Chapter 2

Human Reproduction

Solutions

SECTION - A

Objective Type Questions

(The Male Reproductive System)

1. Each seminiferous tubule is lined on its inside by two types of cells A and B. Which of the following options is **correct**, w.r.t. the type of cell and its function?

A	B
(1) Male germ cells : Undergo meiotic division	Sertoli cells : Provide nutrition to germ cells
(2) Spermatogonia : Undergo mitosis	Sertoli cells : Secrete testicular hormones
(3) Male germ cells : Leading to sperm formation	Leydig cells : Secrete androgens
(4) Sertoli cells : Provide nutrition to germ cells	Leydig cells : Secrete inhibin

Sol. Answer (1)

Spermatogonia are male germ cells.

Leydig cells are found outside the seminiferous tubules.

2. Which of the following is a set of male accessory ducts?

(1) Rete testis, vasa efferentia, tubuli recti, oviduct

(2) Rete testis, vasa efferentia, epididymis and vas deferens

(3) Epididymis, ejaculatory duct, urethra

(4) Seminiferous tubules, vasa efferentia, epididymis and vas deferens

Sol. Answer (2)

The male sex accessory ducts include rete testis, vasa efferentia, epididymis and vas deferens. Oviduct is accessory duct in females.

3. Select the **correct** path of movement of the sperms upto urethra.

(1) Seminiferous tubules → Vasa efferentia → Rete testis → Epididymis → Vas deferens → Ejaculatory duct → Urethra

(2) Seminiferous tubules → Rete testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Urethra

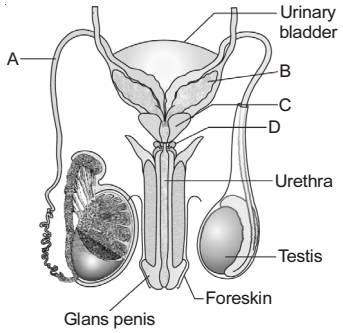
(3) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra

(4) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Ejaculatory duct → Vas deferens → Urethra

Sol. Answer (3)

Epididymis and vasa efferentia are extra testicular ducts.

4. Given below is a diagrammatic sketch of a portion of human male reproductive system. Which of the following part contributes to the maximum portion of semen?



(1) D (2) C (3) B (4) A

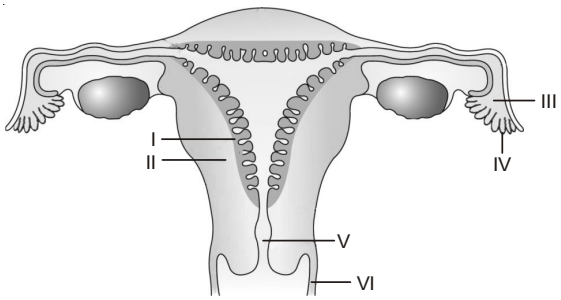
Sol. Answer (3)

Seminal vesicles contribute the major part of the ejaculate (~ 70%)

C is prostate gland and D is bulbourethral gland.

(The Female Reproductive System, Gametogenesis)

5. Which of the following depicts the site of impantation of blastocyst under normal condition?



(1) Ⅱ (2) V (3) I (4) VI

Sol. Answer (3)

I → Endometrium

Ⅱ → Myometrium

Ⅲ → Infundibulum

IV → Fimbriae

V → Cervical canal

VI → Vagina

6. Which one of the following is an **incorrect** match?

(1) Myometrium : Exhibits strong contractions during delivery of the baby

(2) Endometrium : Undergoes cyclical changes during menstrual cycle

(3) Perimetrium : Serosa of uterus

(4) Uterus : Birth canal

Sol. Answer (4)

The cavity of cervix is called cervical canal. Cervical canal + Vagina = Birth canal

7. Which of the following is the **correct** match about the female external genitalia and their functions?

(1) Mons pubis : Cushion of fatty tissue covered by skin and pubic hair and surrounds the vaginal orifice

(2) Labia majora : Fleshy folds of tissue which extends down from the mons pubis and surrounds the vaginal opening

(3) Labia minora : Paired folds of tissue under the labia majora homologous to scrotum in males

(4) Clitoris : A tiny finger like structure which lies at the upper junction of the two labia minora above the urethral opening. It is analogous to penis in males

Sol. Answer (2)

Labia majora surround the vaginal opening and are homologous to scrotum.

Clitoris is homologous to penis.

8. Mammary glands are paired structures that contain the glandular tissue and variable amount of fat. The **correct** sequence of tissues involved in synthesis and flow of milk are

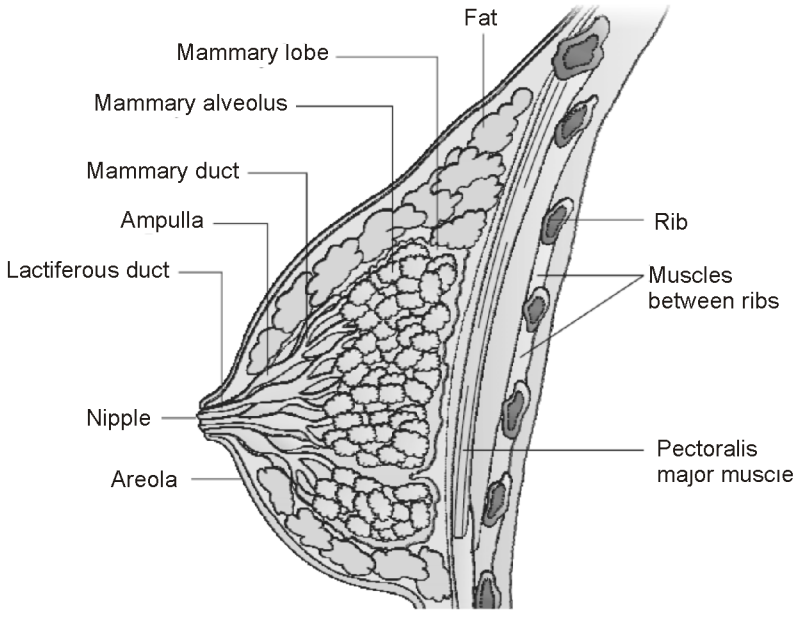
(1) Mammary lobes → Mammary alveoli → Mammary ampulla → Mammary duct → Lactiferous duct

(2) Mammary lobes → Mammary alveoli → Mammary duct → Mammary ampulla → Lactiferous duct

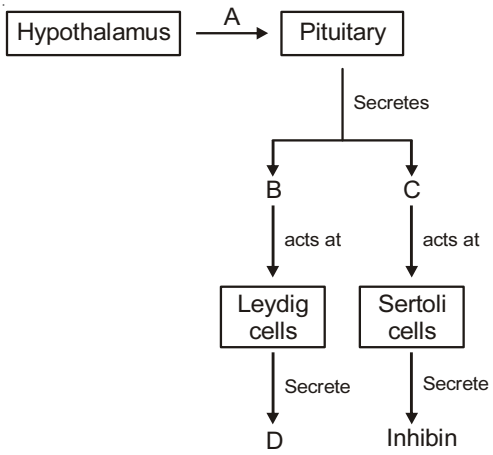
(3) Mammary lobes → Mammary alveoli → Lactiferous duct → Mammary ampulla → Mammary duct

(4) Mammary alveoli → Mammary lobes → Lactiferous duct → Mammary duct

Sol. Answer (2)



9. Study the flow chart. Name the hormones labelled as A, B, C, D at each stage.



Choose the **correct** option.

	A	**B**	**C**	**D**
(1)	Gn-RH	ICSH	Androgen	FSH
(2)	Gn-RH	LH	FSH	Androgens
(3)	Gonadotropins	LH	FSH	Testosterone
(4)	Gn-RH	FSH	LH	Androgens

Sol. Answer (2)

GnRH (Gonadotropin releasing hormone) is a hypothalamic hormone, which acts on anterior pituitary that inturn secretes gonodotropins (FSH & LH). LH acts at Leydig cells and stimulates synthesis and secretion of androgens. FSH acts on Sertoli cells and stimulates secretion of some factors which help in the process of spermiogenesis.

10. Given below are four statements (A - D) each with one or two blanks. Select the option which **correctly** fill up the blanks in two statements :

A. The human male ejaculates about __(i)__ million sperms during a coitus. Out of which, for normal fertility at least __(ii)__ percent sperms must have normal shape and size

B. A primary spermatocyte completes__(i)__ meiotic division leading to the formation of two equal haploid cells called __(i)

C. Spermatogenesis starts at the age of __(i)__ due to significant increase in the secretion of __(ii)__ a hypothalamic hormone

D. Oogenesis is initiated during embryonic development and at puberty only __(i)__ primary follicles are left in each ovary

(1) A - (i) : 200 to 300; (ii) 40
B - (i) : Second; (ii) Spermatids

(2) A - (i) : 200 to 300; (ii) 40
D - (i) : 60,000 to 80,000

(3) B - (i) : First; (ii) Secondary spermatocytes
C - (i) : Puberty; (ii) GnRH

(4) C - (i) : Puberty; (ii) Gonadotropins
D - (i) : 60,000 to 80,000

Sol. Answer (3)

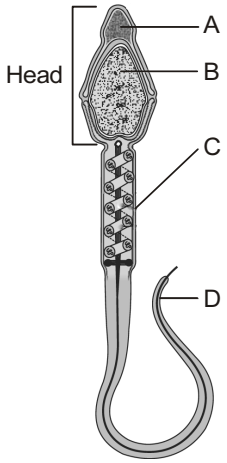
A (i) 200-300 million sperms; (ii) 60

B (i) First; (ii) Secondary spermatocyte

C (i) Puberty; (ii) GnRH

D (i) 60,000 to 80,000

11. Which of the following labelled parts produces energy for the movement of the tail that facilitates sperm motility essential for fertilisation?



