

1.REPRODUCTION IN ORGANISMS

EVALUATION

1.In which type of parthenogenesis are only males produced? -a) Arrhenotoky

2.Animals giving birth to young ones: -c) Viviparous

3.The mode of reproduction in bacteria is by -c) Conjugation

4.In which mode of reproduction variations are seen -c) Sexual

5.Assertion and reasoning questions:

In each of the following questions there are two statements. One is assertion (A) and other is reasoning (R). Mark the correct answer as
B If both A and R are true but R is not the correct explanation for A
C. If A is true but R is false

I. Assertion: In bee society, all the members are diploid except drones.

Reason: Drones are produced by parthenogenesis.

A. both A and R are true and R is correct explanation for A

II. Assertion: Offsprings produced by asexual reproduction are genetically identical to the parent.

Reason: Asexual reproduction involves only mitosis and no meiosis.

A . If both A and R are true and R is correct explanation for A

III. Assertion: Viviparous animals give better protection to their offsprings.

Reason: They lay their eggs in the safe places of the environment.

D both A and R are false.

6.Name an organism where cell division is itself a mode of reproduction.

Amoeba, paramecium and Euglena.

7.Name the phenomenon where the female gamete directly develops into a new organism with an avian example.

-Development of an egg into a complete individual without fertilization is known as parthenogenesis.

-Eg ; Ostrich.

8.What is parthenogenesis? Give two examples from animals

-Development of an egg into a complete individual without fertilization is known as parthenogenesis.

-Eg ;Annelida,sea urchin,honey bees.

9.Which type of reproduction is effective -Asexual or sexual and why?

-sexual reproduction is effective, When two parents participate in the reproductive process involving two types of gametes (ova and sperm), it is called **sexual reproduction**.

-variation occurs in sexual reproduction not in asexual reproduction.

10.The unicellular organisms which reproduce by binary fission are considered immortal. Justify.

-Reproduction by a single parent without the involvement of gamete formation is **asexual reproduction**.

-In **binary fission**, the parent organism divides into two halves and each half forms a daughter individual.it repeats again so no death for unicellular organisms.

11.Why is the offspring formed by asexual reproduction referred as a clone?

-Reproduction by a single parent without the involvement of gamete formation is **asexual reproduction**.

-The offsprings show “uniparental inheritance” without any genetic variation.

12.Why are the offsprings of oviparous animal at a greater risk as compared to offsprings of viviparous organisms?

-In **Ovoviviparous** animals, the embryo develops inside the egg and remains in the mother's body until they are ready to hatch. It may destroy by enemies.

-Viviparity is a type of development in which the young ones are born alive after being nourished in the uterus through the placenta.

13. Give reasons for the following:

(a) Some organisms like honey bees are called parthenogenetic animals

-**Incomplete parthenogenesis** is found in some animals in which both sexual reproduction and parthenogenesis occurs. e.g. In honeybees; fertilized eggs (zygotes) develop into queen and workers, whereas unfertilized eggs develop into drones (male).

(b) A male honey bee has 16 chromosomes where as its female has 32 chromosomes

male bee ; male bee develops from unfertilized (n)nucleus so it has 16 chromosomes.

Female bee or queen ; male and female gametes fused together and formed into 2n nucleus it has 32 chromosomes.

13.Differentiate between the following:

(a) Binary fission in amoeba and multiple fission in *Plasmodium*

Binary fission in Amoeba	Multiple fission in Plasmodium
<p>1.Simple binary fission is seen in <i>Amoeba</i></p> <p>2.The nucleoli disintegrate and the nucleus divides mitotically. The cell then constricts in the middle, so the cytoplasm divides and forms two daughter cells.</p>	<p>1.In <i>Plasmodium</i>, multiple fission occurs in the schizont and in the oocyte stages.</p> <p>2.In multiple fission the parent body divides into many similar daughter cells simultaneously.</p>

(b) Budding in yeast and budding in *Hydra*

Budding in yeast	Budding in Hydra
<p>In budding, the parent body produces one or more buds and each bud grows into a young one.</p>	<p>When buds are formed on the outer surface of the parent body, it is known as exogenous budding e.g. <i>Hydra</i>.</p>

(c) Regeneration in lizard and *Planaria*

Regeneration in lizards	Regeneration in planaria
<p>1.Epimorphosis is the replacement of lost body parts. It is of two types, namely reparative and restorative</p> <p>2.In reparative regeneration, only certain damaged tissue can be regenerated, whereas in restorative regeneration severed body parts can develop. e.g. tail of wall lizard.</p>	<p>1.Regeneration is of two types, morphallaxis and epimorphosis.</p> <p>2.In morphallaxis the whole body grows from a small fragment e.g. <i>Planaria</i>.</p>

14.How is juvenile phase different from reproductive phase?

