Eastern Goldfields College

2B HUMAN BIOLOGICAL SCIENCE

TASK 3 – REPRODUCTION & PREGNANCY TEST

NAME: ________________________________ **WEIGHTING: 12.5%**

DATE: ________________________________ **MARK: ______ / 60 = ______ %**

MULTIPLE CHOICE SECTION ***[5 MARKS]***

Circle your selected answer on the test paper below

1. In which of the following ways are human sperm and ova similar ?
   a. They have approximately the same mass
   b. About the same number of each is produced
   c. They are both motile
   d. They have the same number of chromosomes

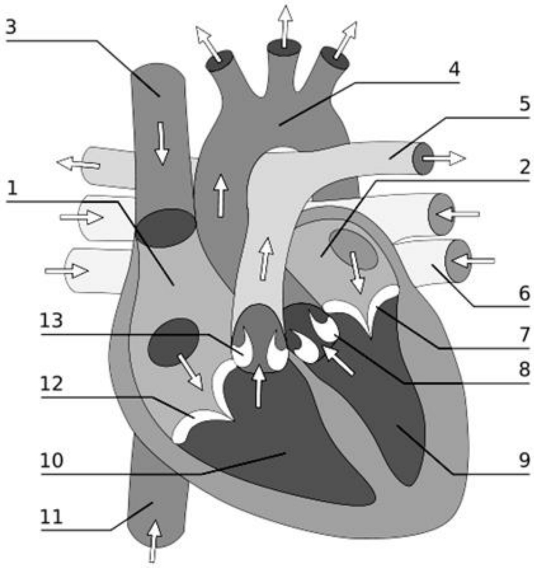
2. The embryo is surrounded by the amniotic cavity, filled with amniotic fluid. This fluid:
   i. Acts as a shock absorber
   ii. Provides a medium through which the exchange of materials takes place between the mother and embryo
   iii. Helps to regulate a constant temperature
   iv. Produces hormones for the developing embryo

   a. i and iv only
   b. ii and iii only
   c. i and ii only
   d. i and iii only

3. During pregnancy:
   a. The embryo divides to form a thick protective tissue
   b. Body organ formation begins during the 20th week of pregnancy
   c. Foetal heart starts beating during the 4th week of pregnancy
   d. The arms and legs of the foetus are formed towards the end of pregnancy

4. The changes in the endometrium that occur during the menstrual cycle are due to:
   a. Prolactin
   b. Oestrogen and progesterone
   c. The presence of an unferilised ova
   d. Secretions from the posterior pituitary gland

5. A developing foetus has a hole in the heart to allow deoxygenated and oxygenated blood to mix. It is known as the foramen ovale and should close over after birth. With reference to the diagram below, when present, the foramen ovale connects:



a. 9 and 10
b. 4 and 5
c. 1 and 2
d. 2 and 9

SHORT ANSWER SECTION ***[43 MARKS]***

Write your answers in the spaces provided below

6. Immediately following fertilisation, the zygote begins to divide to form a solid ball of cells. As cell division continues, the cells arrange themselves into a hollow ball of cells as seen in the micrograph image below: [TOTAL = 8 MARKS]

a. What is the name given to this hollow ball of cells ? [1 mark]

____

b. During the early development of the embryo, three primary germ layers will be differntiated into the following cells and tissues. Name each of the germ layers that give rise to the following cells or tissues [3 marks]

CELLS OR TISSUES	PRIMARY GERM LAYERS
Skeletal muscle	
Red blood cells	
Neurons of the brain	
Hair and fingernails	
Alveoli cells of the lung	
Pancreatic cells	

c. What is a stem cell ? [1 mark]

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d. Complete the following table: [3 marks]

STEM CELL TYPE	CAN GIVE RISE TO…	EXAMPLE OF WHERE CELL CAN BE FOUND
Totipotent		
Pluripotent		
Multipotent		

7. Identify two stages of foetal development for each month given: [TOTAL = 2 MARKS]

GESTATION PERIOD (months)	EVENTS OF FOETAL DEVELOPMENT
3	• •
9	• •

8. Define the following terms: [TOTAL = 2 MARKS]

   a. Morula:

