

3

Reproductive Health

Fastrack® Revision

- ▶ A total well-being in all aspects of reproduction such as physically, mentally and emotionally is called reproductive health.
- ▶ All the reproductive organs should be healthy with normal functions.

▶ Reproductive Health Problems

Major problems associated with reproductive health are:

- **Over Population:** Explosion in population causes a scarcity of every basic need and hence affect the well-being of reproductive health.
- **Sex Education:** Due to lack of sex education, people are not concerned about safe and hygienic sexual practice.
- **Adolescence Related Changes:** The changes which take place in adolescents can lead to sex abuse and hence can affect reproductive health.
- **Sexually Transmitted Diseases:** Sexually transmitted diseases can affect the reproductive health.
- **Sex Abuse and Sex Related Crimes:** Sex abuse can cause physical injury, unwanted pregnancy, vaginal discharge, pelvic pain etc.
- **Female Foeticides:** Female foeticide can affect reproductive and sexual health of a woman.

▶ Reproductive Health Strategies

➤ Family Planning

- The increase in human population, health and education of all the children as well as marriage and child bearing capacity of individuals are some special concerns for the overall reproductive health.
- Keeping in view the concerns of reproductive health, Government of India initiated 'Family Planning' programme in 1951 and 'Reproductive and Child Healthcare' programme (RCH) in 1997.
- The major objectives of the programme are to create awareness among people about various reproductive aspects and maintain a total well-being of the reproductive organs.
- Government and non-government agencies have taken various steps to create awareness about consequences of uncontrolled population growth, social evils like sex abuse, sex related crimes etc.

➤ Sex Education

- Introduction of sex education in schools and colleges is another step to provide right information to the youth.
- Sex education save the young people from myths and misconceptions about sex related issues.
- It is important to provide information to the couples and also who are in marriageable age group about

birth control methods, care of pregnant mothers, importance of breast feeding, equality to the sex and equal opportunities to the male and female child etc.

- Infrastructural facilities and material support should be provided.
- Medical assistance should be provided and females should be cared in reproduction related problems like pregnancy, delivery, STDs, abortions, menstrual problems etc.
- Implementation of better techniques and new strategies from time to time is also required to provide more efficient care and assistance to people.

➤ Ban on Amniocentesis

- Amniocentesis is a foetal sex determination test based on the chromosomal pattern in the amniotic fluid surrounding the developing embryo.
- Amniocentesis is done to determine sex legally and it should be banned as it increases female foeticide.

▶ Massive Child Immunisation Programme

These should be implemented to achieve the goal of reproductive health.

▶ Population Explosion

- The rapid increase in human population over a relatively short period of time is called population explosion.
- Due to overall development in various fields like increased health facilities, better living conditions etc., the quality of life of people has been increased which has a great impact on growth of population.

Knowledge BOOSTER



- Population is defined as the total number of individual's of a species present in a particular area at a given time.
- The scientific study of human populations is called demography.

▶ Reasons for Population Explosion

- A rapid decline in death rate, **Maternal Mortality Rate (MMR)** and **Infant Mortality Rate (IMR)**.
- An increase in number of people in reproductive age.
- Control of diseases and better public healthcare with greater medical attention.

▶ Steps to Control Population Explosion

- People should be educated about the advantages of smaller family.
- Statutory raising the marriageable age of male and female is an effective means to control the population.
- The couples of reproductive age are motivated to family planning by adopting birth control measures.

► Birth Control

Various contraceptive methods are available to control the birth of a child like natural method, barrier methods, intra uterine devices, oral contraceptives, injecting hormones, surgical methods.

I. Natural Methods

This method avoids chances of meeting of sperms and ovum. Some of the natural methods are:

► Periodic Abstinence

- In this method, couples avoid coitus from day 10 to 17 of the menstrual cycle when ovulation could be expected.
- This period is also called as fertile period as the chances of fertilisation is very high during this period.

► Withdrawal or Coitus Interruptus

- In this method, the male partner withdraws his penis from the vagina just before ejaculation to avoid insemination.

► Lactational Amenorrhea

- The menstrual cycle and ovulation do not occur during intense lactation and so the chances of pregnancy are low.
- This method is effective only upto a maximum period of six months after child birth.

