



(University of Choice)

**MASINDE MULIRO UNIVERSITY  
OF  
SCIENCE AND TECHNOLOGY  
(MMUST)  
MAIN CAMPUS  
UNIVERSITY EXAMINATIONS  
2018/2019 ACADEMIC YEAR  
FIRST YEAR FIRST TRIMESTER EXAMINATION  
FOR THE DEGREE  
OF  
BACHELOR OF SCIENCE IN CLINICAL MEDICINE**

**COURSE CODE:** PCM 137

**COURSE TITLE:** HUMAN EMBRYOLOGY 1

**DATE:** Monday 28<sup>th</sup> January 2019

**TIME:** 9:00 AM- 12:00 Noon

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**INSTRUCTIONS TO CANDIDATES**

Section A: Multiple Choice Questions (MCQ) 25 Marks.

Section B: Short Answer Questions (SAQ) 35 Marks.

Section C: Long Answer Question (LAQ) 40 Marks

**TIME:** 3 Hours

MMUST observes ZERO tolerance to examination cheating

This paper contains 7 pages

**SECTION A: MULTIPLE CHOICE QUESTIONS (MCQs)**  
**(CHOOSE ONLY ONE BEST ANSWER)**

**25MKS**

**1. The epiblast forms**

- (A) Only the ectoderm
- (B) The yolk sac
- (C) Only the mesoderm and ectoderm
- (D) All three primary germ layers
- (E) All of the above

**2. The major events of pre-embryonic stage are all the following except?**

- (A) Cleavage
- (B) Placental nutrition
- (C) Implantation
- (D) Embryogenesis
- (E) Blastocyst formation

**3. The process of spermatogenesis includes which of the following sequence?**

- (A) Primary spermatocyte - Secondary spermatocytes - Spermatids - Sperm
- (B) Spermatids- Primary spermatocyte - Secondary spermatocytes- Sperm
- (C) Sperm - Spermatids - Secondary spermatocytes - Primary spermatocyte
- (D) Secondary spermatocytes - Primary spermatocyte - Spermatids - Sperm
- (E) Primary spermatocyte - Spermatids - Secondary spermatocytes - Sperm

**4. The following are functions of sertoli cells EXCEPT?**

- (A) Provide nutrients for the developing spermatozoa
- (B) Support and protect the germ cells
- (C) Assist in the release of mature spermatozoa
- (D) A site for spermiogenesis
- (E) A site for spermatogenesis

**5. in ovulation**

- (A) LH surge occurs during ovulation
- (B) Phases of ovarian cycle include follicular and secretory phase
- (C) Phases of uterine cycle include proliferative and luteal phase
- (D) Corpus luteum formation occurs before ovulation
- (E) During ovulation inhibin levels are high and oestrogen levels are low

**6. The primitive gut develops as a result of**

- (A) Gastrulation.
- (B) Cleavage.
- (C) Embryogenesis.
- (D) Embryonic folding.

(E) Aneuploidy.

**7. Which of the following statements is FALSE about fertilization?**

- (A) The sperm and egg unite in one of the fallopian tubes to form a zygote.
- (B) Polyspermy is where more than one sperm is allowed to fertilize an egg
- (C) Before fertilization the egg changes so that no other sperm can get in
- (D) Fast block to polyspermy involves opening of pores called sodium channels in the egg membrane making the sodium ions to flow rapidly into the egg
- (E) Slow block polyspermy is where sperm penetration triggers an inflow of calcium ions

**8. in the XY SEX-DETERMINATION SYSTEM where it is determined by the pair of sex chromosomes. Which of the following is NOT TRUE?**

- (A) Females have XX chromosomes called homogametic sex
- (B) Male have XY chromosomes called the heterogametic sex.
- (C) The female is the one who determines the sex of the child
- (D) If the sperm has a Y chromosome, your baby will be a boy
- (E) If the sperm has an X chromosome, the baby will be a girl.

**9. The following are biological stages of prenatal development except?**

- (A) Pre-embryonic
- (B) Embryonic
- (C) Fetal
- (D) None of the above
- (E) all of the above

**10. The following statements are true EXCEPT?**

- (A) Asexual reproduction is a type of reproduction by which offspring arise from a single organism, and inherit the genes of that parent only
- (B) In Sexual reproduction two gametes fuse together and each gamete contains the same number of chromosomes of normal cells.
- (C) Mitosis is the process whereby one cell divides, giving rise to two daughter cells that are genetically identical to the parent cell
- (D) Meiosis is the cell division that takes place in the germ cells to generate male and female gametes.
- (E) Crossovers is a critical event in meiosis I leading to formation of chiasma

**11. The following are parts of a blastocyst EXCEPT?**

- (A) Zona pellucida
- (B) Endometrium
- (C) Embryoblast
- (D) Blastocoele
- (E) Trophoblast

- 12. Fetal urine accumulates in which part and contributes to the fluid there.**
- (A) Placental sinus
  - (B) Yolk sac
  - (C) Allantois
  - (D) Chorion
  - (E) Amnion
- 13. The following happen during gastrulation EXCEPT?**
- (A) Establishment of all three germ layers
  - (B) Appearance of primitive streak
  - (C) Bone calcification
  - (D) Development of notochord in the embryo
  - (E) Invagination.
- 14. In anatomy lab session, Wafula pointed to following:  
Can you identify Wafula's one mistake?**
- (A) The biceps muscle in the arm and said, "Splanchnic Mesoderm,"
  - (B) A kidney and said, "Intermediate mesoderm,"
  - (C) The vertebrae of a cadaver and said "sclerotome."
  - (D) To the inner lining of the stomach and said, "endoderm,"
  - (E) The brain and said, "ectoderm."
- 15. The notochord develops from**
- (A) Ectoderm
  - (B) Neural crest
  - (C) Mesoderm
  - (D) Endoderm
  - (E) Somatic mesoderm
- 16. 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
- 17. The following statements are true about embryology EXCEPT?**
- (A) Embryology was coined from Greek embryo, meaning the unborn
  - (B) It is the science of the development of an embryo from the fertilization of the ovum to the fetus stage.