(1) A (2) B

(3) C (4) D

Sol. Answer (3)

A - Acrosome (has enzymes that help in fertilization)

B - Nucleus (chromosomal material)

C - Middle piece (having mitochondria that serve as energy source for swimming)

D - Tail (for motility)

12. Androgen binding protein which helps in concentrating testosterone in the seminiferous tubule, is secreted by

(1) Cells of Leydig

(2) Sustentacular cells

(3) Interstitial cells

(4) Spermatogonial cells

Sol. Answer (2)

Sertoli cells are also known as nurse cells or sustentacular cells. They secrete inhibin.

(Menstrual cycle, Fertilisation and Implantation)

13. What induces the completion of the meiotic division of the secondary oocyte?

(1) Contact of the sperm with the zona pellucida layer of the ovum

(2) The entry of the sperm into the cytoplasm of the ovum through the zona pellucida and the plasma membrane

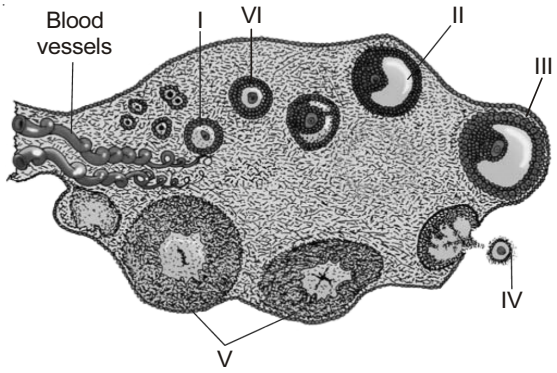
(3) Entry of the sperm in the ampullary-isthmic junction

(4) Copulation

Sol. Answer (2)

The secretions of the acrosome help the sperm enter into cytoplasm of the ovum through the zona pellucida and the plasma membrane. This induces the completion of the meiotic division of the secondary oocyte.

14. The figure given below depicts a diagrammatic sectional view of ovary. Which one set of three parts out of I–VI are correctly identified?



(1) VI - Primary follicle; III - Graafian follicle, V - Corpus luteum

(2) II - Secondary follicle; III - Tertiary; IV - Ovulation

(3) I - Primary follicle; II - Tertiary follicle; V - Corpus luteum

(4) I - Primary follicle; II - Corpus luteum; V - Graafian follicle

Sol. Answer (3)

I - Primary follicle

II - Tertiary follicle showing antrum

III - Graafian follicle

IV - Ovum

V - Corpus luteum

VI - Secondary follicle

* Primary oocyte within the tertiary follicle grows in size and completes its first meiotic division.

15. Which one of the following is the **incorrect** match of the events occurring during menstrual cycle?

(1) Menstruation : Breakdown of endometrium and ovum is not fertilised

(2) Ovulation : LH and FSH attain peak level

(3) Proliferative phase : Rapid regeneration of endometrium and maturation of Graafian follicle

(4) Development of corpus luteum : Follicular phase and increased secretion of progesterone

Sol. Answer (4)

Development of corpus luteum occurs in luteal or secretory phase.

16. Identify the hormones that are secreted in large amount prior to ovulation :

A. LH

B. FSH

C. Estrogen

D. Progesterone

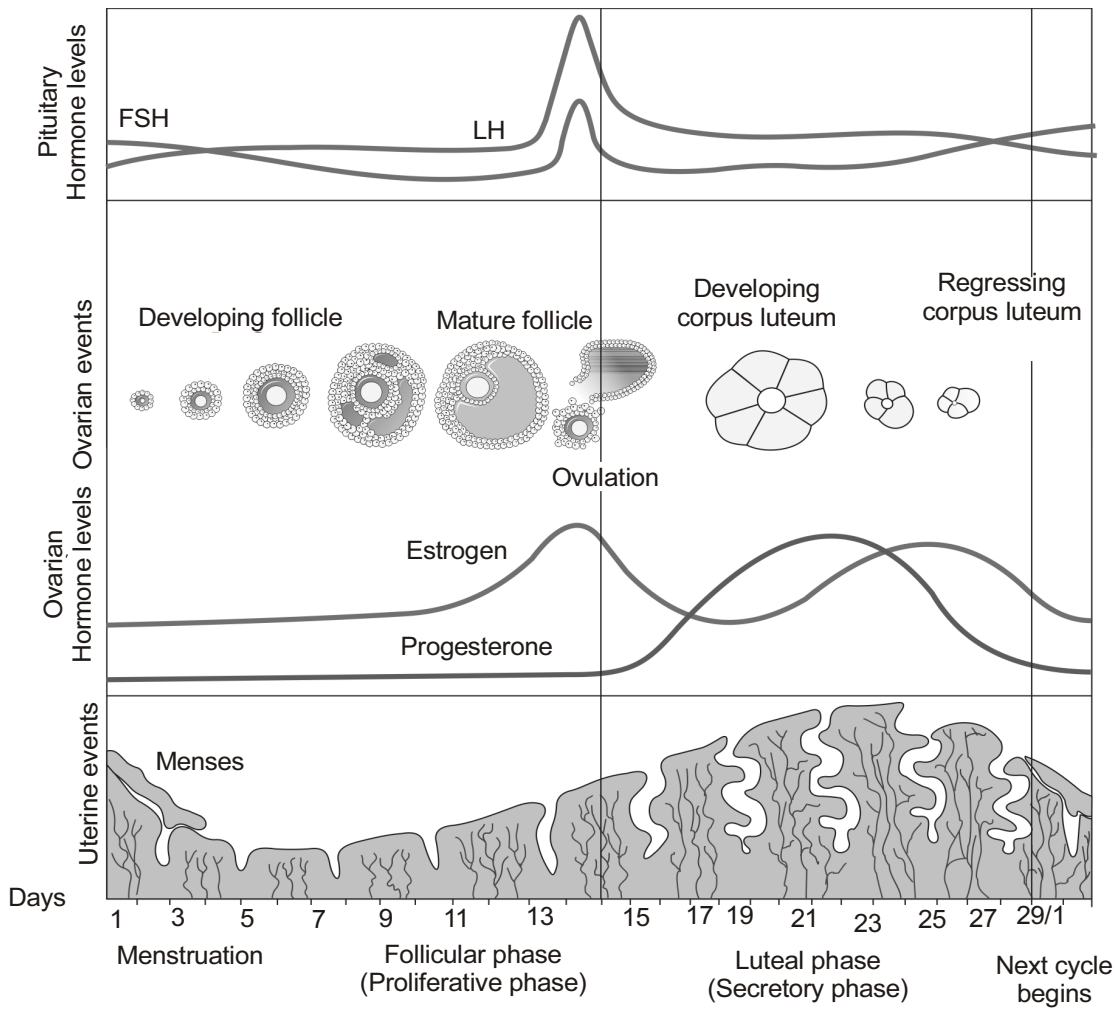
(1) A only

(2) A & B only

(3) A, B & C

(4) A, B, C & D

Sol. Answer (3)



17. Inhibition of uterine contraction ceases and bleeding and cramps of menstruation begin due to

(1) Increase in level of progesterone
(2) Decrease in level of progesterone
(3) Increase in level of LH
(4) Decrease in level of FSH

Sol. Answer (2)

Low level of progesterone cause menstruation because progesterone is responsible for maintaining stability of endometrium of uterus.

18. Why do all copulations not lead to fertilisation and pregnancy? The root cause is _____.

(1) Due to numerous sperms and one ovum
(2) Due to less progesterone
(3) Ovum and sperms are not transported simultaneously to the ampulla
(4) Due to non-formation of corpus luteum

Sol. Answer (3)

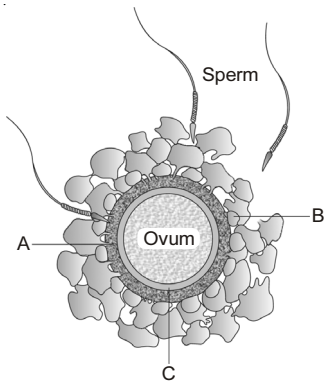
Life span of sperm in male reproductive tract $\rightarrow$ few weeks

Life span of sperm in female reproductive tract $\rightarrow$ 48 to 72 hours.

Viability of secondary oocyte after its release is for 24 hours.

So, both must be viable for fertilization to occur.

