
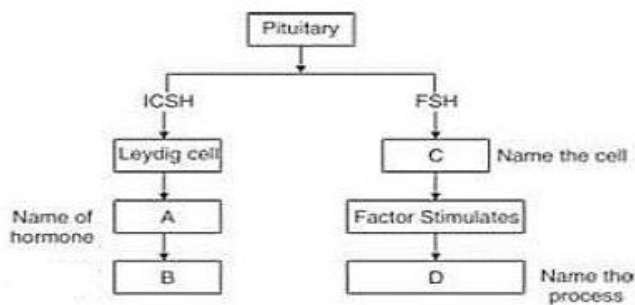
	INDIAN SCHOOL AL WADI AL KABIR	
Class: XII	Department: SCIENCE 2023 – 24 SUBJECT: BIOLOGY	Date of submission: MARCH 2023
Worksheet No: 2 WITH ANSWERS	UNIT: HUMAN REPRODUCTION	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

(CASE STUDY)

1. Given below is an incomplete chart showing influence of hormones on gametogenesis in males.



- State the function of the Leydig cells.
- How are processes B & D different from each other.
- Observe the chart carefully and fill in the blanks A, B, C and D.

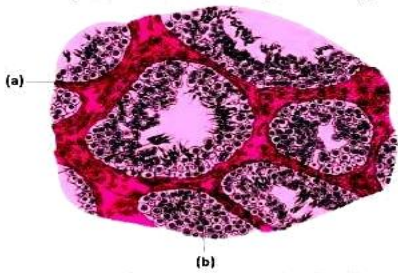
OR

How is the gametogenesis in male different from that of the females in humans?

(CASE STUDY) 2. Read the passage carefully and answer the Questions that follows

Humans are sexually reproducing and viviparous it involves male and female reproductive systems. The male reproductive system is located in the pelvis region. It includes a pair of testis along with accessory ducts, glands and the external genitalia. The testes are situated outside the abdominal cavity within a pouch called the scrotum. The testis is covered by a dense covering. Each testis has about 250 compartments. Each lobule contains one to three highly coiled seminiferous tubules in which sperms are produced. Each seminiferous tubule is lined on its inside by two types of cells. The regions outside the seminiferous tubules called interstitial spaces contain small blood vessels. Seminiferous tubules of the testis open into the vasa efferentia through rete testis. The vasa efferentia leave the testis and open into epididymis located along the posterior surface of each testis.

- Why is the temperature in the scrotum lower than the normal body temperature?
- Identify a & b in the given image.



- a. a - Sertoli cell, b - interstitial cell
 b. a - interstitial cell, b - spermatogonia
 c. a - spermatozoa, b - Sertoli cell
 d. a - spermatozoa, b - spermatogonia

c) Trace the path through which the sperms travel till it is released.

OR

Name any two male accessory glands and state their functions.

Multiple Choice Questions.

1. What would happen if corpus luteum is not degenerated

- (a) Progesterone will not be secreted
 (b) Endometrium will disintegrate
 (c) Proliferation of endometrium will take place
 (d) Ovulation will take place

2. Identify the wrong statement from the following:

- a. High levels of estrogen triggers the ovulatory surge.
 b. Oogonial cells start to proliferate and give rise to functional ova in regular cycles from puberty onwards.
 c. Sperms released from seminiferous tubules are poorly motile /non-motile.
 d. Progesterone level is high during the post ovulatory phase of menstrual cycle.

