

UNIT – VI : REPRODUCTION

Term-I

HUMAN REPRODUCTION

Syllabus

- Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis– spermatogenesis and oogenesis; menstrual cycle; fertilization, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).



STAND ALONE MCQs

(1 Mark each)

Q. 1. 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

Ans. Option (D) is correct.

Explanation : Rete testis, vasa efferentia and epididymis are parts of male reproductive system whereas isthmus is part of fallopian tube which carries an egg from the ovary to the uterus.

Q. 2. Which one of the following is not a male accessory gland?

- (A) Seminal vesicle (B) Ampulla
(C) Prostate (D) Bulbo-urethral gland

Ans. Option (B) is correct.

Explanation : Ampulla is a part of fallopian tube where fertilisation occurs. Fallopian tube is part of female reproductive system.

Q. 3. The vas deferens receives duct from the seminal vesicle and opens into urethra as

- (A) epididymis
(B) ejaculatory duct
(C) efferent ductule
(D) ureter

Ans. Option (B) is correct.

Explanation : The vas deferens receives duct from the seminal vesicle and opens into urethra as ejaculatory duct. These ejaculatory ducts which open into the urethra about half-way through the prostate gland function to mix the sperm stored in the ampulla with fluids secreted by the seminal vesicles and to transport these substances to the prostate.

Q. 4. Urethral meatus refers to the

- (A) urinogenital duct.
(B) opening of vas deferens into urethra.
(C) external opening of the urinogenital duct.
(D) muscles surrounding the urinogenital duct.

Ans. Option (C) is correct.

Explanation : Urethral meatus, also known as the external urethral orifice, is the external opening or meatus of the urethra. The urethra originates from the urinary bladder and extends through the penis to its external opening called urethral meatus.

Q. 5. Seminal plasma, the fluid part of semen, is contributed by

- (i) Seminal vesicle (ii) Prostate
(iii) Urethra (iv) Bulbo-urethral gland
(A) i and ii (B) i, ii and iv
(C) ii, iii and iv (D) i and iv

Ans. Option (B) is correct.

Explanation : Secretion of seminal vesicle (paired), prostate gland (unpaired) and bulbourethral glands or Cowper's glands (paired) constitute the seminal plasma. It contains various proteins and fructose as energy suppliers for sperm motility and is also responsible for making the largest proportion of the alkaline buffer.

Q. 6. Identify the odd one from the following.

- (A) Labia minora (B) Fimbriae
- (C) Infundibulum (D) Isthmus

Ans. Option (A) is correct.

Explanation : Fimbriae, infundibulum, isthmus and ampulla are the parts of fallopian duct while labia minora is female external genitalia.

Q. 7. Prostate glands are located below

- (A) gubernaculum
- (B) seminal vesicles
- (C) epididymis
- (D) bulbourethral glands

Ans. Option (B) is correct.

Explanation : Prostate gland is the part of male reproductive system that is located just below the bladder. Small and walnut shaped, the prostate surrounds the beginning of the urethra.

Q. 8. Lower narrow end of uterus is called

- (A) urethra (B) cervix
- (C) clitoris (D) vulva

Ans. Option (B) is correct.

Explanation : Lower end of uterus is called cervix that opens into vagina. A hollow muscular organ located in front of the rectum and behind the urinary bladder, at the lower end of uterus is called cervix that opens into vagina.

Q. 9. The third stage of parturition is called "after-birth". In this stage

- (A) excessive bleeding occurs
- (B) foetus is born and cervix and vagina contraction to normal condition happens
- (C) foetus is born and contraction of uterine wall prevents excessive bleeding
- (D) placenta is expelled out.

Ans. Option (D) is correct.

Explanation : Third process of parturition is the third and final stage, after the delivery until the placenta or after birth is expelled by powerful uterine contractions. Umbilical cord is cut close to the baby's navel. It lasts for 10-15 minutes after the birth of child.

Q. 10. Which of the following contains the actual genetic part of a sperm?

- (A) Whole of it (B) Tail
- (C) Middle piece (D) Head

Ans. Option (D) is correct.