Juvenile phase	Reproductive phase
<p>Juvenile phase/ vegetative phase is the period of growth between the birth of the individual upto</p>	<p>reproductive phase/ maturity phase the organisms reproduce and their offsprings reach maturity period.</p>

reproductive maturity.	
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15.What is the difference between syngamy and fertilization?

Syngamy	Fertilization
In syngamy , the fusion of two haploid gametes takes place to produce a diploid zygote.	In fertilization fusion of male and female gametes from two parent and form 2n zygote .

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2.HUMAN REPRODUCTION

Evaluation

1. The mature sperms are stored in the - c. **Epididymis**
2. The male sex hormone testosterone is secreted from -b. **Leydig cell**
3. The glandular accessory organ which produces the largest proportion of semen is -a. **Seminal vesicle**
4. The male homologue of the female clitoris is - b. **Penis**
5. The site of embryo implantation is the -a. **Uterus**
6. The foetal membrane that forms the basis of the umbilical cord is -a. **Allantois**
7. The most important hormone in initiating and maintaining lactation after birth is -c. **Prolactin**
8. Mammalian egg is -c. **Alecithal and non cleidoic**
9. The process which the sperm undergoes before penetrating the ovum is - d. **Capacitation**
10. The milk secreted by the mammary glands soon after child birth is called - b. **Colostrum**
11. Colostrum is rich in - b. **Ig A**

12. The Androgen Binding Protein (ABP) is produced by -c. **Sertoli cells**

13. Which one of the following menstrual irregularities is correctly matched?-

b. **Amenorrhoea - absence of menstruation**

14. Find the wrongly matched pair

C. **Luteal phase** - rise in FSH level

15. **A - In human male, testes are extra abdominal and lie in scrotal sacs.**

R - Scrotum acts as thermoregulator and keeps temperature lower by 2°C for normal sperm production .

(a) A and R are true, R is the correct explanation of A

16. **A - Ovulation is the release of ovum from the Graafian follicle.**

R - It occurs during the follicular phase of the menstrual cycle.

(c) A is true, R is false

17. **A - Head of the sperm consists of acrosome and mitochondria.**

R - Acrosome contains spiral rows of mitochondria.

(d) Both A and R are false

18. Mention the differences between spermiogenesis and spermatogenesis.

SPERMIOGENESIS	SPERMATOGENESIS
The spermatids are transformed into mature spermatozoa (sperms) by the process called spermiogenesis .	Spermatogenesis is the sequence of events in the seminiferous tubules of the testes that produce the male gametes, the sperms.

19. At what stage of development are the gametes formed in new born male and female?

-After 13-14 years

20. Expand the acronyms

- a. FSH-**Follicle Stimulating Hormone** b. LH- **Lutenizing Hormone** c. Hcg-**human Chorionic Gonadotropin** ,
d. hPL - **human Placental Lactogen (hPL)**,

21. How is polyspermy avoided in humans?

- Once fertilisation is accomplished, cortical granules from the cytoplasm of the ovum form a barrier called the **fertilisation membrane** around the ovum preventing further penetration of other sperms.
- Thus **polyspermy** is prevented.

