CHAPTER

2

HUMAN REPRODUCTION

Exercise 1 : NCERT Based Topic-wise MCQs

2.1 THE MALE REPRODUCTIVE SYSTEM

1. The enlarged end of penis is covered by a loose fold of skin is called .NCERT Page-44 / N-28
(a) glans penis (b) foreskin
(c) hymen (d) urethral meatus

2. The functional maturation of sperm in male, occurs in NCERT Page-48 / N-27
(a) epididymis (b) vas deferens
(c) seminal vesicle (d) All of these

3. Which pathway of the male reproductive system is correct for the sperms transportation?
NCERT Page-43 / N-27
(a) Vas efferentia → Vas deferens → Epididymis
(b) Vas deferens → Epididymis → Seminal vesicle
(c) Epididymis → Vas deferens → Urethra
(d) Rete testis → Epididymis → Vas efferentia

4. The lead to vas deferens that ascends to the and loops over the
NCERT Page-43 / N-27
(a) prostate, stomach, urinary bladder.
(b) epididymis, abdomen, urinary bladder.
(c) vas efferentia, abdomen, ureter.
(d) urinary bladder, ejaculatory duct, abdomen.

5. Which of the following is a transporting tube leading from the bladder to which brings urine outside the body via penis?
NCERT Page-43 / N-27
(a) Urethra
(b) Epididymis
(c) Ejaculatory duct (d) Urethra meatus

6. If for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from
(a) testes to epididymis
NCERT Page-43 / N-27
(b) epididymis to vas deferens
(c) ovary to uterus
(d) vagina to uterus

7. Which of the following is true regarding the male reproductive system?
NCERT Page-43 / N-27,28
(a) Sperms are diploid.
(b) It includes testes, accessory ducts and glands, and oviducts.
(c) The scrotum keeps the testes warmer, thus helping it to promote the sperm formation.
(d) Sertoli cells are found in seminiferous tubules and provide nutrition to germ cells.

8. Which of the following pair is incorrectly matched?
(a) Leydig cells - Androgen.
NCERT Page-47 / N-27, 28
(b) Spermatogenesis - Seminiferous tubules
(c) Male reproductive system - Pelvis region
(d) Spermatocytes - Mitotic division

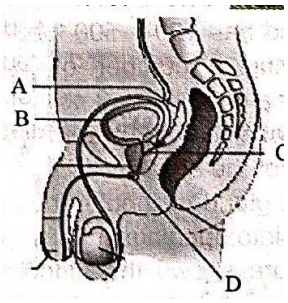
9. Two types of cells present in the lining of seminiferous tubules are__and_____
(a) leydig cells, sertoli cells.
NCERT Page-43 / N-27, 28
(b) male germ cells, sertoli cells.
(c) spermatogonium, spermatids.
(d) primary oocyte, leydig cells.

10. Identify the structure on the basis of the given statement which surrounds the primary sex organ of male reproductive system. "It is responsible for maintaining the low temperature by about $2 - 2.5°C$ from normal body temperature to mature sperm."
NCERT Page-43/N-27, 28
(a) Penis (b) Scrotum
(c) Ureter (d) Urethra

11. Read the following statement and answer the question. "The urethra originates from a structure (called ' X) and extends through the male external genitalia (called ' *Y* ' which helps in introducing semen into the vagina) to its external opening called urethral meatus." Identify *X* and *Y*.
NCERT Page-43/N-27, 28
(a) *X*-Urinary bladder; *Y* - Penis
(b) *X* - Vas efferentia; *Y* - Penis
(c) *X* - Ejaculatory duct ; *Y* - Ureter
(d) *X* - Bulbourethral gland; *Y* – Ureter

12. The feature of some structures of male reproductive system is given below. Identify the structure on the basis of the characteristics which surrounds the primary sex organ of male reproductive system. NCERT Page-43 / N-27, 28
(a) Its enlarged end is called glans penis.
(b) It travels through the penis and carry semen as well as urine.
(c) It is responsible for maintaining the low temperature by about $2 - 2.5°C$ from normal body temperature to mature sperm.
(d) Stores sperms prior to ejaculation.

13. The given figure shows the male reproductive system. Some structures are marked as A, B, C, and D. Identify the structure.
NCERT Page-43 / N-27, 28



(a) Seminal vesicles, urinary bladder, bulbourethral gland and ejaculatory duct.
(b) Urinary bladder ejaculatory duct, bulbourethral gland and seminal vesicles
(c) Bulbourethral gland, urinary bladder, ejaculatory duct, and seminal vesicles.
(d) Seminal vesicles, urinary bladder, ejaculatory duct and bulbourethral gland.
When semen is released by the penis into the vagina during copulation, then it is called
(a) ovulation (b) insemination
NCERT Page-44 / N-28
(c) menstruation (d) gametogenesis

2.2 THE FEMALE REPRODUCTIVE SYSTEM

15. Most of the primary follicles in the ovary normally
(a) undergo atresia and disintegrate.
(b) mature and are ovulated.
(c) are lost in the menstrual flow each month.
(d) develop throughout the life span.

16. Which of the following is not part of the female external genitalia? NCERT Page-46 / N-28
(a) Clitoris (b) Vagina
(c) Labia majora (d) Labia minora

17. In human females, meiosis-II is not complete until?
(a) fertilization (b) uterine implantation
(c) birth (d) puberty

18. If one ovary of 30 year old lady is removed surgically then what happens in affected lady?
(a) Menstrual cycle is stopped
(b) Menstrual cycle is normal but ovulation does not occur
(c) Duration of menstrual cycle is prolonged
(d) No effect on menstrual cycle

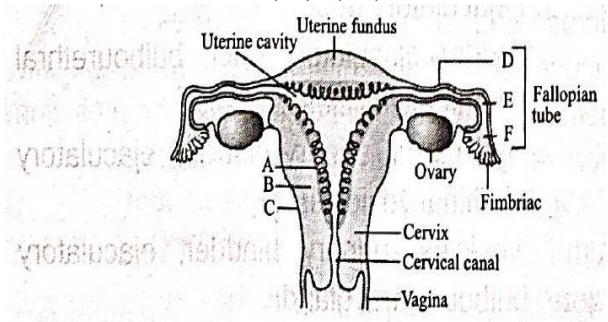
19. Asac shaped like an upside down pear with a thick lining and muscles in the pelvic area where a fertilized egg or zygote comes to grow into a baby is called
(a) oviduct (b) uterus
(c) vagina (d) vulva

20. Which of the following is a finger like structure and lies at the upper junction of the two labia minora above the urethral opening?
NCERT Page-46 / N-30

(a) Clitoris (b) Oviduct
(c) Ampulla (d) Chorionic villi

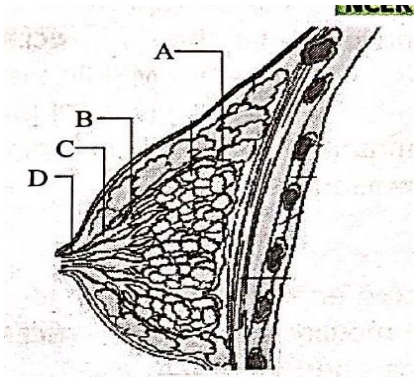
21. Which of the following statements regarding mammary gland is incorrect?
NCERT Page-46 / N-30
(a) They are paired glandular structure that lies over the pectoral muscles.
(b) Each gland has $100-500$ lobulated milk glands each having a number of lobules containing number of alveoli.
(c) The cells of alveoli secrete milk which is stored in the cavity of the alveoli.
(d) Each milk gland or lobules has lactiferous ducts that drain into openings in the nipple.

22. The given figure shows the diagrammatic sectional view of female reproductive system with few structures marked as A, B, C, D, E and F.



Which of the following options shows the correct labeling of A – F ? NCERT Page-45 / N-29
(a) A → Myometrium, B → Isthmus, C → Endometrium, *D* → Perimetrium, *E* → Ampulla, *F* → Infundibulum
(b) A → Infundibulum, B → Perimetrium, C → Endometrium, D → Myometrium, E → Ampulla, F → Isthmus
(c) A → Endometrium, B → Myometrium, C → Perimetrium, D → Isthmus, E → Ampulla, F → Infundibulum
(d) A → Perimetrium, B → Endometrium, C → Isthmus, D → Infundibulum, E → Ampulla, F → Myometrium

23. Refer the figure of mammary gland with few structures marked as A, B, C and D. Identify the marked structures.
NCERT Page-46 / N-30



(a) Mammary lobe, mammary duct, ampulla and lactiferous duct.
(b) Ampulla, mammary duct, lactiferous duct and mammary lobe.
(c) Lactiferous duct, mammary lobe, mammary lobe and ampulla.
(d) Mammary duct, mammary lobe lactiferous duct and ampulla.

2.3 GAMETOGENESIS

24. In the process of spermatogenesis, first maturation division is called NCERRI Page-47 / N-31
(a) mitotic division
(b) reduction division
(c) amitotic division
(d) None of the these

25. The LH surge from the anterior pituitary gland
(a) occurs just prior to ovulation.
NCERT Page-47 / N-31
(b) occurs just prior to menstruation.
(c) stimulates an estrogen surge from the ovaries.
(d) is responsible for follicle development in the uterus.

26. Which of the following statements about oogenesis is false?
NCERA Page-48, 49 / N-32, 33
(a) The polar bodies degenerate after the second meiotic division.
(b) The ovum produced is haploid.
(c) The major growth phase of the primary oocyte occurs in prophase-I.
(d) The primary oocyte is haploid.

