



Class: XII	DEPARTMENT OF SCIENCE: 2026– 2027 SUBJECT: BIOLOGY	Date: 17/04/2026
Worksheet: 2	UNIT- VI- REPRODUCTION CHAPTER 2-HUMAN REPRODUCTION	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

I. MULTIPLE CHOICE QUESTIONS (1M)

1. The process of spermatogenesis involves a series of steps that result in the formation of mature sperm. What cells are released after the completion of the multiplication stage?
 - A. Spermatids.
 - B. Primary Spermatocyte.
 - C. Secondary Spermatocyte.
 - D. Spermatogonia.
2. In females, certain developmental changes occur during pregnancy due to the release of hormones. Which hormone is responsible for the enlargement of breasts during pregnancy?
 - A. Oxytocin
 - B. Progesterone
 - C. Estrogen
 - D. Both A and B
3. The growth, maintenance and functioning of secondary sex organs is maintained by the _____.
 - A. Leydig cells
 - B. seminal vesicles
 - C. posterior pituitary gland
 - D. testosterone
4. What is the name of the process that converts spermatids into mature spermatozoa?
 - A. Spermatogenesis.
 - B. Spermiogenesis.
 - C. Spermiation.
 - D. None of these.
5. What is the correct sequence of events in human reproduction?
 - A. Gametogenesis -> Insemination -> Fertilization -> Implantation -> Gestation -> Parturition

- B. Insemination -> Gametogenesis -> Implantation -> Fertilization
 - C. Gametogenesis -> Fertilization -> Insemination -> Implantation
 - D. Gestation -> Parturition -> Implantation -> Fertilization
6. A mature Graafian follicle is generally present in the ovary of a healthy human female around:
 - A. 5 – 8 days of the menstrual cycle
 - B. 11 –17 days of the menstrual cycle
 - C. 18 – 23 days of the menstrual cycle
 - D. 24 – 28 days of the menstrual cycle
 7. The immature male germ cell undergoes division to produce sperm by the process of spermatogenesis. Choose the correct one with reference to the 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 the second meiotic division
 - D. Spermatozoa are transformed into spermatids
 8. Acrosomal reaction of the sperm occurs due to:
 - A. Its contact with the 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
 9. What would happen if the corpus luteum were not degenerated?
 - A. Progesterone will not be secreted
 - B. Endometrium will disintegrate
 - C. Proliferation of the endometrium will take place
 - D. Ovulation will take place
 10. Identify the wrong statement from the following:
 - A. High levels of estrogen trigger 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 the seminiferous tubules are poorly motile /non-motile.
 - D. Progesterone level is high during the post-ovulatory phase of the menstrual cycle.

For the following questions, two statements are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below:

- i) Both A and R are true, and R is the correct explanation of the assertion.**
- ii) Both A and R are true, but R is not the correct explanation of the assertion**
- iii) A is true, but R is false.**
- iv) A is false, but R is true**

11. **Assertion(A):** Secondary spermatocytes are diploid in human males.
Reason(R): Secondary spermatocytes are formed after meiosis.

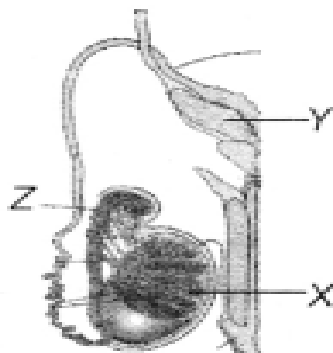
12. **Assertion(A):** Twins may arise from a single egg or from two eggs.
Reason(R): One egg gives rise to identical twins by the separation of blastomeres, and two eggs produce non-identical twins
13. **Assertion(A):** At the embryonic stage, a female foetus has millions of oogonia, at puberty, this number decreases to 60 to 80 thousand, but about 500 oocytes are released during the reproductive phase of a female human.
Reason(R): Primary oocytes exhibit a constant degeneration before achieving maturity.
14. **Assertion(A):** The endometrium undergoes cyclical changes during the menstrual cycle
Reason(R): The endometrium is necessary for implantation.

