



# **MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2023/2024 ACADEMIC YEAR**

**FIRST YEAR FIRST TRIMESTER EXAMINATION**

**FOR THE DEGREE  
OF**

- 1. BACHELOR OF SCIENCE IN PHYSIOTHERAPY**
- 2. BACHELOR OF SCIENCE IN CLINICAL MEDICINE AND  
COMMUNITY HEALTH**

**COURSE CODE:     PHC 114**

**COURSE TITLE:     FUNDAMENTALS OF EMBRYOLOGY &  
HISTOLOGY**

**DATE: WEDNESDAY 6<sup>TH</sup> DECEMBER 2023**

**TIME: 2:00PM – 4:00PM**

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## **INSTRUCTIONS TO CANDIDATES**

1. READ THE INSTRUCTIONS AT THE BEGIN OF EACH SECTION
2. DO NOT WRITE ON THE QUESTION PAPER.
3. NUMBER ALL QUESTIONS CORRECTLY.
4. THIS PAPER CONSIST OF:

Section A: Multiple Choice Questions (MCQ)

20 Marks.

Section B: Short Answer Questions (SAQ)

40 Marks.

Section C: Long Answer Question (LAQ)

40 Marks

5. NO MOBILE PHONE IS ALLOWED IN THE EXAMINATION ROOM

**DURATION: 2 Hours**

**MMUST observes ZERO tolerance to examination cheating**

**This Paper Consists of SIX Printed Pages. Please Turn Over.**

**SECTION A: MULTIPLE CHOICE QUESTIONS (CHOOSE ONE BEST ANSWER FROM EACH QUESTION) (20MKS)**

1. **The primitive gut develops as a result of:-**
  - A. Embryonic folding.
  - B. Gastrulation.
  - C. Cleavage.
  - D. Embryogenesis.
  - E. Aneuploidy.
2. **Which of the following embryonic structures arise from the somites?**
  - A. Intermediate mesoderm
  - B. notocord
  - C. Endoderm
  - D. Somatic mesoderm
  - E. Sclerotome
3. **Placental nutrition becomes the dominant mode of nutrition at the beginning of which week?**
  - A. 3
  - B. 5
  - C. 7
  - D. 9
  - E. 14
4. **In ovulation the following is not true?**
  - A. Ovulation is when a mature egg is released from the ovary, pushed down the fallopian tube, and is made available to be fertilized.
  - B. Follicle from which the egg is released is called the corpus luteum.
  - C. When menstrual cycle begins, your estrogen levels are low
  - D. If fertilization does not occur the egg dissolves after 24 hours.
  - E. Shedding of an unfertilized egg and the uterine wall is the time of ovulation
5. **Which of the following is formed by the villi becoming surrounded by pools of free blood which eventually merge to form a single blood filled cavity?**
  - A. Yolk sac
  - B. Placental sinus
  - C. Chorionic plate
  - D. Intervillous space
  - E. Amniotic cavity
6. **The fetal period is:-**
  - A. From weeks 9–38
  - B. The time of rapid growth of body organs
  - C. A time of cell differentiation
  - D. All of the above

- E. None of the above
7. **The major events of pre-embryonic stage are all the following except?**
- A. Cleavage
  - B. Implantation
  - C. Neurulation
  - D. Embryogenesis
  - E. Blastocyst formation
8. **The following are Functions of the Placenta except:-**
- A. Transports fetal antibodies into maternal blood to confer immunity on fetus.
  - B. Transports nutrients from the maternal blood to the fetal blood.
  - C. Stores nutrients in early pregnancy and releases them to the fetus later.
  - D. Transports nitrogenous wastes from the fetal blood to the maternal blood.
  - E. Transports O<sub>2</sub> from mother to fetus, and CO<sub>2</sub> from fetus to mother.
9. **In anatomy lab session, Ken who is an anatomy student pointed to following:  
Can you identify Ken's correct answer?**
- A. A kidney and said, "Intermediate mesoderm,"
  - B. The biceps muscle in the arm and said, "Splanchnic Mesoderm,"
  - C. The vertebrae of a cadaver and said "notochord."
  - D. To the inner lining of the stomach and said, "ectoderm,"
  - E. The brain and said, "endoderm"
10. **Most birth defects can be traced to disruption of the developmental events during which part of the prenatal period?**
- A. First 2 weeks
  - B. End of Month 3
  - C. End of month 4
  - D. Month 2 & 3
  - E. Months 8 and 9
11. **The following are true in relation to the umbilical cord except?**
- A. The chorionic villi are filled with fetal blood and surrounded by maternal blood.
  - B. placental barrier is only 3.5  $\mu\text{m}$  thick
  - C. Blood flows to the placenta by way of one umbilical artery
  - D. The placenta is permeable to nicotine and alcohol.
  - E. Chorionic villi have thick membranes that are not very permeable to nutrients and wastes.
12. **The outer layer of the blastocyst, which attaches to the uterine wall, is the:-**
- A. Yolk sac
  - B. Trophoblast