27. In humans, male germs cells differentiate into the end of first meiotic division.
NCERT Page-49 / N-31
(a) spermatid (b) spermatogonium

(c) secondary spermatocyte
(d) primary spermatocyte

28. Increased secretion of which hormone start the process of sperm formation at the time of puberty? NCERT Page-47 / N-31
(a) GH (b) TSH
(c) PRL (d) GnRH

29. By which process sperms released from the seminiferous tubules? NCERT Page-47 / N-31
(a) Spermiation (b) Insemination
(c) Spermatogenesis (d) Spermiogenesis

30. The mobility of a mature sperm is controlled by the mitochondria located in the NCERT Page-48 / N-32
(a) Head (b) Middle piece
(c) Tall (d) In all of them

31. Each spermatogonium which is diploid contains how many chromosomes? NCERT Page 49
(a) 23 (b) 26
(c) 46 (d) 48

32. The acrosome enables the sperm to NCERT Page-48 / N-32
(a) help in motility.
(b) produce energy for activity.
(c) penetrate vitelline membrane of ovum.
(d) fertilize more than one ovum.

33. Which of the following group of cells involved in spermatogenesis represent haploid cells?
(a) Spermatogonium NCERT Page-47 / N-31
(b) Primary spermatocyte
(c) Both (a) and (b)
(d) Secondary spermatocyte

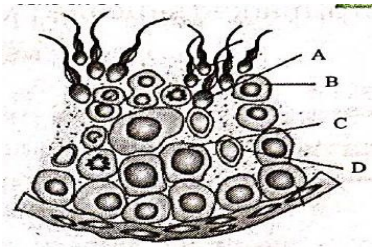
34. Select the option which shows the correct part of a sperm with its corresponding function.
(a) Head: Stimulate Leydig cells to produce androgen hormone.
(b) Neck: Essential for maturation and motility of sperm. NCERT Page-48 / N-32
(c) Middle piece: Produces energy from mitochondria for tail movement which facilitate sperm motility.
(d) Tail: Help in fertilization with the help of enzyme present in acrosome.

35. First polar body is formed during the formation of and_completion of meiotic division.
(a) Primary oocytes, II NCERT Page-49 / N-33
(b) Secondary oocytes, 1
(c) Secondary spermatocytes, II
(d) Primary spermatocytes, I

36. Second meiotic division in secondary oocyte results in the formation of NCERT Page-49 / N-33
(a) first polar body and a diploid ovum.
(b) first polar body and a haploid ovum.
(c) second polar body and a diploid ovum.
(d) second polar body and a haploid ovum

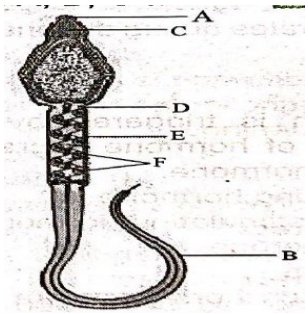
37. Which of the following shows the correct sequence of events leading to the formation of mature sperm? NCERT Page-47 / N-31
(a) Spermatogonium → Secondary spermatocyte → Primary spermatocyte → Spermatids → Sperms.
(b) Spermatogonium → Spermatids → Secondary spermatocyte → Primary spermatocyte → Sperms.
(c) Spermatids → Primary spermatocyte → Secondary spermatocyte → Spermatogonium → Sperms.
(d) Spermatogonium → Primary spermatocyte → Secondary spermatocyte → Spermatids → Sperms.

38. The figure given below shows the sectional view of seminiferous tubule.



Which marked structure (A to *D*) undergoes second meiotic division to produce four equal haploid cells (called spermatids)?
NCERT Page-47 / N-31
(a) A (b) B
(c) C (4) D

39. The figure given below shows the structure of sperm. Identify the correct feature corresponding to the marked structure A, B, C and D.
NCERT Page-48 / N-32



(a) A - plasma membrane, B - tail, C - Acrosome, *D* - Neck, *E* - middle piece and *F* - Mitochondria.
(b) A-middle piece, B - plasma membrane, C-Neck, *D* - Mitochondria, *E* - tail and *F* - Acrosome.
(c) A - Mitochondria, B - tail, C - Neck, D - plasma membrane, E - Acrosome and F - middle piece.
(d) A-Acrosome, B - middle piece, C - mitochondria, D - tail, *E* - plasma membrane and F - Neck.

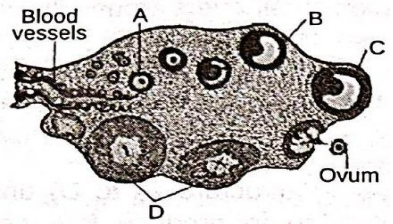
40. Seminal plasma in humans is rich in NCERT Page-44 / N-28
(a) fructose and calcium but no enzymes
(b) glucose and certain enzymes but has no calcium
(c) fructose and certain enzymes but poor in calcium
(d) fructose, calcium and certain enzymes.

41. Semen is a constituent of seminal plasma with NCERT Page-48 / N-32
(a) ovum (b) sperm
(c) zygote (d) follicle

42. Which of the following contains a fluid filled cavity called antrum?
(a) Primary spermatocyte. NCERT Page-48 / N-32
(b) Primary follicle of ovary.
(c) Tertiary follicle of ovary.
(d) Secondary spermatocyte.

43. Immediately after ovulation, the mammalian egg is covered by a membrane known as NCERT Page-49
(a) chorion (b) zona pellucida
(c) corona radiata (d) vitelline membrane

44. The figure given below shows the sectional view of ovary. Select the option which gives correct identification of marked structure (A to *D*) and its feature. NCERT Page-49 / N-33



(a) A: Primary follicle, it is also called gamete mother cell.
(b) B: Corpus luteum, it cannot be formed and added after birth.
(c) C: Grafian follicle, mature follicle which ruptures to release secondary oocyte.
(d) D: Tertiary follicle, a large number of this follicle degenerates during the phase from birth to puberty.

2.4 MENSTRUAL CYCLE

45. Menstruation is triggered by a sudden decline in the amount of hormone secreted by corpus luteum. Identify the hormone. NCERT Page-51 / N-34
(a) Luteinizing hormone
(b) Follicle stimulating hormone
(c) Progesterone (d) Estrogen

46. Level of which hormones are at their highest during the luteal phase (second half of the cycle) of the menstrual cycle? NCERT Page-51 / N-34
(a) Estrogen (b) Progesterone
(c) Luteinizing hormone
(d) Follicular stimulating hormone

47. Which phase of menstrual cycle is also called proliferative phase? NCERT Page-50 / N-34
(a) Luteal (b) Ovulatory
(c) Follicular (d) Menstruation

48. Which phase of menstrual cycle is also called secretory phase? NCERT Page-50 / N-34
(a) Luteal (b) Ovulatory
(c) Follicular (d) Menstruation

49. Which of the following indicates pregnancy? NCERT Page-50 / N-34
(a) Lack of menstruation.
(b) Occurrence of menstrual flow.
(c) When released ovum is not fertilized.
(d) When Graafian follicle matures and endometrium regenerates through proliferation.

50. The correct sequence of hormone secretion from beginning of menstruation is
NCERT Page-51 / N-34, 35
(a) FSH, progesterone, estrogen.
(b) estrogen, FSH, progesterone.
(c) FSH, estrogen, progesterone.
(d) estrogen, progesterone, FSH.

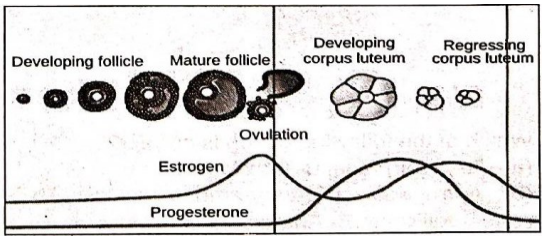
51. Select the correct sequence of menstrual cycle.
NCERT Page-50 / N-34, 35
(a) Menstruation, Secretory, Follicular, New cycle.
(b) Menstruation, Follicular, Luteal, New cycle.
(c) Follicular, Menstruation, Luteal, New cycle.
(d) Luteal, Menstruation, Follicular, New cycle.

52. In human female, menopause is a stage in which
NCERT Page-51 / N-32
(a) oogenesis starts at puberty.
(b) menstruation starts at puberty.
(c) corpus luteum starts secreting progesterone for maintaining pregnancy.
(d) menstruation stops at the age of 50 years and reproductive capacity is arrested.

53. Which of the following statement is **correct** regarding menstruation?
NCERT Page-51 / N-34, 35
(a) The menstrual fluid can easily clot.
(b) The end of the cycle of menstruation is called menarche.
(c) At menopause in the female, there is especially abrupt decrease in gonadotropic hormones.
(d) Both LH and FSH attain a peak-level in the middle of cycle.

54. Menstruation is initiated by
NCERT Page-50 / N-34, 35
(a) a sudden release of FSH from the anterior pituitary.
(b) a lack of estrogens and progesterone due to degeneration of the corpus luteum.
(c) an increased release of estrogens and progesterone from the corpus luteum.
(d) a sudden drop in LH.

55. Study the given figure and identify the correct event occurring in this. NCERT Page-50 / N-34



(a) Role of pituitary hormones levels.
(b) Events occurring in uterine tissues.
(c) Role of ovarian hormone levels and growth of ovarian follicles.
(d) Both (a) and (c).

56. Which of the following hormones attains a peak level in the middle of menstrual cycle?
(a) LH and estrogen
NCERT Page-51 / N-34
(b) FSH and progesterone
(c) FSH and LH
(d) Estrogen and progesterone

57. In normal pregnant women, the amount of total gonadotropin activity was assessed. The result expected was
(a) high level of circulating FSH and LH in the uterus to stimulate implantation of the embryo
(b) high level of circulating hCG to stimulate endometrial thickening
(c) high levels of FSH and LH in uterus to stimulate endometrial thickening
(d) high levels of circulating hCG to stimulate estrogen and progesterone synthesis.