3. Spot the odd one out from the following structures with reference to the male reproductive system:

- a. Ret testis
 b. Epididymis
 c. Vasa efferentia
 d. Isthmus

4. Seminal plasma, the fluid part of semen, is contributed by.

- i. Seminal vesicle
 ii. Prostate
 iii. Urethra
 iv. Bulbourethral gland

- (a) i and ii
 (b) i, ii and iv
 (c) ii, iii and iv

(d) i and iv

5. Spermiation is the process of the release of sperms from:

- a. Seminiferous tubules
- b. Vas deferens
- c. Epididymis
- d. Prostate gland

6. Mature Graafian follicle is generally present in the ovary of a healthy human female around

- a. 5 – 8 day of menstrual cycle
- b. 11 – 17 day of menstrual cycle
- c. 18 – 23 day of menstrual cycle
- d. 24 – 28 day of menstrual cycle

7. Acrosomal reaction of the sperm occurs due to:

- a. Its contact with zona pellucida of the ova
- b. Reactions within the uterine environment of the female
- c. Reactions within the epididymal environment of the male
- d. Androgens produced in the uterus

8. Which one of the following is not a male accessory gland?

- a. Seminal vesicle
- b. Ampulla
- c. Prostate
- d. Bulbourethral gland

9. The immature male germ cell undergoes division to produce sperms by the process of spermatogenesis. Choose the correct one with reference to above.

- a. Spermatogonia have 46 chromosomes and always undergo meiotic cell division
- b. Primary spermatocytes divide by mitotic cell division
- c. Secondary spermatocytes have 23 chromosomes and undergo second meiotic division
- d. Spermatozoa are transformed into spermatids

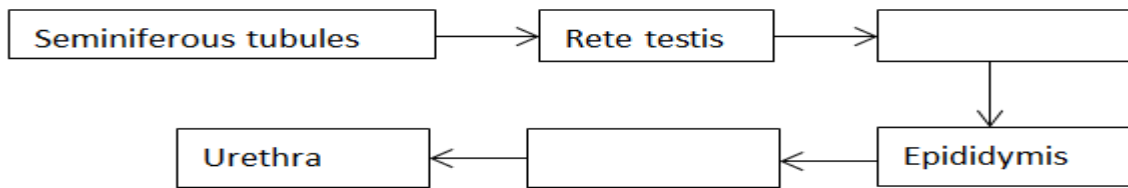
10. Which of the following hormones is not secreted by human placenta?

- a. HCG
- b. Estrogen
- c. Progesterone
- d. LH

Short Answer Type Questions 2mks

Q.1. List the following events observed in human reproduction in chronological order. Fertilization, gametogenesis, insemination, gestation, parturition, implantation.

Q.2. Fill in the missing boxes exhibiting the route of sperm transport.



Q.4. What is the reason for the absence of menstrual cycles during conception or pregnancy?

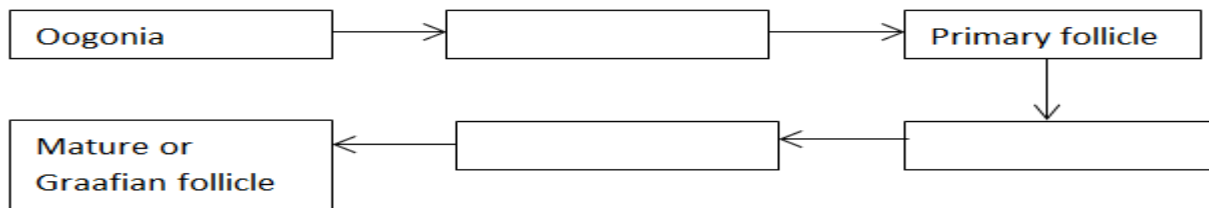
Q.5. Fill up the missing data in the table where Column A shows female reproductive organs and Column B shows its respective functions.

Q.6. Name the hormone crucial in parturition. Does the parturition signal originate from the mother or the foetus?

Q.7. State the role of the epididymis in male fertility.

Q.8. List the names of the hormones, endocrine glands along with functions of the hormones that are crucial in causing spermatogenesis.

Q.9. Fill in the missing boxes for the levels in the transformation of mother germ cells into a mature follicle.



Q.10. How is a primary oocyte different from a secondary oocyte?

Q.11. a) State the role of the ampullary-isthmic junction in the female reproductive tract.

b) How is polyspermy checked by the zona pellucida of the ovum?

