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+2 ZOOLOGY

IMPORTANT QUESTIONS WITH ANSWERS

UNIT I

(CHAPTERS 1, 2 and 3)

CHAPTER 1 REPRODUCTION IN ORGANISMS

2 MARK QUESTIONS:

1. Name the phenomenon where the female gamete directly develops into a new organism with an avian example.
Parthenogenesis is the phenomenon where the female gamete directly develops into a new organism. Ex. turkey
2. What is parthenogenesis? Give two examples from animals.
Development of an egg into a complete individual without fertilization is known as parthenogenesis. Ex. Honey bee, aphid, gall fly.
3. Which type of reproduction is effective sexual or asexual and why?
Sexual reproduction is effective. In sexual reproduction a male and a female gamete fused to form a diploid zygote. Hence young ones will show many genetic variations and such variations lead to evolution.
4. What do you mean by somatogenic or blastogenic reproduction?
Asexual reproduction occurs usually by amitotic or mitotic division of the somatic (body) cells. Hence it is also known as somatogenic or blastogenic reproduction.
5. Why is the offspring formed by asexual reproduction referred as a clone?
The offspring produced by asexual reproduction show uniparental inheritance and are genetically identical to their single parent. Hence, they are referred as clones.
6. Say about power of regeneration in sponges.
Sponges have great power of regeneration. When a sponge is macerated and squeezed through fine silk cloth, the cluster of cells pass through, and these can regenerate into new sponges.
7. What is encystment?
During unfavourable conditions amoeba withdraws its pseudopodia and secretes a three-layered, protective, chitinous cyst wall around it and becomes inactive. This phenomenon is called encystment.

3 MARK QUESTIONS:

8. Why are the offspring of oviparous animals at a greater risk as compared to offspring of viviparous organisms?
The eggs of the oviparous animals are laid outside the body of the female. So, the eggs are not getting prenatal protection and nourishment by the mother. Hence, they are at greater risk as compared to viviparous organisms.

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9. Give reasons for the following:

- Some organisms like honey bees are called parthenogenetic animals.
- A male honey bee has 16 chromosomes where as its female has 32 chromosomes.

In honey bees unfertilized eggs develop into males or drones. So, they are called parthenogenetic animals.

As male honey bees are developed from unfertilized eggs or haploid cells, they have 16 chromosomes. On the other hand, females develop from fertilized or diploid cells, hence they have 32 chromosomes.

10. Differentiate budding in yeast and in hydra.

Budding in yeast	Budding in Hydra
In yeast bud develops as an outgrowth of the parent body. No division of the cells occur.	In hydra a small elevation appears on the surface of the body by increase in the number of ectodermal cells.
The nucleus of the parent body divides into two and one moves into the bud.	The bud contains an interior lumen in continuation with the parent's gastro-vascular cavity.

11. Differentiate regeneration in lizard and Planaria

Regeneration in lizard	Regeneration in planaria
Regeneration in lizard is called reparative regeneration, which comes under the type epimorphosis.	Regeneration in planaria is called morphallaxis.
The parts which are lost or damaged alone will be regenerated.	The whole organism can grow from any small fragment of the body.

12. What is the difference between syngamy and fertilization?

Syngamy refers to mixing up of the pro nucleus of male and female gametes.

Fertilization refers to the whole process of fusion of male and female gametes resulting in the formation of a diploid zygote.

13. What is conjugation?

Conjugation is the temporary union of the two individuals of the same species. During their union both individuals, called the conjugants exchange certain amount of nuclear material (DNA) and then get separated. Ex. *Paramecium*, *Vorticella* and bacteria (Prokaryotes).

14. Mention the different types of natural parthenogenesis.

Arrhenotoky:

Only males are produced by parthenogenesis. Ex. Honey bees

Thelytoky:

Only females are produced by parthenogenesis. Ex. Solenobia

Amphitoky:

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Eggs may develop into any sex. Ex. Aphis

15. Differentiate internal and external fertilization.

In internal fertilization, the fusion of male and female gametes takes place within the body of female organisms. Ex. reptiles, aves and mammals.

In external fertilization, the fusion of male and female gametes takes place outside the body of female organisms in the water medium. Ex. sponges, fishes and amphibians.

16. Differentiate reparative and restorative regeneration.

In reparative regeneration, only certain damaged tissue can be regenerated. Ex. human beings.