II. VERY SHORT QUESTIONS (2M):

15. Name the muscular and glandular layers of the human uterus. Which one of these layers undergoes cyclic changes during the menstrual cycle? Name the hormone essential for the maintenance of this layer.
16. i) Where do the signals for parturition originate in humans?
 ii) Why is it important to feed newborn babies on colostrum?
17. Name the hormone crucial in parturition. Does the parturition signal originate from the mother or the foetus?
18. State the role of the epididymis in male fertility.
19. List the names of the hormones, endocrine glands, and functions of the hormones that are crucial in causing spermatogenesis.

III. SHORT ANSWER TYPE QUESTIONS: (3M)

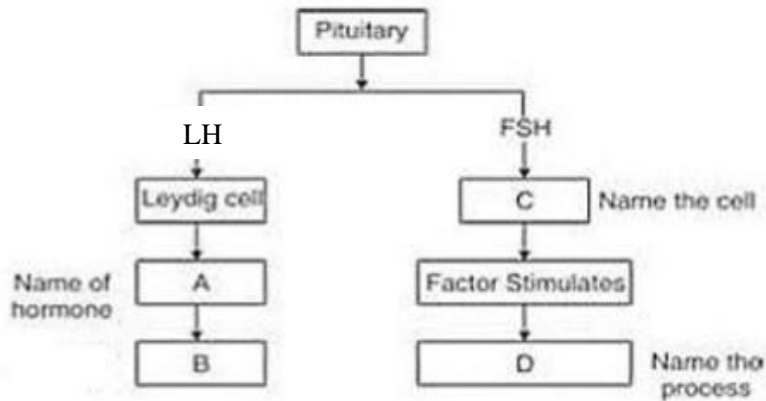
20. List the different parts of the human oviduct through which the ovum travels till it meets the sperm for fertilisation.
21. The diagram below shows the human male reproductive system (one side only).



- i) Identify 'X' and write its location in the body.
 ii) Name the accessory gland 'Y' and its secretion.
 iii) Name and state the function of 'Z'.
22. Draw a labelled diagrammatic view of the human male reproductive system.
23. i) Where are Leydig cells present? What is their role in reproduction?
 ii) Differentiate between vas deferens and vasa efferentia.

IV. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

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



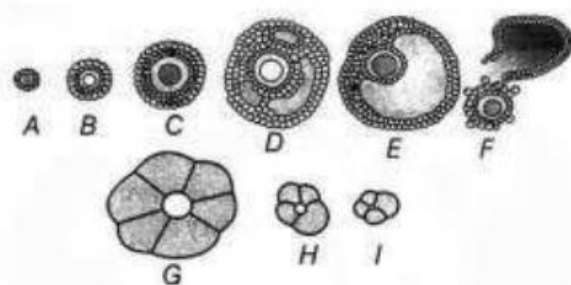
- State the function of the Leydig cells.
- How are processes B & D different from each other?
- Observe the chart and fill in the blanks A, B, C, and D.

OR

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

V. LONG ANSWER TYPE QUESTIONS. (5M)

- Explain the role of pituitary gonadotropins during the follicular and ovulatory phases of the menstrual cycle. Describe the shifts in steroidal secretions.
- When and where are primary oocytes formed in a human female? Trace the development of these oocytes till ovulation (in the menstrual cycle). How do gonadotropins influence this developmental process?
- The following is the illustration of the sequence of ovarian events (a - i) in a human female.