II. Barrier Methods

Here, barriers are used to prevent the physical contact of sperms and ovum. Some of the common methods are:

► Condoms

- The barriers which are made of thin rubber latex sheath to cover the penis or vagina in males and females respectively are called condoms.
- They also prevent the spread of sexually transmitted diseases.
- Condoms trap the ejaculate and prevent semen from entering the vagina.
- **Example:** Nirodh is a popular brand of condoms for males.

► Diaphragms, Cervical Caps and Vaults

- It is made up of rubber which is inserted in female reproductive tract to cover the cervix during coitus to prevent conception by blocking the entry of sperms through the cervix.
- Spermicidal creams, jellies and foams are usually used along with them to increase their contraceptive efficiency.

III. Intra Uterine Devices

- Inserted by doctors in the uterus through the vagina which increases the phagocytosis of sperms within the uterus.
- These are available as non-medicated IUDs such as lippes loop, copper releasing IUDs such as Cu-T, Cu-7, multiload-375 and hormone releasing IUDs such as LNG-20, Progestasert etc.

IV. Oral Contraceptive Pills

- Small doses of progesterone or progesterone-estrogen combinations are used by the females in the form of tablets popularly called **pills**.
- These are taken daily for 21 days starting from the fifth day of menstrual cycle and after a gap of 7 days, it has to be repeated again.

- Hormonal pills prevent ovulation and implantation by inhibiting the secretions of FSH and LH from the pituitary glands.

- **Example:** Saheli, an oral contraceptive pill is a non-steroid preparation used by females.

V. Injections of Hormones

- Progesterone along with other estrogen is used by females as injections under the skin. The effective period is longer than pills but action is similar.

VI. Surgical Methods

These are irreversible methods used by male/female partner to prevent any more pregnancies. Surgical or sterilisation methods used are:

► Vasectomy

- The sterilisation process in males is called vasectomy.
- In this process, a small part of the vas deferens is removed or tied up through a small incision on the scrotum.

► Tubectomy

- The sterilisation procedure in the females is called as tubectomy.
- In this method, a small part of the Fallopian tube is removed or tied up through a small incision in the abdomen or through vagina.

► Medical Termination of Pregnancy (MTP)

- Intentional or voluntary termination of pregnancy is called medical termination of pregnancy.
- Medical termination of pregnancy is also termed as **induced abortion**.
- MTPs are used to get rid of unwanted pregnancies and the pregnancies which could be harmful or fatal to the mother or to the foetus or both.
- MTPs are safe up to 12 weeks *i.e.*, the first trimester of pregnancy.
- Government of India legalised MTP in 1971 with strict conditions to avoid misuse.

► Sexually Transmitted Diseases (STDs)

- Diseases which are transmitted through sexual intercourse with infected person are called sexually transmitted diseases or venereal diseases or Reproductive Tract Infections (RTI).
- Gonorrhea, syphilis, genital herpes, genital warts, hepatitis-B, AIDS, chlamydiasis are sexually transmitted diseases.
- STDs can transmit through the following means:
 - Sexual contact with infected persons.
 - Sharing of needles or surgical instruments contaminated with infected blood.
 - Transfusion of contaminated blood.
 - STDs, can also be transmitted from an infected mother to the foetus.
- STDs can be prevented by taking preventive measures like:
 - Avoid sex with unknown persons or multiple persons.
 - Always use condoms during sex.
 - If the early symptoms like itching, fluid discharge, slight pain, swellings occur in the genital regions, one must consult a doctor.
- STDs, if left untreated, can lead to Pelvic Inflammatory Diseases (PID), abortions, still births, ectopic pregnancies, infertility or even cancer of the reproductive tract.

► Infertility

- Inability to give birth to a child or inability to conceive is called Infertility.
- The reasons for Infertility can be physical, hereditary, drugs, immunological, psychological etc.
- The couples could be assisted to have their own child through certain special techniques called as **Assisted Reproductive Technologies (ART)**.