In restorative regeneration severed body parts can develop. Ex. star fish, tail of wall lizard.

5 MARK QUESTIONS:

17. Explain the types of natural parthenogenesis with an example.

Natural parthenogenesis may be of two types, viz., complete and incomplete.

Complete parthenogenesis: Parthenogenesis is the only form of reproduction in certain animals and there is no biparental sexual reproduction. There are no male organisms and so, such individuals are represented by females only. Ex. Whiptail lizard

Incomplete parthenogenesis: It is found in some animals in which bothsexual reproduction and parthenogenesis occur.

Ex. In honeybees fertilized eggs (zygotes) develop into queen and workers, whereas unfertilized eggs develop into drones (male).

18. Explain various phases of life cycle.

Phases of life cycle:

Organisms have three phases – Juvenile phase, reproductive phase and senescent phase.

Juvenile phase/ vegetative phase: It is the period of growth between the birth of the individual up to reproductive maturity.

Reproductive phase/ maturity phase: It is the period during which organisms reproduce and their offspring reach maturity period.

Senescent phase: This period begins at the end of reproductive phase when degeneration sets in the structure and functioning of the body.

19. Differentiate between paedogenetic parthenogenesis and artificial parthenogenesis.

Paedogenetic parthenogenesis or paedogenesis:

In paedogenetic parthenogenesis (paedogenesis) the larvae produce a

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new generation of larvae by parthenogenesis. Ex. Sporocysts and Redia larvae of liver fluke, larvae of Gall fly.

Artificial parthenogenesis:

In artificial parthenogenesis, the unfertilized egg (ovum) is induced to develop into a complete individual by physical or chemical stimuli. e.g., Annelid and sea urchin eggs.

CHAPTER 2 HUMAN REPRODUCTION

ONE MARK QUESTIONS:

20. Where are mature sperms stored?
Seminiferous tubules
21. Name the process by which sperms and ovum are produced.
Gametogenesis
22. Name the process by which spermatids are transformed into mature spermatozoa.
Spermiogenesis
23. What is the duration of pregnancy in humans?
280 days
24. What do you mean by azoospermia?
Absence of sperms
25. Name the proteolytic enzyme secreted by acrosome of sperm.
Hyaluronidase, also called as sperm lysin
26. Name the outermost covering of testes.
Tunica albuginea
27. What is vesiculase?
Vesiculase is a coagulating enzyme present in seminal plasma.
28. What is the function of vesiculase?
It enhances sperm motility.
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31. What is mesovarium?
Mesovarium is the ovarian ligament.
32. What is hirsutism?
The excessive facial or body hair growth is called hirsutism.
33. What do you mean by capacitation?
It is a biochemical reaction that enables sperm to penetrate and fertilize the egg.
34. What is ectopic pregnancy?
If the fertilized ovum is implanted outside the uterus, it leads to

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ectopic pregnancy.

35. Where does ectopic pregnancy commonly occur?

95% of ectopic pregnancies occur in fallopian tube.

36. What do you mean by “after birth”?

The placenta along with the remains of the umbilical cord is called “after birth”

37. How is placenta formed?

It is formed by the chorionic villi and the uterine tissues.

2 MARK QUESTIONS:

38. What is the composition of semen?

Semen or seminal fluid is a milky white fluid which contains sperms and the seminal plasma (secreted from the seminal vesicles, prostate gland and the bulbourethral glands).

39. What are the symptoms of PCOS?

Irregular menstrual cycles, increased androgen levels, hirsutism, acne, obesity, reduced fertility and increased risk of diabetes.

40. What is the function of the seminal fluid?

The seminal fluid acts as a transport medium, provides nutrients, contains chemicals that protect and activate the sperms and also facilitate their movement.

41. Define gametogenesis.

Gametogenesis is the process of formation of gametes i.e., sperms and ova from testes and ovaries respectively.

42. What are Sertoli cells? What is the function of Sertoli cells?

Sertoli cells are present in seminiferous tubules. They provide nourishment to the sperms till maturation.

43. What is the importance of interstitial cells?

Interstitial cells also called Leydig cells are endocrine in nature and secrete male hormone testosterone, which initiates spermatogenesis.

44. How is fertilization membrane formed?

Once fertilization is accomplished, cortical granules from the cytoplasm of the ovum form the fertilization membrane.