Explanation : Head of the sperm is anterior, broad, flattened and almond shape. It consists of two parts. The head portion is mainly a cell nucleus; it consists of genetic substances, and anterior small cap-like acrosome. The nucleus consists of condensed DNA and basic proteins.

Q. 11. Identify the wrong statement from the following.

- (A) High levels of oestrogen triggers the ovulatory surge.
- (B) Oogonial cells start to proliferate and give rise to functional ova in regular cycles from puberty onwards.
- (C) Sperms released from seminiferous tubules are poorly motile/non-motile.
- (D) Progesterone level is high during the post-ovulatory phase of menstrual cycle.

Ans. Option (B) is correct.

Explanation : Oogenesis is initiated during the embryonic developmental stage when a couple of million gamete mother cell (oogonia) is formed within each foetal ovary (about third month of foetal ovary). Unlike sperm formation that starts at puberty egg formation begins before birth. No more oogonia are formed and added after birth.

Q. 12. The immature male germ cells undergo division to produce sperms by the process of spermatogenesis. Choose the correct one with reference to above.

- (A) Spermatogonia have 46 chromosomes and always undergo meiotic cell division.
- (B) Primary spermatocytes divide by mitotic cell division.
- (C) Secondary spermatocytes have 23 chromosomes and undergo second meiotic division.
- (D) Spermatozoa are transformed into spermatids.

Ans. Option (C) is correct.

Explanation :

- (A) Spermatogonia have 46 chromosomes and always undergo mitotic cell division.
- (B) Primary spermatocytes divide by meiotic cell division.
- (D) Spermatids are transformed into spermatozoa.

Q. 13. Spermiation is the process of the release of sperms from

- (A) seminiferous tubules.
- (B) vas deferens.
- (C) epididymis.
- (D) prostate gland.

Ans. Option (A) is correct.

Explanation : Spermiation is the process by which mature spermatids or spermatozoa are released from sertoli cells into the seminiferous tubule lumen prior to their passage to the epididymis.

Q. 14. Match between the following representing parts of the sperm and their functions and choose the correct option.

Column A

- A. Head
- B. Middle piece
- C. Acrosome
- D. Tail

Column B

- i. Enzymes
- ii. Sperm motility
- iii. Energy
- iv. Genetic material

Options :

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

Ans. Option (B) is correct.

Explanation :

- A. Sperm head contains nucleus with densely coiled chromatin fibres surrounded by acrosome. Nucleus transfers the genetic material to next generation.
- B. Middle piece of sperm contains large number of mitochondria to provide energy needed for the movement.
- C. Acrosome present in the cap of sperm contains hydrolytic enzymes which help sperm to penetrate the egg. These enzymes break down the outer membrane of the ovum, called the zona pellucida, allowing the haploid nucleus in the sperm cell to join with the haploid nucleus in the ovum.
- D. Tail of sperm helps in propelling or swims the sperm cell forwards to meet the egg.

Q. 15. Mature Graafian follicle is generally present in the ovary of a healthy human female around

- (A) 5–8 days of menstrual cycle.
- (B) 11–17 days of menstrual cycle.
- (C) 18–23 days of menstrual cycle.
- (D) 24–28 days of menstrual cycle.

Ans. Option (B) is correct.

Explanation : Mature Graafian follicle is the follicular stage present in the ovary. It is formed after the completion of first mitotic division but before ovulation. It therefore contains a 2N diploid oocyte. Graafian follicle is characterised by a large follicular antrum and releases one or more ova into the Fallopian tube and leaving behind the corpus luteum. It is generally present in the ovary of a healthy human female around 11–17 days of menstrual cycle.

Q. 16. Which among the following has 23 chromosomes?

- (A) Spermatogonia
- (B) Zygote
- (C) Secondary oocyte
- (D) Oogonia

Ans. Option (C) is correct.

Explanation : Secondary oocyte ($n = 23$). Primary oocyte completes first meiotic division to form secondary oocyte (23 chromosomes) and polar body (23 chromosomes), whereas spermatogonia, zygote and oogonia have 46 chromosomes, hence diploid.

Q. 17. The membranous cover of the ovum at ovulation is

- (A) corona radiata.
- (B) zona radiata.
- (C) zona pellucida.
- (D) chorion.

