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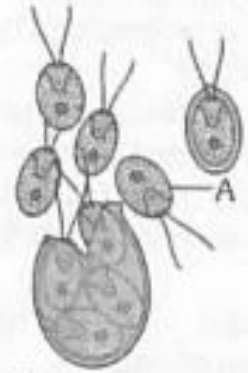
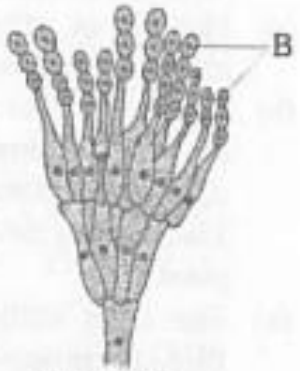
An Initiative by अमर उजाला

HUMAN REPRODUCTION
PROBLEM SOLVING-LECT 2

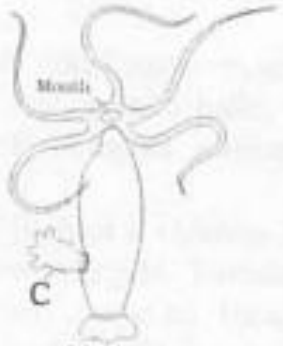
Identify A to D in given figures showing asexual reproductive structure



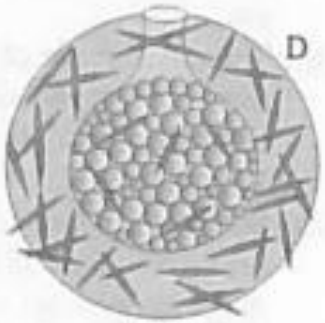
Chlamydomonas



Penicillium



Hydra



Sponge

(a) A- Zoospore, B - Conidiosporangium, C - Bud, D - Gemmule
(b) A - Zoospore, B - Conidia, C - Bud, D - Gemmule
(c) A - Zoogamete, B - Conidia, C - Bud, D - Gemmule
(d) A - Aplanospore, B - Conidia, C - Bud, D – Gemmule

Which option is correct for the region labelled as 'a' and 'b' in the given diagram