22. What is colostrum? Write its significance.

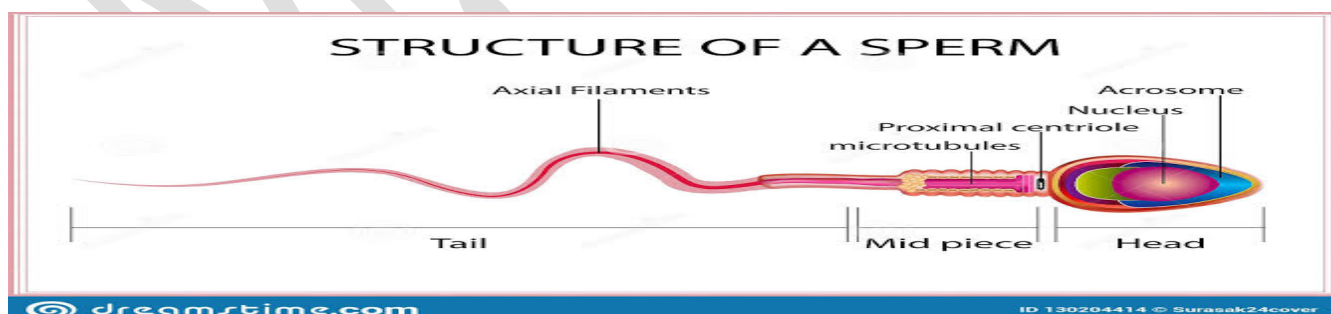
- The mammary glands secrete a yellowish fluid called **colostrum** during the initial few days after parturition.
- It has less lactose than milk and almost no fat, but it contains more proteins, vitamin A and minerals.

23. Placenta is an endocrine tissue. Justify.

- During pregnancy, the placenta acts as a temporary endocrine gland and produces large quantities of **human Chorionic Gonadotropin (hCG)**, **human Chorionic Somatomammotropin (hCS)** or **human Placental Lactogen (hPL)**, **oestrogens** and **progesterone** which are essential for a normal pregnancy.

24. Draw a labeled sketch of a spermatozoan.

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25. What is inhibin? State its functions.

- Sertoli cells** secrete **inhibin**, a hormone which is involved in the negative feedback control of sperm production. .

26. Mention the importance of the position of the testes in humans.

- Since viable sperms cannot be produced at normal body temperature, the scrotum is placed outside the abdominal cavity to provide a temperature 2-3°C lower than the normal internal body temperature.
- Thus, the scrotum acts as a **thermoregulator** for spermatogenesis.

27. What is the composition of semen?

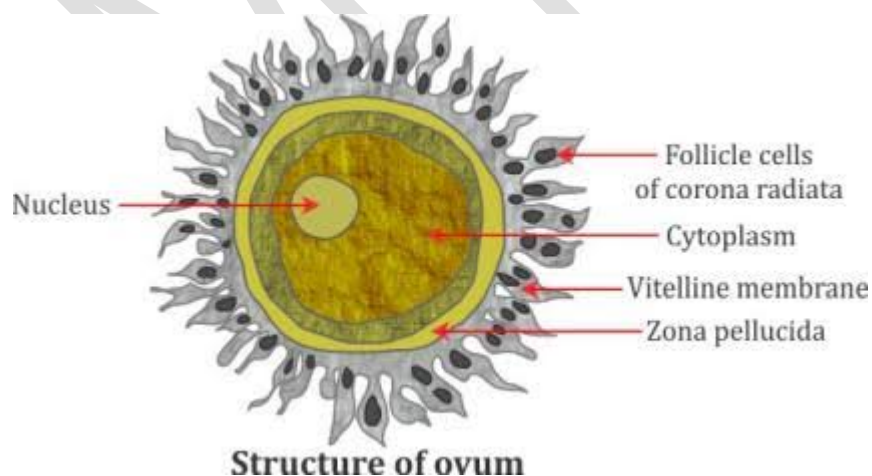
- The seminal vesicles secrete an alkaline fluid called seminal plasma containing fructose sugar, ascorbic acid, prostaglandins and a coagulating enzyme called **vesiculase** which enhances sperm motility.