Ans. Option (A) is correct.

Explanation : Corona radiata is the innermost layer of the cells of the cumulus oophorus and is directly adjacent to the zona pellucida, the outer protective glycoprotein layer of the ovum. Zona radiata is a striated membrane situated next the yolk of an ovum. Chorion is an extra embryonic foetal membrane which is responsible for the formation of placenta.

Q. 18. At what stage of life is oogenesis initiated in a human female ?

- (A) At puberty
- (B) During menarch
- (C) During menopause
- (D) During embryonic development

Ans. Option (D) is correct.

Explanation : During embryonic development the process of formation of haploid ova from diploid germinal cell is called oogenesis and the process occurred in the ovary. Oogenesis begins during embryonic development but is completed only at puberty of the secondary oocyte with the sperm.

Q. 19. A human female reaches menopause around the age of

- (A) 50 years
- (B) 15 years
- (C) 70 years
- (D) 25 years.

Ans. Option (A) is correct.

Explanation : The end of a woman's fertility is called menopause and the stop of the menstrual cycle. The ovaries stop producing hormones and in humans, the menstrual cycle ceases at around 50 years of age. but sometime due to health related problems it varies.

Q.20. Layers of an ovum from outside to inside is

- (A) corona radiata, zona pellucida and vitelline membrane
- (B) zona pellucida, corona radiata and vitelline membrane
- (C) vitelline membrane, zona pellucida and corona radiata
- (D) zona pellucida, vitelline membrane and corona radiata.

Ans. Option (A) is correct.

Explanation : The corona radiata is thick and the outer layer of follicular (granulosa), zona pellucida is inner and thick and non cellular. The zona pellucida surrounds the oocyte and located between the oocyte and the follicular cells. The vitelline membrane is a membrane enclosing an egg that comprises the zona pellucida in mammals.

- Q. 21.** 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 fertilisation.

Ans. Option (C) is correct.

Explanation : Polyspermy may be defined as the fertilisation of an ovum by more than one sperm. During fertilisation, a sperm comes in contact with the zona pellucida layer of the ovum and induces changes in the membrane that block the entry of additional sperms. Thus, it ensures that only one sperm can fertilise an ovum.

- Q. 22.** Acrosomal reaction of the sperm occurs due to
- (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.

Ans. Option (A) is correct.

Explanation : Acrosomal reaction of the sperm occurs due to its contact with zona pellucida of the ova. The reaction that occurs in acrosome of sperm is triggered by the release of fertilizin. The main purpose of the acrosomal reaction is to start the fusion of the oocyte membrane with the sperm cell membrane allowing the combination of genetic material contained in both gametes, leading to the fertilisation of the oocyte.

- Q. 23.** Morula is a developmental stage
- (A) between the zygote and blastocyst.
 - (B) between the blastocyst and gastrula.
 - (C) after the implantation.
 - (D) between implantation and parturition.

Ans. Option (A) is correct.

Explanation : Morula is a developmental stage between the zygote and blastocyst. It is a solid ball of 16–32 blastomeres, produced by a series of cleavage divisions of the early embryo from which a blastula is formed.

- Q. 24.** Match the following and choose the correct options.

Column I

A. Trophoblast

B. Cleavage

C. Inner cell mass

D. Implantation

Column II

i. Embedding of blastocyst in the endometrium

ii. Group of cells that would differentiate as embryo

iii. Outer layer of blastocyst attached to the endometrium

iv. Mitotic division of zygote

Options :

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

Ans. Option (D) is correct.

Explanation :

- A. Trophoblast is the peripheral cells of the blastocyst, which attach the zygote (fertilised ovum) to the uterine wall and become the placenta and the membranes that nourish and protect the developing organism.
- B. Cleavage is the repeated mitotic division of cells in the early embryo.
- C. Inner cell mass forms within the blastocyst, prior to its implantation within the uterus. It differentiates to form embryo.
- D. Implantation is a process of attachment and invasion of the uterus endometrium by the blastocyst (conceptus).

- Q. 25.** Which of the following hormones is not secreted by human placenta?

- (A) hCG
- (B) Estrogens
- (C) Progesterone
- (D) LH

Ans. Option (D) is correct.