45. What is gastrulation?

The transformation of the blastocyst into a structure called, gastrula with the primary germ layers by the movement of the blastomeres is called gastrulation.

3 MARK QUESTIONS:

46. Mention the differences between spermiogenesis and spermatogenesis.

Spermiogenesis is the process of transforming the spermatids into mature spermatozoa (sperms).

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Spermatogenesis is the sequence of events in the seminiferous tubules of the testes that produce the male gametes, the sperms.

47. How is polyspermy avoided in humans?

Once fertilization is accomplished, cortical granules from the cytoplasm of the ovum forms a barrier called the fertilization membrane around the ovum preventing further penetration of other sperms. Thus, polyspermy is prevented.

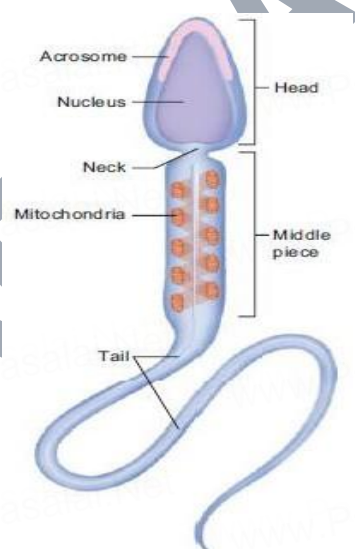
48. What is colostrum? Write its significance.

Colostrum, a nutrient rich fluid produced by the human female immediately after giving birth, is loaded with immunity, growth and tissue repair factors. It acts as a natural antimicrobial agent to actively stimulate the maturation of the infant's immune system. Therefore, this should be definitely fed to the baby after birth.

49. Placenta is an endocrine tissue. Justify.

During pregnancy, the placenta acts as a temporary endocrine gland and produces large quantities of human Chorionic Gonadotropin (hCG), human Chorionic Somatomammotropin (hCS) or human Placental Lactogen (hPL), oestrogens and progesterone which are essential for a normal pregnancy.

50. Draw a labelled sketch of a spermatozoan.



51. What is inhibin? State its functions.

The stratified epithelium of the seminiferous tubule is made of cells called Sertoli cells or nurse cells. They secrete a hormone, inhibin, which is involved in the negative feedback control of sperm production.

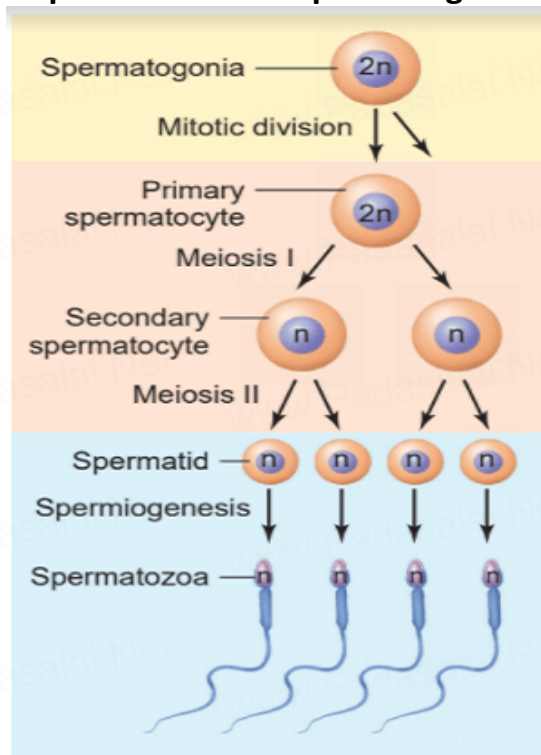
52. Mention the importance of the position of the testes in humans.

Testes are a pair of ovoid bodies lying in a skin of sac that hangs outside the abdominal cavity. Since viable sperms cannot be

