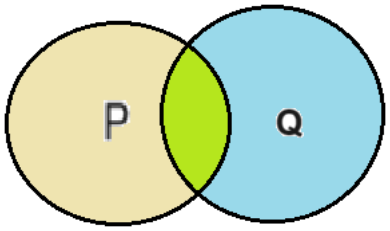
CBT JUNE 2024
CLASS – XII : BIOLOGY

GENERAL INSTRUCTION :
SCORE AND REVIEW OF ALL THE QUESTIONS WILL BE PROVIDED IN THE EMAIL TO ALL THE STUDENTS ON NEXT DAY AND AFTER CLOSING OF QUIZ TIME.
IMPORTANT : ALL THE STUDENTS SHOULD FILL THE CORRECT SCHOOL NAME FROM DROP DOWN BUTTON

CHAPTERS COVERED:
Chapter-2: Human Reproduction (Gametogenesis, Fertilization and post fertilization events and Embryonic Development)

Q.1: Refer to the diagram below where, the first circle (P) includes parts of the human female reproductive system that support conception and the second circle (Q) includes parts that support pregnancy.



Now answer following MCQ type questions incorporating the provided Venn diagram.

1. Which of the following parts specifically belong to P (parts that support conception)?
   a) Uterus and Placenta
   b) Ovaries and Fallopian tubes
   c) Uterus and mammary glands
   d) Placenta and Ovaries
Answer: b) Ovaries and Fallopian tubes
FEEDBACK: The ovaries produce eggs (ova) necessary for fertilization, and the fallopian tubes provide the site for fertilization and transport the fertilized egg to the uterus.

2. Which of the following parts belong to Q (parts that support pregnancy)?
   a) Ovaries and Cervix
   b) Fallopian tubes and Uterus
   c) Uterus and Placenta
   d) Vagina and Fallopian tubes
Answer: c) Uterus and Placenta
FEEDBACK: The uterus houses and nurtures the developing foetus during pregnancy, while the placenta facilitates nutrient and waste exchange between the mother and foetus.

3. Which two parts support both conception and pregnancy?
   a) Ovaries and Vagina
   b) Uterus, Ovaries and Oviducts
   c) Placenta and Fallopian tubes
   d) Cervix and Uterus
   Answer: b) Uterus, Ovaries and Oviducts

FEEDBACK: The ovaries produce the eggs necessary for conception, Oviduct give site of fertilisation as well as carries fertilised egg towards the uterus and the uterus supports implantation and development of the embryo and foetus during pregnancy.

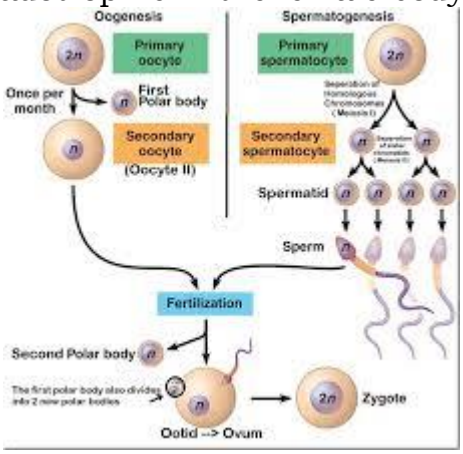
4. Which two parts function as endocrine glands?
   a) Uterus (Q) and Vagina (P)
   b) Placenta (Q) and Cervix (P)
   c) Ovaries (P) and Placenta (Q)
   d) Fallopian tubes (P) and Uterus (Q)
   Answer: c) Ovaries (P) and Placenta (Q)

FEEDBACK: The ovaries (part of P) produce hormones like estrogen and progesterone, while the placenta (part of Q) secretes hormones such as human chorionic gonadotropin (hCG) during pregnancy.

5. Which part from the endocrine glands mentioned in above question is temporary?
   a) Ovaries
   b) Uterus
   c) Placenta
   d) Cervix
   Answer: c) Placenta

FEEDBACK: The placenta is a temporary organ that forms during pregnancy and is expelled from the body after childbirth, whereas the ovaries are permanent endocrine glands.

Q.2: Spermatozoa are the mature male gametes in many sexually reproducing organisms. Thus, spermatogenesis is the male version of gametogenesis, of which the female equivalent is oogenesis.
The cells in the germline that undergo meiosis, primary spermatocytes or primary oocytes, are derived from the zygote by a long series of mitoses before the onset of meiosis. Male and female gametes have different histories, marked by different patterns of gene expression that reflect their developmental origin as XY or XX embryos.
The spermatozoa fuses with the egg cell to create a viable embryo. The ovum is released by the action of gonadotropins in the female body.



1. Does ovulation happen during the period of pregnancy?
a) Yes, because the body continues to release eggs regularly.
b) No, because hormonal changes prevent the release of eggs.
c) Yes, because the ovaries remain active.
d) No, because the uterus is occupied by the developing embryo.
Answer: b) No, because hormonal changes prevent the release of eggs.

FEEDBACK: During pregnancy, high levels of progesterone and estrogen inhibit the release of gonadotropins, thereby preventing ovulation. This ensures that no new eggs are released while a pregnancy is already in progress.

2. Why are contraceptive pills able to inhibit ovulation?
a) They increase the release of eggs.
b) They block the fertilization of the egg.
c) They maintain constant hormone levels that inhibit the release of gonadotropins.
d) They cause the uterus to reject sperm.
Answer: c) They maintain constant hormone levels that inhibit the release of gonadotropins.
FEEDBACK: Contraceptive pills contain synthetic hormones that mimic pregnancy, keeping estrogen and progesterone levels high. This inhibits the secretion of gonadotropins (LH and FSH) from the pituitary gland, preventing the ovaries from releasing eggs and thus inhibiting ovulation.

3. Two statements are given below - one labelled Assertion (A) and the other labelled Reason (R).
Assertion (A): Only one sperm can fertilise an ovum.
Reasoning (R): During fertilisation, a sperm comes in contact with the zona pellucida layer of the ovum.
Which of the following is correct?
a) Both A and R are true, and R is a correct explanation of A.
b) Both A and R are true, but R is not a correct explanation of A.
c) A is true, but R is false.
d) A is false, but R is true.
Answer: B. Both A and R are true, but R is not a correct explanation of A.
FEEDBACK: While it is true that only one sperm can fertilise an ovum (due to a mechanism called the block to polyspermy), the reason given (contact with the zona pellucida) is not the correct explanation for why only one sperm can fertilise the ovum. The zona pellucida reaction prevents additional sperms from binding to and penetrating the egg after the first sperm has successfully fused.

4. Organisms possessing identical sex chromosomes are referred to as the homogametic sex. Organisms with different sex chromosomes are known as the heterogametic sex. Which of the following is CORRECT about humans?
a) Both males and females are homogametic.
b) Both males and females are heterogametic.
c) Males are homogametic while females are heterogametic.
d) Males are heterogametic while females are homogametic.
Answer: D. Males are heterogametic while females are homogametic.
FEEDBACK: In humans, males have different sex chromosomes (XY) and are thus heterogametic, while females have identical sex chromosomes (XX) and are therefore homogametic.

5. Which of these cells of the human male reproductive system is haploid?
a) Spermatid
b) Sertoli cell
c) Leydig cell
d) Spermatogonium
Answer: A. Spermatid
FEEDBACK: Spermatids are the result of the second meiotic division and are haploid cells, meaning they contain half the number of chromosomes (23) compared to diploid

cells. In contrast, Sertoli cells and Leydig cells are somatic cells and spermatogonia are diploid germ cells.