegans* contains:
- 19-20,000 protein-encoding genes
 - 10-15,000 protein-encoding genes
 - 5-10,000 protein-encoding genes
 - 4-5000 protein-encoding genes



University of Science and Technology, Meghalaya

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| Instructions to Candidates | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <ol style="list-style-type: none"> This answer booklet has 4 pages. Please check before writing whether it is complete or in good condition. Do not write your name anywhere in the answer booklet. Write legibly on both sides of the paper You may use some space for any rough notes or calculation on the answer booklet if you need. These rough notes, calculations must be scored out before submitting the answer booklet. Do not bring any book or loose paper in the examination hall. Do not tear any page from the answer booklet. Do not write anything on the question paper or blotting paper or any pieces of paper while you are in the examination hall. Any act of indiscipline or misbehavior in the examination hall will result in your expulsion. No examinee is allowed to leave the examination hall until 30 minutes lapse after the commencement of the examination. Additional answer sheet will be supplied after the main answer booklet is completed. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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