- (C) is the study of prenatal development, it starts from the production of sperm and eggs to fertilization, embryonic and fetal development and finally birth.  
(D) The development of the embryo is called gametogenesis.  
(E) In organisms that reproduce sexually, once a sperm fertilizes an egg cell and the result is a zygote

**18. A friend in your dormitory, tells you that she just discovered she is 3 months pregnant. You know that since she came to college she has been experimenting with recreational drugs. Which is the best advice you could give her.**

- (A) She must stop taking the drugs, but they could not have affected her fetus during these first few months of her pregnancy.  
(B) Harmful substances usually cannot pass from mother to embryo, so she can keep using drugs.  
(C) There could be defects in the fetus, so she should stop using drugs and visit a doctor as soon as possible.  
(D) If she has not taken any drugs in the last week, she is OK.  
(E) She should stop taking the drugs and await delivery.

**19. When a conceptus arrives in the uterus, it is at what stage of development?**

- (A) Zygote  
(B) Morula  
(C) Blastomere  
(D) Embryo  
(E) Blastocyst

**20. 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.

**21. In oogenesis the cell gets arrested and is completed only if the oocyte is fertilized or otherwise the cell degenerates approximately 24 hours after ovulation.**

**In which stage of meiosis does the cell get arrested?**

- (A) Telophase I  
(B) Telophase II  
(C) Metaphase I  
(D) Metaphase II  
(E) Prophase II

**22. Chorionic villi develop from**

- (A) The zona pellucida.  
(B) The endometrium.

- (C) The syncytiotrophoblast.
- (D) The embryoblast.
- (E) The epiblast.

**23. Implantation takes place in which part of the uterus?**

- (A) Myometrium
- (B) Perimetrium
- (C) Fallopian tube
- (D) Cervix
- (E) Endometrium

**24. The feature that distinguishes a fetus from an embryo is that the fetus has**

- (A) All of the organ systems.
- (B) Three germ layers.
- (C) A placenta.
- (D) An amnion.
- (E) Arm and leg buds.

**25. For the first 8 weeks of gestation, a conceptus is nourished mainly by**

- (A) The placenta.
- (B) Amniotic fluid.
- (C) Colostrum.
- (D) Decidual cells.
- (E) Yolk cytoplasm.

**SECTION B: SHORT ANSWER QUESTIONS (SAQs)**  
**ANSWER ALL THE QUESTIONS**

**35 Marks**

1. A) What is Capacitation? **1mk**  
 B) Explain the Two Effects of Capacitation? **4mks**
  
2. Mary is a married woman who has come to your clinic for advice on how to get a **BABY GIRL** since she has three children who all are boys.
  - A) List Two methods of Sexual Determination you can use to advise her? **2mks**
  - B) State Two Characteristics of Each X and Y chromosome? **4mks**
  - C) Basing on the Above Characteristics, Explain during which period in the menstrual cycle in relation to Ovulation and Timing of Intercourse you will advise her to **engage sexual intercourse** so that she can have a **baby girl**? **2mks**
  - D) Define and explain **IN-VITRO** fertilization? **2mks**
  
- 3.

- A) State the Two types of Prenatal Nutrition that nourishes the Conceptus after Implantation? **2mks**
- B) State Three functions of the Amniotic Fluid? **3mks**
- C) State Three functions of the Placenta? **3mks**
- D) State the number of Blood Vessels in the Umbilical Cord and explain how blood flows in the Umbilical blood vessels? **2mks**

4. A) Define the following terminologies

- i. Ectopic Pregnancy? **1mk**
- ii. Teratogen? **1mk**

B) State the three major classes of teratogens? **3mks**

5. Before Kenny studied embryology course, she imagined a developing human as a shapeless mass of indistinct tissues until about halfway through pregnancy.

- A) Was Kenny correct? **1mk**
- B) At what stage does the embryo or fetus really start to look like a developing human? **1mk**
- C) Many embryonic events first occur cranially, then proceed caudally. Give three examples of structures that develop Cranio - Caudally? **3mks**

**SECTION C: LONG ANSWER QUESTIONS (LAQs)**

**40MKS.**

**ANSWER QUESTION 1 (COMPULSARY) AND ANY OTHER ONE QUESTION.**

1. Discuss the Major Events of Prenatal Development, with Emphasis on the Fetal Stage in terms of:  
     Weeks,  
     Crown-to-Rump Length  
     Weight and Developmental Events **20mks**
2. Discuss the major derivatives of the embryonic germ layers? **20mks**
3. Discuss the Prenatal Development of the Integumentary System? **20mks**
4. Discuss some of the Mutagens and Genetic Anomalies? **20mks**

**END**