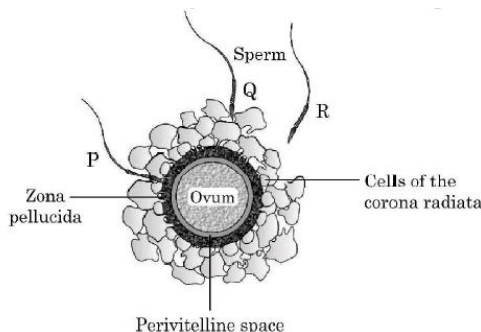


- Identify the figure that illustrates ovulation and mention the stage of oogenesis it represents.
- Name the ovarian hormone and the pituitary hormone that have caused the above-mentioned event.
- Explain the changes that occur in the uterus simultaneously in anticipation.
- Write the difference between 'c' and 'h'.
- Draw a labelled sketch of the structure of a human ovum before fertilisation.

VI. BOARD QUESTIONS

28. Given below is the diagram of a human ovum surrounded by a few sperms. Observe the diagram and answer the questions that follow: (2022)

- Compare the fate of sperms 'P', 'Q', and 'R' shown in the diagram.
- Write the role of the zona pellucida in this process.
- Analyse the changes occurring in the ovum after the entry of sperm.
- How acrosome and the middle piece of a human sperm play an important role in human fertilization?



29. The reproductive cycle in the female primates is called the menstrual cycle. The first menstruation begins at puberty. Answer the following questions: (2023)

- Name the four phases of the menstrual cycle in a proper sequence.
- How long does the menstrual phase last in a menstrual cycle?
- When and why do hormones estrogen and progesterone reach their peak levels, respectively, in the menstrual cycle?
- Give the significance of the LH surge.

30. i) Name and explain the structural organisation of the male sex accessory ducts in the human male reproductive system. (2024)

ii) Describe the role of gonadotropin FSH in the regulation of spermatogenesis.

31. i) Explain the menstrual phase in the menstrual cycle of the human female. (2026)

ii) Why is the follicular phase also called the proliferative phase?

iii) Explain the events that occur in the Graafian follicle at the time of ovulation and thereafter.

iv) Draw a Graafian follicle and label – Antrum and secondary oocyte.

ANSWER KEY

I. OBJECTIVE-TYPE QUESTIONS

1.	D. Spermatogonia
2.	C. Estrogen
3.	D. Testosterone
4.	B. Spermiogenesis
5.	A. Gametogenesis → Insemination → Fertilization → Implantation → Gestation → Parturition

6.	B. 11 –17 days of the menstrual cycle
7.	C. Secondary spermatocytes have 23 chromosomes and undergo the second meiotic division
8.	A. Its contact with zona pellucida of the ova
9.	C. Proliferation of the endometrium will take place
10.	B. Oogonial cells start to proliferate and give rise to functional ova in regular cycles from puberty onwards.
11.	iv) A is false, but R is true
12.	i) Both A and R are true and R is the correct explanation of the assertion.
13.	i) Both A and R are true and R is the correct explanation of the assertion.
14.	ii) Both A and R are true, but R is not the correct explanation