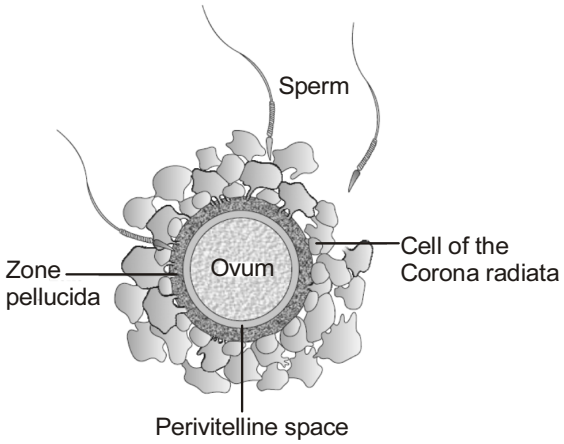
19. Following the diagram of an ovum surrounded by few sperms :



Which of the following option is **correct** for the labelled parts A, B and C?

	A	B	C
(1)	Follicular cells	Corona radiata	Perivitelline space
(2)	Zona pellucida	Perivitelline space	Corona radiata
(3)	Zona pellucida	Corona radiata	Perivitelline space
(4)	Perivitelline space	Zona pellucida	Corona radiata

Sol. Answer (3)



20. Which of the following enzyme helps sperm to penetrate zona pellucida?

(1) Hyaluronidase
(2) Neuraminidase
(3) Acrosin
(4) Corona penetrating enzyme (CPE)

Sol. Answer (3)

Acrosin is also called zona lysin and digests zona pellucida. Hyaluronidase dissolves hyaluronic acid. CPE dissolves corona radiata.

21. Which centriole of spermatozoa is required for first cleavage?

(1) Proximal centriole
(2) Distal centriole
(3) Ring centriole
(4) Posterior centriole

Sol. Answer (1)

Proximal centriole and nucleus of sperm enter the secondary oocyte during fertilization.

22. Select the **incorrect** statement

(1) Polyspermy is prevented by depolarisation of the membrane is called as fast block

(2) Entry of sperm into ovum restarts the cell cycle by breaking down MPF and turning on the APC

(3) If implantation occurs anywhere else other than uterus, it is called tubal pregnancy

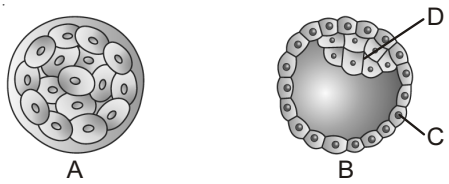
(4) Ability to reproduce is lost in female primate after menopause

Sol. Answer (3)

Ectopic pregnancy is the term given for implantation occurring at site other than uterus. Implantation normally occurs in fundus part of uterus.

(Pregnancy, Embryonic development, Parturition and Lactation)

23. Identify the stages A and B and select the correct labelling of C and D?



Choose the correct option.

	A	B	C	D
(1)	Morula	Blastocyst	Follicular cells	Inner cell mass
(2)	Morula	Blastocyst	Embryoblast	Tropho blast
(3)	Morula	Blastocyst	Trophoblast	Inner cell mass
(4)	Blastocyst	Morula	Trophoblast	Inner cell mass

Sol. Answer (3)

Blastomeres in the blastocyst are arranged into an outer layer called trophoblast and an inner group of cells attached to trophoblast called the inner cell mass.

24. The first sign of the growing foetus may be noticed by listening to the heart sound carefully through the stethoscope. Embryo's heart is formed _____.

(1) By the end of the second month of pregnancy (2) By the end of first trimester

(3) After one month of pregnancy (4) During fifth month

Sol. Answer (3)

The first heart sounds can be heard after four weeks of embryonic development.

25. In human beings, pregnancy lasts for 9 months. The gestation period of dog, elephant, cat and cow is given below. Which of the following is wrong match?

	Animal	Gestation period
(1)	Dog	60 - 65 days
(2)	Elephant	607 - 641 days
(3)	Cat	52 - 65 days
(4)	Cow	330 - 345 days

Sol. Answer (4)

Cow's gestation period = 279 to 292 days.

26. Which of the following decidua layer forms a partition between developing embryo and lumen at uterus?

(1) Decidua basalis (2) Decidua parietalis (3) Decidua capsularis (4) Contra deciduate

Sol. Answer (3)

The modified portion of endometrium of uterus upon implantation is called decidua. It sheds when foetus is delivered.

Decidua basalis is part underlying the chorionic vill and overlying myometrium.

Decidua parietalis (= Decidua vera) is the part that lines the uterus at places other than the site of attachment of embryo.

'Contra-deciduate' is that animal in which even the foetal part of placenta is retained and gets absorbed to provide nourishment. Example, *Talpa* (mole).

27. Which of the following is **not** a correct statement about umbilical cord?

(1) It connects the placenta to the embryo

(2) It helps in the transport of substances to and from the embryo

(3) It produces several hormones like hPL, estrogen and progesterone

(4) It has 100% foetal blood

Sol. Answer (3)

Umbilical cord is not an endocrine structure but placenta functions as temprary endocrine gland.

28. Sometimes the labor pains are less and uterine contractions have to be induced. What do you think the doctors inject to facilitate delivery?

(1) Progesterone and estrogen hormones (2) Oxytocin/Pitocin

(3) FSH and LH (4) Relaxin

Sol. Answer (2)

Oxytocin is also called birth hormone and milk ejecting hormone

29. Which of the following is **not** the function of Sertoli cells (sustentacular cells)?

(1) Release of androgen binding protein (2) Release of antimullerian factor

(3) Regulation of spermatogenesis by releasing inhibin (4) Secretion of testosterone

Sol. Answer (4)

Leydig cells (interstitial cells) secrete testosterone upon stimulation by LH or ICSH.

30. If both ovaries are removed from pregnant human female in first trimester of pregnancy then it will lead to

(1) Abortion (2) Normal development

(3) Irregular ovulation no fixed time interval (4) Menarche

Sol. Answer (1)

In first trimester, corpus luteum is required for the production of progesterone (the pregnancy hormone), however, after first trimester, placenta secretes sufficient progesterone. Removal of ovary in first trimester leads to loss of corpus luteum.

31. Decidua which takes part in the formation of maternal portion of the placenta is

(1) Decidua basalis (2) Decidua capsularis (3) Decidua parietalis (4) Chorion

Sol. Answer (1)

Decidua basalis lies under the chorionic villi and over the myometrium.

32. The minimum number of barriers present between foetal and maternal blood is present in which type of placenta?

(1) Syndesmochorial (2) Haemochorial (3) Haemoendothelial (4) Endotheliochorial

Sol. Answer (3)

In Haemoendothelial type, all barriers except endothelium of foetal part of placenta get eroded, *e.g.*, rat, rabbit.

33. Blood flowing in umbilical cord of mammalian embryo is

(1) 100% maternal (2) 50% maternal and 50% foetal

(3) 100% foetal (4) 75% foetal and 25% maternal

Sol. Answer (3)

Umbilical cord is connection between foetus and placenta and has 100% foetal blood.

34. Epiboly is the process of

(1) Rotation of gastrula within vitelline membrane so that animal pole becomes anterior

(2) Overgrowth of micromeres which divide rapidly and spread downward over megameres except at yolk plug

(3) Mass migration of cells from animal hemisphere so that upper micromeres migrate over edge of dorsal lip, roll inside and tucked beneath outer layer

(4) Formation of small slit like invagination upon grey crescent

Sol. Answer (2)

Epiboly - descending of dividing cells to cover other cells.

Invagination - tucking in blastula wall.

Emboly - Upward movement of dividing cells underneath the cells.

35. Drugs such as Thalidomide taken by woman in first trimester of pregnancy cause all the following malformations in the developing embryo, **except**

(1) Phocomelia (2) Amelia (3) Heart disorder (4) Placentitis

Sol. Answer (4)

Placentitis is inflammation of placenta.

36. Home use kits for determining a women's fertile period depend on the detection of one hormone in the urine. This hormone is

(1) Progesterone (2) Estradiol (3) hCG (4) LH

Sol. Answer (4)

LH surge occurs during fertile period. LH induces ovulation.

37. Neural crest cells break off from the _____ and later move to the sides of the developing embryo to form _____

(1) Placodes, sense organs of head

(2) Ectoderm, sense organs of head

(3) Notochord, vertebral column

(4) Neural tube, autonomic ganglia

Sol. Answer (4)

Neural tube is formed from ectoderm. Its anterior part forms brain and posterior part forms spinal cord.

38. Type of placenta in the human is

(1) Chorionic, discoidal, epitheliochorial, deciduate

(2) Deciduate, hemochorial, diffuse, allantochorionic

(3) Hemochorial, metadiscoidal, deciduate, chorionic

(4) Non-deciduate, discoidal, chorionic, hemoendothelial

Sol. Answer (3)

Haemochorial placenta has only three barriers. Maternal part of placenta is completely absent. It occurs in humans, apes, lemurs.

Metadiscoidal - Diffuse first, then discoidal.

Deciduate - A portion of uterine tissue is detached and passed out at birth.

Chorionic - Formed by chorionic villi.

39. Which type of placenta is present in the early human embryo?

(1) Discoidal (2) Diffuse (3) Zonary (4) Cotyledonary

Sol. Answer (2)

Metadiscoidal - diffuse first then discoidal.