Explanation : The major hormones secreted by the human placenta are : Human chorionic gonadotropin (hCG), estrogen, progesterone and human placental lactogen. LH (luteinising hormone) is produced by gonadotropic cells in the anterior pituitary gland. This hormone is considered a gonadotrophic hormone because of its role in controlling the function of ovaries in females and testes in males, which are known as the gonads.

- Q. 26.** The early stage human embryo distinctly possesses
- (A) gills
 - (B) gill slits
 - (C) external ear (pinna)
 - (D) eyebrows.

Ans. Option (B) is correct.

Explanation : Early embryo, organism of various vertebrates possesses a dorsal hollow nerve cord, a well developed notochord and a series of gill slits, which represent the fundamental chordate characters.

- Q. 27. Gastrula is the embryonic stage in which
 (A) cleavage occurs (B) blastocoel form
 (C) germinal layers form (D) villi form.

Ans. Option (C) is correct.

Explanation : Transformation of the blastocyst into gastrula with primary germ layers by rearrangement of the cells is called gastrulation. During gastrulation, the embryo develops three germ layers (endoderm, mesoderm, and ectoderm) The structures derived from ectoderm are
 (i) pituitary gland
 (ii) cornea
 (iii) kidneys
 (iv) notochord

- (A) (i) and (iii) (B) (ii) and (iii)
 (C) (i) and (ii) (D) (ii) and (iv).

Ans. Option (C) is correct.

Explanation :

Germ layer	Derivatives
Ectoderm	- Epidermis, neural tissue, hair, nails, enamel of teeth, etc.
Mesoderm	- Blood vessel, joints, connective tissue, skeletal muscles, kidney, etc.
Endoderm	- Epithelium of mouth, intestine, liver, etc.

- Q. 28. Implantation takes place after _____ of fertilisation.
 (A) 5 days (B) 6 days

- (C) 7 days (D) 8 days

Ans. Option (C) is correct.

Explanation : When a fertilized egg- travels down the fallopian tube and embedding of the blastocyst into endometrium of uterus is called implantation . Implantation begins about 7th day after fertilisation of ovum and it takes about 3 days for the process to be completed.

- Q. 29. Cleavage differs from mitosis in lacking
 (A) synthetic phase (B) growth phase
 (C) both (A) and (B) (D) none of these.

Ans. Option (B) is correct.

Explanation : Cleavage starts after fertilisation and it occurs in fallopian tube. It is holoblastic. There is no growth phase, so it differs from mitosis.

- Q. 30. In human adult females oxytocin
 (A) stimulates pituitary to secrete vasopressin
 (B) causes strong uterine contractions during parturition
 (C) is secreted by anterior pituitary
 (D) stimulates growth of mammary glands.

Ans. Option (B) is correct.

Explanation : Oxytocin is produced in the hypothalamus and is secreted by the posterior pituitary gland. It causes contraction during parturition and help to brings baby out from the mother womb.



ASSERTION AND REASON BASED MCQs (1 Mark each)

Directions : In the following questions a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 (B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 (C) Assertion (A) is true but reason (R) is false.
 (D) Assertion (A) is false but reason (R) is true.

- Q. 1. Assertion (A) : Urethra in human male act as a urinogenital canal.

Reason (R) : Urethra carries only urine while sperms are carried by vasa deferentia only.

Ans. Option (B) is correct.

Explanation : Urethra is the canal through which both urine and semen is discharged therefore it is called urinogenital canal.

- Q. 2. Assertion (A) : In human male, testes are extra-abdominal and lie in scrotal sacs.

Reason (R) : Scrotum protects the testes.

Ans. Option (A) is correct.

Explanation : The scrotum is a bag-like structure that helps to protect the testicles. Testicles make sperm and for this, they need to be cooler than the inside of the body. This is why the scrotum is located outside the body.

- Q. 3. Assertion (A) : The region outside the seminiferous tubules is called interstitial spaces, which contain Leydig's cells.

Reason (R) : Leydig's cells synthesize and secrete testicular hormones called androgen.

Ans. Option (B) is correct.