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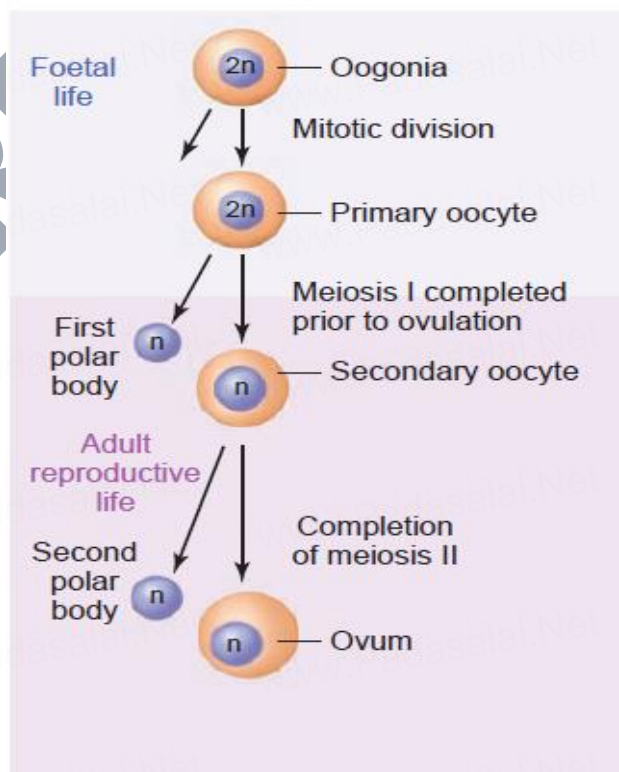
produced at normal body temperature, the scrotum is placed outside the abdominal cavity to provide a temperature 2-3°C lower than the normal internal body temperature.

53. Give a schematic representation of spermatogenesis in humans.



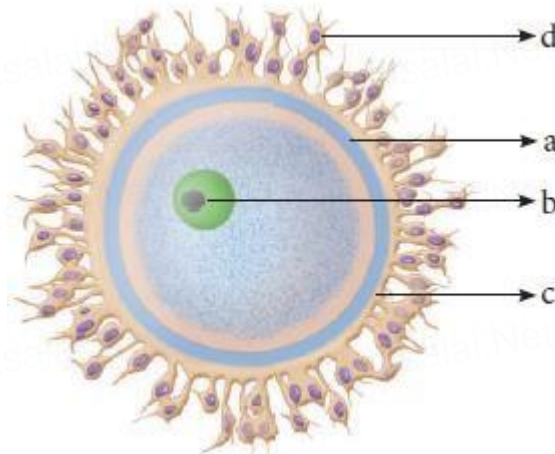
54. Give a schematic representation of oogenesis in humans.

Oogenesis



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55. Identify the given image and label its parts marked as a, b, c and d



a. Vitelline membrane b. Nucleus c. Zona pellucida d. Corona radiata

56. Mention the four main functions of reproductive system.

- to produce the gametes namely sperms and ova
- to transport and sustain these gametes
- to nurture the developing offspring
- to produce hormones

57. How does scrotum act as a thermoregulator? Why is it placed outside the body?

The scrotum has 2-3°C lesser temperature than that of body temperature and acts as a thermoregulator for spermatogenesis. Since viable sperms cannot be produced at normal body temperature, scrotum is placed outside the body.

58. What is acrosomal reaction?

On reaching the surface of the egg, the acrosomal membrane of the sperm disintegrates and releases the proteolytic enzyme, hyaluronidase, so that it can enter into egg through the corona radiata and zona pellucida. This is called acrosomal reaction.

5 MARK QUESTIONS:

59. Write down the major reproductive events in human beings.

Gametogenesis: Formation of gametes by spermatogenesis and oogenesis.

Insemination: Transfer of sperms by the male into the female genital tract.

Fertilization: Fusion of male and female gametes to form zygote.

Cleavage: Rapid mitotic divisions of the zygote which convert the single celled zygote into a multicellular structure called blastocyst.

Implantation: Attachment of blastocyst to the uterine wall.

Placentation: Formation of placenta which is the intimate connection

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between foetus and uterine wall of the mother for exchange of nutrients.

Gastrulation: Process by which blastocyst is changed into a gastrula with three primary germ layers

Organogenesis: Formation of specific tissues, organs and organ systems from three germ layers.

Parturition: Expulsion of the foetus from the mother's womb.

60. Say about menstrual disorders.

Amenorrhoea:

Absence of menstruation is called amenorrhoea. If menarche does not appear till the age of 18, it is called primary amenorrhoea. Absence of menstruation for over three consecutive months is secondary amenorrhoea.

Polymenorrhoea:

It refers to a menstrual cycle that is shorter than 21 days.

Dysmenorrhoea:

Pain associated with menstruation is called dysmenorrhoea.