► Assisted Reproductive Technologies: Some of the methods are:

► In Vitro Fertilisation (IVF)

- IVF involves fertilisation of ovum outside the body followed by **Embryo Transfer (ET)**.
- Ova from the wife/donor female and sperms from the husband/donor male are collected and are induced to form zygote under stimulated conditions in the laboratory.
- The zygote is then transferred into the Fallopian tube called as **Zygote Intra Fallopian Transfer (ZIFT)**.
- If the embryo is with more than 8 blastomeres, it is transferred into the uterus called as **Intra Uterine Transfer (IUT)**.

- The transferred embryo completes its further development within the uterus.

Knowledge BOOSTER

- Dr. Robert Edwards got 2010 Nobel prize for developing a technique for production of test tube baby.
- A woman who substitutes or takes the place of the real mother to nurse the embryo is called surrogate mother.

- **Gamete Intra Fallopian Transfer (GIFT):** Here, ovum is collected from a donor female and is transferred into the Fallopian tube of another female who cannot produce ovum, but can provide suitable environment for fertilisation and further development of embryo.
- **Intra Cytoplasmic Sperm Injection (ICSI):** In this method, sperm is directly injected into the ovum under laboratory conditions.
- **Artificial Insemination or Intra Uterine Insemination:** Here, the semen collected either from the husband or a healthy donor is artificially introduced either into the vagina or into the uterus of the female.



Practice Exercise



Multiple Choice Questions

Q 1. Which of the following is ART?

- a. IUDs b. GIFT c. ZIFT d. Both b. and c.

Q 2. The technique called Gamete Intra Fallopian Transfer (GIFT) is recommended for those females:

- a. who cannot produce an ovum.
b. who cannot retain the foetus inside uterus.
c. who cannot provide suitable environment for fertilisation.
d. All of the above

Q 3. Increased IMR and decreased MMR in a population will:

- a. cause rapid increase in growth rate.
b. result in decline in growth rate.
c. not cause significant change in growth rate.
d. result in an explosive population.

Q 4. A national level approach to build up a reproductively healthy society was taken up in our country in:

- a. 1950s b. 1960s c. 1980s d. 1990s

Q 5. Which of the following correctly describes the measures that can be used to control over population?

- a. Educating people about the advantages of a small family.
b. Raising the age of marriage.
c. Encouraging family planning programme.
d. All of the above

Q 6. Amniocentesis is a technique used to:

- a. determine errors in amino acid metabolism in embryo.
b. pinpoint specific cardiac ailments in embryo.
c. determine any hereditary genetic abnormality in embryo.
d. All of the above

Q 7. Emergency contraceptives are effective if used within:

- a. 72 hrs of coitus
b. 72 hrs of ovulation
c. 72 hrs of menstruation
d. 72 hrs of implantation

Q 8. Condoms are one of the most popular contraceptives because of the following reasons:

- a. these are effective barriers for insemination.
b. they do not interfere with coital act.
c. these help in reducing the risk of STDs.
d. All of the above

Q 9. The correct surgical procedure as a contraceptive method is:

- a. ovariectomy b. hysterectomy
c. vasectomy d. castration

Q 10. Which of the following is not a characteristic of an ideal contraceptive?

- a. User-friendly b. Irreversible
c. Easily available d. Least side-effects

Q 11. The most important component of oral contraceptive pills is:

- a. progesterone-estrogen b. growth hormone
c. thyroxine d. Luteinizing hormone

Q 12. What is true about "Saheli"?

- (i) Developed at the CDRI, Lucknow
(ii) Contains a steroidal preparation
(iii) "Once-a-week" pill
(iv) Many side effects
(v) High contraceptive value
(vi) Very few side effects value
(vii) Low contraceptive value

- a. (i), (ii), (iii), (v), (vi) b. (i), (iii), (v), (vi), (vii)
c. (i), (ii), (iii), (iv), (v) d. (i), (iii), (iv), (v)