28. Name the hormones produced from the placenta during pregnancy.

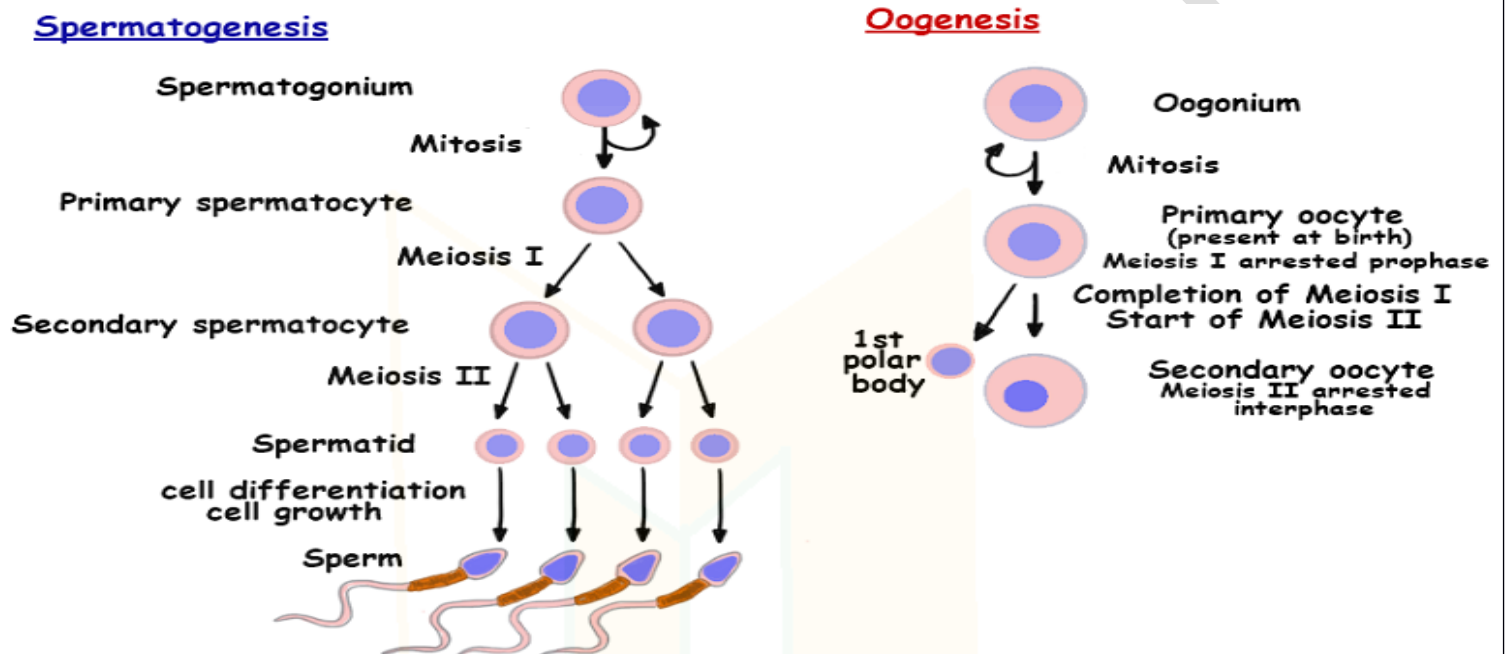
- Human Chorionic Gonadotropin (hCG),
- human Chorionic Somatomammotropin (hCS) or human Placental Lactogen (hPL),
- oestrogens and progesterone

29. Define gametogenesis.

- Gametogenesis is the process of formation of gametes i.e., sperms and ovary from the primary sex organs in all sexually reproducing organisms.
- Meiosis plays the most significant role in the process of gametogenesis

30. Describe the structure of the human ovum with a neat labelled diagram.

31. Give a schematic representation of spermatogenesis and oogenesis in humans.



32. Explain the various phases of the menstrual cycle.

- **Menstrual cycle comprises of the following 4 phases**

1. Menstrual phase
2. Follicular or proliferative phase
3. Ovulatory phase
4. Luteal or secretory phase

1. Menstrual phase

-The cycle starts with the menstrual phase when menstrual flow occurs and lasts for 3-5 days.

- Menstrual flow is due to the breakdown of endometrial lining of the uterus, and its blood vessels due to decline in the level of progesterone and oestrogen.

-Menstruation occurs only if the released ovum is not fertilized.

-Absence of menstruation may be an indicator of pregnancy. However it could also be due to stress, hormonal disorder and anaemia.

2. Follicular or proliferative phase

-The follicular phase extends from the 5th day of the cycle until the time of ovulation.