2.5 FERTILISATION AND IMPLANTATION

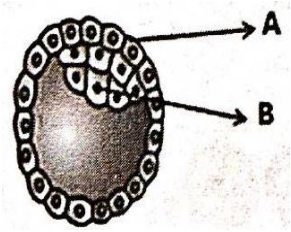
58. Which of the following stage of oogenesis forms a membrane called zona pellucida surrounding it?
(a) Oogonia (b) Polar body
NCERT Page-52 / N-36
(c) Corpus luteum (d) Secondary oocytes

59. At the time of implantation, the human embryo is called NCERT Page-53 / N-37
(a) zygote (b) blastocysts
(c) embryo (d) foetus

60. Fusion of haploid nucleus of sperm and that of ovum lead to the formation of
NCERT Page-52 / N-35
(a) zygote (b) blastocysts
(c) embryo (d) foetus

61. Which of the following differentiate into embryo?
NCERT Page-53 / N-36
(a) Morula (b) Zygote
(c) Trophoblast (d) Inner cell mass

62. In the given figure the structure of blastocyst. Some art are labelled as A and B.



Which of the following option is correct?
(a) A-Inner mass, B-trophoblast
(b) A-trophoblast, B- inner mass
(c) A-follicular, B-Antrum
(d) None of these

63. At the time of fertilization, chromosome number
NCERT Page-52 / N-36
(a) is halved (b) remains haploid
(c) becomes diploid (d) does not change

64. Fertilization can only occurs if
NCERT Page-51 / N-35, 36
(a) sperm reaches to the ampullary - isthmic junction before the ovum.
(b) ovum reaches to the ampullary - isthmic junction before the sperm.
(c) sperms are transported to the uterus and ovum to the fallopian tube simultaneously.
(d) sperm and ovum are transported simultaneously to the ampullary - isthmic junction.

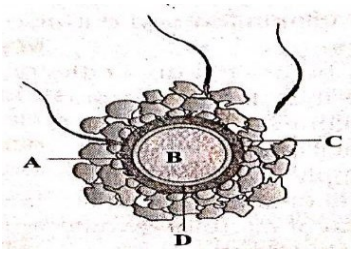
65. Which of the following does not occur in the time during and immediately following fertilization?
(a) Fusion of the sperm and ovum nuclei.
NCERT Page-52 & 53 / N-35, 36
(b) Division of the oocyte cell by meiosis
(c) Implantation of the ovum in the uterus.
(d) Digestion of cell layers around the oocyte by sperm.

66. What happens during fertilization in humans after many sperms reach close to the ovum?
(a) Cells of corona radiata trap all the sperms except one NCERT Page-51 / N-36
(b) Only the closest sperm to the ovum penetrates the zona pellucida.
(c) Secretions of acrosome helps one sperm enter cytoplasm of ovum through zona pellucida and plasma membrane.
(d) All sperms except the one nearest to the ovum lose their tails

67. Which of the following is the first change that occurs to the zygote after fertilization?
(a) It divides to form a hollow ball of cells, called the blastocyst. NCERT Page-52 & 53 / N-35
(b) It begins to secrete the hormones.
(c) It contacts the endometrial wall of the uterus and becomes buried inside it.
(d) It initiates the formation of a placenta.

68. Presence of *XX* or *XY* chromosomes in zygote depends on NCERT Page-52 / N-36
(a) the sperm carrying *X* chromosome fertilized the ovum.
(b) the sperm carrying *Y* chromosome fertilized the ovum.
(c) the sperm without any chromosome fertilized the ovum.
(d) the sperm carrying *X* or *Y* chromosomes fertilized the ovum.

69. In the given figure the structure of ovum is surrounded by few sperms and some artare labelled as A, B, C and D.

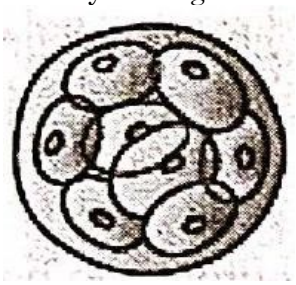


Which of the following options shows the correct labelling?
(a) A → Zona pellucida; B → Ovuin'; C → Cells of corona radiata, D → Perivitelline space
(b) A → Perivitelline space, B → Antrum, C → Zona pellucida D → Ovum
(c) A → Zona pellucida, B → Ootid, C → Cells of corona radiata, D → Perivitelline space
(d) A → Cells of corona radiata, B → Morula, C → Perivitelline space, D → Zona pellucida

70. Which layer of blastocysts gets attached to the endometrium? NCERT Page-53 / N-36
(a) Trophoblast (b) Inner cell mass
(c) Umbilical cord (d) Both (a) and (c)

71. Blastomeres are daughter cells formed in the process of NCERT Page-52 / N-35
(a) cleavage, when zygote undergoes mitotic division.
(b) fertilization, when sperm enters in the cytoplasm of ovum.
(c) implantation, when blastocysts attached to the uterine endometrium.
(d) gametogenesis, when male and female gametes are produced by testis and ovary respectively

72. The given figure represents a stage of embryonic development. Identify the stage with its feature.



(a) Blastocysts, ready to fertilize with sperm.
(b) Secondary oocyte, implants on endometrial layer of uterus.
(c) Morula, formed by mitotic division of zygote.
(d) Ovary, produce female gamete and secretes hormones like estrogen etc

2.6 PREGNANCY AND EMBRYONIC DEVELOPMENT

73. In human embryology, the chorion is derived from NCERT Page-53 / N-38
(a) Ectoderm (b) Mesoderm
(c) Endoderm (d) Trophoblast

74. The majority of human organ formation occurs NCERT Page-54 / N-38
(a) entirely during the last trimester of pregnancy.
(b) after implantation and during the first trimester of pregnancy.
(c) shortly before the onset of true labour.
(d) due to the stimulation generated during Braxton Hicks contractions.

75. Placenta facilitate NCERT Page-53 / N-37
(a) the supply of oxygen and nutrients to the embryo.
(b) removal of carbon dioxide.
(c) removal of excretory/waste materials.
(d) All of the above

76. Identical twins result when
(a) the zygote divides and the daughter cells split and develop independently.
(b) two eggs with identical genetic material are fertilized each by a different sperm.
(c) an embryo splits before cellular differentiation has occurred.
(d) Both (a) and (c)

77. What will happen to pregnancy if placenta fails to function during the gestation?
(a) The pregnancy would not continue.
(b) The foetus would be born prematurely.
(c) There would be no effect on the pregnancy.
(d) The corpus luteum would continue produce hormone as an alternative source until birth.

78. Primary germ layers are
NCERT Page-54 / N-38
(a) ectoderm and inner cell mass only.
(b) trophoblast, ectoderm and mesoderm.
(c) endoderm and mesoderm only.
(d) ectoderm, endoderm and mesoderm.

79. Which of the following hormones is produced in women only during pregnancy?
NCERT Page-53 / N-37
(a) Relaxin (b) Estrogen
(c) Oxytocin (d) Progesterone

80. By the end of how many weeks, major organ system are formed during the embryonic development? NCERT Page-54 / N-38
(a) 4 weeks (b) 8 weeks
(c) 12 weeks (d) 24 weeks

81. All of the following statements concerning pregnancy are accurate EXCEPT
(a) the detection of human chorionic gonadotropin in the urine forms the basis for pregnancy tests.
(b) the cyclic release of pituitary gonadotropins and ovarian steroids is continued.
(c) the mammary gland tissue of the pregnant woman is stimulated to develop by placental hormones.
(d) the corpus luteum of pregnancy maintains the uterus until the placenta is well established.

2.7 PARTURITION AND LACTATION

82. Colostrum NCERT Page-54 / N-38
(a) is a hormone essential for milk secretion.
(b) can be synthesized by the newborn infant but not by a foetus.
(c) stimulates further secretion of oxytocin for uterine contraction.
(d) is a source of antibodies essential to develop resistance against diseases in new born babies.

83. Which of the following hormone acts on uterine muscle and causes its stronger contraction?
(a) Relaxin (b) Estrogen
(c) Oxytocin (d) Progesterone

84. Which of the following induces foetal ejection reflex? NCERT Page-54 / N-38
(a) Initiation of lactation
(b) Fully developed foetus and placenta
(c) Expulsion of the baby out of the uterus.
(d) Transport of embryo in the fallopian tube.

85. During parturition, a pregnant woman is having prolonged labour pains and child birth has to be fastened. It is advisable to administer a hormone that can NCERT Page-54 / N-38
(a) increase the metabolic rate.
(b) release glucose in the blood.
(c) stimulate the ovary.
(d) activate smooth muscles.