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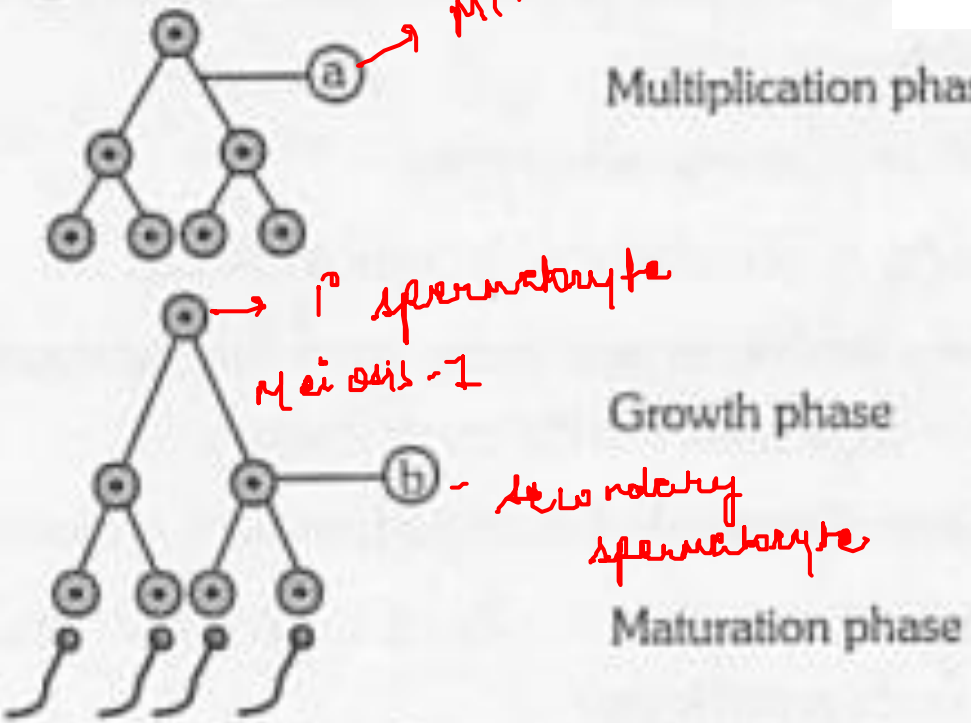
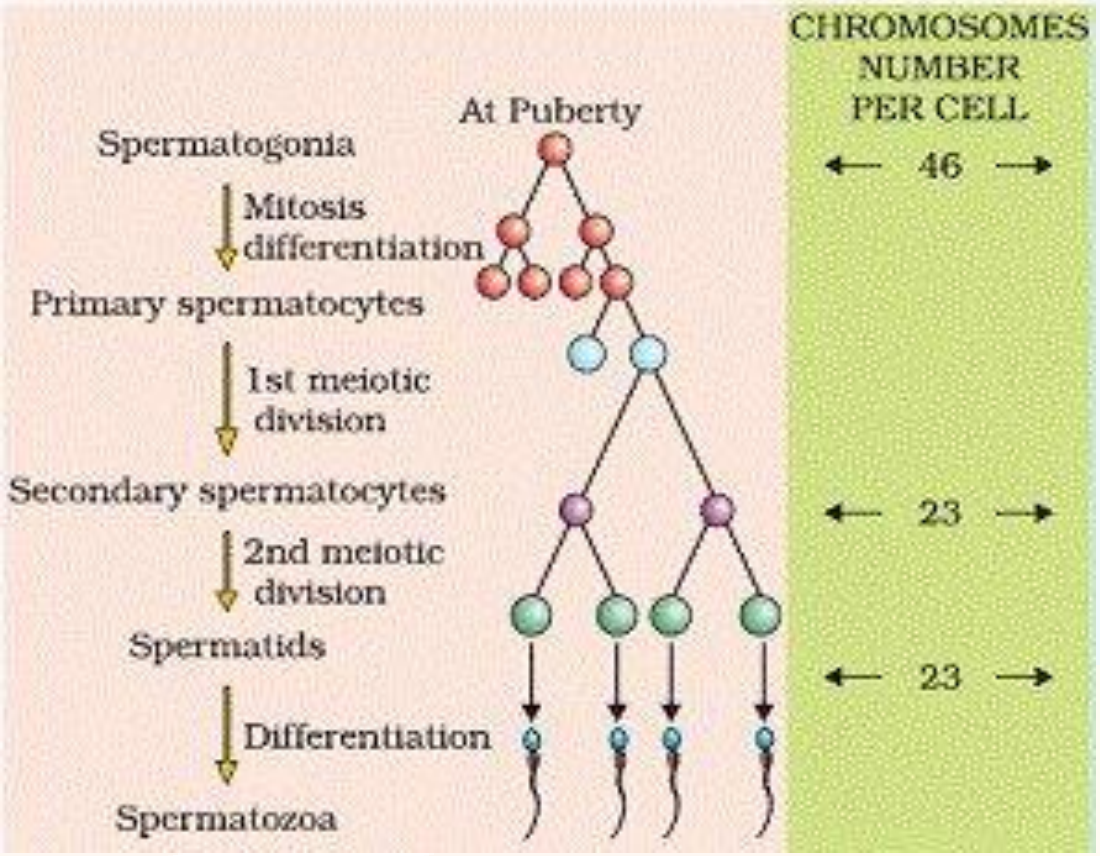