   ____

   ____

   b. Cleavage:

   ____

   ____

9. Gametogenesis is the process that produce gametes in males and females. Spermatogenesis is the process that forms male gametes, known as spermatozoa. Oogenesis is the process that forms female gametes, known as ova [TOTAL = 5 MARKS]

   a. How many chromosomes are found in spermatozoa ? [1 mark]

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   b. Why is it important that spermatozoa have this chromosome number ? [1 mark]

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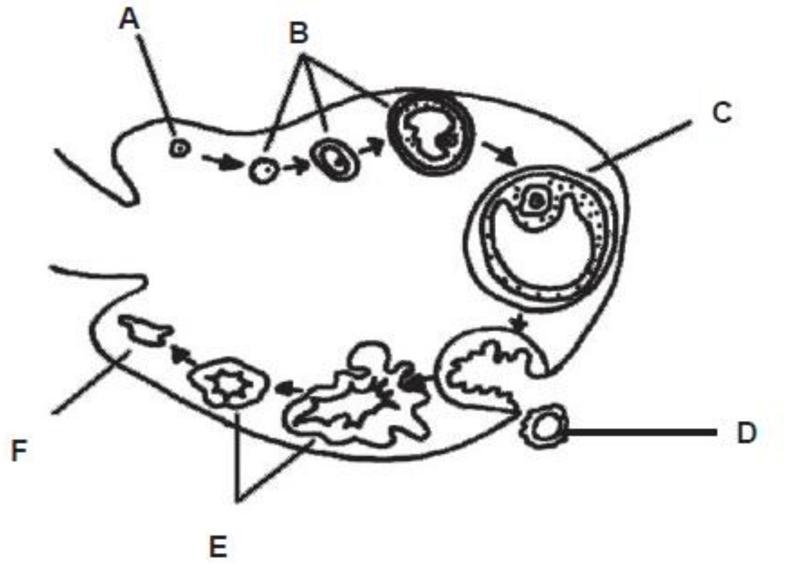
   c. Complete the table below, which outlines the differences between the processes of spermatogenesis and oogenesis ? [3 marks]

	SPERMATOGENESIS	**OOGENESIS**
Age of individual when the process starts occuring		
Number of gametes produced for each cell that undergoes the process		
Size of the products		

10. Examine the diagram below, which shows the events that occur inside the ovary during a normal ovarian cycle [TOTAL = 9 MARKS]



a. Name structure A ? [1 mark]

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b. What is the name of the event shown at point D ? [1 mark]

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c. The corpus albicans is best represented by which structure ? [1 mark]

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d. Name a hormone secreted by structure E and state its function ? [2 marks]

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e. At approximately what day in the cycle would you expect to find structure C ? [1 mark]

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f. At what point in the cycle would you expect mensturation to occur ? [1 mark]

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g. After fertilisation, what day of embryonic development does implantation occur and into what tissue does the blastocyst attach ? [2 marks]

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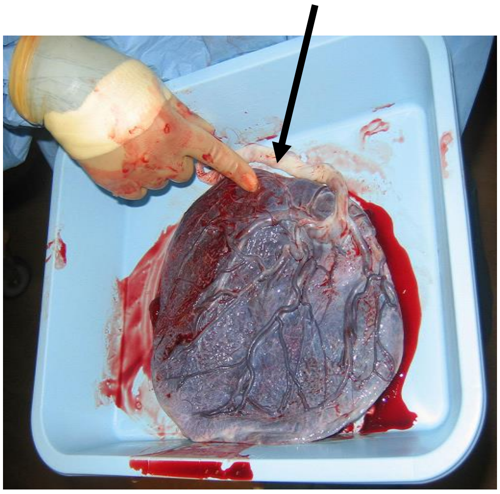
11. The human placenta averages 22cm in length and 2-2.5cm in thickness. It typically weights 500gm. A human placenta can be seen with the umbilical cord still attached at the top: [TOTAL = 9 MARKS]



a. Describe three functions of the human placenta ? [3 marks]

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b. At what stage of pregnancy is the placenta fully functional ? [1 mark]