86. Study the statement given below and answer the question. 'Vigorous contraction of the ' *X* ' at the end of the ' *Y* ' causes expulsion of the foetus." Identify *X* and *Y*.
(a) X-Vagina ; *Y* - Fertilization
NCERT Page-54 / N-38
(b) *X* - Uterus; *Y* - Pregnancy
(c) *X* - Placenta ; *Y* - Implantation
(d) *X* - Embryo ; *Y* – Ovulation

87. Signals for parturition originate from:
NCERT Page-54 / N-38
(a) Both placenta as well as fully developed foetus
(b) Oxytocin released from maternal pituitary
(c) Placenta only
(d) Fully developed foetus only

Exercise 2 : NCERT EXEMPLAR & NEET

NCERT EXAMPLAR QUESTIONS

1. Choose the incorrect statement from the following
(a) In birds and mammals internal fertilisation takes place

(b) Colostrum contains antibodies and nutrients
(c) Polyspermy is prevented by the chemical changes in the egg surface
(d) In the human female implantation occurs almost seven days after fertilization

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 cycle 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) Rete testis (b) Epididymis
(c) Vasa efferentia (d) Isthmus

4. Seminal plasma, the fluid part of semen, is contributed by NCERT Page-44
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 NCERT Page-47 / N-31
(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
NCERT Page-50 / N-35
(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
NCERT Page-51
(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 undergo division to produce sperms by the process of spermatogenesis. Choose the correct one with reference to above.
NCERT Page-49
(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 among the following has 23 chromosomes?
NCERT Page-49
(a) Spermatogonia (b) Zygote
(c) Secondary oocyte (d) Oogonia

11. Which of the following hormones is not secreted by human placenta?
(a) Hcg (b) Estrogens
NCERT Page-53
(c) Progesterone (d) LH

12. The vas deferens receives duct from the seminal vesicle and opens into urethra as NCERT Page-43
(a) epididymis (b) ejaculatory duct
(c) efferent ductule (d) ureter

13. Urethral meatus refers to the:
NCERT Page-43
(a) urinogenital duct
(b) opening of vas deferens into urethra
(c) external opening of the urinogenital duct
(d) muscles surrounding the urinogenital duct

14. Morula is a developmental stage
NCERT Page-52
(a) between the zygote and blastocyst
(b) between the blastocyst and gastrula
(c) after the implanation
(d) between implanation and parturition

15. The membranous cover of the ovum at ovulation is
NCERT Page-51
(a) coröna radiata (b) zona radiata
(c) zona pellucida (d) chorion

16. Identify the odd one from the following.
(a) labia minora (b) fimbriae
(c) infundibulum (d) isthmus

NEET QUESTIONS

17. Fertilization in humans is practically feasible only if
(a) the sperms are transported into vagina just after the release of ovum in fallopian tube
(b) the ovum and sperms are transported simultaneously to ampullary isthmic junction of the fallopian tube
(c) the ovum and sperms are transported simultaneously to ampullary - isthmic junction of the cervix
(d) the sperms are transported into cervix within 48 hrs of release of ovum in uterus

18. Select the incorrect statement :
NCERT Page-51 / N-32
(a) FSH stimulates the sertoli cells which help in spermiogenesis
(b) LH triggers ovulation in ovary
(c) LH and FSH decrease gradually during the follicular phase
(d) LH triggers secretion of androgens from the Leydig cells

19. Capacitation occurs in :
(a) Epididymis (b) Vas deferens
(c) Female reproductive tract (d) Rete testis

20. The difference between spermiogenesis and spermiation is NCERT Page-47 / N-31 |
(a) In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.
(b) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.
(c) In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.
(d) In spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.

21. The amnion of mammalian embryo is derived from
(a) ectoderm and mesoderm
(b) endoderm and mesoderm
(c) ectoderm and endoderm
(d) mesoderm and trophoblast

22. Hormones secreted by the placenta to maintain pregnancy are NCERT Page-53 / N-37 |
(a) hCG, hPL, progestogens, prolactin
(b) hCG, hPL, estrogens, relaxin, oxytocin
(c) hCG, progestogens, estrogens, glucocorticoids
(d) hCG, hPL, progestogens, estrogens

23. Extrusion of second polar body from egg nucleus occurs:
(a) after entry of sperm but before fertilisation
(b) after fertilisation
(c) before entry of sperm into ovum
(d) simultaneously with first cleavage

24. Select the correct sequence for transport of sperm cells in male reproductive system
(a) Testis → Epididymis → Vasa efferentia → Rete testis → Inguinal canal → Urethra
(b) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
(c) Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra
(d) Testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Inguinal canal → Urethra → Urethral meatus

25. Which of the following hormone levels will cause release of ovum (ovulation) from the graffian follicle?
(a) High concentration of Progesterone
NCERT (Page-50 / N-34 |
(b) Low concentration of LH
(c) Low concentration of FSH
(d) High concentration of Estrogen

26. Meiotic division of the secondary oocyte is completed
(a) At the time of copulation
(b) After zygote formation
(c) At the time of fusion of a sperm with an ovum
(d) Prior to ovulation

27. Match the following columns and select the correct option.

NCERT Page-49 / N-33 |.

Column-I		Column-II	
(A)	Placenta	(i)	Androgens
(B)	Zona pellucida	(ii)	Human Chorionic Gonadotropin (hCG)
(C)	Bulbo-urethral glands	(iii)	Layer of the ovum
(D)	Leydig cells	(iv)	Lubrication of the Penis

(A) (B)(C) (D)
(a) (i) (iv) (ii) (iii)
(b) (iii) (ii) (iv) (i).
(c) (ii) (iii) (iv) (i)
(d) (iv) (iii) (i) (ii)

28. Receptors for sperm binding in mammals are present on : NCERT Page-51 / N-35 |
(a) Zona pellucida (b) Corona radiata
(c) Vitelline membrane (d) Perivitelline space

29. Which of these is not an important component of initiation of parturition in humans?
(a) Release of prolactin NCERT (Page-54 / N-38
(b) Increase in estrogen and progesterone ratio
(c) Synthesis of prostaglandins
(d) Release of oxytocin

30. Which of the following secretes the hormone, relaxin, during the later phase of pregnancy?
(a) Uterus (b) Graafian follicle NCERT Page-53 / N-37
(c) Corpus luteum. (d) Foetus
Given below are two statements: NCERT Page-47 / N-31 |
Statement I: The release of sperms into the seminiferous tubules is called spermiation.
Statement II: Spermiogenesis is the process of formation of sperms from spermatogonia.
In the light of the above statements, choose the most appropriate answer from the options given below:
(a) Both Statement I and Statement II are incorrect
(b) Statement I is correct but Statement II is incorrect
(c) Statement I is incorrect but Statement II is correct
(d) Both Statement I and Statement II are correct

32. Which of the following statements are true spermatogenesis but do not hold true Oogenesis?
(i) It results in the formation of haploid gametes NCERT Page-47, 48 & 49 / N-31, 32, 33 |
(ii) Differentiation of gamete occurs after the completion of meiosis
(iii) Meiosis occurs continuously in a mitotically dividing stem cell population
(iv) It is controlled by the Luteinising hormone (LH) and Follicle Stimulating Hormone (FSH) secreted by the anterior pituitary
(v) It is initiated at puberty
Choose the most appropriate answer from the options given below:
(a) (ii) and (iii) only (b) (ii), (iv) and (v) only
(c) (ii), (iii) and (v) only' (d) (iii) and (v) only

33. At which stage of life the oogenesis process is initiated? NCERT Page-48 / N-32 |
(a) Embryonic development stage (b) Birth
(c) Adult (d) Puberty

34. Given below are two statements: NCERT Page-44 / N-28
Statement I: Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct.
Statement II: The cavity of the cervix is called cervical canal which along with vagina forms birth canal. In the light of the above statements, choose the correct answer from the options given below:
(a) Both Statement I and Statement II are true.
(b) Both Statement I and Statement II are false.
(c) Statement I is correct but Statement II is false.
(d) Statement I is incorrect but Statement II is true.

35. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: Endometrium is necessary for implantation of blastocyst.
Reason R: In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.
NCERT Page-53 / N-35, 36
In the light of the above statements, choose the correct answer from the options given below:
(a) Both *A* and *R* are true and *R* is the correct explanation of *A*.
(b) Both *A* and *R* are true but *R* is NOT the correct explanation of *A*.
(c) *A* is true but *R* is false.
(d) *A* is false but *R* is true.

Exercise 3 : MATCHING, STATEMENTS & ASSERTION REASON TYPE

MATCH THE FOLLOWING

1. In the given columns, column I contain structures of male reproductive system and column II contains its feature. Select the correct match from the options given below.
NCERT Page-43,44 / N-27, 28

Column I (Structure of Male Reproductive System)		Column II (Features)	
A.	Seminiferous tubule	I.	Network of seminiferous tubule
B.	Rete testis	II.	Secondary sexual characters
C.	Leydig cells	III.	Meiosis and sperm formation occurs
D.	Glans Penis	IV.	Place of implantation
		V.	Enlarged end of penis

(a) A-I; B - II; C-III; D -V (b) A – IIIB – I; C – II; D – V

(c) A – IIIB – I; C – IV; D – II (d) A-II; B - IV; C - III; D – V

2. In the given columns, column-I contain structures of female reproductive system and column-II contain its feature. Select the correct match from the option given below. NCERT Page-45,46 / N-28, 29, 30

Column-1 (Structures of female reproductive system)		Column-II (Features)	
A.	Ampulla	I.	It undergoes cyclical changes during menstrual cycle.
B.	Labia majora	II.	It helps in collection ofovum after ovulation.
C.	Oviduct	III.	Wider part of fallopian tube where fusion of male and female gametes takes place.
D.	Fimbriae	IV.	Larger hairy folds which extend down from the mons pubis and surrounds the vaginal opening.
		V.	Also called fallopian tubes, which extend from the periphery of each ovary to the womb.

(a) A – I; B – II; C – III; D – V (b) A – III; B – I; C – II; D – V
(c) A – III; B – IV; C – V; D – II (d) A-II; B - IV; C-III; D – V

3. Match the column-I with column-II and select the correct option. Match from the options given below NCERT Page-48 / N-32

Column-I		Column-II	
A.	Primary oocyte	I.	It is formed when oogonia starts division and temporarily arrested at phase of meiosis I.
B.	Secondary oocyte	II.	A large haploid cell which retains bulk of nutrient rich cytoplasm of the primary oocyte.
C.	Primary follicle	III.	A large number of these degenerate during the phase from puberty to birth.
D.	Graafian follicle	V.	Rupture to release ovum from the ovary.