-During this phase, the primary follicle in the ovary grows to become a fully mature Graafian follicle and simultaneously, the endometrium regenerates through proliferation.

-These changes in the ovary and the uterus are induced by the secretion of gonadotropins like FSH and LH, which increase gradually during the follicular phase. It stimulates follicular development and secretion of **oestrogen** by the follicle cells.

3. Ovulatory phase

-Both LH and FSH attain peak level in the middle of the cycle (about the 14th day).

-Maximum secretion of LH during the mid cycle called **LH surge** induces the rupture of the Graafian follicle and the release of the ovum (secondary oocyte) from the ovary wall into the peritoneal cavity. This process is called as **ovulation**.

4. Luteal or secretory phase

-During luteal phase, the remaining part of the Graafian follicle is transformed into a transitory endocrine gland called corpus luteum.

-The corpus luteum secretes large amount of progesterone which is essential for the maintenance of the endometrium. If fertilisation takes place, it paves way for the implantation of the fertilized ovum.

-The uterine wall secretes nutritious fluid in the uterus for the foetus. So, this phase is also called as **secretory phase**. -----During pregnancy all events of menstrual cycle stop and there is no menstruation.

-In the absence of fertilisation, the corpus luteum degenerates completely and leaves a scar tissue called **corpus albicans**. -It also initiates the disintegration of the endometrium leading to menstruation, marking the next cycle.

33. Explain the role of oxytocin and relaxin in parturition and lactation.

-Oxytocin causes the "**Let-Down**" reflex-the actual ejection of milk from the alveoli of the mammary glands.

-Relaxin promotes parturition by relaxing the pelvic joints and by dilatation of the cervix with continued powerful contractions.

34. Identify the given image and label its parts marked as a, b, c and d

A-vitaline membrane, b.nucleus, c.zona pellucida, d.corona radiata

35. The following is the illustration of the sequence of ovarian events (a-i) in a human female.

a) Identify the figure that illustrates ovulation and mention the stage of oogenesis it represents.

-ovulation

b) Name the ovarian hormone and the pituitary hormone that have caused the above-mentioned events.

-ovarian hormone ; progesterone,estrogen.

-pituitary hormone ;FSH,LH Hormones.

c) Explain the changes that occurs in the uterus simultaneously in anticipation.

-endometrium form again,If fertilisation takes place, it paves way for the implantation of the fertilized ovum.

-The uterine wall secretes nutritious fluid in the uterus for the foetus.

d) Write the difference between C and H.

C-Secondary oocyte	H-Corpus luteum
Maximum secretion of LH during the mid cycle called LH surge induces the rupture of the Graafian follicle and the release of the ovum (secondary oocyte) from the ovary wall into the peritoneal cavity. This process is called as ovulation .	During luteal phase, the remaining part of the Graafian follicle is transformed into a transitory endocrine gland called corpus luteum. The corpus luteum secretes large amount of progesterone which is essential for the maintenance of the endometrium.

3.REPRODUCTIVE HEALTH

Evaluation

1. Which of the following is correct regarding HIV, hepatitis B, gonorrhoea and trichomoniasis?

(c) HIV is a pathogen whereas others are diseases.

2.Which one of the following groups includes sexually transmitted diseases caused by bacteria only?

(b) Syphilis, chlamydiasis and gonorrhoea

3.Identify the correct statements from the following

(d) Both syphilis and gonorrhoea are easily cured with antibiotics.

4.A contraceptive pill prevents ovulation by

(b) inhibiting release of FSH and LH

5.The approach which does not give the defined action of contraceptive is

b.vasectomy -prevent spermatogenesis

6.Statement 2: They are chemical barriers of conception and are reusable.

(a) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.

(c) Statement 1 is correct but statement 2 is incorrect.

(d) Both statements 1 and 2 are incorrect.

7.Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Copper releasing IUD	(i) LNG-20
B. Hormone releasing IUD	(ii) Lippes loop IUD
C. Non medicated IUD	(iii) Saheli
D. Mini pills	(iv) Multiload-375

(d) A-(iv), B-(i), C-(ii), D-(iii)

8. Select the incorrect action of hormonal contraceptive pills from the following

(a) Inhibition of spermatogenesis.