- C. Amnion
  - D. Inner cell mass
  - E. Zona pellucida
13. **The following happen during gastrulation EXCEPT:-**
- A. Establishment of all three germ layers
  - B. Appearance of primitive streak
  - C. Development of notochord in the embryo
  - D. Invagination
  - E. Formation of somites
14. **The entry of a sperm nucleus into an egg must be preceded by**
- A. Cortical reaction.
  - B. Acrosomal reaction.
  - C. Fast block.
  - D. Implantation.
  - E. Cleavage.
15. **When a conceptus arrives in the uterus, it is at what stage of development?**
- A. Blastocyst
  - B. Zygote
  - C. Morula
  - D. Blastomere
  - E. Embryo
16. **Fetal urine accumulates in which part and contributes to the fluid there:-**
- A. Placental sinus
  - B. Amnion
  - C. Yolk sac
  - D. Allantois
  - E. Chorion
17. **About capacitation, the following is true?**
- A. It is a step required to render spermatozoa incompetent to fertilize an oocyte.
  - B. Uterus aids in the steps of capacitation.
  - C. Sperm move normally and look immature prior to capacitation.
  - D. Non-mammalian spermatozoa require capacitation.
  - E. Chemical changes in the tail allow a greater mortality in the sperm.
18. **Chorionic villi develop from:-**
- A. syncytiotrophoblast.
  - B. endometrium.
  - C. zona pellucida.
  - D. embryoblast.
  - E. epiblast.

19. Which of The following is not a function of amniotic fluid?

- A. Plays a role in lung development.
- B. It enables the embryo to develop symmetrically.
- C. Allows the freedom of movement important to bone development
- D. Keeps its inner tissues from adhering to each other.
- E. Protects it from trauma, infection, and temperature fluctuations.

20. The following is true about the characteristic of chromosomes?

- A. X are tiny and have a long lifespan.
- B. Ericsson method exploits timing of the intercourse and the sexual position.
- C. Y are hardier and travel faster.
- D. Shettles method involves separation of X and Y sperms and artificial insemination.
- E. Male chromosomes are called heterogametic sex.

**SECTION B: SHORT ANSWER QUESTIONS (ANSWER ALL QUESTIONS, 5 marks each) (total 40MKS)**

1.
  - a) List two neural tube defects that may occur due to failure of complete closure?
  - b) Explain the four derivatives that arise from the mesoderm layer?
2. A baby born at 6 months gestation is having trouble breathing. Why?
3. A mother of two boys with normal 28 day menstrual cycle comes to you and inquire how she can get a baby gal in her third pregnancy. Using the ovulation cycle, explain to her?
4. Describe the circulatory changes that occur at birth
5. Name the organs found in the embryonic foregut, midgut and hindgut?
6. Enumerate factors that influence the action of a teratogen?
7. Explain the process of neurulation?
8.
  - a. Why are cranial sutures and fontanelles important?
  - b. Explain four embryological abnormalities of the skeletal system?

**SECTION C: LONG ANSWER QUESTIONS (ANSWER ALL QUESTIONS, 20 marks each) (Total 40MKS)**

1. Discuss the process of spermatogenesis in male and oogenesis in female showing their similarities and differences?
2. Discuss the derivatives of pharyngeal apparatus.

**END**