- Q 13. World AIDS day is observed on:
 a. December 21 b. December 1
 c. November 1 d. June 11
- Q 14. From the sexually transmitted diseases mentioned below, identify the one which does not specifically affect the sex organs?
 a. Syphilis b. AIDS
 c. Gonorrhoea d. Genital warts
- Q 15. Which one of the following groups includes sexually transmitted diseases caused by bacteria only?
 a. Syphilis, gonorrhoea, chancroid
 b. Syphilis, chlamydisis, chancroid
 c. Syphilis, gonorrhoea, scabies
 d. Syphilis, scabies, pediculosis
- Q 16. During parturition, a pregnant woman is having prolonged labour pains and childbirth has to be fastened. It is advisable to administer a hormone that can: (CBSE SQP 2021, Term-1)
 a. Increase the metabolic rate
 b. release glucose in the blood
 c. stimulate the ovary
 d. activate smooth muscles
- Q 17. A female undergoing IVF treatment has blocked Fallopian tubes. The technique by which the embryo with more than 8 blastomeres will be transferred into the female for further development is: (CBSE SQP 2021, Term-1)
 a. ZIFT b. GIFT c. IUT d. AI

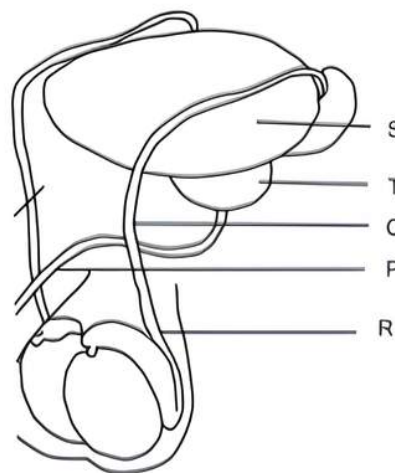
- Q 18. Given below are Column A with a list of certain Assisted Reproductive Technologies (ART) and in Column B the procedures followed during ART:

Column A		Column B	
S. No.	Names of ART	S. No.	Procedures
(A)	GIFT	(i)	Transfer of ovum from a donor into the Fallopian tube of another female.
(B)	ICSI	(ii)	Transfer of semen from the donor into the vagina of the female.
(C)	ZIFT	(iii)	Injecting sperms directly into the ovum.
(D)	IUI	(iv)	Transfer of early embryos into the Fallopian tube.

Choose the option where ART correctly matches with the procedure. (CBSE 2023)

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

- Q 19. The mode of action of the copper ions in an IUD is to: (CBSE SQP 2021, Term-1)
 a. Increase the movement of sperms
 b. decrease the movement of the sperms
 c. make the uterus unsuitable for implantation
 d. make the cervix hostile to the sperms
- Q 20. An IUD recommended to promote the cervix hostility to the sperms is : (CBSE 2021, Term-1)
 a. Cu-T b. Multiload-375
 c. LNG-20 d. Cu-7
- Q 21. Identify the disease which is not a sexually transmitted disease. (CBSE 2021, Term-1)
 a. Gonorrhoea b. Syphilis
 c. Amoebiasis d. Chlamydisis
- Q 22. A human male decides to adopt a surgical method for contraception. Identify the point in the diagram where a cut would be made and tied. (CBSE 2023)



- a. Point S b. Point R c. Point Q d. Point P



Assertion & Reason Type Questions

Directions (Q.Nos. 23-32): Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Select the correct answer to these questions from the codes a, b, c and d as given below.

- a. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 b. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 c. Assertion is true but Reason is false.
 d. Assertion is false but reason is true.

- Q 23. Assertion (A): Sponge and delphin are chemical methods of contraception.
 Reason (R): Diaphragms and cervical caps are disposable barrier method of contraception.
- Q 24. Assertion (A): Fetal chromosomal disorders can be diagnosed by chorionic villi sampling.
 Reason (R): Karyotyping can be done for mitotically dividing cells of chorionic villi.
- Q 25. Assertion (A): Generally, a woman does not conceive during the lactation period.
 Reason (R): The hormone prolactin initiates and maintains lactation in a postpartum woman.

Q 26. Assertion (A): PCR, ELISA, DNA hybridisation are confirmatory tests for sexually transmitted diseases.

Reason (R): Incidence of STDs is very high in persons above the age of 30.

Q 27. Assertion (A): Determining the sex of an unborn child followed by MTP is an illegal practice.

Reason (R): Amniocentesis is a practice to test the presence of genetic disorders also. (CBSE 2023)

Q 28. Assertion (A): Lactational amenorrhea is the natural method of contraception.