Explanation : Hypothalamus releases GnRH. This hormone stimulates the secretion of LH, which further acts on interstitial cells of Leydig and induces the release of androgen.

- Q. 4. Assertion (A) : Large number of mitochondria are present in middle piece of sperm.

Reason (R) : Numerous mitochondria in the middle piece of sperm produce energy which is required for their movement.

Ans. Option (A) is correct.

Explanation : Mitochondria is a power house organelle. It stores energy in the form of ATP. This energy helps in sperm motility.

Q. 5. Assertion (A) : The secretory phase in the human menstrual cycle is also called the luteal phase.

Reason (R) : During the luteal phase development of corpus luteum and secretion of progesterone occurs.

Ans. Option (A) is correct.

Explanation : The luteal phase begins after ovulation. It lasts about 14 days, and ends just before a menstrual period. In this the ruptured follicle closes after releasing the egg and forms the corpus luteum.

Q. 6. Assertion (A) : Vasa efferentia develop from rete testis.

Reason (R) : Sperm conduction takes place by the ciliary current.

Ans. Option (A) is correct.

Explanation : Vasa efferentia are short, straight tubes, develop from rete testis. They help in sperm conduction which takes place by the ciliary current.

Q. 7. Assertion (A) : The fusion of sperm and ovum to form zygote is called fertilization.

Reason (R) : It occurs at ampullary isthmic junction of the fallopian tube.

Ans. Option (B) is correct.

Explanation : Fertilization in humans occur at the ampullary isthmic junction of the fallopian tube. The fusion of sperm and ovum to form a zygote is called fertilization.

Q. 8. Assertion (A) : Oxytocin helps in parturition.

Reason (R) : Oxytocin acts on uterine muscle and

causes expulsion of the foetus.

Ans. Option (A) is correct.

Explanation : Oxytocin acts on uterine muscles and also increases the production of prostaglandins, which increase the contractions further.

Q. 9. Assertion (A) : Endometrium is a mucosal tissue made up of two layers.

Reason (R) : It is a inner lining of the uterus. Each month it thickens and renew itself, preparing for pregnancy.

Ans. Option (A) is correct.

Explanation : It's two layers-the stratum functionalis and stratum basalis. If conception takes place, the embryo implants into the endometrium.

Q. 10. Assertion (A) : The leydig cells of testis are present outside the seminiferous tubules.

Reason (R) : Testis helps to synthesise and secrete hormones called androgens.

Ans. Correct option is (A)

Q. 11. Assertion: The gamete formed in males determines the sex of the offspring.

Reason: Sex determination in human depend upon cumulative effect of some genes of X and Y chromosomes.

Ans Correct option is (C)

Explanation : Sex determination depends either of the chromosome contributed by male, If chromosome is contributed in zygote formation the offspring will be male and if Y is contributed then the offspring will be female.



CASE-BASED MCQs

Attempt any 4 sub-parts from each question. Each sub-part carries 1 mark.

I. Read the following text and answer the following questions on the basis of the same:

During sexual reproduction, the male inserts the sperm into the female reproductive tract, and sperm receive by the ovary and after that sperm fuse with the egg (ovum) in the ampullary region, this process is called fertilization, haploid nucleus of sperm fuse with that of ovum to form Diploid zygote.

Q.1. The phenomenon of sperm activation in mammals is known as.

- (A) Parthenogenesis (B) Amphimixis
(C) Capacitation (D) Acrosomal reaction

Ans. Option (C) is correct.

Explanation : This step is a biochemical event, in which the acrosome reaction occur so, the reaction can penetrate the zona pellucida of the oocyte and fertilize with the an egg (ovum).

Q. 2. Fertilization take place in

- (A) Vagina (B) Follicle
(C) Uterus (D) Fallopian tube

Ans. Option (D) is correct.

Explanation : Fusion of sperm with an egg is known as fertilization, most of the time student's think that this process is occur in ovary but that's not true it actually occur In the fallopian tube that links an ovary to the uterus fertilized egg successfully travels down the fallopian tube and implants in the uterus.

Q. 3. Egg development without fertilization is known as

- (A) Gametogenesis (B) Parthenogenesis
(C) Metagenesis (D) Oogenesis

Ans. Option (B) is correct.