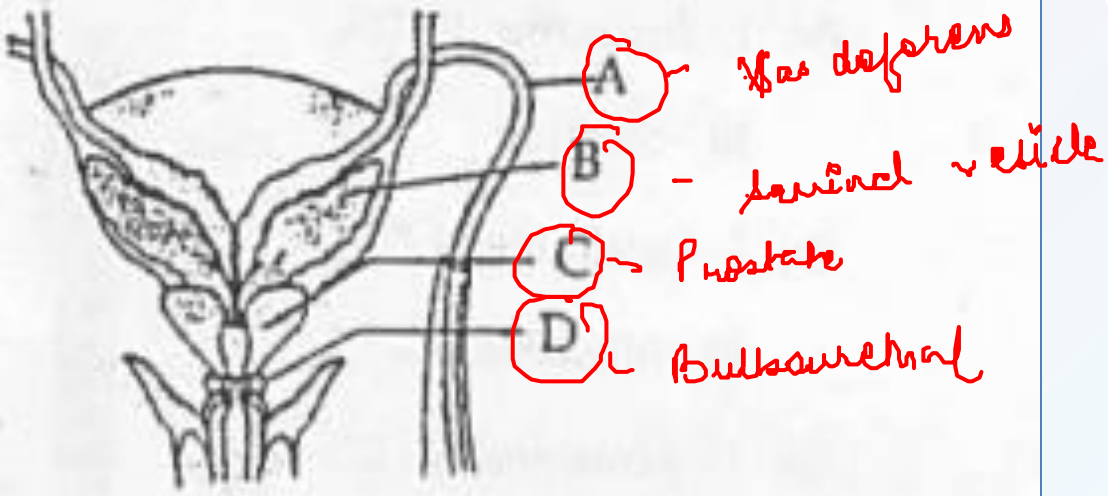
(a) a = Mitosis, b = Primary spermatocyte
(b) a = Meiosis, b = Secondary spermatocyte
(c) a = Mitosis, b = Secondary spermatocyte
(d) a = Meiosis, b = Primary spermatocyte

Ans :C


CHROMOSOMES NUMBER PER CELL
At Puberty
Spermatogonia
Mitosis differentiation
46
Primary spermatocytes
1st meiotic division
Secondary spermatocytes
23
2nd meiotic division
Spermatids
23
Differentiation
Spermatozoa

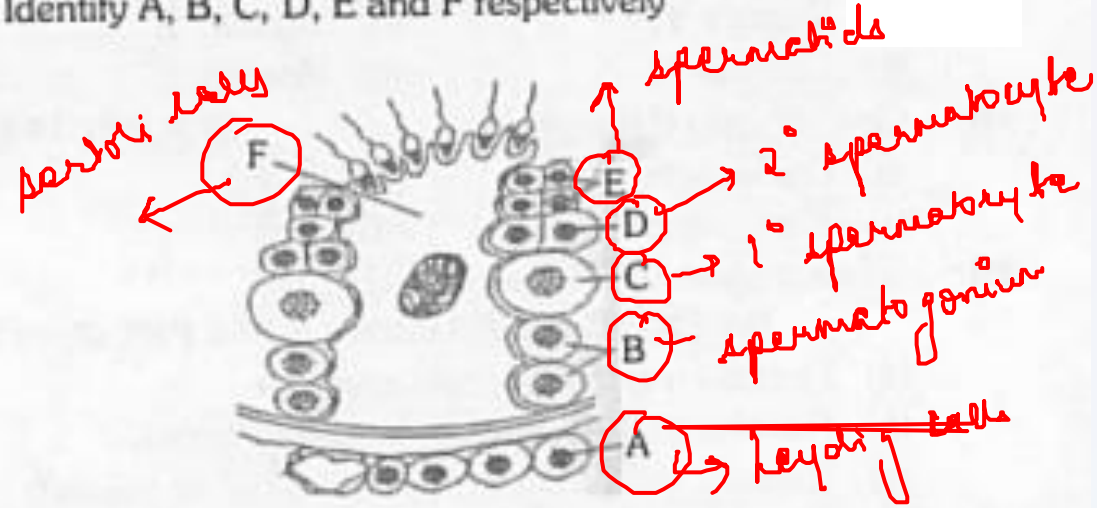
Given below is a diagrammatic sketch of a portion of human male reproductive system. Select the correct set of names of the parts labelled A, B, C, D

2009]



	A	B	C	D
(a)	Ureter	Prostate	Seminal vesicle	Bulboure thral gland
(b)	Vas deferens	Seminal vesicle	Prostate	Bulboure thral gland
(c)	Vas deferens	Semianl vesicle	Bulboure thral gland	Prostate
(d)	Ureter	Seminal vesicle	Prostate	Bulboure thral gland

The given figure is a portion of a seminiferous tubule. Identify A, B, C, D, E and F respectively



(a) A - Leydig cells, B - Spermatogonium, C - Primary spermatocyte, D - Secondary spermatocyte, E - Spermatozoa, F- Sertoli cells