Reason (R): It increases the phagocytosis of sperm. (CBSE SQP 2021, Term-1)

Q 29. Assertion (A): Saheli, an oral contraceptive for females, contains a steroidal preparation.

Reason (R): It is a "once a week" pill with very few side-effects. (CBSE SQP 2021, Term-1)

Q 30. Assertion (A): Parturition is induced by a complex neuroendocrine mechanism.

Reason (R): At the end of gestation period, the maternal pituitary releases prolactin which causes uterine contractions. (CBSE SQP 2021, Term-1)

Q 31. Assertion (A): Very often persons suffering from Sexually Transmitted Diseases (STDs) do not go for timely detection and proper treatment.

Reason (R): Absence or less significant symptoms in the early stages of STDs and the social stigma attached to the disease. (CBSE 2021, Term-1)

Q 32. Assertion (A): Vasectomy is a sterilisation procedure advised for females as a terminal method.

Reason (R): In vasectomy, a small part of the vas deferens is removed or tied by blocking gamete transport therefore preventing conception. (CBSE 2021, Term-1)

Answers

1. (d) Both b. and c.

Both GIFT and ZIFT are the Assisted Reproductive Technologies (ART). Intra Uterine Device (IUD) is a method of birth control.

2. (a) who cannot produce an ovum.

Gamete Intra Fallopian Transfer (GIFT) is transfer of an ovum collected from a donor into the Fallopian tube of another female who cannot produce ova but can provide proper environment for fertilisation and further development.

3. (b) result in decline in growth rate

4. (a) 1950s

5. (d) All of the above

6. (c) determine any hereditary genetic abnormality in embryo.

In amniocentesis, amniotic fluid containing cells from the skin of the foetus and other sources is withdrawn with a syringe. These cells are then examined to detect certain biochemical, enzymatic and hereditary genetic abnormalities in embryo. But now-a-days, it is being misused to determine the sex of the foetus so that the female foetus may be aborted.

7. (a) 72 hrs of coitus

Fertilisation takes place after 24 to 48 hours of coitus and Implantation takes place after 6-7 days. If the morning after sex pill of the contraceptives is taken after 72 hours.

8. (d) All of the above

9. (c) vasectomy

Vasectomy is the process of sterilisation in a surgical contraceptive method. In this method, a part of the vas deferens is removed or tied.

10. (b) Irreversible

11. (a) progesterone-estrogen

Birth control pills (oral contraceptives) check ovulation in female by inhibiting the secretion of FSH and LH that are necessary for ovulation. It contains small doses of either progesterone alone or a combination of progesterone and estrogen (combined pill).

12. (d) (i), (iii), (iv), (v)

13. (b) December 1

14. (b) AIDS

15. (a) Syphilis, gonorrhoea, chancroid

16. (d) activate smooth muscles

During birth, prostaglandins initiate the contraction in smooth muscles of uterine wall which causes labour pains. The pressure of foetus's head against the cervix and sends signals to make hypothalamus to trigger the release of oxytocin from posterior pituitary. Together, oxytocin (OT) and prostaglandins stimulate strong uterine muscle contraction forcing the foetus downwards and thereby expelling it out of uterus. Thus, to hasten the childbirth, it is advisable to administer the hormone that stimulates uterine smooth muscle contraction, i.e. oxytocin.

17. (b) GIFT

GIFT is the technique by which the embryo with more than 8 blastomeres will be transferred into the female for further development.

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

19. (b) decrease the movement of the sperms

The presence of the IUD in the uterine cavity creates a local inflammatory reaction that appears

to prevent sperm from reaching the Fallopian tubes. In addition, copper-bearing IUDs release copper inside the uterus and the Fallopian tubes, enhancing the debilitating effect on sperm thereby decreasing their movement.