40. Which of the following can be termed as milk ejecting hormone?

(1) Prolactin (2) Oestrogen (3) Progesterone (4) Oxytocin

Sol. Answer (4)

Oxytocin is milk ejecting because it stimulates contraction of smooth muscles of mammary glands.

41. Active inrolling of endodermal and mesodermal cells into interior of embryo is

(1) Ingression (2) Involution (3) Inversion (4) Epiboly

Sol. Answer (2)

42. Which of the following are the derivatives of endoderm?

(1) Muscles and blood (2) Alimentary canal and respiratory organs

(3) Excretory and reproductive organs (4) Skin and nerve cord

Sol. Answer (2)

43. Which of the following are mesodermal and endodermal in origin respectively?

(1) Urinary bladder – Kidney

(2) Kidney – Inner lining of urinary bladder

(3) Urinary ducts – Genital ducts

(4) Genital ducts – Urinary ducts

Sol. Answer (2)

44. Kidneys, heart and gonads are formed from

(1) Ectoderm (2) Endoderm (3) Inner cell mass (4) Mesoderm

Sol. Answer (4)

SECTION - B

Previous Years Questions

1. The amnion of mammalian embryo is derived from **[NEET-2018]**

   (1) ectoderm and mesoderm
   (2) endoderm and mesoderm
   (3) ectoderm and endoderm
   (4) mesoderm and trophoblast

Sol. Answer (1)

The extraembryonic or foetal membranes are amnion, chorion, allantois and Yolk sac.

Amnion is formed from mesoderm on outer side and ectoderm on inner side.

Chorion is formed from trophoectoderm and mesoderm whereas allantois and Yolk sac membrane have mesoderm on outerside and endoderm in inner side.

2. The difference between spermiogenesis and spermiation is **[NEET-2018]**

   (1) In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.
   (2) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.
   (3) In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.
   (4) In spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.

Sol. Answer (3)

Spermiogenesis is transformation of spermatids into spermatozoa whereas spermiation is the release of the sperms from sertoli cells into the lumen of seminiferous tubule.

3. Hormones secreted by the placenta to maintain pregnancy are **[NEET-2018]**

   (1) hCG, hPL, progestogens, prolactin
   (2) hCG, hPL, estrogens, relaxin, oxytocin
   (3) hCG, progestogens, estrogens, glucocorticoids
   (4) hCG, hPL, progestogens, estrogens

Sol. Answer (4)

Placenta releases human chorionic gonadotropic hormone (hCG) which stimulates the Corpus luteum during pregnancy to release estrogen and progesterone and also rescues corpus luteum from regression. Human placental lactogen (hPL) is involved in growth of body of mother and breast. Progesterone maintains pregnancy, keeps the uterus silent by increasing uterine threshold to contractile stimuli.

4. Match the items given in Column I with those in Column II and select the **correct** option given below : **[NEET-2018]**

	Column I		**Column II**
a.	Proliferative Phase	i.	Breakdown of endometrial lining
b.	Secretory Phase	ii.	Follicular Phase
c.	Menstruation	iii.	Luteal Phase

	a	b	c
(1)	iii	ii	i
(2)	i	iii	ii
(3)	iii	i	ii
(4)	ii	iii	i

Sol. Answer (4)

During proliferative phase, the follicles start developing, hence, called follicular phase.

Secretory phase is also called as luteal phase mainly controlled by progesterone secreted by corpus luteum. Estrogen further thickens the endometrium maintained by progesterone.

Menstruation occurs due to decline in progesterone level and involves breakdown of overgrown endometrial lining.

5. GnRH, a hypothalamic hormone, needed in reproduction, acts on **[NEET-2017]**

(1) Anterior pituitary gland and stimulates secretion of LH and oxytocin

(2) Anterior pituitary gland and stimulates secretion of LH and FSH

(3) Posterior pituitary gland and stimulates secretion of oxytocin and FSH

(4) Posterior pituitary gland and stimulates secretion of LH and relaxin

Sol. Answer (2)

Hypothalamus secretes GnRH which stimulates anterior pituitary gland for the secretion of gonadotropins (FSH and LH).

6. Capacitation occurs in **[NEET-2017]**

(1) Rete testis (2) Epididymis

(3) Vas deferens (4) Female Reproductive tract

Sol. Answer (4)

Capacitation is increase in fertilising capacity of sperms which occurs in female reproductive tract.

7. A temporary endocrine gland in the human body is **[NEET-2017]**

(1) Pineal gland (2) Corpus cardiacum (3) Corpus luteum (4) Corpus allatum

Sol. Answer (3)

Corpus luteum is the temporary endocrine structure formed in the ovary after ovulation. It is responsible for the release of the hormones like progesterone, oestrogen etc.

8. Which of the following depicts the **correct** pathway of transport of sperms? **[NEET (Phase-2) 2016]**

(1) Rete testis $\rightarrow$ Efferent ductules $\rightarrow$ Epididymis $\rightarrow$ Vas deferens

(2) Rete testis $\rightarrow$ Epididymis $\rightarrow$ Efferent ductules $\rightarrow$ Vas deferens

(3) Rete testis $\rightarrow$ Vas deferens $\rightarrow$ Efferent ductules $\rightarrow$ Epididymis

(4) Efferent ductules $\rightarrow$ Rete testis $\rightarrow$ Vas deferens $\rightarrow$ Epididymis

Sol. Answer (1)

Pathway of transport of sperms in human male is

Rete testis $\rightarrow$ Efferent ductules (Vasa efferentia) $\rightarrow$ Epididymis $\rightarrow$ Vas deferens.

9. Match **Column-I** with **Column-II** and select the correct option using the codes given below:

[NEET (Phase-2) 2016]

Column-I	**Column-II**
a. Mons pubis	(i) Embryo formation
b. Antrum	(ii) Sperm
c. Trophectoderm	(iii) Female external genitalia
d. Nebenkern	(iv) Graafian follicle

Codes:

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

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

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

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

Sol. Answer (2)

Correct match is:

(a) Mons pubis – Female external genitalia

(b) Antrum – Graafian follicle

(c) Trophoectoderm – Embryo formation

(d) Nebenkern – Sperm

10. Several hormones like hCG, hPL, estrogen, progesterone are produced by **[NEET (Phase-2) 2016]**

(1) Ovary

(2) Placenta

(3) Fallopian tube

(4) Pituitary

Sol. Answer (2)

Hormones secreted by placenta are hCG, hPL, estrogen and progesterone.

11. Fertilization in humans is practically feasible only if **[NEET-2016]**

(1) The sperms are transported into cervix within 48 hrs of release of ovum in uterus

(2) The sperms are transported into vagina just after the release of ovum in fallopian tube

(3) The ovum and sperms are transported simultaneously to ampullary - isthmic junction of the fallopian tube

(4) The ovum and sperms are transported simultaneously to ampullary - isthmic junction of the cervix

Sol. Answer (3)

Fertilization in human is practically feasible only if the sperms and ovum are transported simultaneously at ampullary-isthmic junction.

12. Identify the correct statement on inhibin **[NEET-2016]**

(1) Is produced by nurse cells in testes and inhibits the secretion of LH

(2) Inhibits the secretion of LH, FSH and Prolactin

(3) Is produced by granulosa cells in ovary and inhibits the secretion of FSH

(4) Is produced by granulosa cells in ovary and inhibits the secretion of LH

Sol. Answer (3)

Inhibin is produced by granulosa cells in ovary and has direct effect on the secretion of FSH.

13. Changes in GnRH pulse frequency in females is controlled by circulating levels of **[NEET-2016]**

(1) Progesterone and inhibin

(2) Estrogen and progesterone

(3) Estrogen and inhibin

(4) Progesterone only

Sol. Answer (2)

High level is of estrogen and progesterone give negative feedback to hypothalamus for the release of GnRH.

14. Select the **incorrect** statement : **[NEET-2016]**

(1) LH triggers secretion of androgens from the Leydig cells

(2) FSH stimulates the sertoli cells which help in spermiogenesis

(3) LH triggers ovulation in ovary

(4) LH and FSH decrease gradually during the follicular phase

Sol. Answer (4)

In follicular phase of menstrual cycle, LH and FSH increase gradually.

15. Ectopic pregnancies are referred to as **[Re-AIPMT-2015]**

(1) Pregnancies terminated due to hormonal imbalance

(2) Pregnancies with genetic abnormality

(3) Implantation of embryo at site other than uterus

(4) Implantation of defective embryo in the uterus

Sol. Answer (3)

Any extra uterine pregnancy is ectopic pregnancy. Implantation can occur in the wall of abdominal cavity, ovaries but 90-95% of ectopic pregnancies are tubal pregnancy where implantation occurs in fallopian tube.

16. Which of the following events is **not** associated with ovulation in human female? **[Re-AIPMT-2015]**

(1) LH surge (2) Decrease in estradiol

(3) Full development of Graafian follicle (4) Release of secondary oocyte

Sol. Answer (2)

In 28 days reproductive cycle, ovulation occurs on 14^{th} day due to LH surge. In the mid cycle, the level of FSH and estrogen are also high. The female gamete is released from the ovary in secondary oocyte stage after completing meiosis I.