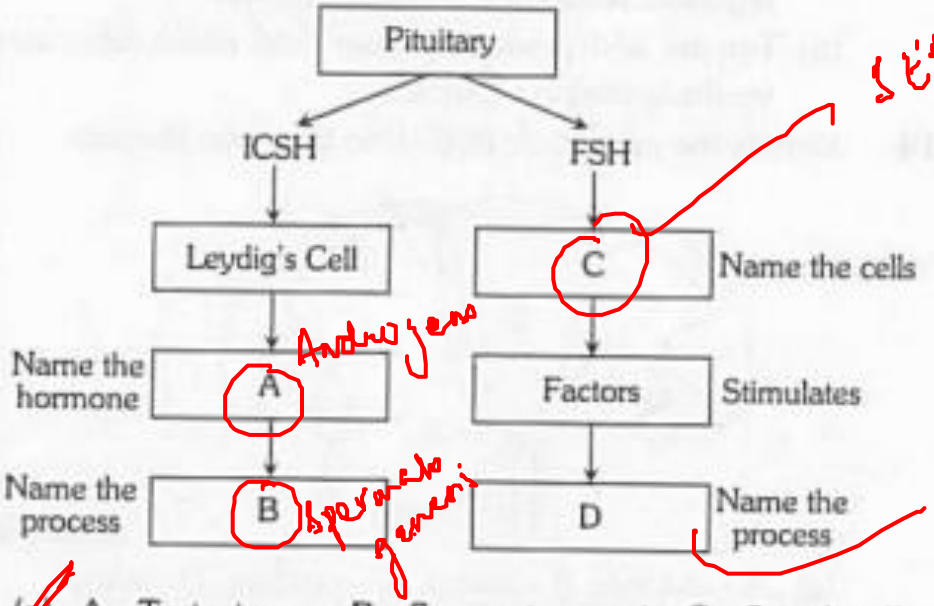
(b) A - Leydig cells, B - Primary spermatocyte, C - Spermatogonium, D - Secondary spermatocyte, E - Spermatids, F- Sertoli cells

(c) A - Sertoli cells, B - Spermatogonium, C - Primary spermatocyte, D - Secondary spermatocyte, E - Spermatids, F- Leydig cells

(d) A - Leydig cells, B - Spermatogonium, C - Primary spermatocyte, D - Secondary spermatocyte, E - Spermatids, F- Sertoli cells

Ans : D

The figure given below is an incomplete chart showing influence of hormones on gametogenesis in males. Examine the chart carefully and select the appropriate words for the blanks A, B, C and D **[NCERT]**



(a) A - Testosterone, B - Spermatogenesis, C - Sertoli cells, D - Spermiogenesis

(b) A - Testosterone, B - Spermiogenesis, C - Sertoli cells, D - Spermatogenesis

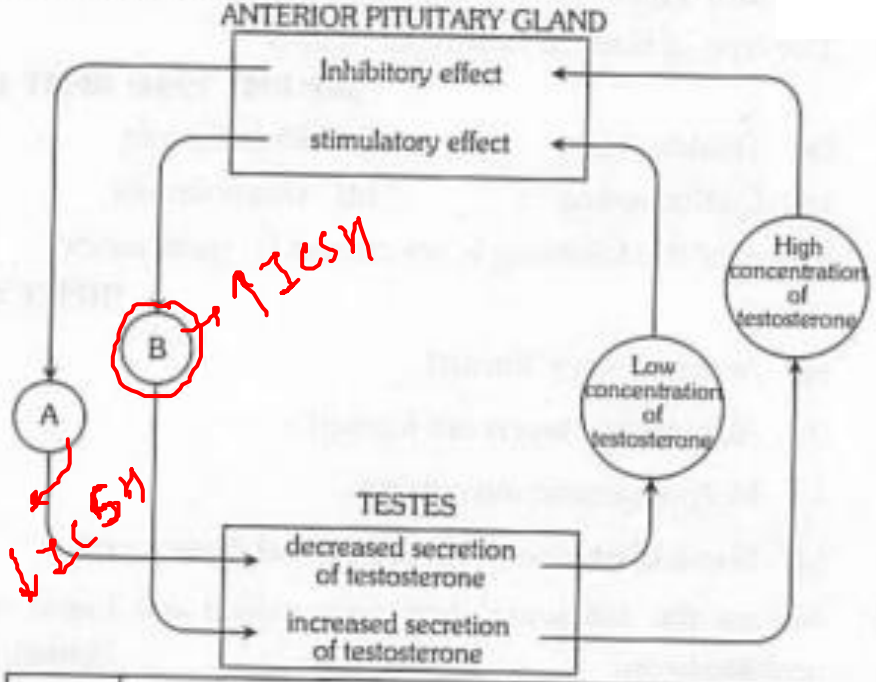
(c) A - Testosterone, B - Spermatogenesis, C - Testis, D - Spermiogenesis