20. (c) LNG – 20. 21. (c) Amoebiasis. 22. (c) Point Q
23. (c) Assertion is true but Reason is false.
Diaphragms, cervical caps and vaults are made of rubber, inserted into the female reproductive tract to cover the cervix before coitus. They prevent fertilisation by blocking the entry of sperms through the cervix. These barriers are reusable.
24. (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
During early pregnancy, fetal chromosomal disorders can be diagnosed using chorionic villi sampling. In this technique the physician inserts a narrow, flexible tube through the mother's vagina and cervix into the uterus (guided by ultrasound) and withdraws a small amount of fetal tissue (chorionic villi) from the placenta. Because the cells of the chorionic villi are undergoing rapid mitosis, these cells can be used for karyotyping.
25. (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
Milk secretion is maintained as long as breast feeding, and hence hormone production continues. A woman does not conceive during the lactation period because lactation stimulates prolactin secretion and there is evidence that prolactin inhibits GnRH secretion, and antagonises the action of gonadotropins on the ovaries. Ovulation is inhibited, and the ovaries are inactive, so estrogen and progesterone output falls to low levels. Thus during lactation a woman does not conceive. Only 5-10% chances are there during lactation period. This can also be interpreted as mechanism devised by nature so that mother can look after the newborn child by providing it with milk.
26. (c) Assertion is true but Reason is false.
STDs are a major threat to healthy society. Incidence of STDs is very high in persons who have 15-24 years of age.
27. (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
28. (c) Assertion is true but Reason is false.
Lactational amenorrhea means absence of menstruation and is based on the fact that ovulation and therefore the cycle does not occur during the period of intense lactation. So, it is called as the natural method of contraception. But it does not increase the phagocytosis of sperms.
29. (d) Assertion is false but Reason is true.
Saheli is a new oral contraceptive for the females that contains a non-steroidal preparation. It is once a week pill with very few side effects and high contraceptive value.
30. (c) Assertion is true but Reason is false.
The process of delivery of the foetus (childbirth) is called parturition. Parturition is induced by a complex neuroendocrine mechanism. The signals

for parturition originate from the fully developed foetus and the placenta which induce mild uterine contractions called foetal ejection reflex. This triggers release of oxytocin from the maternal pituitary. Oxytocin acts on the uterine muscle and causes stronger uterine contractions, which in turn stimulates further secretion of oxytocin. The stimulatory reflex between the uterine contraction and oxytocin secretion continues resulting in stronger and stronger contractions. This leads to expulsion of the baby out of the uterus through the birth canal.

31. (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
32. (d) Assertion is false but Reason is true.



Case Study Based Questions

Case Study 1

Birth Control

Over population causes number of family problems. Strategies like birth control methods help to control population explosion. Natural methods of birth control do not involve medications or devices to prevent pregnancy but rather rely on behavioural practices and/or making observations about menstrual cycle.

- Q 1. Which method helps in contraception by temporary absence of sex?
- Coitus interruptus
 - Withdrawal method
 - Rhythm method
 - Lactational amenorrhea method
- Q 2. On which days of menstrual cycle should coitus be avoided to prevent fertilisation?
- 10-17
 - 6-13
 - 1-5
 - 15-28
- Q 3. Why is lactational amenorrhea effective for about 4-5 months after parturition?
- Ovulation occurs on about the 14th day of menstruation.
 - Ovulation does not occur during intense lactation.
 - This method inhibits mobility of sperms.
 - Both b. and c.
- Q 4. Which fact is not the basis of periodic absence method of birth control?
- Ovum remains alive for about 1-2 days.
 - Ovulation occurs on about 14th day of menstruation.
 - Sperms survive for about 3 days.
 - Alteration in uterine endometrium.
- Q 5. Assertion (A): The effectiveness of coitus interruptus method is limited.
Reason (R): Some sperms may pass into vagina before ejaculation.
- Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - Assertion is true but Reason is false.
 - Both Assertion and Reason are false.

1. (c) 2. (a) 3. (b) 4. (d) 5. (a)

Case Study 2

Barrier Method of Contraception

Intra uterine devices are most widely accepted methods of contraception. These are used by females and are inserted by doctor or nurses in the uterus through vagina. However these devices are not recommended for those who eventually intend to conceive.