Menorrhagia:

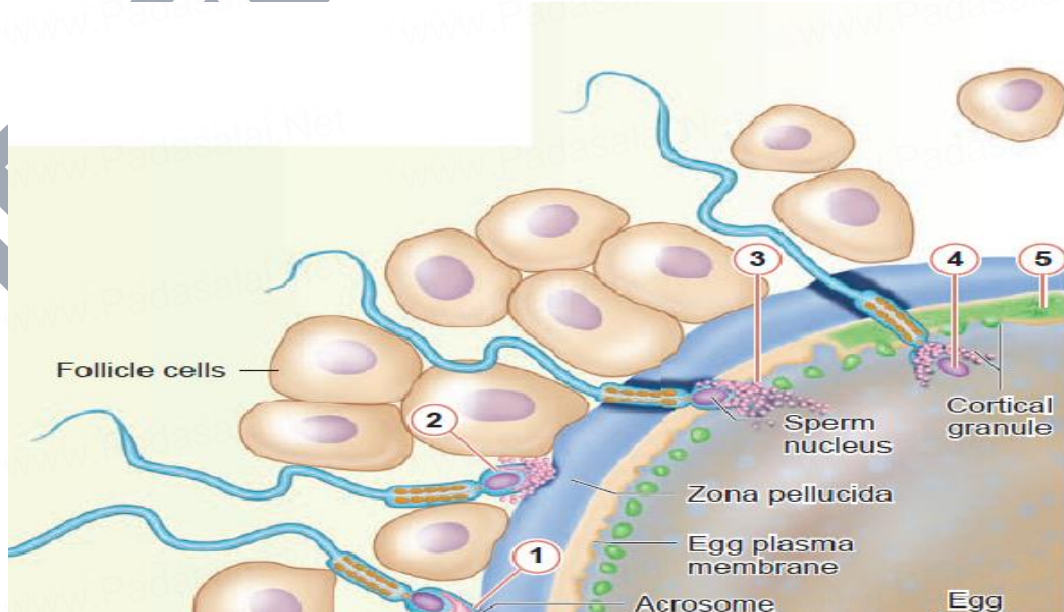
Heavy and prolonged menstrual period that disrupts a woman's normal activities is referred to as menorrhagia.

Oligomenorrhoea:

It is a condition with infrequent menstrual periods.

61. Give in sequential order, the events of fertilization.

- The sperm migrates through the coat of follicle cells and binds to receptor molecules in zona pellucida of the egg.



- This binding induces the acrosomal reaction in which the sperm releases hyaluronidase into the zona pellucida.

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- Breakdown of the zona pellucida by this enzyme allows the sperm to reach the plasma membrane of the egg.
- The nucleus and other components of the sperm enter the egg.
- Cortical granules form a barrier called fertilization membrane which prevents polyspermy.

62. What is the role of extra embryonic membranes in the maintenance of pregnancy and embryonic development?

The extra embryonic membranes namely the amnion, yolk sac, allantois and chorion protect the embryo from desiccation, mechanical shock and help in the absorption of nutrients and exchange of gases.

Amnion is a double layered translucent membrane filled with the amniotic fluid. It provides a buoyant environment to protect the developing embryo from injury, regulates the temperature of the foetus and provides a medium in which the foetus can move.

Yolk sac forms a part of the gut and is the source of the earliest blood cells and blood vessels.

Allantois forms a small out pocketing of embryonic tissue at the caudal end of the yolk sac. It is the structural base for the umbilical cord that links the embryo to the placenta and ultimately it becomes part of the urinary bladder.

Chorion is the outermost membrane which encloses the embryo and all other membranes and also helps in the formation of the placenta.

CHAPTER 3 REPRODUCTIVE HEALTH

ONE MARK QUESTIONS:

63. When was family planning programme initiated?

1951

64. What is the suitable period to perform amniocentesis?

Between 15th and 20th week of pregnancy

65. What is the average foetal heart rate?

Between 120 and 160 beats per minute

66. Expand UNDP's GII

United Nations Developmental Programme's Gender Inequality Index

67. Say about POCSO Act.

Prevention Of Children from Sexual Offences Act is to protect children from sexual abuse.

68. What does Sexual harassment at workplace act and recommendations of Justice Verma committee aim at?

They aim at providing a secure environment for both males and females at work place.