Explanation : Parthenogenesis is a method in which a new individual developed without fertilization, and there is no involvement of male gamete. e.g., Honey bee and drosophila etc.

Q.4. Site of fusion of sperm with an ovum.

- (A) Infundibulum
- (B) Ampullary isthmic junction of oviduct
- (C) Cervix of uterus
- (D) Ovary

Ans. Option (B) is correct.

Explanation : Fallopian tube has three parts first is isthmus second is ampulla (ampullary – isthmic junction) is the most common site for fertilization and the third is infundibulum which is farthest from the uterus, and the first cleavage division of zygote occurs in the ampullary-isthmic junction.

Directions : In the following questions a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (C) Assertion (A) is true but reason (R) is false.
- (D) Assertion (A) is false but reason (R) is true.

Q. 5. Assertion (A) : All copulations do not lead to the fertilisation and pregnancy.

Reason (R) : Fertilisation can occur only if the ovum and sperms are transported simultaneously to the ampullary-isthmic junction.

Ans. Option (A) is correct.

II. Read the following text and answer the following questions on the basis of the same:

Read the passage and answer any four questions :

Implantation is the embedding of the blastocyst into the endometrium of the uterus. Blastocyst is a ball of cells with a large, fluid-filled cavity called the blastocoel. The blastomeres in the blastocyst are arranged into an outer layer called trophoblast and inner cell mass. With the formation of blastocoel, morula is converted to blastula which is called blastocyst in mammals.

Q. 1. State of embryo development, in which implantation occurs in human female is :

- (A) Morula
- (B) Zygote
- (C) Blastocyst
- (D) Transient 3-celled stage.

Ans. Option (C) is correct.

Explanation : Blastocyst implant in the uterus, normally developing embryo will contain about six to 10 cells,

Q. 2. Which organ is formed during gastrulation ?

- (A) Gill
- (B) Vitelline membrane
- (C) Archenteron
- (D) Heart.

Ans. Option (C) is correct.

Explanation : The primary gut that forms during gastrulation in the developing zygote is known as the archenteron.

Q. 3. The process that transforms the embryo into a three-layered stage is called..... .

- (A) Blastulation
- (B) Cleavage
- (C) Gastrulation
- (D) Organogenesis.

Ans. Option (C) is correct.

Explanation : The process that transforms the embryo into a three-layered stage is called gastrulation (a phase early in the embryonic development of most animals).

Q. 4. The ectoderm cells will form the..... .

- (A) Skeletal system
- (B) Nervous system
- (C) Excretory system
- (D) Respiratory system

Ans. Option (B) is correct.

Explanation : Ectodermal cells form the central nervous system.

Directions : In the following questions a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (C) Assertion (A) is true but reason (R) is false.
- (D) Assertion (A) is false but reason (R) is true.