(a) A-I; B - II; C - III; D – V (b) A – III; B – I; C – IV; D – V
(c) A – II; B – IV; C – V; D – III (d) A-II; B - IV; C - III; D – V

4. Match the column-I with column-II and select the correct option. NCERT Page-52 & 53 / N-35, 36

Column-I		Column-II	
A.	Fertilization	I.	Mitotic division
B.	Implantation	II.	Embryo with 8 to 16 blastomeres
C.	Cleavage	III.	Ampullary-isthmic junction
D.	Morula	IV.	Structure formed by the continuous division of 8 to 16 blastomeres
		V.	Embedding of blastocysts in the endometrium

(a) A – I; B – II; C – IV; D – V
(b) A – III B - I; C-IV; D - II
(c) A – III; B – V; C – I; D – IV
(d) A – III; B – V; C – I; D – II

5. Match the hormones given in column-I with their functions given in column-II and select the correct option.
NCERT Page-51,53 & 54 / N-37

Column-I (Hormones)		Column-II (Functions)	
A.	Luteinizing hormone	I.	Develop corpus luteum
B.	Progesterone	II.	Essential for maintenance of uterine layer (called endometrium)
C.	Estrogen	III.	Develops female secondary Sexual characters
D.	Oxytocin	IV.	Maturation of Graafian hormone follicle
		V.	Causes uterine contraction.

(a) A-I; B - V; C-III; D - IV
(b) A – III; B – I; C – II; D – V
(c) A – I; B – II; C – III D - V
(d) A-I; B - II; C - III; D – IV

6. In the given columns, column-I contain features of developing child and column-II contain the time of their occurrence. Select the correct match.

Column-I (Features of developing child)		Column-II (Time of there occurrence)	
A.	Heart sound	I.	By the end of the second month of pregnancy
B.	Foetus develops limbs and digit	III.	During the fifth Month
c.	Formation of major organ system	III.	First sign of growing foetus
D.	First movement of foetus and appearance of hair on head	IV.	By the end of 12 weeks
		V.	By the end of 24 weeks

(a) A-I; B - II; C-III; D - IV
(b) $A-III; B-I; C-IV; D-II$
(c) $\mathrm{A}-\mathrm{II}; \mathrm{B}-\mathrm{I}; \mathrm{C}-\mathrm{III}; \mathrm{D}-\mathrm{V}$
(d) A - III; B - IV; C - II; D – V

7. Match between the following representing parts of the sperm and their functions and choose the correct option.

Column I		Column II	
A.	Head	I.	Enzymes
B.	Middle piece	II.	Sperm motility
C.	Acrosome	III.	Energy
D.	Tail	IV.	Genetic material

	A	B	C	D
(a)	II	IV	I	III
(b)	IV	III	I	II
(c)	IV	I	II	III
(d)	II	I	III	IV

8.

Match the following and choose the correct options. NCERT Page-52 &53/ N-37

Column 1		Column II	
A.	Trophoblast	I.	Embedding of blastocyst in the endometrium
B.	Cleavage	II.	Group of cells that would differentiate as embryo
C.	Inner cell mas	III.	Outer layer of Blastocyst attached to the endometrium
D.	Implantation	IV.	Mitotic division of zygote

	A	B	C	D
(a)	II	I	III	IV
(b)	III	IV	II	I
(c)	III	I	II	IV
(d)	II	IV	III	I

9. Match the items given in Column I with those Column II and select the NCERT Page-49 & 50 / N-34

Column I		Column II	
A.	Proliferative Phase	I.	Breakdown of endometrial lining
B.	Secretory Phase	II.	Follicular Phase
C.	Menstruation	III.	Luteal Phase
D.	Menarche	IV	At puberty

A B C D
(a) III II I IV
(b) I III II IV
(c) III I II IV
(d) II III, I IV

TWO STATEMENT TYPE QUESTIONS

DIRECTION: Read the statements carefully and answer the question on the basis of following options.
(a) Both Statement I and Statement II are incorrect
(b) Statement I is correct but Statement II is incorrect
(c) Statement I is incorrect but Statement II is correct
(d) Statement II is correct but statement I is incorrect.

10. Statement I: Parturition is induced by a complex neuroendocrine mechanism. Statement II: Oxytocin acts on the uterine muscle and causes stronger uterine contractions. NCERT Page-54 / N-38

11. Statement I: The uterine cells divide rapidly and covers the blastocyst.
Statement II: The blastomeres continues to divide and transforms into blastocyst. NCERT Page-53 / N-36

12. Statement I: The head of sperm contains materials which helps in sex-determinate in foetus.
NCERT -43 / N-32
Statement II: The function of mitochondria in sperm is to provide energy for the movement of sperm.

13. Statement I: Clitoris lies at the upper junction of the two labia minora.
Statement II: The valve includes mons pubis, labia mayera labia minora, clitoris and hymen.
NCERT -46 / N-30

14. Statement I: The second meiotic division results in the formation of a first polar body. NCERT Page-52/N-32
Statement II: The haploid nucleus of the sperms and ovum fuse together to form a diploid zygote.

Four/Five Statement Type Questions

15. Select the correct statements regarding oogenesis.
NCERT (Page-48 & 49 / N-32
(i) It is initiated during the embryonic development stage when millions of oogonia are formed within each ovary.
(ii) Graafian follicle releases primary oocyte from the ovary by ovulation.
(iii) At puberty only $60{,}000 - 80{,}000$ primary follicles are left in each ovary.
(iv) Secondary oocyte within tertiary follicles grows in size and completes its second meiotic division.
(v) The primary oocyte forms a new membrane called vona pellucida.
(a) (i), (ii) and (iii) (b) (i) and (iii)
(c) (ii), (iv) & (v) (d) all the five statements.

16. The division of primary oocyte results in:
(i) unequal cells a smaller haploid secondary oocyte and a larger diploid polar body.
(ii) unequal cells a larger haploid secondary oocyte and a smaller haploid polar body.
(iii) unequal cells a smaller diploid secondary oocyte and a larger haploid polar body.
(iv) equal cells a haploid secondary oocyte and a haploid polar body.
(a) Only (i) (b) Only (ii)
(c) Only (iii) (d) Only (iv)

17. Which of the following statement regarding female reproductive system is (are) correct?
(i) Myometrium undergoes strong contraction at the time of delivery of baby.
(ii) Ovary is secondary female sex organ which produces female gamete and steroid hormones.
(iii) Ovarian stroma is divided into two zones: inner cortex and outer medulla.
(iv) Infundibulum possess finger like projections which help in collection of ovum after the release of secondary oocyte.
(v) The uterus opens into vagina through a narrow cervix.
(a) (i), (iv) and (v) (b) (i), (ii) and (iii)
(c) (iii), (iv) and (v) (d) All the four statements

18. Which of the following statements are correct with respect to hormones secreted by placenta?
(i) Placenta secretes relaxin during later stage of pregnancy. NCERTI Page-53 / N-37
(ii) Placenta secretes high amount of FSH during pregnancy.
(iii) Placenta secretes relaxin during initial stage of pregnancy.
(iv) Placenta secretes hCG and hPL during pregnancy.

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

Assention& Reason Questions

DIRECTION: These questions consist of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.
(a) Both (A) and (R) are correct but (R) is not the correct explanation of (A) (b) (A) is correct but (R) is not correct
(c) (A) is not correct but (R) is correct
(d) Both (A) and (R) are correct and (R) is the correct explanation of (A)

19. Assertion : During fertilisation, acrosome help the sperm enter into the cytoplasm through zona pellucida. Reason : If several spermatozoa hit the egg at same time, all can enter the egg.
NCERT Page-51 / N-35

20. Assertion : Corpus luteum degenerates in the absence of fertilisation.
Reason : Progesterone level decreases.
NCERT Page-51 / N-35

21. Assertion : Head of sperm consists of acrosome and mitochondria.
Reason :Middle piece contains spiral row of mitochondria.
NCERT Page-48/N N-32

22. Assertion : Testicular lobules are the compartments present in testis.
Reason : These lobules are involved in the process of fertilisation.
NCERT Page-43 / N-27, 28

23. Assertion: Placenta is an endocrine Tissue.
Reason: It secretes many hormones during pregnancy.
NCERT Page-53 / N-37

24. Assertion : In females, parturition occurs after the pregnancy.
Reason : Signal for parturition originates from fully developed embryo. NCERT Page-54 / N-38

Answer Keys

Exercise-1 (NCERT Based Topic-wise MCQs)

1	(b)	10	(b)	19	(b)	28	(d)	37	(d)	46	(b)	55	(c)	64	(d)	73	(d)	82	(d)
2	(d)	11	(a)	20	(a)	29	(a)	38	(b)	47	(c)	56	(c)	65	(c)	74	(b)	83	(c)
3	(c)	12	(c)	21	(b)	30	(b)	39	(a)	48	(a)	57	(d)	66	(c)	75	(d)	84	(b)
4	(b)	13	(d)	22	(c)	31	(c)	40	(d)	49	(a)	58	(d)	67	(a)	76	(d)	85	(d)
5	(a)	14	(b)	23	(a)	32	(c)	41	(b)	50	(c)	59	(b)	68	(d)	77	(b)	86	(b)
6	(a)	15	(a)	24	(b)	33	(d)	42	(c)	51	(b)	60	(a)	69	(a)	78	(d)	87	(a)
7	(d)	16	(b)	25	(a)	34	(c)	43	(c)	52	(d)	61	(d)	70	(a)	79	(a)		
8	(d)	17	(a)	26	(d)	35	(b)	44	(c)	53	(d)	62	(b)	71	(a)	80	(c)		
9	(b)	18	(c)	27	(c)	36	(d)	45	(c)	54	(b)	63	(c)	72	(c)	81	(b)		