9. What is amniocentesis? Why a statutory ban is imposed on this technique?

--Amniocentesis is a prenatal technique used to detect any chromosomal abnormalities in the foetus and it is being often misused to determine the sex of the foetus.

- Once the sex of the foetus is known, there may be a chance of female foeticide.

- Hence, a statutory ban on amniocentesis is imposed.

10. Select the correct term from the bracket and complete the given branching tree

(A-Barrier, B-Lactational amenorrhoea, C-Tubectomy, D-CuT)

11. Correct the following statements

a) Transfer of an ovum collected from donor into the fallopian tube is called.

ANS-GIFT

b) Transferring of an embryo with more than 8 blastomeres into uterus is called .

ANS-ZIFT

c) Multiload 375 is a

ANS-Copper releasing IUDs

12. Which method do you suggest the couple to have a baby, if the male partner fails to inseminate the female or due to very low sperm count in the ejaculate?

-I will suggest **Intra-cytoplasmic sperm injection (ICSI)**

-In this method only one sperm is injected into the focal point of the egg to fertilize. The sperm is carefully injected into the cytoplasm of the egg.

13. Expand the following

- a) ZIFT-**Zygote intra-fallopian transfer**
- b) ICSI -**Intra-cytoplasmic sperm injection**

14. What are the strategies to be implemented in India to attain total reproductive health?

-Creating awareness and providing medical assistance to build a healthy society.

- Introducing sex education in schools to provide information about adolescence and adolescence related changes.
- Educating couples and those in the marriageable age groups about the available birth control methods and family planning norms.

15. Differentiate foeticide and infanticide.

-**Female foeticide** refers to 'aborting the female in the mother's womb';

-whereas female **infanticide** is 'killing the female child after her birth'.

16. Describe the major STDs and their symptoms.

-Gonorrhoea

-Pain and pus discharge in the genital tract and burning sensation during urination.

2. AIDS-

Enlarged lymph nodes, prolonged fever, prolonged diarrhoea, weight reduction, night sweating.

3. Candidiasis

-Vaginal itching or soreness, abnormal vaginal discharge and pain during urination.

17. How are STDs transmitted?

-Sexually transmitted infections (STI). Normally STI are transmitted from person to person during intimate sexual contact with an infected partner.

- Infections like **Hepatitis-B** and **HIV** are transmitted sexually as well as by sharing of infusion needles, surgical instruments, etc with infected people, blood transfusion or from infected mother to baby.

18. Write the preventive measures of STDs.

- a. Avoid sex with unknown partner/ multiple partners
- b. use condoms
- c. In case of doubt, consult a doctor for diagnosis and get complete treatment.

19. The procedure of GIFT involves the transfer of female gametes into the fallopian tube, can gametes be transferred to the uterus to achieve the same result? Explain.

-Intra uterine transfer (IUT)

Embryo with more than 8 blastomeres is inserted into uterus to complete its further development.

-Gamete intra-fallopian transfer (GIFT)

Transfer of an ovum collected from a donor into the fallopian tube. In this the eggs are collected from the ovaries and placed with the sperms in one of the fallopian tubes.

-The zygote travels toward the uterus and gets implanted in the inner lining of the uterus.

20. Amniocentesis, the foetal sex determination test, is banned in our country, Is it necessary? comment.

-Due to small family norms and the skewed choice for a male child, female population is decreasing at an alarming rate. ---Amniocentesis is a prenatal technique used to detect any chromosomal abnormalities in the foetus and it is being often misused to determine the sex of the foetus.

-Once the sex of the foetus is known, there may be a chance of female foeticide.

-Hence, a statutory ban on amniocentesis is imposed.

21. 'Healthy reproduction, legally checked birth control measures and proper family planning programmes are essential for the survival of mankind' Justify.

-India is amongst the first few countries in the world to initiate the '**Family planning programme**' since 1951 and is periodically assessed every decade. These programmes are popularly named as '**Reproductive and Child Health Care** (RCH). Major tasks carried out under these programmes are:

-Creating awareness and providing medical assistance to build a healthy society.

-Introducing sex education in schools to provide information about adolescence and adolescence related changes.

-Educating couples and those in the marriageable age groups about the available birth control methods and family planning norms.

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