II. VERY SHORT QUESTIONS (2M):

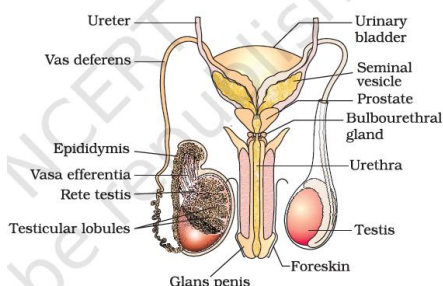
15.	<ul style="list-style-type: none"> • Muscular layer: Myometrium • Glandular layer: Endometrium • The endometrium undergoes cyclic changes during the menstrual cycle. • Hormone essential for its maintenance: Progesterone
16.	<p>a) Signals for parturition originate from the fully developed foetus and placenta (foetal ejection reflex).</p> <p>b) Colostrum is important because:</p> <ul style="list-style-type: none"> • It is rich in antibodies (IgA). • Provides passive immunity to the newborn.
17.	<ul style="list-style-type: none"> • Hormone crucial in parturition: Oxytocin • The parturition signal originates from the foetus.
18.	<p>Role of the Epididymis in Male Fertility:</p> <ul style="list-style-type: none"> • Sperm maturation • Acquisition of motility • Temporary storage of sperms
19.	<p>Gonadotropin-releasing hormone</p> <ul style="list-style-type: none"> • Gland: Hypothalamus • Function: Stimulates the anterior pituitary to release FSH and LH <p>Follicle-stimulating hormone</p> <ul style="list-style-type: none"> • Gland: Anterior pituitary • Function: Acts on Sertoli cells; stimulates spermatogenesis <p>Luteinizing hormone</p> <ul style="list-style-type: none"> • Gland: Anterior pituitary • Function: Stimulates Leydig cells to secrete testosterone <p>Testosterone</p> <ul style="list-style-type: none"> • Gland: Testes (Leydig cells) • Function: Essential for spermatogenesis and the development of male secondary sexual characters

III. SHORT ANSWER TYPE QUESTIONS: (3M)

20.	<p>The ovum travels through the following parts of the Fallopian tube:</p> <ol style="list-style-type: none"> 1. Infundibulum (with fimbriae) 2. Ampulla (site of fertilisation) 3. Isthmus (opens into uterus)
21.	<p>i) X is the testis. It is located in the scrotum, outside the abdominal cavity.</p> <p>ii) Y is the seminal vesicle. It secretes fructose-rich seminal fluid that</p>

nourishes sperm.
 iii) Z is the vas deferens. Its function is to transport sperm from the epididymis to the urethra.

22.



23.

- i) Leydig cells
 Present in the interstitial spaces of the testis.
 They secrete Testosterone, which regulates spermatogenesis.
- ii) Difference between Vas deferens and Vasa efferentia
- Vas deferens – Transports sperm from epididymis to urethra; single thick tube.
 - Vasa efferentia – Carry sperm from rete testis to epididymis; 10–20 small ducts.

IV. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

24.

- A. Function of Leydig cells
 Leydig cells secrete the male sex hormone testosterone (under the influence of ICSH/LH).
 Testosterone:
- Stimulates spermatogenesis
 - Develops and maintains male secondary sexual characters
- B. Difference between processes B and D
- Process B → Development of male secondary sexual characters (caused by testosterone).
 - Process D → Spermatogenesis (formation of sperm).
- Difference:
 B is related to body development and sexual characteristics, whereas D is the actual formation of male gametes (sperms).
- C. Filling the blanks
- A → Testosterone
 - B → Development of male secondary sexual characters
 - C → Sertoli cells
 - D → Spermatogenesis

OR

Male (Spermatogenesis)	Female (Oogenesis)
Begins at puberty	Begins before birth
Continuous process	Discontinuous process
Produces 4 sperms from one cell	Produces 1 ovum + 2 polar bodies
Occurs in testes	Occurs in the ovaries

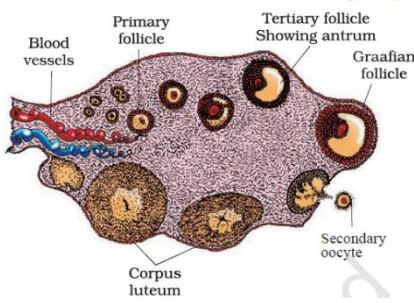
V. LONG ANSWER TYPE QUESTIONS. (5M)

25.

- The pituitary gland secretes Follicle-stimulating hormone and Luteinizing hormone.
 Follicular Phase
- FSH stimulates growth of ovarian follicles.
 - Developing follicles secrete Estrogen.