Exercise-2 (NCERT Exemplar & NEET)

1	(c)	5	(a)	9	(c)	13	(c)	17	(b)	21	(a)	25	(d)	29	(a)	33	(a)		
2	(b)	6	(b)	10	(c)	14	(a)	18	(c)	22	(d)	26	(c)	30	(c)	34	(a)		
3	(d)	7	(a)	11	(d)	15	(a)	19	(c)	23	(a)	27	(c)	31	(b)	35	(b)		
4	(b)	8	(b)	12	(b)	16	(a)	20	(c)	24	(b)	28	(a)	32	(c)				

Exercise-3 (Matching, Statement & Assertion Reason Type)

1	(b)	4	(d)	7	(b)	10	(d)	13	(b)	16	(b)	19	(b)	22	(b)				
2	(c)	5	(c)	8	(b)	11	(b)	14	(c)	17	(a)	20	(a)	23	(d)				
3	(b)	6	(b)	9	(d)	12	(c)	15	(b)	18	(a)	21	(c)	24	(d)				

HINTS & SOLUTIONS

EXERCISE -1

1. (b) Foreskin is a double-layered fold of smooth muscle tissue; blood vessels, neurons, skin, and mucous membrane that covers and protects the glans penis and the urinary meatus when the penis is not erect. The foreskin is mobile, fairly stretchable, and acts as a natural lubricant.
2. (d) Secretions of epididymis, vas deferens, seminal vesicle and prostate are essential for maturation and motility of sperms.
3. (c) Epididymis lies between vas efferents and vas deferens.
4. (b) The epididymis leads to vas deferens that ascends to the abdomen and loops over the urinary bladder.
5. (a) The urethra originates from the urinary bladder and extends through the penis to its external opening called urethral meatus.
6. (a)
7. (d) Sperm are haploid male gametes. Oviducts are a part of female reproductive system. Scrotum maintains testes at lower (2-2.5 degrees) than normal body temperature. Sertoli cells certainly nourish the developing male germ cells.
8. (d) A spermatogonium divides into two primary spermatocytes. Each primary spermatocyte duplicates its DNA and subsequently undergoes meiosis I to produce two haploid secondary spermatocytes. Each of the two secondary spermatocytes further undergoes meiosis II to produce two haploid spermatids.
9. (b)
10. (b)
11. (a) The urethra originates from a structure [called urinary bladder (X)] and extends through the male external genitalia [called penis (Y) which helps in introducing semen into the vagina] to its external opening called urethral meatus.
12. (c) The scortum helps in maintaining the low temperature of the testes $2-2.5^{\circ}C$ which is lower than of normal body temperature.
13. (d)
14. (b) The process of insemination is the release of semen containing male gametes, the sperms, into the female reproductive tract during coitus.
15. (a) Although the human female is born with millions of primordial follicles in the ovaries that can give rise to primary, secondary and mature follicles, the vast majority become atretic. Although a number of follicles begin to develop each month, only one primary follicle matures to become the dominant follicle that is ovulated in each monthly ovarian cycle. Approximately 400

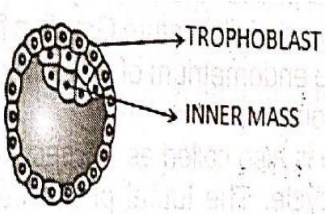
mature follicles are ovulated during the reproductive life of the human female.

16. (b) The vagina is an internal reproductive organ and is not considered part of the vulva.
17. (a)
18. (c)
19. (b) The uterus is a female reprofductive organ located between the bladder and the rectum, in the pelvic area. The main purpose of the uterus is to nourish a foetus prior to birth. In menstruating females, the ovaries release eggs which travel via the fallopian tubes to the uterus.
20. (a) Clitoris is a small, sensitive, erectile part of the female genitals at the anterior end of the vulva. It is homologous with the penis.
21. (b) The glandular tissue of each breast is divided into 15-20 mammary lobes containing clusters of cells called alveoli.
22. (c) In the given figure of female reproductive system, the marked structures (A to F) are the parts of uterus and fallopian tube. A to F are respectively endometrium, myometrium, perimetrium, isthmus, ampulla and infundibulum.
23. (a) The structures marked in the figure of mammary gland are A-mammary lobe, B-mammary duct C-ampulla, and D-lactiferous duct. The mammary gland is a gland located in the breasts of females that is responsible for lactation. Mammary glands only produce milk after childbirth. Mammary lobe (A) contains clusters of cells called alveoli which secrete milk which is stored in the cavities of alveoli.
24. (b) The immature male germ cells or primary spermatocyte duplicates its DNA and subsequently undergoes meiosis I which is a reductional division to produce two haploid secondary spermatocytes.
25. (a) The LH surge is a peak burst of LH from the anterior pituitary gland, which causes ovulation. It occurs in the middle of the ovarian cycle and is stimulated by the positive feedback of a high blood level of estrogen that is sustained for 48 to 50 hours. Although FSH and LH stimulate follicle development at the beginning of a cycle, it is the LH surge that results in the rupture of the dominant follicle from the ovary.
26. (d) During oogenesis, the primary oocyte is diploid; after the first meiotic division into the secondary oocyte the cell becomes haploid.
27. (c) Each primary spermatocyte duplicates its DNA and subsequently undergoes meiosis I to produce two equal, haploid secondary spermatocytes. Each of the two secondary spermatocytes further undergoes meiosis II to produce two haploid spermatids. Therefore, total four equal, haploid spermatids are producted after second meiotic division.
28. (d) Gonadotropin-releasing hormone (GnRH) is released from the anterior pituitary. GnRH activity is very low during childhood, and is activated at puberty or adolescence. At the puberty increased secretion of GnRH start the process of sperm formation.
29. (a) The mature spermatozoa are released from the protective sertoli cells into the lumen of the seminiferous tubule and a process called spermiation then takes place, which removes the remaining unnecessary
30. (b) cytoplasm and organelles.
31. (c) Each human somatic cell is diploid with a set of pair of 23 chromosomes, so the total number of chromosomes is 46 . Spermatogonia are also diploid in nature having 46 chromosomes.
32. (c) The acrosome (head of the sperm) contains the necessary enzymes (hyaluronidase and acrosin) to penetrate the membrane of the ovum.
33. (d) Secondary spermatocytes are the result of meiotic division, so they are the haploid ones.
34. (c)
35. (b) First polar body is formed during the formation of secondary oocytes and completion of Ist meiotic division. In humans, the secondary oocytes are produced when the primary oocytes complete meiosis I.
36. (d) Second meiotic division in secondary oocyte results in the formation of a second polar body & a haploid ovum (ootid).
37. (d) A spermatogonium divides into two primary spermatocytes. Each primary spermatocyte duplicates its DNA and subsequently undergoes meiosis-I to produce two haploid secondary spermatocytes. Each of the two secondary spermatocytes further undergoes meiosis II to produce two haploid spermatids.
38. (b) ' B ' are the secondary spermatocytes which further undergoes meiosis II to produce two haploid spermatids.
39. (a) In the given figure, A, B, C, D, E and F are marked as plasma membrane, tail, acrosome, neck, middle piece and mitochondria.
40. (d) Seminal plasma is secreted from male acessory glands & it is rich in fructose, calcium and certain enzymes.
41. (b) Semen, or seminal fluid, is an alkaline fluid that contains spermatozoa embedded in seminal plasma.

Semen is ejaculated by male reproductive system during orgasm.

42. (c) In biology, antrum is a general term for a cavity or chamber, which may have specific meaning in reference to certain organs or sites in the body. Tertiary follicle of ovary contains a fluid filled cavity called antrum and a secondary oocyte ready for ovulation.
43. (c) Immediately after ovulation, the layer that forms around the ovum is called corona radiata. It is formed by the granulosa cells of cumulus oophorus. Corona radiata probably increases the likelihood that the ovum will be picked up in the uterine tube.
44. (c) Oogonia are called as gamete mother cell. Corpus luteum is formed as a temporary endocrine structure after the ovulation. It is involved in the production of relatively high levels of progesterone and moderate levels of estradiol and inhibin A to maintain pregnancy. A large number of primary follicles degenerate during the phase from birth to puberty.
45. (c) The corpus luteum secretes large amounts of progesterone which is essential for maintenance of the endometrium and the pregnancy but its decrease in secretion triggers the menstrual cycle.
46. (b) The ovulation (ovulatory phase) is followed by the luteal phase (latter phase of the menstrual cycle) during which the remaining parts of the Graafian follicle transform as the corpus luteum, which produces progesterone. So progesterone is highest at luteal phase.
47. (c) The menstrual phase is followed by the follicular phase. During this phase, the primary follicles in the ovary grow to become a fully mature Graafian follicle and simultaneously the endometrium of uterus regenerates through proliferation.
48. (a) Luteal phase is also called as the secretory phase of menstruation cycle. The luteal phase begins with the formation of the corpus luteum and ends in either pregnancy or luteolysis. The main hormone associated with this stage is progesterone, which is significantly higher during the luteal phase than other phases of the cycle.
49. (a) During pregnancy, all events of the menstrual cycle stop and there is no menstruation.
50. (c) FSH, estrogen, progesterone
51. (b) The cycle starts with the menstrual phase. When menstrual flow occurs, it lasts for $3-5$ days. The menstrual phase is followed by the follicular phase or proliferative phase. The luteal or secretory phase just follows the former and completes the cycle. Then, all new cycle begins thereafter.
52. (d) In human beings, menstrual cycles ceases around 50 years of age; that is termed as menopause.
53. (d) Menstrual cycle is the cycle of natural changes that occurs in the uterus and ovary as an essential part of making sexual reproduction possible. Menstrual fluid cannot easily clot. The end of the cycle of menstruation is called menopause. During the follicular phase, gonadotropins (LH and FSH) increase gradually and stimulate follicular development as well as secretion of estrogen by growing follicles.
54. (b) A decrease in estrogen and progesterone as the corpus luteum degenerates (in the absence of pregnancy) initiates menstruation.
55. (c) The given figure shows the role of ovarian hormones and growth of ovarian follicles in the various phases of menstrual cycle.
56. (c) Both LH and FSH attain a peak level in the middle of menstrual cycle (about 14th day) resulting in ovulation.
57. (d) Placenta acts as an endocrine gland during pregnancy and produces several hormones include human chorionic gonadotropin (hCG), estrogen, progesterone and so on. hCG stimulates the corpus luteum to secrete progesterone.
58. (d) The zona pellucida is a glycoprotein thick noncellular membrane surrounding the plasma membrane of an oocyte or secondary oocytes.
59. (b) During human embryogenesis, the blastocyst arises from the morula in the uterus, after 5 days of fertilization. The early embryo undergoes cell, differentiation and structural changes to become the blastocyst. It is then prepared for implantation into the uterine wall 6 days after fertilization. Implantation marks the end of the germinal stage and the beginning of the embryonic stage of development.
60. (a) In sexual reproduction in organisms, when the two nuclei of male and female gametes fuse together the immediate cell which is formed is called the zygote. The zygote goes on to become an embryo and later stages of development.
61. (d) In the blastocyst, the blastomeres are arranged into an outer layer called trophoblast and an inner group of cells attached to trophoblast called the inner cell mass. The trophoblast layer then gets attached to the endometrium and the inner cell mass gets differentiated

