

Topic :- Human Reproduction

- 1 **(b)**
The signals for parturition originates from the fully developed foetus and the placenta, which induce mild uterine contraction called foetal ejection reflex.
- 2 **(d)**
One time of ejaculation contains about 200 to 300 million sperms. If the sperm become less than 20 million then, it causes infertility
- 3 **(c)**
The duration of pregnancy in human being is about 9 month \pm 7 days, which is called gestation period. Infact, the gestation period is the time from conception till birth
- 4 **(a)**
During growth phase of oogenesis, an egg nest forms ovarian follicle (Graafin follicle), one central oogonium grows and functions as primary oocyte. The others from the covering follicular cells. The later provide nourishment to primary oocyte. Yolk is deposited in this state. This phenomenon is called vitellogenesis.
- 5 **(b)**
Corpus luteum is a yellow glandular mass in the ovary formed by the cells of ovarian follicle that has matured and discharged its ovum.
- 6 **(c)**
3rd month.

Summary of important development changes in the human embryo

Time from Fertilisation	Organ Formed
Week 1	Fertilisation cleavage starts about 24 hours after fertilisation cleavage to form a blastocyst 4-5 days after fertilisation. More than 100 cells implantation 6-9 days after fertilisation
Week 2	The three primary germ layers (ectoderm, endoderm and mesoderm)

	develop
Week 3	Woman will not have a period. This may be the first sign that she is pregnant. Beginning of the backbone. Neural tube develops, the beginning of the brain and spinal cord (first organs)
Week 4	Heart, blood vessels, blood and gut start forming. Umbilical cord developing
Week 5	Brain developing, 'Limb buds', small swelling which are the beginning of the arms and legs. Heart is a large tube and starts to beat, pumping blood. This can be seen an ultrasound scan
Week 6	Eyes and ears start to form
Week 7	All major internal organs developing. Face forming. Eyes have some colour. Mouth and tongue develop. Beginning of hand and feet
Week 12	Foetus fully formed, with all organs, muscles, bones toes and fingers. Sex organs well developed. Foetus is moving
Week 20	Hair beginning to grow including eyebrows and eyelashes. Fingerprints developed. Fingernails and toenails growing. Firm hand grip.

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	Between 16 and 20 weeks baby usually felt moving for first time
Week 24	Eyelids open. Legal limit of abortion in most circumstances
By Week 26	Has a good chance of survival if born prematurely
By Week 28	Baby moving vigorously. Responds to touch and loud noises. Swallowing amniotic fluid and urinating
By Week 30	Usually lying head down ready for birth
40 Weeks	Birth

7 **(c)**

Golgi body.

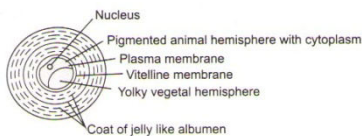
Acrosome is the part of sperm, which is found at the head region. It is the modified Golgi body that contain many enzymes for the penetration to ovum.

Acrosome contains hyaluronidase proteolytic enzymes, which is popularly known as sperm lysin as it is used to penetrate egg (ovum) at the time of fertilisation

8 **(a)**

Frog's egg is spherical and about 1.6 mm in diameter with a covering of vitelline membrane and three concentric layers of albuminous jelly. The roughly one half blackish brown animal hemisphere containing most of the cytoplasm and large nucleus is uppermost, whereas the whitish vegetal hemisphere is lowermost.

An unfertilized ripe egg of frog is shown in the diagram below.



9 **(b)**

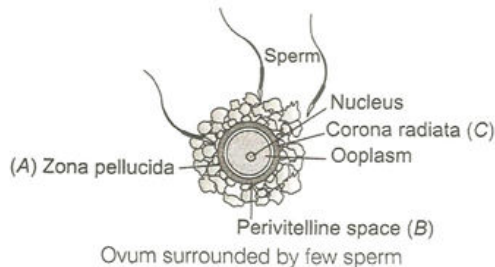
The acrosome of sperm contains large quantities of proteolytic enzymes, particularly hyaluronidase, which digests the hyaluronic acid, a constituent of the extracellular matrix. It allows the sperm to digest a path through the zona pellucida to the oocyte.

10 **(d)**

Foetal haemoglobin does not sickle even in those destined to have sickle cell anaemia, *i.e.*, haemoglobin of foetus has a higher affinity of oxygen than that of an adult.

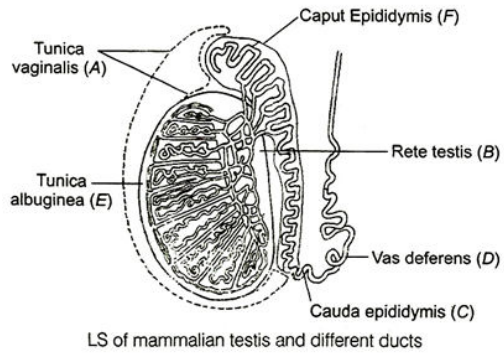
- 11 **(b)**
Structure B in the diagram indicates the ova, which is in meiosis-I stage. Before birth all ova have this stage
- 12 **(a)**
Cleavage in human is simple holoblastic slow and synchronous. Cleavage in mammals ovum takes place during its passage through the fallopian tube to the uterus. The resultant cells of cleavage are called blastomeres.
- 13 **(b)**
The chromatin material inside the nucleus is composed of DNA, some proteins and RNA. Thus, in an enucleated ovum, DNA will be present in mitochondria.
The mature RBCs, lack nucleus and membrane bound cell organelles, *i.e.*, lack DNA in nucleus and mitochondria.
- 14 **(b)**
Parthenogenesis refers to the development of unfertilized ovum into a new individual. In honey bee, drones develop parthenogenetically.
- 15 **(a)**
Stem cells are the specialized cell which can transform or differentiated into any kind of cells

- 16 **(c)**
Sperm entry stimulates the secondary oocyte to complete the suspended second meiotic division. This produces a haploid mature ovum and a second polar body. The head of the sperm which contains the nucleus separates from the middle piece and tail and becomes male pronucleus. The second polar body and the sperm tail degenerates. The nucleus of the ovum is now called female pronucleus. The male and female pronucleus move towards each other. Their nuclear membrane disintegrates; mixing up of the chromosome of a sperm and an ovum is called *karyogamy* or amphimixis. The fertilized ovum (egg) is now called zygote



- 17 **(a)**
Hyaluronidase enzyme assists in acrosomal reaction. This enzyme acts on the ground substances of follicle cells
- 18 **(b)**
Leydig's cells or interstitial cells lie between the seminiferous tubules and secrete the male hormone, testosterone that controls spermatogenesis.
- 19 **(c)**
Protective Coverings (tunicae) of Testis Testis is surrounded by three coverings (layers)
(i) **Tunica Vaginalis** It is the outer covering of the testis
(ii) **Tunica Albuginea** It is the fibrous covering surrounding the testis, situated under tunica vaginalis

(iii) **Tunica Vasculosa** Consist of network of capillaries supported by delicate connective tissue which lines the tunica albuginea.



20 (d)

Sertoli cells present in the mammalian testis, nourishes the sperms. That's why Sertoli cells are also called nurse cells. These cells also produces the inhibin hormone which halts spermatogenesis

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	B	D	C	A	B	C	C	A	B	D
Q.	11	12	13	14	15	16	17	18	19	20
A.	B	A	B	B	A	C	A	B	C	D