	<ul style="list-style-type: none"> • Estrogen causes proliferation of the endometrium. <p>Ovulatory Phase</p> <ul style="list-style-type: none"> • High estrogen causes an LH surge. • LH surge induces ovulation. <p>Shift in steroid secretion</p> <ul style="list-style-type: none"> • Before ovulation → Estrogen dominant. • After ovulation, → Corpus luteum secretes progesterone, preparing the uterus for implantation.
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26.	<p>Formation of primary oocytes</p> <ul style="list-style-type: none"> • Formed during foetal life in the ovaries from oogonia. • They remain arrested in Prophase I till puberty. <p>Development till ovulation</p> <ul style="list-style-type: none"> • At puberty, FSH stimulates follicular growth. • Primary oocyte completes Meiosis I → Secondary oocyte. • LH surge causes ovulation. <p>Role of gonadotropins</p> <ul style="list-style-type: none"> • FSH → Follicular growth. • LH → Ovulation and corpus luteum formation.
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27.	<p>i) Figure showing ovulation</p> <ul style="list-style-type: none"> • Figure 'f' represents ovulation. • It represents completion of Meiosis I and release of the secondary oocyte. <p>ii) Hormones causing ovulation</p> <ul style="list-style-type: none"> • Ovarian hormone – Estrogen • Pituitary hormone – Luteinizing hormone <p>iii) Changes in the uterus</p> <ul style="list-style-type: none"> • Endometrium thickens. • Becomes vascular and glandular. • Prepares for implantation. <p>iv) Difference between 'c' and 'h'</p> <ul style="list-style-type: none"> • c – Secondary follicle stage (growing follicle). • h – represents a regressing corpus luteum <p>v)</p> 
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VI. BOARD QUESTIONS

28.	<p>i) P can penetrate or fertilise the ovum, whereas Q and R are unable to penetrate or fertilise.</p> <p>ii) When a sperm comes in contact with the zona pellucida layer of the ovum, it induces changes in the membrane that block the entry of additional sperm.</p> <p>iii) Entry of sperm induces completion of meiotic division of the secondary oocyte and formation of the second polar body and a haploid ovum (ootid)</p> <p>iv) Acrosome: It is filled with the enzyme that helps the sperm to enter the cytoplasm of the ovum Middle piece: It has numerous mitochondria, which produce energy for the movement of</p>
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	the tail that facilitates sperm motility for fertilisation.
29.	<ul style="list-style-type: none"> i) Menstrual phase → proliferative / follicular phase → ovulatory phase → luteal / secretory phase. ii) 3 – 5 days. iii) Estrogen reaches its peak during the proliferative phase just before ovulation, because it is secreted by the growing follicles. - Progesterone reaches its peak during the luteal phase or secretory phase, it is because progesterone is secreted by the corpus luteum. iv) LH surge induces rupture of the Graafian follicle / the release of the ovum /ovulation.
30.	<ul style="list-style-type: none"> i) The male sex accessory ducts (rete testis, vasa efferentia, epididymis, and vas deferens) form a tubular pathway for storing, maturing, and transporting sperm from the testes to the urethra. ii) FSH, secreted by the anterior pituitary, stimulates Sertoli cells to support spermatogenesis by producing Androgen Binding Protein (ABP), which concentrates testosterone required for sperm production.
31.	<ul style="list-style-type: none"> i) Menstrual phase in human females- It is the first phase (Day 1–5) of the menstrual cycle. The endometrium (uterine lining) breaks down due to a fall in estrogen and progesterone levels. This leads to bleeding (menstruation), consisting of blood, mucus, and endometrial cells. ii) During this phase, estrogen levels increase. Estrogen causes regeneration and thickening (proliferation) of the endometrium. Hence, it is called the proliferative phase. iii) Events in the Graafian follicle at ovulation and thereafter-At ovulation, the mature Graafian follicle ruptures and releases the secondary oocyte. After ovulation, the remaining follicle transforms into the corpus luteum. The corpus luteum secretes progesterone, which maintains the endometrium. If fertilization does not occur, it degenerates into corpus albicans.

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