62. (b)



63. (c) Fertilization through the process of the fusion of haploid male and female gametes, ensures the restoration of the diploidy of the human foetus.
64. (d) The ampullary-isthmus junction is the particular place where actually fertilization occurs. This is the crucial place for the fertilization because the ovum released by the ovary is transported to the ampullary-isthmic junction.
65. (c) Implantation is not the immediate process. It takes 5 days to occur after fertilization.
66. (c) During fertilization in humans, when many sperms reach close to the ovum, the secretion of acrosome helps the sperm to enter into the cytoplasm of the ovum through the zona pellucida and the plasma membrane. This induces the completion of the meiotic division of the secondary oocyte.
67. (a) The zygote divides mitotically to form 8,16 daughter cells called blastomeres. This stage is called morula which continues to divide and transforms into blastocyst.
68. (d) Ovum contains the haploid set of chromosomes with one of the *X* chromosomes. The haploid set of chromosomes in the male gamete, sperm has either the *X* or *Y* chromosome. Thus, the sex of the foetus depends on the male gamete fertilizing the ovum.
69. (a)
70. (a) The outer wall of the blastocyst i.e., the trophoblast gets attached to the endometrium of the uterus during implantation.
71. (a) Blastomeres are a type of cell produced by cleavage (cell division) of the zygote after fertilization and are an essential part of blastula formation.
72. (c) The given figure shows the morula stage of embryonic development. Morula is produced by a series of cleavage (mitotic) divisions of the early embryo, starting with the single-celled. Once the embryo has divided into 16 cells, it begins to resemble a mulbery, hence the name.
73. (d)
74. (b) The development of organs and organ systems, a process called organogenesis, occurs during the latter. half of the first trimester.
75. (d) All of the above statements are correct.
76. (d) If an embryo splits before cell fate has been determined, identical twins may result.
77. (b)
78. (d) Primary germ layers are ectoderm, endoderm & mesoderm. Many animals are primarily triploblastic, as endoderm (inner) and ectoderm (outer) interact to produce a third germ layer, called mesoderm (middle). Together, the three germ layers will give rise to every organ in the body, from skin and hair to the digestive tract.
79. (a) ,
80. (c) By the end of 12 weeks (first trimester), most of the major organ systems are formed, for example, the limbs and external genital organs are well-developed.
81. (b) The high levels of estrogen and progesterone in the maternal circulation during pregnancy inhibit the cyclic release of pituitary gonadotropins and prevent the menstrual cycles. Pregnancy hormones include hCG, which maintains the corpus luteum of pregnancy and forms the basis for pregnancy diagnosis urine tests. Ovarian and placental estrogen and progesterone, human placental lactogen, and pituitary prolactin stimulate development of the ducts and alveoli in the mammary glands.
82. (d) Milk produced during the initial few days of lactation is called colostrum. This contains several antibodies absolutely essential to develop resistance for the newborn babies.
83. (c) Oxytocin acts on the uterine muscle and causes its strong contractions, which inturn further stimulates the secretion of oxytocin making a kind of feedback loop. Thus, the resultant stimulatory reflex between the uterine contraction and oxytocin secretion continues
resulting in stronger and stronger contractions.
84. (b) Fully developed foetus and the placenta induce foetal ejection reflex. Foetal ejection reflex is also called mild uterine contraction.
85. (d) activate smooth muscles
86. (b) Vigorous contraction of the uterus at the end of the pregnancy causes expulsion of the foetus.
87. (a) The signals for child birth (parturition) originate from the fully matured foetus and placenta which induce mild uterine contractions called foetal ejection reflex.

EXERCISE - 2
NCERT Exemplar Questions

1. (c) Polyspermy describes an egg that has been fertilised by more than one sperm. Binding of the sperm to the egg during fertilisation, induces depolarisation of the egg plasma membrane that block the entry of additional sperms. Rest all statements are correct.
2. (b) Oogenesis is the process of formation of a mature female gamete. Unlike sperm formation that starts at puberty, egg formation begins before birth. Primordial germ cells complete the proliferative stage of oogenesis in the early embryonal state when million of gamete mother cells (oogonia) are formed within each faetal ovary, no more oogonia are formed and added after birth.
3. (d) Isthmus is the part of female reproductive system. The fallopian tube (oviduct) in female reproductive system consists four regions, i.e., Infundibulum, ampulla, isthmus and uterine part. Isthmus has a narrow lumen and it joins the uterus. It is the line that separates the body of the uterus from the cervix.
4. (b) The male accessory glands are paired seminal vesicles, a prostate and paired bulbourethral glands. Secretions of these glands constitute the seminal plasma that is rich in fructose, calcium and certain enzymes.
   The secretions of bulbourethral glands also help in the lubrication of penis.
   Urethra is the duct that extends through the penis in male reproductive system and serve as a comman passage for both sperm and urine. In female, urethra has no reproductive function.
5. (a) Spermiation is the process of release of spermatozoa from Sertoli cells into the cavity of the seminiferous tubules. From here, sperms pass through vasa efferentia into the epididymis for temporary storage.
6. (b) In humans (female), the menstrual cycle lasts for about 28/29 days. In the follilcular phase in which the primary follicles in the ovary grows to become a fully mature graafian follicle due to stimulation of FSH. This phase (follicular) lasts for about 14 days.
   During this phase, the secretion of gonadotropins (LH and FSH) increases gradually and stimulates secretion of estrogen by the growing follicles both LH and FSH attain a peak level in the middle of cycle (about 14th day).
   This rapid secretion of LH called LH surge, induces rupture of Graafian follicle and thereby the release of ovum. This ovulatory phase is followed by the luteal phase during which the remaining follicular cells enlarge to become the corpus luteum.
7. (a) One of the three glycoproteins (ZP3) that functions as a sperm receptor, binds to a complementary molecule on the surface of the sperm head. This binding of the sperm head to the receptor molecule $ZP3$ induces the acrosome of the sperm to release its hydrolytic enzymes (sperm lysins).
8. (b) Ampulla is one of the four region of Fallopian tubes. The oviducts (Fallopian tubes), uterus and vagina constitute the female accessory ducts.
9. (c) In testis, the immature male germ cells (spermatogonia) produce sperms by the process of spermatogenesis. The spermatogonia present on the inside wall of seminiferous tubules multiply by mitotic division and increase in numbers.
   Each spermatogonia is diploid that contains $46(2n)$ chromosomes. Some of the spermatogonia called primary spermatocytes periodically undergo meiosis. A primary spermatocyte completes the first meiotic division (reduction division) leading to formation of two equal, haploid cells called secondary spermatocytes, which contains only 23 chromosomes each (n).
   The secondary spermatocytes undergo the second meiotic division to produce four equal, haploid spermatids. The spermatids are transformed into spermatozoa (sperms) by the process called spermiogenesis.
10. (c) Secondary oocyte is a product of meiotic division of primary oocyte during oogenesis in the ovary and has 23 chromosomes. Oogenesis is initiated at the foetal ovary in the early embryonic stage of female and a fixed number of oogonia (gamete mother cells) are formed and before the birth of the female child no more oogonia are added after birth.
    Spermatogonia is the immature male germ cells that produce sperms. Each spermatogonium is diploid (2n) that contain 46 chromosomes.
    The sperms containing haploid nucleus and that of the ovum fuse together to form a diploid ($2n$) zygote i.e., 46 chromosomes.
    During foetal development, certain cells in the germinal epithelium of the ovary undergo mitotic

divisions, producing undifferentiated germ cells called oogonia. The oogonia is diploid (2n) and contain 46 chromosomes.