17. In human females, meiosis-II is **not** completed until **[Re-AIPMT-2015]**

(1) Birth (2) Puberty (3) Fertilization (4) Uterine implantation

Sol. Answer (3)

In human females, meiosis II is completed after the entry of sperm into the cytoplasm of secondary oocyte at the time of fertilisation leading to the formation of ovum and II^{nd} polar body.

18. Which of the following layers in an antral follicle is acellular? **[Re-AIPMT-2015]**

(1) Zona pellucida (2) Granulosa (3) Theca interna (4) Stroma

Sol. Answer (1)

Zona pellucida is a non-cellular membrane made up of glycoproteins. It is secreted by secondary oocyte in Graafian follicle.

19. Which of these is **not** an important component of initiation of parturition in humans? **[AIPMT-2015]**

(1) Release of prolactin (2) Increase in estrogen and progesterone ratio

(3) Synthesis of prostaglandins (4) Release of oxytocin

Sol. Answer (1)

At the time of parturition, there is decrease in progesterone; release of prostaglandins and oxytocin, this will stimulate the contraction of smooth muscles of uterus.

20. Capacitation refers to changes in the **[AIPMT-2015]**

(1) Sperm after fertilization (2) Sperm before fertilization

(3) Ovum before fertilization (4) Ovum after fertilization

Sol. Answer (2)

Before the sperm can fertilize the ovum, it has to undergo capacitation and acrosomal reaction. Capacitation is a period of conditioning which occur in sperms starting from vagina. In this the cholesterol vesicles adhering the membrane surrounding the acrosome are removed.

21. Hysterectomy is surgical removal of **[AIPMT-2015]**

(1) Mammary glands (2) Uterus (3) Prostate gland (4) Vas-deference

Sol. Answer (2)

Uterus is also called as hystera. So, removal of uterus is hysterectomy.

22. Which of the following cells during gametogenesis is normally diploid? **[AIPMT-2015]**

(1) Secondary polar body (2) Primary polar body

(3) Spermatid (4) Spermatogonia

Sol. Answer (4)

Spermatogonia are diploid.

23. The main function of mammalian corpus luteum is to produce **[AIPMT-2014]**

(1) Estrogen only (2) Progesterone

(3) Human chorionic gonadotropin (4) Relaxin only

Sol. Answer (2)

Corpus luteum secretes progesterone (mainly) and some estrogen.

24. Menstrual flow occurs due to lack of **[NEET-2013]**

(1) FSH (2) Oxytocin

(3) Vasopressin (4) Progesterone

Sol. Answer (4)

Progesterone maintains endometrium which is shed during menstruation due to low levels of progesterone.

25. What is the **correct** sequence of sperm formation? **[NEET-2013]**

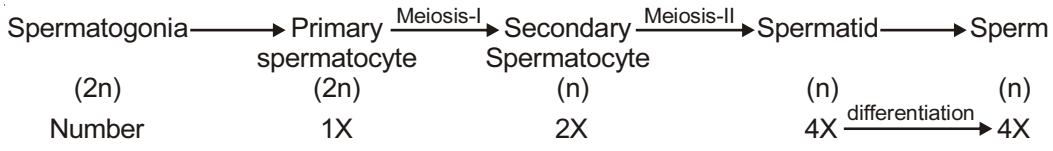
(1) Spermatogonia, spermatocyte, spermatozoa, spermatid

(2) Spermatogonia, spermatozoa, spermatocyte, spermatid

(3) Spermatogonia, spermatocyte, spermatid, spermatozoa

(4) Spermatid, spermatocyte, spermatogonia, spermatozoa

Sol. Answer (3)



26. Which one of the following is **not** the function of placenta? It **[NEET-2013]**

(1) Secretes estrogen

(2) Facilitates removal of carbon dioxide and waste material from embryo

(3) Secretes oxytocin during parturition

(4) Facilitates supply of oxygen and nutrients to embryo

Sol. Answer (3)

Oxytocin is secreted by anterior pituitary of mother.

27. In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was **[AIPMT (Prelims)-2012]**

(1) High level of circulating HCG to stimulate estrogen and progesterone synthesis

(2) High level of circulating FSH and LH in the uterus to stimulate implantation of the embryo

(3) High level of circulating HCG to stimulate endometrial thickening

(4) High levels of FSH and LH in uterus to stimulate endometrial thickening

Sol. Answer (1)

hCG (= human chorionic gonadotropin) stimulates corpus luteum to secrete progesterone and estrogen.

28. Signals for parturition originate from **[AIPMT (Prelims)-2012]**

(1) Fully developed foetus only

(2) Both placenta as well as fully developed foetus

(3) Oxytocin released from maternal pituitary

(4) Placenta only

Sol. Answer (2)

Fully developed foetus and placenta stimulate foetal ejection reflex, which triggers release of oxytocin from maternal pituitary.

29. Which one of the following statements is **false** in respect of viability of mammalian sperm? **[AIPMT (Prelims)-2012]**

(1) Sperms must be concentrated in a thick suspension

(2) Sperm is viable for only up to 24 hours

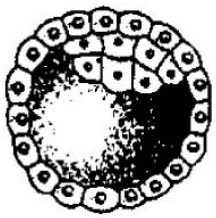
(3) Survival of sperm depends on the pH of the medium and is more active in alkaline medium

(4) Viability of sperm is determined by its motility

Sol. Answer (2)

Sperm is viable for 48-72 hours.

30. Identify the human developmental stage shown below as well as the related right place of its occurrence in a normal pregnant woman, and select the right option for the two together. **[AIPMT (Mains)-2012]**



	Developmental stage	Site of occurrence
(1)	Late morula	Middle part of Fallopian tube
(2)	Blastula	End part of Fallopian tube
(3)	Blastocyst	Uterine wall
(4)	8-celled morula	Starting point of Fallopian tube

Sol. Answer (3)

In normal pregnancy, blastocyst gets implanted in the fundus region of uterus.

31. The secretory phase in the human menstrual cycle is also called **[AIPMT (Mains)-2012]**

(1) Follicular phase and lasts for about 13 days (2) Luteal phase and lasts for about 6 days

(3) Follicular phase lasting for about 6 days (4) Luteal phase and lasts for about 13 days

Sol. Answer (4)

Uterus	Ovary	Duration
Secretory phase	luteal phase	14 days
Proliferative phase	follicular phase	about 10 days

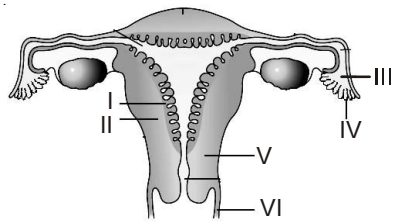
32. The Leydig cells as found in the human body are the secretory source of **[AIPMT (Prelims)-2012]**

(1) Glucagon (2) Androgens (3) Progesterone (4) Intestinal mucus

Sol. Answer (2)

LH stimulates Leydig cells to secrete androgens.

33. The figure given below depicts a diagrammatic sectional view of the female reproductive system of humans. Which one set of three parts out of I – VI have been **correctly** identified?



[AIPMT (Prelims)-2011]

(1) (I) Perimetrium, (II) Myometrium, (III) Fallopian tube (2) (II) Endometrium, (III) Infundibulum, (IV) Fimbriae

(3) (III) Infundibulum, (IV) Fimbriae, (V) Cervix (4) (IV) Oviducal funnel, (V) Uterus, (VI) Cervix

Sol. Answer (3)

(I) Endometrium (II) Myometrium (III) Infundibulum (IV) Fimbriae

(V) Cervix (VI) Vagina

34. The testes in humans are situated outside the abdominal cavity inside a pouch called scrotum. The purpose served is for **[AIPMT (Prelims)-2011]**

(1) Providing a secondary sexual feature for exhibiting the male sex

(2) Maintaining the scrotal temperature lower than the internal body temperature

(3) Escaping any possible compression by the visceral organs

(4) Providing more space for the growth of epdidymis

Sol. Answer (2)

Spermatogenesis requires 2.5°C lower than the body temperature.

35. If for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from **[AIPMT (Prelims)-2011]**

(1) Vagina to uterus
(2) Testes to epididymis
(3) Epididymis to vas deferens
(4) Ovary to uterus

Sol. Answer (2)

Vasa efferentia or ductuli efferentes connect rete testis to epididymis, part of the extratesticular duct system.

36. What happens during fertilisation in humans after many sperms reach close to the ovum? **[AIPMT (Mains)-2011]**

(1) Cells of corona radiata trap all the sperms except one
(2) Only two sperms nearest the ovum penetrate zona pellucida
(3) Secretions of acrosome helps one sperm enter cytoplasm of ovum through zona pellucida
(4) All sperms except the one nearest to the ovum lose their tails

Sol. Answer (3)

Zona reaction makes the zona pellucida impervious to second sperm by destroying sperm receptors.

37. About which day in a normal human menstrual cycle does rapid secretion of LH (Popularly called LH-surge) normally occurs on **[AIPMT (Mains)-2011]**

(1) 5th day (2) 11th day (3) 14th day (4) 20th day

Sol. Answer (3)

LH surge occurs prior to ovulation. LH induces ovulation.