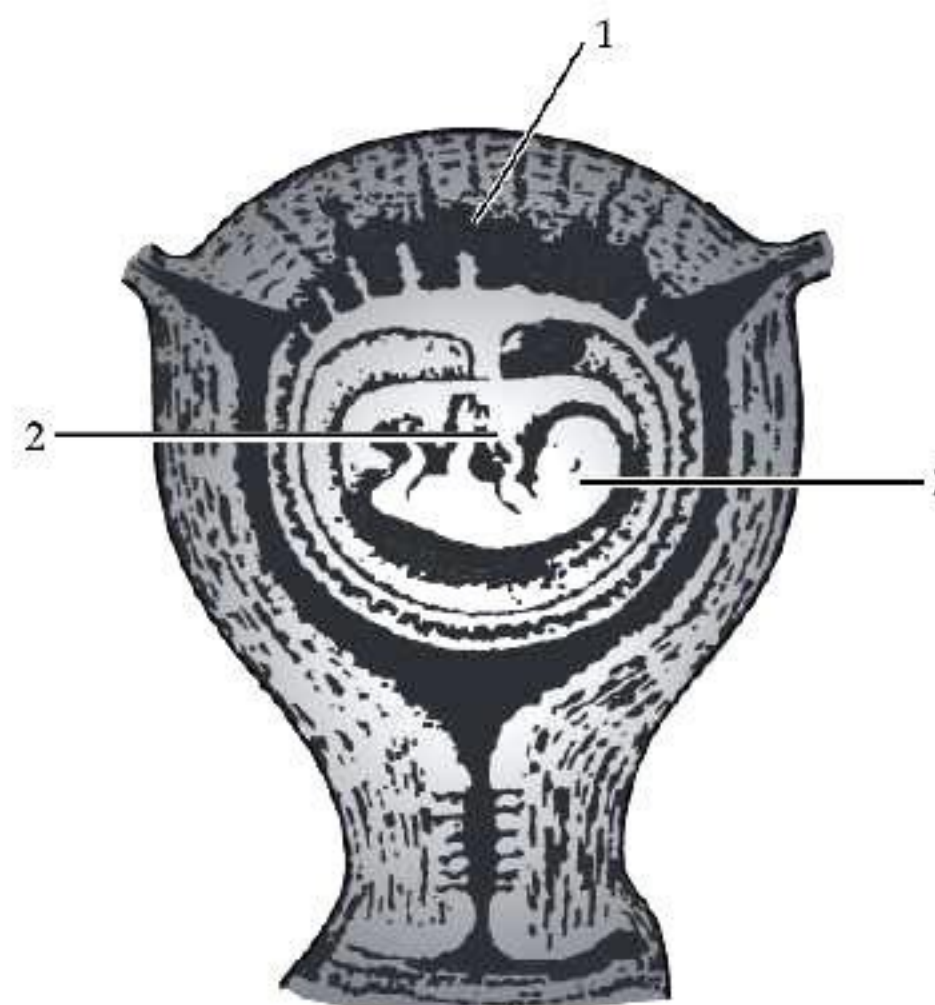
Q. 5. Assertion (A) : Blastocyst undergoes gastrulation to form three germinal layers.

Reason (R) : This involves cell movements (morphogenetic movement) that help to attain new shape and morphology of embryo.

Ans. Option (C) is correct.

Explanation : During gastrulation, the blastula reorganizes cells migrate to the interior of the embryo, forming the three germ layers.

III. Study the given diagram and answer any of the four questions given below :



Q. 1. Identify the parts labelled 1, 2 and 3 in the diagram given.

- (A) 1-Placental villi, 2-Umbilical cord with its vessels, 3-Yolk sac.
- (B) 1- Umbilical cord with its vessels, 2- Yolk sac, 3- Placental villi
- (C) 1- Yolk sac, 2- Umbilical cord with its vessels, 3- Placental villi
- (D) None of these

Ans. Option (A) is correct.

Explanation : 1. Placental villi having finger like projections
2. the umbilical cord is a tube that connects you to your baby during pregnancy.
3. The yolk sac is a membranous sac attached to an embryo.

Q. 2. During embryonic development which of the following is formed first ?

- (A) Heart
- (B) Brain
- (C) Skin
- (D) Neural tube.

Ans. Option (D) is correct.

Explanation : During embryonic development Neural tube formed first, it is the embryonic precursor to the central nervous system.

Q. 3. The signals for parturition originate from :

- (A) Placenta only
- (B) Placenta as well as fully developed foetus

- (C) Oxytocin released from maternal pituitary.
- (D) Fully developed foetus only.

Ans. Option (B) is correct.

Explanation : The signals for parturition originate from Placenta as well as fully developed foetus, which prompt little uterine contraction is known as foetal expulsion reflex

Q. 4. Hormones secreted by the placenta to maintain pregnancy are :

- (A) hCG, hPL, progesterone, prolactin
- (B) hCG, progesterone, estrogen, glucocorticoid
- (C) hCG, hPL, progesterone, estrogen
- (D) hCG, hPL, estrogen, relaxin oxytocin.

Ans. Option (C) is correct.

Explanation : hCG, progesterone, estrogens and human placental lactogen, are secreted by the placenta during pregnancy.

Q. 5. Gestation period in human is :

- (A) 10 weeks
- (B) 28 weeks
- (C) 32 weeks
- (D) 38 weeks

Ans. Option (D) is correct.

Explanation : The average length of human gestation is 38 weeks, from the first day of the woman's last menstrual period.