11. (d) LH-Luteinizing Hormone is produced by anterior pituitary gland. The organ that connects the developing embryo (foetus) and maternal body (uterine wall) to allow nutrient uptake, waste elimination and gas exchange via the mother's blood supply is known as placenta.
    It also acts as an endocrine tissue and produces several hormones like Human Chorionic Gonadotropin (hCG), Human Placental Lactogen (hPL), estrogenes, progesterone, etc.
12. (b) The vas deferens is a continuation of the cauda epididymis. It is about 40cm long and enters the abdominal cavity through the inguinal canal. Then, it passes over the urinary bladder, curves round the ureter and joins a duct from seminal vesicle and opens into urethra as the ejaculatory duct. These ducts store and transport the sperms from the testis to the outside through urethra.
13. (c) From the urinary bladder the urethra originates and extends through the penis to its external opening called urethral meatus. Opening of vas deferens along with a duct of seminal vesicle open into urethra as the ejaculatory duct.
14. (a) The sperms and ovum fuses together to form a diploid zygote. As the zygote moves through the isthmus of the oviduct towards the uterus, the mitotic division (cleavage) starts and forms 2, 4,8, 16 daughter cells called blastomeres.
    The embryo containig $8-16$ blastomeres is called a morula. The morula further divides and transforms into blastocyst, further gets embedded in the endometrium of the uterus. This is called implantation.
15. (a) The ovum is surrounded by the inner thin, transparent, non-cellular coat zona pellucida and outer thick coat corona radiata. During fertilisation sperm first comes in contact with the corona radiata and zona pellucida to reach the plasma membrane of the egg (ovum).
16. (a) The female accessory ducts constitute the oviducts (Fallopian tubes), uterus and vagina. Each fallopian tube extends from the periphery of each ovary to the uterus. The closer part of the ovary is the funnel-shaped infundibulum, that possess finger-like projections called fimbriae. The infundibulum leads to a wider part of the oviduct called ampulla. The last part of the oviduct is isthmus. While, labia minora is the female external genitalia.

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17. (b) The word ampulla is derived from the Latin word 'flask'. Being the second portion of the fallopian tube, it is the intermediate dilated portion which immediately curves over the ovary. This is the common site of human fertilization as both the ovum and sperms are simultaneously transported here.
18. (c) Considering the female reproductive endocrinology, ovulation is the process of the monthly release of the viable oocyte from the ovary between the time of menarche and menopause. During this time, there is a surge in the production of LH and FSH, termed as gonadotropins, thereby initiating estradiol and progesterone secretion from the ovary. Both these hormones are very important for the menstrual cycle.
19. (c) Capacitation is increase in fertilising capacity of sperms which occurs in female reproductive tract. It is required to render sperm to fertilize an oocyte.
20. (c) Spermiogenesis is conversion of spermatids into spermatozoa whereas spermiation is the release of the sperms from sertoli cells into the cavity of seminiferous tubule.
21. (a) The extraembryonic membranes are amnion, chorion, allantois and yolk sac. Amnion is derived from mesoderm on the outer side and ectoderm on the inner side. Chorion is formed from trophoectoderm and mesoderm, whereas allantois and yolk sac membrane have mesoderm on outerside and endoderm in inner side.
22. (d) The placenta is an endocrine gland that is only present during pregnancy. It relases hCG, hPL, progestogens, estrogens, etc. Human chorionic gonadotropic hormone (hCG) stimulates the corpus luteum during pregnancy to release estrogen and progesterone. Human placental lactogen (hPL) is involved in growth of body of mother and breast. Progesterone maintains pregnancy.
23. (a) Extrusion of second polar body from egg nucleus occurs after entry of sperm into the secondary oocyte but before fertilisation. The entry of sperm into the ovum induces completion of the meiotic division of the secondary oocyte. Entry of sperm causes breakdown of metaphase promoting factor (MPF) and turns on anaphase promoting complex (APC).

24. (b) The correct sequence for transport of sperm cells in male reproductive system is:
Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
25. (d) The gonadotropin (LH and FSH) increases gradually during the follicular phase, and stimulates follicular development as well as secretion of estrogens by the growing follicles. Both LH and FSH attain a peak level in the middle of cycle (about 14th day). Rapid secretion of LH leading to its maximum level during the mid-cycle called LH surge induces rupture of Graafian follicle and thereby the release of ovum (ovulation).
26. (c) Meiotic division of secondary oocyte is completed after the entry of sperm in secondary oocyte which lead to the formation of a large ovum and a tiny 2nd polar body.
27. (c) The correct option is (c) because placenta secretes human chorionic gonadotropin (hCG). Zona pellucida is a primary egg membrane secreted by the secondary oocyte. The secretions of bulbourethral glands help in lubrication of the penis Leydig cells synthesise and secrete testicular hormones called androgens.
28. (a) In mammals during the process of fertilisation sperm interacts with thick extracellular coat of a egg that is called as the zona pellucida receptors are present. The space that is present between the vitelline membrane and the zona pellucida is called as Perivittelline space.
29. (a) At the end of gestation, the completely developed foetus is expelled out. This process is called parturition.
- Parturition is controlled by a complex neuroendocrine mechanism.
- Estrogen and progesterone ratio increases as estrogen levels rise significantly.
- Prostaglandins, which stimulate uterine contractions are also produced that act on myometrium.
- Oxytocin, the main hormone, also called as birth hormone is released by maternal pituitary, which brings about strong uterine contractions.
- Prolactin is a lactation hormone that has no role in initiation of parturition.

30. (c) The hormone relaxin is produced in the later phase of pregnancy. It is produced by the ovary.
- Graafian follicle is not formed when the woman is pregnant.
- Uterus and foetus do not produce relaxin.
- Relaxin is produced by the corpus luteum present in the ovary. Ruptured Graafian follicle is called corpus luteum, which has endocrine function.

31. (b) The spermatids are transformed into spermatozoa (sperms) by the process called spermiogenesis. After spermiogenesis, sperm heads become embedded in the Sertoli cells, and are finally released from the seminiferous tubules by the process called spermiation.
32. (c) Oocytes start division and enter into prophase-I of the meiotic division and get temporarily arrested at that stage, called primary oocytes. Oogenesis is initiated during the embryonic development stage when a couple of million gamete mother cells (oogonia) are formed within each fetal ovary; no more oogonia are formed and added after birth.
33. (a) Oogenesis is initiated during the embryonic development stage when a couple of million gamete mother cells (oogonia) are formed within each fetal ovary; no more oogonia are formed and added after birth.
34. (a) Both the statements are correct. Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct. The cavity of the cervix is called cervical canal which along with vagina forms birth canal.
35. (b) Both assertion and reason are correct but reason is not the correct explanation of assertion. Corpus luteum secretes large amount of progesterone which is essential for maintenance of endometrium of uterus. In absence of fertilisation, the corpus luteum degenerates hence the decrease in the level of progesterone hormone will cause disintegration of endometrium leading to menstruation.

EXERCISE – 3

1. (b) $\mathrm{A-III; B-I; C-II; D-V}$
2. (d) $A-II; B-IV; C-III; D-V$

3. (b) $A - IIIB - I; C - IV; D - V$
4. (d) $A - IIIB - V; C - I; D - II$
5. (c) $\mathrm{A - I; B - II; C - III; D - V}$
6. (b) $A - IIIB - I; C - IV; D - II$
7. (b)

Column I		Column II
A.	Head	Genetic material
B.	Middle piece	Energy
C.	Acrosome	Enzymes
D.	Tail	Sperm motility

8.

Column I		Column II
A.	Trophoblast	Outer layer of blastocyst attached to the endometrium
B.	Cleavage	Mitotic division of zygote
C.	Inner cell mass	Group of cells that would differentiate as embryo
D.	Implantation	Embedding of blastocyst in the endometrium

9. (d) In proliferative phase, the follicles start developing, called follicular phase. Secretory phase is also called as luteal phase mainly controlled by progesterone secreted by corpus luteum. Menstruation involves breakdown of overgrown endometrial lining.
10. (d) Both the statements are correct.
11. (b) After attachment, the uterine cells divide rapidly and cover the blastocyst. As a result, the blastocyst becomes embedded in the endometrium of the uterus. The morula continues to divide and transforms into blastocyst.
12. (c) The head of the sperm is known as acrosome that has enzymes which help sperm to enter an egg.
13. (a)
14. (c) The second meiotic division is also unequal and results in the formation of a second polar body and a haploid ovum (ootid). Soon the haploid nucleus of the sperms and that of the ovum fuse to form a diploid zygote.
15. (b) Graafian follicle releases secondary oocyte from the ovary by the process of ovulation. Primary oocyte within the tertiary follicle grows in size and completes its first meiotic division. The secondary oocyte forms a new membrane called zona pellucida.
16. (b) The division of primary oocyte results in unequal cells a larger haploid secondary oocyte and a smaller haploid polar body.
17. (a)
18. (a) Placenta secretes hCG and hPL during pregnancy while it secrete relaxin during later stages of pregnancy.
19. (b) Fertilisation is the fusion of male and female gametes to form zygote. During fertilisation, only head of the sperm enters the egg. After that polyspermy is avoided by fertilisation membrane.
20. (a) In female, Graafian follicle forms corpus luteum after ovulation. The cells of corpus luteum are called luteal cells. The cytoplasm of luteal cells have yellow granules called lutein which secrete the hormone progesterone to maintain pregnancy if fertilisation takes place. In the absence of fertilisation, corpus luteum degenerates and forms corpus albicans and there is decrease in progesterone level as well.

21. (c) Head of a sperm has acrosome but the spiral row of mitochondria are present in the mid (connecting) piece of the sperm.
22. (b) Testicular lobules, the compartments present in the testes, are not involved in the process of fertilisation as whole. Fusion of male and female gametes is called fertilisation.
23. (d) Placenta is an endocrine gland that is present only during pregnancy. It is responsible for production of various hormones like human chorionic gonadotropin (hCG), oestrogen, progesterone, human placental lactogen (hPL).