Q.12a) What is the significance of LH surge through the menstrual cycle?

b) During which stage of cell division are spermatids formed from the secondary spermatocytes?

Q.13.a. How many spermatozoa does one secondary spermatocyte produce?

b. Where in zygote does the first cleavage division occur?

Q.14. Why is breastfeeding recommended during the initial stages of infant growth?

Long Answer Type Questions 3mks

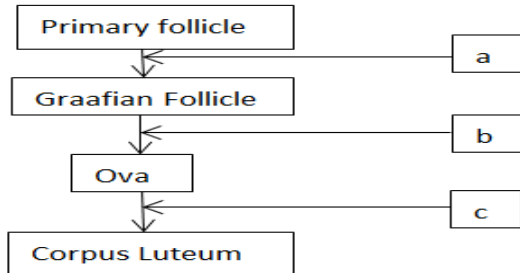
Q.1. Why does corpus luteum stay active throughout pregnancy and in the absence of fertilization, is active only for 10-12 days?

Q.2. What is foetal ejection reflex? How does it cause parturition?

Q.3a. How is the placenta formed.

b. What are the functions of placenta other than its endocrine function?

Q.4. Mention the names of the hormones responsible for ovarian changes during the menstrual cycle in the boxes provided.



Q.5. Draw a schematic diagram depicting oogenesis. (Label without description)

Very Long Type Questions 5mks

Q.1. Explain the role of pituitary gonadotropins during the follicular and ovulatory phases of the menstrual cycle. Describe the shifts in steroidal secretions.

Q.2. Explain in detail the difference between the meiotic division of oogenesis and spermatogenesis.

Q.3. Explain in detail the various developmental stages of the zygote until implantation with suitable diagrams.

Q.4. With the help of a neat labelled diagram of the female reproductive system, depict the following sites:

- (a) production of gamete
- (b) site of fertilization
- (c) site of implantation
- (d) birth canal

Q.5. Explain the organization of the mammary gland with the help of a diagram.

Q.6a. What is Menopause?

b). What is the menstrual cycle? Name the Hormones, which controls the menstrual cycle.

- i. Explain the process of spermatogenesis in humans.
- ii. Draw a human sperm and label acrosome and middle piece. Mention their functions.

OR

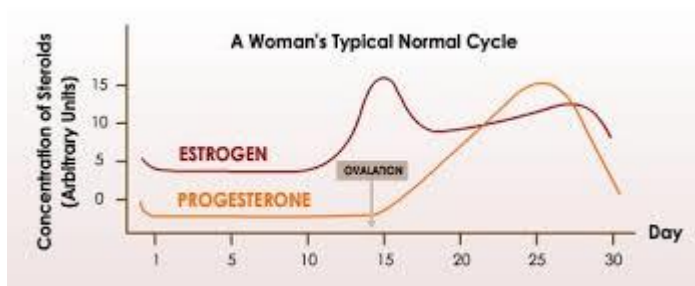


- i. Identify the figure that illustrates corpus luteum and name the pituitary hormone that influences its formation.
- ii. Specify the endocrine function of corpus luteum. How does it influence the uterus? Why is it essential?
- iii. What is the difference between 'd' and 'e'?

PREVIOUS YEARS' BOARD QUESTIONS

1. Draw a diagrammatic sectional view of a seminiferous tubule and label Sertoli cells, primary spermatocytes, spermatogonium and spermatozoa in it.
2. Explain the hormonal regulation of spermatogenesis in humans
3. When and where do chorionic villi appear in humans? State their function.
4. Draw a diagrammatic sectional view of the female reproductive system of human and label the parts
 - a) Where the secondary oocytes develop.
 - b) Which help in collection of ova after ovulation.
 - c) Where fertilization occurs.
 - d) Where implantation of embryo occurs.
5. Explain the role of pituitary and the ovarian hormones in menstrual cycle in human females.
6. (a) Describe the events of spermatogenesis with the help of a schematic representation.
(b) Write two differences between spermatogenesis and oogenesis
7. Draw the following diagrams related to human reproduction and label them
 - (a) The zygote after the first cleavage division
 - (b) Morula stage
 - (c) Blastocyst stage (sectional view)
- 8 (a) Where do the signals for parturition originate from in humans?
(b) Why is it important to feed the new born babies on colostrum?
9. Read the graph given above and correlate the uterine events that take place according to the hormonal levels on
 - (i) 6 – 15 days
 - (ii) 16 – 25 days
 - (iii) 26 – 28 days (if ovum is not fertilized)

(b) Specify the sources of the hormones mentioned in the graph.