69. Expand MTP.

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Medical Termination of Pregnancy

2 MARK QUESTIONS:

70. Differentiate foeticide and infanticide.
Female foeticide refers to 'aborting the female in the mother's womb'.
Female infanticide is 'killing the female child after her birth'.
71. How do oral contraceptives prevent pregnancy?
Oral contraceptives like pills are used to prevent ovulation by inhibiting the secretion of FSH and LH hormones.
72. What do you mean by Lippes's loop?
It is a non- medicated Intra Uterine birth control device. It is a double S - shaped plastic device.
73. What are the symptoms of Chlamydia?
The cells of the columnar epithelium in the urinogenital tract, respiratory tract and conjunctiva are affected.
74. What is Saheli?
It is a contraceptive pill produced by Central Drug Research Institute in Lucknow. It contains a non- steroidal preparation called Centchroman.
75. What do you mean by lactational amenorrhea?
During breast feeding, the normal ovarian cycle may be delayed for six months. This is called lactational amenorrhea.
76. Say about copper releasing IUDs.
Copper IUDs such as Cu T-380 A, Nova T, Cu 7, Cu T 380 Ag, Multiload 375 etc. release free copper and copper salts into the uterus and suppress sperm motility.
77. What is ART?
Assisted Reproductive Technology refers to the collection of procedures to handle gametes and/or embryos outside the body to achieve pregnancy.
78. What do you mean by Chorionic villus sampling (CVS)?
CVS is a prenatal test that involves taking a sample of the placental tissue to test for chromosomal abnormalities.
79. What is foetoscope?
Foetoscope is a clinical device used to monitor the foetal heart rate and other functions during late pregnancy and labour.
80. Amniocentesis, the foetal sex determination test, is banned in our country, Is it necessary? Comment.
Yes, it is necessary to ban Amniocentesis as it will lead to female foeticide. But in case of identifying any chromosomal abnormalities it can be allowed.

3 MARK QUESTIONS:

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81. What is amniocentesis? Why a statutory ban is imposed on this technique?

Amniocentesis involves taking a small sample of the amniotic fluid that surrounds the foetus to diagnose for chromosomal abnormalities.

It is being often misused to determine the sex of the foetus. Once the sex of the foetus is known, there may be a chance of female foeticide. Hence, a statutory ban on amniocentesis is imposed.

82. What should be the characteristics of an ideal contraceptive?

It should be,

User friendly

Easily available

With least side effects and should not interfere with sexual drive

83. Differentiate tubectomy and vasectomy.

Tubectomy:

It is the surgical sterilization in women. In this procedure, a small portion of both fallopian tubes are cut and tied up through a small incision in the abdomen or through vagina. This prevents fertilization as well as the entry of the egg into the uterus.

Vasectomy:

It is the surgical sterilization in men. In this procedure, both vas deferens are cut and tied through a small incision on the scrotum to prevent the entry of sperm into the urethra.

84. Write a note on Surrogacy?

Surrogacy is a method of assisted reproduction or agreement whereby a woman agrees to carry a pregnancy for another person, who will become the new born child's parent after birth.

5 MARK QUESTIONS:

85. What are the strategies to be implemented in India to attain total reproductive health?

- Creating awareness and providing medical assistance to build a healthy society.
- Introducing sex education in schools to provide information about adolescence and adolescence related changes.
- Educating couples and those in the marriageable age groups about the available birth control methods and family planning norms.
- Creating awareness about care for pregnant women, post-natal care of mother and child and the importance of breast feeding.
- Encouraging and supporting governmental and non-

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governmental agencies to identify new methods and/or to improve upon the existing methods of birth control.

86. Explain Intra Uterine Devices.

Intrauterine Devices (IUDs):

Intrauterine devices are inserted by medical experts in the uterus through the vagina. These devices are available as copper releasing IUDs, hormone releasing IUDs and non-medicated IUDs.

Copper releasing IUDs:

They differ from each other by the amount of copper. Copper IUDs such as Cu T-380 A, Nova T, Cu 7, Cu T 380 Ag, Multiload 375, etc. release free copper and copper salts into the uterus and suppress sperm motility.

Hormone-releasing IUDs:

Progestasert and LNG – 20 are often called as intrauterine systems (IUS). They increase the viscosity of the cervical mucus and thereby prevent sperms from entering the cervix.

Non-medicated IUDs:

These are made of plastic or stainless steel. Lippe's loop is a double S-shaped plastic device.

ALL THE BEST!

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