- Q 1. How does Cu prevent conception?**
- a. Cu ions make uterus unsuitable for implantation.
 - b. Cu ions make cervix hostile to the sperms.
 - c. Cu ions suppress sperms motility.
 - d. Cu ions inhibit ovulation.
- Q 2. Which of the following IUDs makes uterus unsuitable for implantation?**
- a. LNG-20
 - b. Multiload 375
 - c. Cu-7
 - d. Lippes' loop
- Q 3. Identify the correct statement for IUDs.**
- a. They slowly release synthetic progesterone in the body.
 - b. They increase phagocytosis of sperms within the uterus.
 - c. They block entry of sperms through the cervix.
 - d. Both b. and c.
- Q 4. Select the correctly they matched pair:**
- a. Hormone releasing IUD - LNG-20
 - b. Non-medicated IUD - Progestasert
 - c. Copper releasing IUD - Lippes' loop
 - d. None of the above
- Q 5. Assertion (A): IUDs can cause excess menstrual bleeding and pain.**

Reason (R): IUDs can perforate uterus.

- Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- Assertion is true but Reason is false.
- Assertion is false but Reason is true.

1. (c) 2. (a) 3. (b) 4. (a) 5. (b)

Case Study 3

Infertility

A young couple married for 5 years is unable to bear a child inspite of not practising any birth control method. Upon consultation, doctor advised them an assisted reproductive technology involving transfer of gametes into oviducts.

- Q 1. Identify the technique adopted by the couple.**
- | | |
|---------|---------|
| a. ZIFT | b. IUI |
| c. GIFT | d. ICSI |

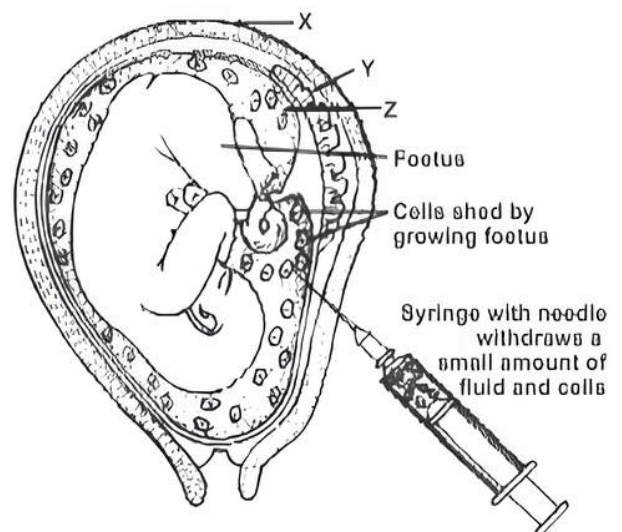
- Q 2. What is the pre-requisite of this technique?**
- a. Gamete formation should be normal.
 - b. Fallopian tubes should be normal.
 - c. Female should have thick endometrial lining.
 - d. Male should be able to copulate the female.
- Q 3. What is the success rate of this procedure?**
- a. 30-50%
 - b. <20%
 - c. 80-85%
 - d. 27-30%
- Q 4. The procedure advised to couple involves the transfer of:**
- a. fertilised ovum
 - b. embryo with 8 blastomeres
 - c. sperms and unfertilised ovum
 - d. embryo with 16 blastomeres
- Q 5. Assertion (A):** GIFT is an *in vitro* fertilisation technique.
- Reason (R):** In GIFT, gametes are fertilised outside the female body.
- a. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. Assertion is true but Reason is false.
 - d. Both Assertion and Reason are false.

1. (c) 2. (b) 3. (d) 4. (c) 5. (d)

Case Study 4

Amniocentesis

A technique known as amniocentesis is used to determine fetal abnormalities. This test is based on the chromosomal pattern in amniotic fluid. However, this technique is legally banned now.



Read the given passage carefully and give the answer of the following questions:

- Q 1. What is amniocentesis?**
Ans. Amniocentesis is a technique used to determine fetal abnormalities.

Q 2. Identify X and Y in the given figure.

Ans. X is Uterine wall, and Y is Placenta.

Q 3. What is the function of Z?

Ans. Z is an amniotic fluid which prevents dessication of an embryo.

OR

Mention a non-invasive technique of detecting fetal disorder.

Ans. Ultrasound imaging is a non-invasive technique of detecting fetal disorder.