HINTS & SOME ANSWERS

MCQs

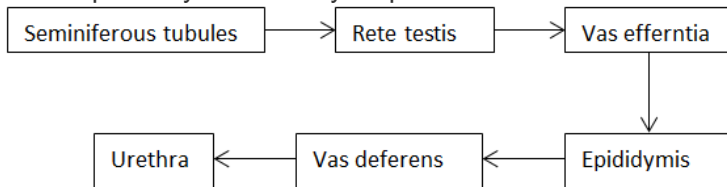
1-d	2-d	3-d	4-b	5-a
6-b	7-a	8-b	9-c	10-d

Short Answers 2mks

A.1. Following is the sequence of events occurring in the process of human reproduction:

1. Gametogenesis
2. Insemination
3. Fertilization
4. Implantation
5. Gestation
6. Parturition

A.2. The pathway followed by a sperm.



A.3. The cervix is a narrow opening through which the uterus opens up to the vagina. The cervical canal is the cavity of the cervix which alongside the vagina goes on to form the birth canal.

A.4. During pregnancy, all the events of the **menstrual cycle** stop and there is no menstruation. Menstruation occurs only when the egg that is released is not fertilized. But in pregnancy, the released egg is fertilized and hence the uterus lining does not shed, instead nourishes the fetus. However, a woman may experience uterine bleeding during pregnancy due to various reasons. It is not due to the period.

A.5

Column A (Organs)	Column B (Corresponding Functions)
Ovaries	Ovulation
Oviduct	Fertilization
Uterus	Pregnancy
Vagina	Birth

ANSWERS

A.6. The hormone is Oxytocin. The signal originates from the placenta and fully developed foetus which initiate the foetal ejection reflex triggering the release of the hormone, oxytocin

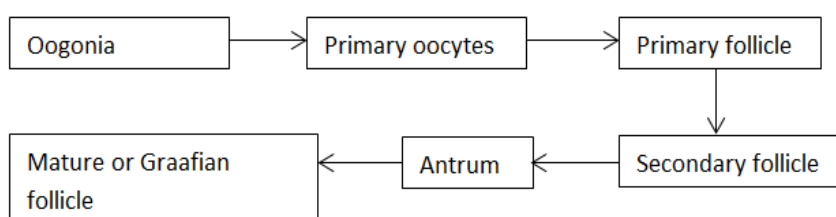
A.7. It is situated along the posterior surface of each testis where spermatozoa acquire motility and the capacity to fertilize the egg. The surface of the sperm is altered in response to secretions of the epididymis which is key to achieve the ability to fertilize an egg.

A.8.

Name of the hormone	Endocrine glands where the hormone is released	Functions of the hormone

Gonadotropin-releasing hormone (GnRH)	Hypothalamus	Increase in secretion of GnRH initiates spermatogenesis at puberty age After acting on the anterior pituitary gland – triggers the secretion of LH and FSH
Luteinising hormone (LH)	Anterior pituitary gland	Triggers the production and secretion of androgens
Follicle Stimulating Hormone (FSH)	Pituitary gland	Acts on Sertoli cells and stimulates the secretion

A.9



A.10. The primary oocyte is a diploid cell whereas secondary oocyte is a haploid cell. The primary oocyte is formed when oogonia are at the prophase-I of the meiotic division in the foetal ovary whereas secondary oocyte is formed from primary oocyte after meiosis – I division to produce ova in females during the stage of puberty.