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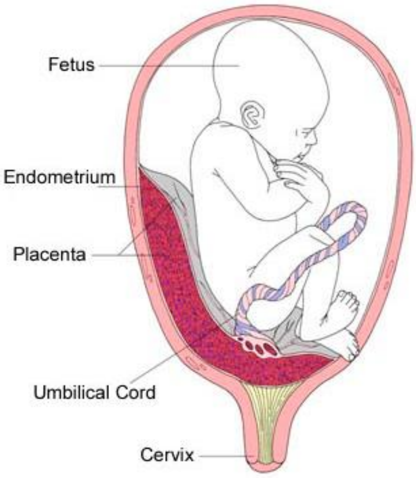
c. The foetus is connected to the placenta by the umbilical cord, which consists of two umbilical arteries and one umbilical vein. In what direction does blood flow through these vessels ? [1 mark]

i. Umbilical arteries: ____

ii. Umbilical vein: ____

d. The diagram below shows an example of a pregnancy condition known as placenta previa:



A woman with placenta previa requires a cesarean section to ensure healthy delivery of the baby. A cesarean section involves an incision made through the abdominal wall and uterus, allowing the baby to be removed from the mother. Explain why a woman with placenta previa is required to have a cesarean section and cannot deliver her baby naturally ? [4 marks]

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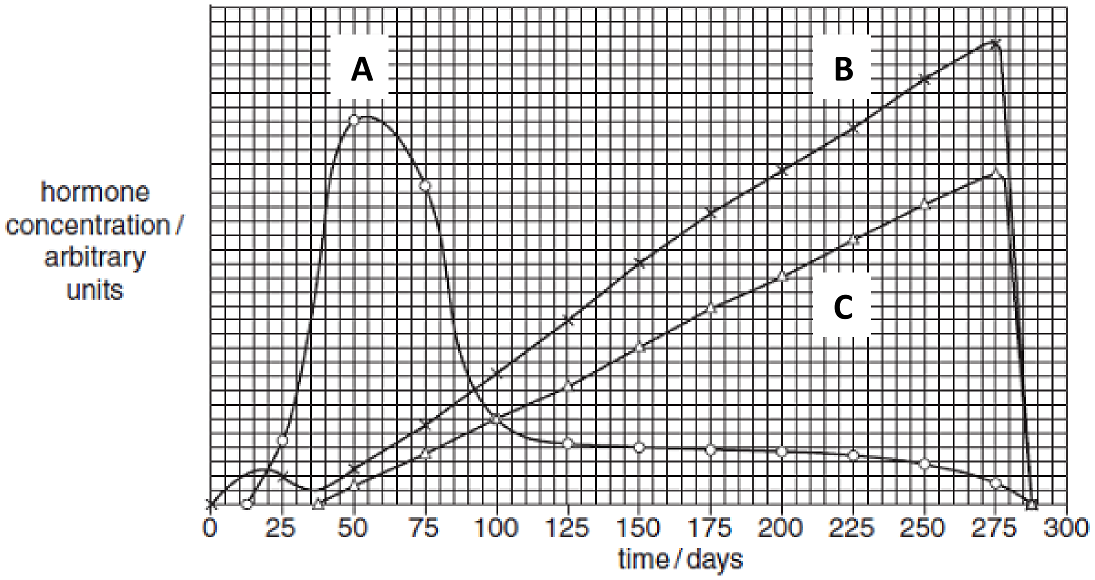
12. The graph below shows changes in the concentration of hormones in the blood during pregnancy [TOTAL = 8 MARKS]



a. Name each of the following hormones: [3 marks]

i. Hormone A: ____

ii. Hormone B: ____

iii. Hormone C: ____

b. Refer to the graph and account for the changes in hormone A, in your answer refer to the corpus luteum and the developing embryo ? [4 marks]

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c. Describe what happens to all hormone levels at approximately 290 days and suggest a reason why this occurred ? [1 mark]

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EXTENDED ANSWER SECTION ***[13 MARKS]***

Note: You need to answer BOTH questions 13 and 14 in the space below

13. List five major changes that take place in a female during pregnancy and explain the reason for each change ? [5 marks]

14. Provide a description of the major developments that occur during the first five weeks of embryonic development ? [8 marks]

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