38. Which one of the following conditions of the zygotic cell would lead to the birth of a normal human female child? **[AIPMT (Mains)-2011]**

(1) Only one X chromosome
(2) One X and one Y chromosome
(3) Two X chromosome
(4) Only one Y chromosome

Sol. Answer (3)

XX - female baby

XY - male baby

39. Ureters act as urinogenital ducts in **[AIPMT (Mains)-2011]**

(1) Frog's both males and females
(2) Frog's males
(3) Human males
(4) Human females

Sol. Answer (2)

40. The second maturation division of the mammalian ovum occurs **[AIPMT (Prelims)-2010]**

(1) In the Graafian follicle following the first maturation division
(2) Shortly after ovulation before the ovum makes entry into the Fallopian tube
(3) Until after the ovum has been penetrated by a sperm
(4) Until the nucleus of the sperm has fused with that of the ovum

Sol. Answer (3)

Secondary oocyte is arrested at metaphase-II state and meiosis-II is completed only when sperm enters the mature egg.

41. Which one of the following statements about human sperm is **correct**? **[AIPMT (Prelims)-2010]**

(1) Acrosome serves no particular function

(2) Acrosome has a conical pointed structure used for piercing and penetrating the egg resulting in fertilization

(3) The sperm lysins in the acrosome dissolve the egg envelope facilitating fertilization

(4) Acrosome serves as a sensory structure leading the sperm towards the ovum

Sol. Answer (3)

Acrosome is filled with enzymes that help in fertilization.

42. Sertoli cells are found in **[AIPMT (Prelims)-2010]**

(1) Pancreas and secrete cholecystokinin

(2) Ovaries and secrete progesterone

(3) Adrenal cortex and secrete adrenaline

(4) Seminiferous tubules and provide nutrition to germ cells

Sol. Answer (4)

Sertoli cells are also called nurse cells.

43. Vasa efferentia are the ductules leading from **[AIPMT (Prelims)-2010]**

(1) Epididymis to urethra

(2) Testicular lobules to rete testis

(3) Rete testis to vas deferens

(4) Vas deferens to epididymis

Sol. Answer (3)

Vasa efferentia connect rete testis to extratesticular genital system.

44. Seminal plasma in human males is rich in **[AIPMT (Prelims)-2010]**

(1) Ribose and potassium

(2) Fructose and calcium

(3) Glucose and calcium

(4) DNA and testosterone

Sol. Answer (2)

Seminal plasma is rich in fructose, Ca^{2+} and certain enzymes.

45. The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy? **[AIPMT (Prelims)-2010]**

(1) Third month

(2) Fourth month

(3) Fifth month

(4) Sixth month

Sol. Answer (3)

46. The part of fallopian tube closest to the ovary is **[AIPMT (Prelims)-2010]**

(1) Ampulla

(2) Isthmus

(3) Infundibulum

(4) Cervix

Sol. Answer (3)

Infundibulum, also called oviducal funnel, is closest to ovary.

47. In human female the blastocyst **[AIPMT (Mains)-2010]**

(1) Forms placenta even before implantation

(2) Gets implanted into uterus 3 days after ovulation

(3) Gets nutrition from uterine endometrial secretion only after implantation

(4) Gets implanted in endometrium by the trophoblast cells

Sol. Answer (4)

Placenta is formed after implantation. Blastocyst gets implanted about 7 days after fertilization. As morula enters the uterus, it gets rich supply of nutrients from endometrial fluid.

48. Which one of the following statements about morula in humans is **correct**? **[AIPMT (Prelims)-2010]**

(1) It has more cytoplasm and more DNA than an uncleaved zygote

(2) It has almost equal quantity of cytoplasm as an uncleaved zygote but much more DNA

(3) It has far less cytoplasm as well as less DNA than in an uncleaved zygote

(4) It has more or less equal quantity of cytoplasm and DNA as in uncleaved zygote

Sol. Answer (2)

During cleavage, there is no increase in mass of cytoplasm of developing embryo. There is increase in DNA content. Interphase is without growth phase.

49. Signals from fully developed foetus and placenta ultimately lead to parturition which requires the release of **[AIPMT (Mains)-2010]**

(1) Estrogen from placenta

(2) Oxytocin from maternal pituitary

(3) Oxytocin from foetal pituitary

(4) Relaxin from placenta

Sol. Answer (2)

Oxytocin is birth hormone. It stimulates contractions of smooth muscles of uterus.

50. Secretions from which one of the following are rich in fructose, calcium and some enzymes? **[AIPMT (Mains)-2010]**

(1) Male accessory glands

(2) Liver

(3) Pancreas

(4) Salivary glands

Sol. Answer (1)

Male accessory glands include seminal vesicles, prostate gland and bulbourethral glands.

51. Foetal ejection reflex in human female is induced by: **[AIPMT (Prelims)-2009]**

(1) Release of oxytocin from pituitary

(2) Fully developed foetus and placenta

(3) Differentiation of mammary glands

(4) Pressure exerted by amniotic fluid

Sol. Answer (2)

The signals for parturition originate from the fully developed foetus and placenta which induce mild uterine contractions called foetal ejection reflex. This triggers release of oxytocin from maternal pituitary.

52. A change in the amount of yolk and its distribution in the egg will affect: **[AIPMT (Prelims)-2009]**

(1) Pattern of cleavage
(2) Number of blastomeres produced
(3) Fertilization
(4) Formation of zygote

Sol. Answer (1)

Pattern of cleavage depends upon amount and distribution of yolk.

53. Which one of the following is the **correct** matching of the events occurring during menstrual cycle ? **[AIPMT (Prelims)-2009]**

(1) Proliferative phase : Rapid regeneration of myometrium and maturation of Graafian follicle
(2) Development of corpus luteum : Secretory phase and increased secretion of progesterone
(3) Menstruation : Breakdown of myometrium and ovum not fertilised
(4) Ovulation : LH and FSH attain peak level and sharp fall in the secretion of progesterone

Sol. Answer (2)

Menstruation - breakdown of endometrium, occurs when ovum is not fertilized.

Ovulation - After ovulation, large amounts of progesterone are secreted by corpus luteum during luteal phase.

Proliferative phase - Regeneration of endometrium.

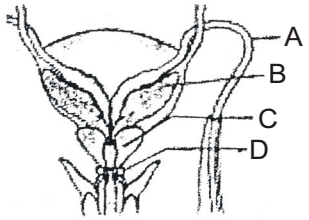
54. Seminal plasma in humans is rich in **[AIPMT (Prelims)-2009]**

(1) Fructose and calcium but has no enzymes
(2) Glucose and certain enzymes but has no calcium
(3) Fructose and certain enzymes but poor in calcium
(4) Fructose, calcium and certain enzymes

Sol. Answer (4)

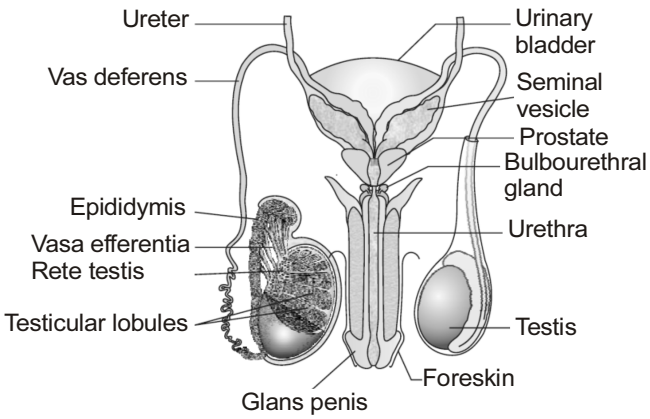
Fructose is energy yielding substrate, required for motility.

55. Given below is a diagrammatic sketch of a portion of human male reproductive system. Select the correct set of the names of the parts labelled A, B, C, D **[AIPMT (Prelims)-2009]**



	A	B	C	D
(1)	Vas deferens	Seminal vesicle	Prostate	Bulbourethral gland
(2)	Vas deferens	Seminal vesicle	Bulbourethral gland	Prostate
(3)	Ureter	Seminal vesicle	Prostate	Bulbourethral gland
(4)	Ureter	Prostate	Seminal vesicle	Bulbourethral gland

Sol. Answer (1)



56. Which one of the following is the most likely root cause why menstruation is not taking place in regularly cycling human female? **[AIPMT (Prelims)-2009]**

(1) Maintenance of the hypertrophical endometrial lining

(2) Maintenance of high concentration of sex hormones in the blood stream

(3) Retention of well-developed corpus luteum

(4) Fertilisation of the ovum

Sol. Answer (4)

Root cause of menstruation is unfertilized ovum.