A.11a) In the ampullary-isthmic junction, fertilization of the ovum takes place.

b) The zona pellucida is a thick layer that is girdled by corona radiata cells. During fertilization, cortical granules are released from the egg which blocks fusing of multiple sperms with an egg.

A.12a) It triggers the rupture of Graafian follicle and causes the release of the ovum in the fallopian tube.

b) The second meiotic division.

A.13. a. The secondary spermatocytes undergo meiotic division – II to generate four haploid spermatids which through the process of spermiogenesis are transformed into spermatozoa.

b. Cleavage occurs within the fallopian tube and is holoblastic, dividing the zygote completely into blastomeres. The first cleavage divides the zygote longitudinally into two blastomeres wherein one is slightly larger than the other.

A.14. The mammary glands in females start producing milk towards the end of pregnancy through the process of lactation which helps the mother feed the newborn. Colostrum is the milk produced during the initial few days. Colostrum contains antibodies which are crucial in developing resistance in the newborns hence it is recommended by doctors to bring up a healthy baby.

Long Answers 3mks

A.1. During the luteal phase, the leftover parts of Graafian follicle transform into the corpus luteum.

It discharges large quantities of progesterone hormone which is required for the maintenance of the endometrium.

The endometrium is important for implantation of the fertilized egg and various other stages of pregnancy.

Hence corpus luteum has a long life in pregnancy.

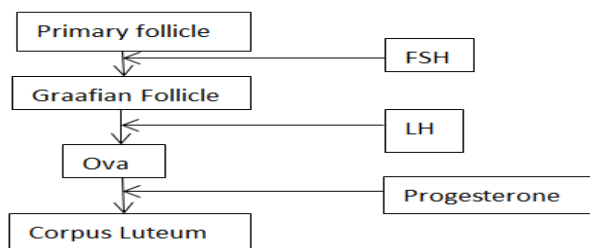
In the absence of fertilization, upholding of the corpus luteum is not required and thus it declines within 10-12 days, which causes the lining of the endometrium to menstruate and hence the onset of the new menstrual cycle.

A.2. Foetal ejection reflex is the mild uterine contractions that arise from the parturition signals from the fully developed foetus and the placenta-This reflex stimulates the release of oxytocin, which causes uterine contractions, in turn, stimulating the increased secretion of oxytocin.

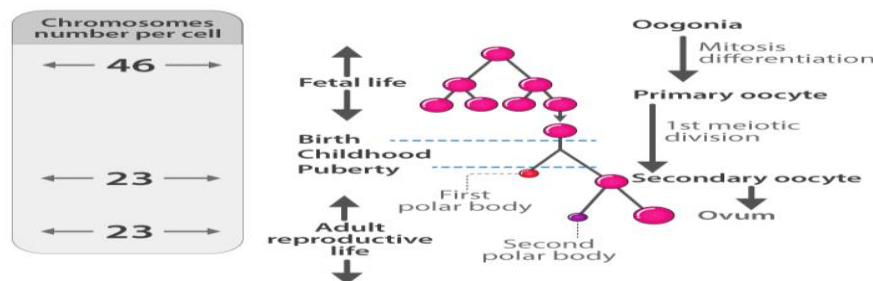
This action of uterine contractions and oxytocin secretion further results in stronger contractions leading to the dilation and hence expulsion of the baby out of the uterus.

A3.b. The placenta promotes the supply of nutrients and oxygen to the embryo. It also facilitates the elimination of excretory wastes and carbon dioxide produced by the embryo. Placenta aids in the transportation of substances to and from the embryo as it is connected to the embryo through the umbilical cord.

A.4



A.5



A.6. Testis also called as the Testicles. It is a pair of oval-shaped organs masked in a pouch called the scrotum. They are responsible for the production of sperms and the male hormone testosterone.

The ovary is a ductless reproductive gland, which functions by producing a female sex hormone called estrogen and also involved in producing and storing the ovum or the egg cell.

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