(d) A - LH, B - Spermatogenesis, C - Sertoli cells, D – Spermiogenesis

Ans : A

LH acts at the Leydig cells and stimulates synthesis and secretion of androgens. Androgens, in turn, stimulate the process of spermatogenesis. FSH acts on the Sertoli cells and stimulates

The figure given below shows the self - regulating effect of testosterone. Which option in the following table correctly identifies the terms missing from circles A and B



	Circle A	Circle B
(a)	Increased secretion of ICSH	Decreased secretion of ICSH
(b)	Decreased secretion of FSH	Increased secretion of FSH
(c)	Increased secretion of FSH	Decreased secretion of FSH
(d)	Decreased secretion of ICSH	Increased secretion of ICSH

Ans : D

Match the following and choose the correct options

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

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 : B

How many eggs will be formed from 100 primary oocytes

(a) 300
(b) 400
(c) 200
(d) 100

100 primary oocytes → 100 eggs

100 primary spermatocytes → 400 sperm

18. Select the right option in which A and B are correctly identified with their respective functions

Blastocyst

	A	B	Function of A	Function of B
(a)	Ectoderm	Endoderm	differentiated as embryo	get attach to the endometrium
(b)	Trophoblast	Inner cell mass	differentiated as embryo	get attach to the endometrium
(c)	Inner cell mass	Trophoblast	get attach to the endometrium	differentiated as embryo
(d)	Trophoblast	Inner cell mass	get attach to the endometrium	differentiated as embryo

Ans : D

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

Blastocyst

Options

	Developmental stage	Site of occurrence
(a)	Late morula	Middle Part of Fallopian tube
(b)	Blastula	End part of Fallopian tube
(c)	Blastocyst	Uterine wall
(d)	8-celled morula	Starting point of Fallopian tube

Ans : C

1. Select the option which correctly matches the endocrine gland with its hormone and its function

[NEET (Kamataka) 2013]

	Endocrine gland	Hormone	Function
(a)	Placenta	Estrogen	Initiates secretion of the milk
(b)	Corpus luteum	Estrogen	Essential for maintenance of endometerium
(c)	Leydig cells	Androgen	Initiates the production of sperms
(d)	Ovary	FSH	Stimulates follicular development and the secretion of estrogens