57. In humans, at the end of the first meiotic division, the male germ cells differentiate into the **[AIPMT (Prelims)-2008]**

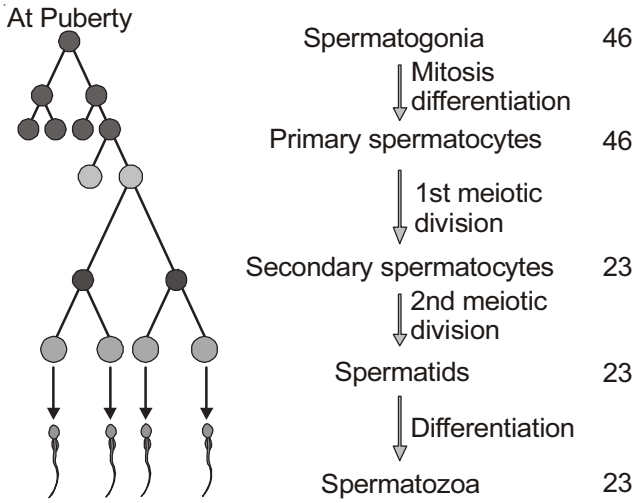
(1) Spermatogonia

(2) Primary spermatocytes

(3) Secondary spermatocytes

(4) Spermatids

Sol. Answer (3)



58. Which extraembryonic membrane in humans prevents desiccation of the embryo inside the utrerus? **[AIPMT (Prelims)-2008]**

(1) Amnion (2) Chorion (3) Allantois (4) Yolk sac

Sol. Answer (1)

59. In the human female, menstruation can be deferred by the administration of **[AIPMT (Prelims)-2007]**

(1) FSH only (2) LH only

(3) Combination of FSH and LH (4) Combination of estrogen and progesterone

Sol. Answer (4)

Progesterone is essential for maintenance of endometrium, which is thickened by estrogen.

Menstrual flow occurs due to the breakdown of endometrial lining of uterus as a result of fall in level of progesterone.

60. Which part of ovary in mammals acts as an endocrine gland after ovulation? **[AIPMT (Prelims)-2007]**

(1) Vitelline membrane (2) Graafian follicle (3) Stroma (4) Germinal epithelium

Sol. Answer (2)

After ovulation, the remaining parts of the Graafian follicle transform as the corpus luteum, which secretes large amounts of progesterone and some estrogen.

61. Sertoli cells are regulated by the pituitary hormone known as **[AIPMT (Prelims)-2006]**

(1) FSH (2) GH (3) Prolactin (4) LH

Sol. Answer (1)

62. Grey crescent is the area **[AIPMT (Prelims)-2005]**

(1) At the point of entry of sperm into ovum

(2) Just opposite to the site of entry of sperm into ovum

(3) At the animal pole

(4) At the vegetal pole

Sol. Answer (2)

Grey crescent is the area formed opposite to the point of entry of sperm in animal half. It is observed in frog during fertilization.

63. If mammalian ovum fails to get fertilized, which one of the following is unlikely? **[AIPMT (Prelims)-2005]**

(1) Corpus luteum will disintegrate

(2) Estrogen secretion further decreases

(3) Primary follicle starts developing

(4) Progesterone secretion rapidly declines

Sol. Answer (3)

Primary follicles start developing mainly in follicular phase after menstrual phase.

64. Which of the following best illustrates FEEDBACK in development?

(1) As tissue (X) develops, it secretes something that slows down the growth of tissue (Y)

(2) Tissue (X) secretes RNA which changes the development of tissue (Y)

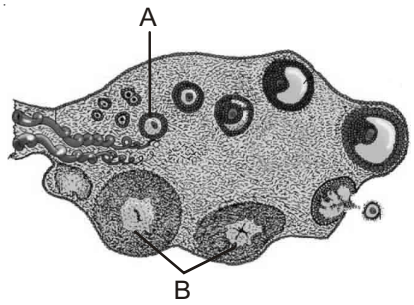
(3) As tissue (X) develops, it secretes enzymes that inhibit the development of tissue (Y)

(4) As tissue (X) develops, it secretes something that induces tissue (Y) to develop

Sol. Answer (4)

Feedback in development is mainly induction by developed tissue to form another tissue.

65. The figure shows a section of human ovary. Select the option which gives the correct identification of A and B with function/characteristic



(1) A – Primary oocyte – it is in prophase–I of the meiotic division

(2) B – Corpus luteum – secretes progesterone

(3) A – Tertiary follicle – forms Graafian follicle

(4) B – Corpus luteum – secretes estrogen

Sol. Answer (2)

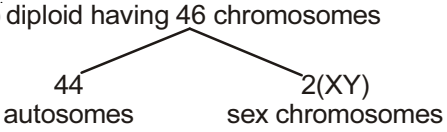
A-Primary follicle having primary oocyte.

66. The number of autosomes in human primary spermatocyte is

(1) 46 (2) 44 (3) 23 (4) 22

Sol. Answer (2)

Primary spermatocyte is (2n) diploid having 46 chromosomes



67. Corpus luteum releases

(1) Estrogen (2) Progesterone

(3) Estrogen and progesterone (4) Androgen

Sol. Answer (3)

Corpus luteum secretes large amounts of progesterone and some estrogen.

68. Which of the following organs is devoid of glands?

(1) Uterus (2) Vagina

(3) Vulva (4) Oviduct

Sol. Answer (2)

Vagina has no glands. It is highly vascular lined internally by mucus membrane.

69. Primary spermatocyte differs from spermatogonium in

(1) Number of chromosomes (2) Size and volume

(3) DNA content (4) Size of chromosomes

Sol. Answer (2)

Some spermatogonia grow, increase in size by accumulating nourishing materials and are called primary spermatocytes.

70. In human, cleavage divisions are

(1) Slow and synchronous
(2) Fast and synchronous
(3) Slow and asynchronous
(4) Fast and asynchronous

Sol. Answer (3)

A transient 3 celled embryo is formed.

71. Bartholin's glands are situated

(1) On the sides of the head of some amphibians
(2) At the reduced tail end of birds
(3) On either side of vagina in humans
(4) On either side of vas deferens in humans

Sol. Answer (3)

Bartholin's glands are paired greater vestibular glands.

They are present on both sides of vaginal orifice and secrete alkaline secretion for lubrication and neutralising urinary acidity.

72. Which one of the following statements is incorrect about menstruation?

(1) The beginning of the cycle of menstruation is called menarche
(2) During normal menstruation about 40 ml blood is lost
(3) The menstrual fluid can easily clot
(4) At menopause in the female, there is especially abrupt increase in gonadotropic hormones

Sol. Answer (3)

Uterus secretes fibrinolytic enzyme and dissolves the clotted blood in uterus during menstrual phase. Hence, blood in the menses always remains in liquid state.

73. In human adult females oxytocin

(1) Causes strong uterine contractions during parturition
(2) Is secreted by anterior pituitary
(3) Stimulates growth of mammary glands
(4) Stimulates pituitary to secrete vasopressin

Sol. Answer (1)

Oxytocin is birth hormone.

74. What is true about cleavage in the fertilized egg in humans?

(1) It starts while the egg is in fallopian tube
(2) It starts when the egg reaches uterus
(3) It is meroblastic
(4) It is identical to the normal mitosis

Sol. Answer (1)

First cleavage is completed after 30 hours of fertilization.

75. The extra embryonic membranes of the mammalian embryo are derived from

(1) Trophoblast
(2) Inner cell mass
(3) Formative cells
(4) Follicle cells

Sol. Answer (1)

Embryo is formed by inner cells mass and extra embryonic membranes by trophoblast.

76. In the 28 day human ovarian cycle, the duration of luteal phase is approximately?

(1) 14 days (2) 28 days (3) 30 days (4) 5 days

Sol. Answer (1)

Luteal phase or the post ovulatory phase lasts for 14 days.

77. The mammalian corpus luteum produces

(1) Luteotropic hormone (2) Luteinizing hormone (3) Estrogen (4) Progesterone

Sol. Answer (4)

Corpus luteum secretes large amounts of progesterone and some estrogen.

78. Fertilizin is a chemical substance produced from

(1) Polar bodies (2) Middle piece of sperm

(3) Mature eggs (4) Acrosome

Sol. Answer (3)

Fertilizin is produced by mature egg and antifertilizin is produced by sperm. These are species specific.

79. In human beings, the eggs are

(1) Mesolecithal (2) Alecithal (3) Microlecithal (4) Macrolecithal

Sol. Answer (2)

Human egg is without yolk, hence cleavage is holoblastic.

80. In the fertile human female, approximately on which day of the menstrual cycle does ovulation take place?

(1) Day 14 (2) Day 18 (3) Day 1 (4) Day 8

Sol. Answer (1)

Day of evolution = number of days in menstrual cycle – 14.

Normally, 28 – 14 = 14

81. Which one of the following cells, found in testes of rabbit secretes male hormone?

(1) Epithelial cells (2) Spermatocytes (3) Leydig's cell (4) Sertoli cells

Sol. Answer (3)

Leydig cells or interstitial cells secrete testosterone.

82. The middle piece of the sperm contains

(1) Proteins (2) Mitochondria (3) Centriole (4) Nucleus

Sol. Answer (2)

Mitochondria serve as energy source for swimming.

83. After ovulation Graafian follicle regresses into

(1) Corpus atresia (2) Corpus callosum (3) Corpus luteum (4) Corpus albicans

Sol. Answer (3)

Corpus luteum is the yellow body formed after ovulation.

84. Cleavage in mammals is described as

(1) Holoblastic equal (2) Holoblastic unequal (3) Superficial (4) Discoidal

Sol. Answer (1)

Cleavage is holoblastic (and equal) because human egg is alecithal.