Pituitary

55 Which of the following ...

Which of the following is a correct sequence in human embryo development

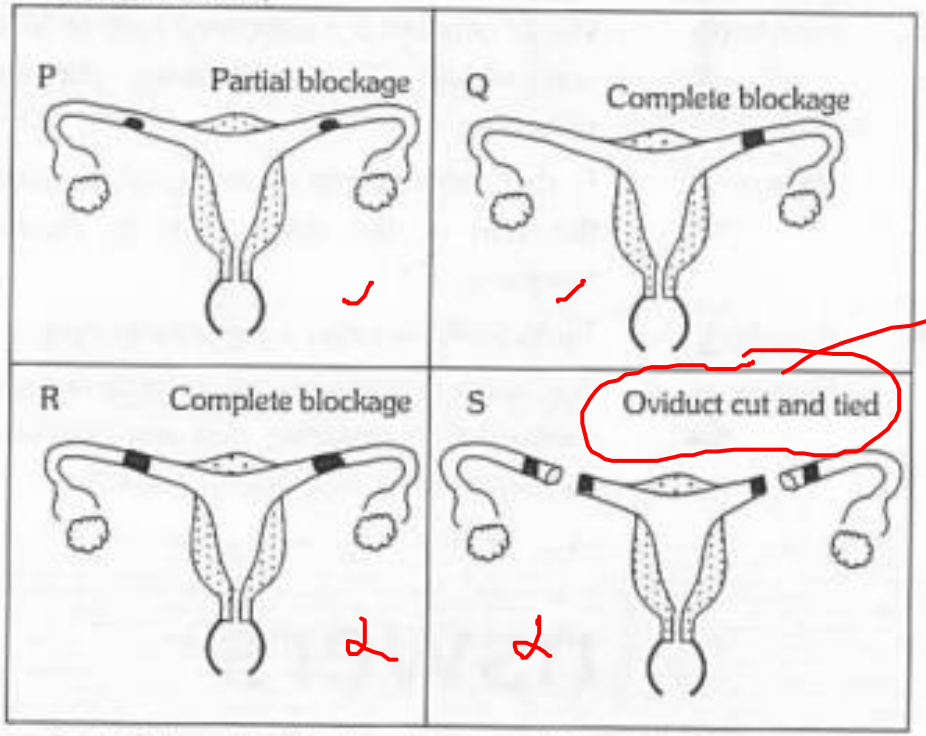
(a) Cleavage, gastrulation, blastulation

(b) Blastulation, cleavage, gastrulation

(c) Cleavage, blastulation, gastrulation

(d) Gastrulation, blastulation, cleavage

22. The following figure shows the uterine tubes of four women (P, Q, R and S)



Tubectomy

Out of them fertilization is impossible in which two women at present

(a) P and Q
(b) Q and R
(c) R and S
(d) S and P

Match the contraceptive methods given under Column I with their examples given under Column II. Select the correct choice from those given below

Column I		Column II	
A.	Chemical	p.	Tubectomy and Vasectomy
B.	IUDs	q.	Copper T and Loop
C.	Barriers	r.	Condom and Cervical cap
D.	Sterilization	s.	Spermicidal Jelly and foam
		t.	Coitus interruptus and calendar method

[KCET 2012]

(a) A = s, B = q, C = r, D = p

(b) A = s, B = t, C = q, D = r

(c) A = p, B = r, C = q, D = t

(d) A = s, B = q, C = t, D = p

Which of the following approaches does **not** give the defined action of contraceptive **[NEET (Phase-I) 2016]**

(a)	Barrier methods	Prevent fertilization
(b)	Intra uterine devices	Increase phagocytosis of sperms, suppress sperm motility and fertilizing capacity of sperms
(c)	Hormonal contraceptives	Prevent/retard entry of sperms, prevent ovulation and fertilization
(d)	Vasectomy	Prevents spermatogenesis

Match the following sexually transmitted diseases (Column-I) with their causative agent (Column-II) and select the correct option

	Column–I		Column-II
(A)	Gonorrhea	(i)	HIV
(B)	Syphilis	(ii)	Neisseria
(C)	Genital Warts	(iii)	Treponema
(D)	AIDS	(iv)	Human Papilloma - Virus

Options

[NEET 2017]

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

Ans : A

The phase of menstrual cycle in humans that lasts for 7-8 days, is

(A) Follicular phase

(B) Ovulatory phase

(C) Luteal phase

(D) Menstruation

BQ25S483

Ans [A]

The Period between the Menstruation and Ovulation is called as Follicular Phase. This Period of Menstrual Cycle ranges from 6 to 13 Days in the average 28 Days Cycle.During this Phase, Follicles in the ovary matures into the Graffian Follicle. Also, Oestrogen Production is increased during this Phase.

BQ25Q484

Which one of the following statements with regard to embryonic development in humans is correct?

(A) Cleavage divisions bring about considerable increase in the mass of protoplasm.

(B) In the second cleavage division, one of the two blastomeres usually divides a little sooner than the second.

(C) With more cleavage divisions, the resultant blastomeres become larger and larger.

(D) Cleavage division results in a hollow ball of cells called morula.

BQ25S484

Ans [B]

Cleavage is a series of mitotic cell divisions that increase the number of cells but does not change the size of the original mass. During embryonic development of human, in the second cleavage division, one of the two blastomeres usually divides a little sooner then the second.

Interphase in cleavage divisions is short and does not involve growth so that the resulting blastomeres become smaller and smaller as their number increases.

Cleavage division results in a hollow ball of cells called blastocyst. A morula is distinct from a blastocyst in that a morula (3-4 days post fertilization) is an 8 cell mass in a spherical shape whereas a blastocyst (4-5 days post fertilization) has a cavity inside the zona pellucida along with an inner cell mass.

BQ25Q485

Women who consumed the drug thalidomide for relief from vomiting during early months of pregnancy gave birth to children with

(A) No spleen

(B) Hare-lip

(C) Extra fingers and toes

(D) Under developed limbs

BQ25S485

Ans [D]

Thalidomide was used against nausea and was used to alleviate morning sickness in pregnant women.

The women who consumed this drug gave birth to children with phocomelia, the malformation of limbs. Those subjected to thalidomide while in the womb experienced limb deficiencies in a way that the long limbs were either not developed or presented themselves as stumps.

BQ25Q486

A cross section at the midpoint of the middle piece of a human sperm will show

(A) Centriole, mitochondria and 9 + 2 arrangement of microtubules.

(B) Centriole and mitochondria.

(C) Mitochondria and 9 + 2 arrangement of microtubules.

(D) 9 + 2 arrangement of microtubules only.

BQ25S486

Ans [C]

The middle piece is the tubular structure in which mitochondria are spirally arranged and it also has the beginning part of the flagellum. The sperm tail or the flagellum is based upon unique 9+2 arrangement. This arrangement refers to the nine peripheral, symmetrically arranged microtubule doublets.

Thus, the cross-section of the middle piece of sperm will show mitochondria and 9+2 arrangement of microtubules.

BQ25Q487

Which one of the following events is correctly matched with the time period in a normal menstrual cycle?

(A) Release of egg : 5th day

(B) Endometrium regenerates : 5-10 days (Proliferative Phase)

(C) Endometrium secretes nutrients for implantation : 11-18 days

(D) Rise in progesterone level : 1-15 days

BQ25S487

Ans [B]

The menstrual cycle can be divided into four phases: menstruation, proliferative, ovulatory and secretory phase.

- Day 1-5 (menstruation phase) experience lower estrogens and progesterone level, which in turn results in disintegration of endometrium and menses.
- Day 5-13 (proliferative phase) is marked by endometrium thickening under influence of estrogens as secreted by developing follicle.
- Ovulation refers to rupture of mature Graafian follicle and release of ovum/egg in body cavity on 14th days of 28 days menstrual cycle.
- Ovulatory phase is followed by luteal phase (day 15-28) in which LH stimulates the formation of corpus luteum from ovulated Graafian follicle, which in turn secretes estrogens and progesterone. In absence of fertilization, progesterone and estrogens exert negative feedback control over the anterior pituitary's secretion of LH and cause degeneration of corpus luteum in the ovary within 10 days of its formation.
- The lower progesterone level, as caused by the disintegration of corpus luteum, results in disintegration of endometrium thereby initiating the next menstrual cycle (day 1-5).
- A progesterone level is at peak during day 15-28 (the secretory phase) and is at minimum/absent during menses (day1-5).

BQ25Q488

Which of the following is true regarding sperm?

(A) Fertilizin: For penetrating egg membrane

(B) Hyalurodinase: For penetrating egg membrane

(C) Acrosin: Dissolves corona radiata → Zona Pellucida

(D) Capacitation: Takes place in penis

BQ25S488

Ans [B]

Sperm is the male gamete that fuses with female gamete and produce a diploid cell called zygote. During fertilization, acrosome of the sperm releases some enzymes, particularly hyaluronidase, that facilitates the penetration of the sperm into ovum. These enzymes dissolve the membrane enveloping the ovum and help the sperm head to enter the ovum.

BQ25Q489

Both corpus luteum and macula lutea are

(A) Found in human ovaries

(B) A source of hormones

(C) Characterized by a yellow colour

(D) Contributory in maintaining pregnancy

BQ25S489

Ans [C]

Both are characterized by a yellow colour. The corpus luteum is a temporary endocrine structure in mammals, involved in production of progesterone, which is needed to maintain pregnancy. The macula or macula lutea is an oval yellow spot near the center of the retina of the human eye.