85. Which set is similar?

(1) Corpus luteum – Graafian follicles
(2) Sebum – sweat
(3) Bundle of His – pace maker
(4) Vitamin B_7 – Niacin

Sol. Answer (1)

Pace maker – Sino Atrial Node

Vitamin B_7 – Biotin

Vitamin B_3 – Niacin

Glands secreting sebum and sweat are different.

86. What is true for cleavage?

(1) Size of embryo increases
(2) Size of cells decrease
(3) Size of cells increase
(4) Size of embryo decreases

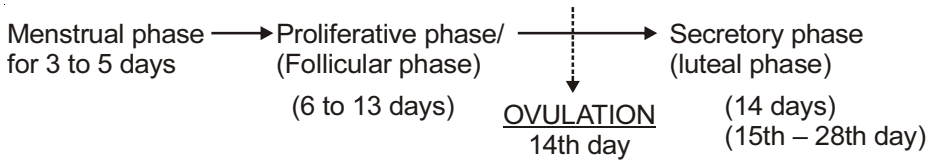
Sol. Answer (2)

In cleavage divisions, interphase is without growth phase.

87. Ovulation in the human female normally takes place during the menstrual cycle

(1) At the mid secretory phase
(2) Just before the end of the secretory phase
(3) At the beginning of the proliferative phase
(4) At the end of the proliferative phase

Sol. Answer (4)



88. The shared terminal duct of the reproductive and urinary system in the human male is

(1) Urethra
(2) Ureter
(3) Vas deferens
(4) Vasa efferentia

Sol. Answer (1)

Urethra is urino-genital duct in human male.

SECTION - C

Assertion-Reason Type Questions

1. A : Failure of testes to descend into the scrotum causes sterility in man.
R : Higher internal body temperature is not suitable for sperm development.

Sol. Answer (1)

Spermatogenesis requires 2 - 2.5°C lower than the body temperature.

2. A : Middle piece of sperm contains organelle called powerhouse.
R : It contains mitochondria.

Sol. Answer (1)

Mitochondria provide energy for motility of sperm.

3. A : Vaginal orifice is partially covered by a membrane called hymen.
R : It is made up of thick layer of smooth muscles.

Sol. Answer (3)

Hymen is a membranous structure, partially covering vaginal orifice.

4. A : The male urethra is longer than the female urethra.
R : It carries both urine as well as semen.

Sol. Answer (2)

Male urethra is about 20 cm long and female urethra is 2-4 cm. In females, genital tract and urinary tract have different openings.

5. A : In humans, ovum is alecithal type.
R : It is almost free of yolk.

Sol. Answer (1)

Alecithal = without yolk.

6. A : Oxytocin acts on the uterine muscles and causes stronger uterine contractions, which in turn stimulate further secretion of oxytocin.
R : Oxytocin is released from maternal pituitary.

Sol. Answer (2)

Oxytocin is also called birth hormone.

7. A : In morula stage the cells divide without any increase in size.
R : Zona pellucida remains intact till cleavage is completed.

Sol. Answer (1)

There is marked increase in DNA but no increase in mass of cytoplasm.

8. A : In frog, grey crescent is formed during fertilization.
R : It is because the black granules move towards the point of entry of the sperm in animal half.

Sol. Answer (1)

Grey crescent is the area just opposite to the site of entry of sperm into ovum in animal half. It is formed in frog during fertilization.

9. A : If fertilization occurs, corpus luteum is rescued from regression by human chorionic gonadotropin, which is produced by placenta.
R : In first trimester, the corpus luteum maintained by hCG is responsible for the production of progesterone.

Sol. Answer (1)

hCG maintains corpus luteum to secrete progesterone and estrogen for longer time. After first trimester, placenta secretes sufficient progesterone.

10. A : If both the ovaries are removed after the first trimester of pregnancy, there would still be normal growth of foetus.
R : After first trimester placenta secretes sufficient progesterone.

Sol. Answer (1)

During first trimester, corpus luteum is responsible for secreting progesterone. If both ovaries are removed during first trimester, there will be abortion.

11. A : Placenta is connected to the embryo through an umbilical cord which helps in the transport of substance to and from the embryo
R : Placenta acts as an endocrine tissue.

Sol. Answer (2)

Umbilical cord is not an endocrine structure.

12. A : All copulations do not lead to fertilisation and pregnancy.
R : Fertilisation can occur if the ovum and sperms are transported simultaneously to the ampulla.

Sol. Answer (1)

Sperm is viable for 48 to 72 hours

Ovum life is for 24 hours

Both have to be viable for fertilization when they reach ampulla.

13. A : Lack of menstruation may be indicative of pregnancy.

R : Menstruation only occurs if the released ovum is fertilised.

Sol. Answer (3)

Menstruation occurs when released secondary ocyte remains unfertilized in a normal female.

14. A : LH acts on Sertoli cells for release of certain factors required for spermatogenesis.

R : Spermiation occurs directly under influence of LH.

Sol. Answer (4)

FSH acts on Sertoli cells for release of factors required for spermatogenesis (Spermiogenesis). Spermiation occurs directly under the influence of testosterone.

15. A : The first sign of growing foetus may be noticed by listening to the heart sound through the stethoscope.

R : By the end of second month of pregnancy, the foetus develops limbs and digits.

Sol. Answer (2)

Human heart is formed after one month of pregnancy.

16. A : Leydig cells synthesise and secrete testicular hormones called androgens.

R : Leydig cells are located between the Sertoli cells.

Sol. Answer (3)

Leydig's cells are located outside the seminiferous tubules.

17. A : In spermatogenesis, the first haploid forms are spermatids.

R : At the end of meiosis cells have diploid set of chromosomes.

Sol. Answer (4)

First haploid forms are secondary spermatocytes.

18. A : Presence or absence of hymen is not a reliable indicator of virginity or sexual experience.

R : It can be broken down by a sudden fall or jolt, insertion of a vaginal tampon, or active participation in some sports like horse riding.

Sol. Answer (1)

Hymen is membrane partially covering vaginal opening.

19. A : After menopause the levels of blood gonadotropins will rise markedly.

R : At the time of menopause all the ovarian follicles are converted into atretic follicles and the ovaries are not responding to the gonadotropins.

Sol. Answer (2)

Gonadotropins are seen in urine of females after menopause. Absence of negative feedback of estrogen and progesterone increases level of gonadotropins in blood.

20. A : The secretions of male accessory glands constitute the seminal plasma which is rich in fructose, calcium and certain enzymes.

R : Fructose serves as a source of energy for the sperms.

Sol. Answer (2)

Energy is required for swimming of sperms in female genital tract.

21. A : Corpus luteum begins to atrophy after a short life of 10 to 14 days, if fertilisation does not occur.
R : Luteolysis may be due to withdrawal of LH support.

Sol. Answer (1)

LH maintains corpus luteum.

22. A : Most birds possess only the left ovary and left oviduct for conveying the ovum released from the ovary.
R : The avian ovary does not form corpus luteum from the ruptured ovarian follicle which undergoes rapid shrinkage.

Sol. Answer (2)

Birds are oviparous and placenta is not formed.

23. A : The most immediate effect of FSH is the maturation of existing late primary or secondary follicle.
R : A rising level of FSH causes the developing egg within the follicle to complete the first meiotic division to form a secondary oocyte.

Sol. Answer (1)

First meiotic division is completed in tertiary follicle under influence of FSH.

24. A : The morula passes through the phase of compaction, produces two major type of cells : the peripheral cells and the inner cell mass.
R : The descendants of inner cell mass become the trophoblast cells.

Sol. Answer (3)

Inner cell mass becomes embryo.

25. A : Development is the emergence of a multicellular organism from a single group of cells.
R : Development involves growth, differentiation and morphogenesis.

Sol. Answer (2)

26. A : Synthesis of milk is stimulated by rise in the level of oxytocin.
R : Oxytocin is released from the adenohypophysis under influence of hypothalamus.

Sol. Answer (4)

Ejection of milk is stimulated by rise in oxytocin.

Synthesis of milk is stimulated by rise in level of prolactin.

27. A : Blastocyst undergoes gastrulation to produce the three germinal layers.
R : This involves cell movements (morphogenetic movement) that eventually help to attain new shape and morphology of embryo.

Sol. Answer (2)

Morphogenetic movements involve epiboly, emboly, involution, invagination and delamination. Delamination is chief in humans.

28. A : Scrotum acts as temperature regulator for the testes.
R : Wall of scrotum is supported by dartos muscles which help in positioning of testes.

Sol. Answer (1)

Cremaster and dartos muscles help in positioning of testes according to the surroundings' temperature.

29. A : Fertilin protein is present in the egg membrane.
R : It helps in agglutination reaction.

Sol. Answer (4)

Fertilizin protein is present on egg membranes and anti-fertilizin on sperms.

30. A : Corticotrophin releasing hormone is a part of the clock that establishes the timing of birth.
R : The signals for parturition originate from the fully developed foetus and placenta which induce mild uterine contractions called foetal ejection reflex.

Sol. Answer (2)

Placenta secretes chorionic corticotropin.

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