BQ25Q490

In humans, what is the ratio of the number of gametes produced from one male primary sex cell to the number of gametes produced from one female primary sex cell?

(A) 1:3

(B) 1:4

(C) 3:1

(D) 4:1

BQ25S490

Ans [D]

Four viable sperm cells are produced from one primary sex cell, whereby only one viable egg cell is produced, due to the unequal division of cytoplasm and the formation of polar bodies, which wither and die.

BQ25Q491

Corpus luteum is a mass of cells found in

(A) Brain

(B) Ovary

(C) Pancreas

(D) Spleen

BQ25S491

Ans [B]

Corpus luteum is a yellow coloured mass of cells found in ovary. Corpus luteum secretes progesterone hormone, which is essential for maintaining pregnancy and therefore also called as “pregnancy hormone.”

BQ25Q492

Cells of leydig are found in

(A) Testes of frog

(B) Testes of rabbit

(C) Kidney of frog

(D) Kidney of rabbit

BQ25S492

Ans [B]

Leydig cells are the characteristic of mammalian testis. They produce hormone, testosterone meant for developement of secondary sexual characters in males.

BQ25Q493

Meroblastic cleavage refers to which type of division of egg

(A) Complete

(B) Spiral

(C) Incomplete

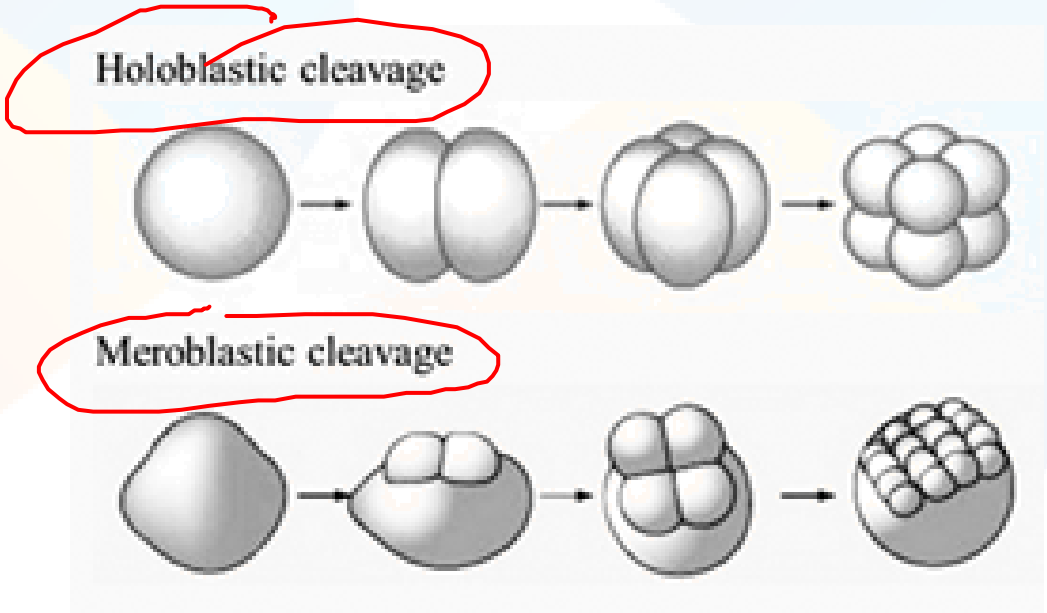
(D) Horizontal

BQ25S493

Ans [C]

In organisms that produce eggs with little yolk, the zygote divides by holoblastic cleavage. In such cleavages, the entire cells is divided equally.

Eggs cells that have larger quantities of yolk undergo meroblastic cleavage after fertilization, in which only a portion of the zygote undergoes cleavage.



BQ25Q494

Which of the following organ is differentiated first during development?

(A) Heart

(B) Skin

(C) Brain

(D) Neural tube

BQ25S494

Ans [A]

In human beings, after one month of pregnancy, the embryo's heart is formed. By the end of second month of pregnancy limbs and digits are developed. By the end of 12 weeks (first trimester) most of the major organ systems are formed.