Case Study 5

Sexually Transmitted Disease

A 23 year old Sahil has been diagnosed with an infection of reproductive tract caused by bacteria. He complains about burning sensation during urination, pus-containing discharge and pain around genitalia. This infection has incubation period of 2-5 days but can be cured.

Read the given passage carefully and give the answer of the following questions:

Q 1. From which disease is Sahil suffering?

Ans. Sahil is suffering from gonorrhoea.

Q 2. Which reproductive tract infections is transmitted by bacteria?

Ans. Chancroid is transmitted by bacteria.

Q 3. Which mode of treatment would be useful for Sahil?

Ans. Use of antibiotic ampicillin would be useful for Sahil.

OR

What technique was used to diagnose Sahil's disease?

Ans. Gram staining of discharge and culture was used to diagnose Sahil's disease.



Very Short Answer Type Questions

Q 1. The present population growth rate in India is alarming. Suggest ways to check it.

Ans. The ways to check population growth rate are:

- (i) By increasing marriageable age.
- (ii) By promoting use of birth control measures.
- (iii) By educating people about consequences of uncontrolled population growth.

Q 2. Expand MMR and IMR.

Ans. MMR – Maternal Mortality Rate

IMR – Infant Mortality Rate.

Q 3. A mother of one-year old daughter wanted to space her second child. Her doctor suggested Cu-T. Explain its contraceptive actions.

Ans. Cu-T increases phagocytosis of sperms within the uterus and the Cu^{2+} ions released suppress sperm motility and the fertilising capacity of sperms.

Q 4. Why is tubectomy considered a contraceptive method?

Ans. Tubectomy involves cutting a piece of the Fallopian tube and tying its ends. This way, the sperms are not able to reach the egg and so fertilisation cannot take place. Thus, it acts as a contraceptive method.

Q 5. What general term is given to the method in which the male partner withdraws his penis from the vagina just before ejaculation so as to avoid insemination?

Ans. Coitus interruptus is such a method.

Q 6. What are the commonly used barrier methods of contraception?

Ans. Condoms, diaphragms, cervical caps and vaults are the commonly used barrier methods of contraception.

Q 7. A newly married couple does not want to produce children at least for one year and also not to use any contraceptives. Suggest a method to prevent pregnancy.

Ans. Periodic abstinence or coitus interruptus can be used to prevent pregnancy.

Q 8. Why do intensely lactating mothers not generally conceive?

Ans. Due to suppression of gonadotropins, ovulation and menstrual cycle do not take place in lactating mothers. So, they do not generally conceive.

Q 9. Name the surgical methods of contraception.

Ans. Vasectomy in males and tubectomy in females are the surgical methods of contraception.

Q 10. What is sterilisation?

Ans. Sterilisation is a surgical method to block gamete transport and thereby prevent conception.

Q 11. What is meant by artificial insemination?

Ans. Artificial insemination is a technique by which semen collected from the husband or a healthy donor is artificially introduced either into the vagina or into the uterus of the female.

Q 12. Mention any two events that are inhibited by the intake of oral contraceptive pills to prevent pregnancy in humans.

Ans. Two events that are inhibited by the intake of oral contraceptive pills to prevent pregnancy in humans are ovulation and implantation.

Q 13. Our government has intentionally imposed strict conditions for MTP in our country. Justify giving a reason.

Ans. The Government has imposed strict conditions for MTP to prevent female foeticide, to maintain sex ratio and to avoid any danger for (young) mother and foetus.

Q 14. Government of India has raised the marriageable age of female to 18 years and of males to 21 years. Suggest any two more measures adopted by Government for the purpose.

Ans. The measures adopted by government for the purpose are:

- (i) Incentives given to couples with small families.
- (ii) Media publicity through posters of happy couples with two children (Hum Do Humare Do).
- (iii) Motivation to promote smaller families by using contraceptive methods. (Any two)

Q 15. A doctor has observed the chromosomal disorders in developing foetus and advised the couple to undergo abortion. Suggest the technique by which doctor absorbed the chromosomal disorders.

OR

Give the technical term for foetal sex determination test based on the chromosomal pattern in the amniotic fluid surrounding the developing embryo.

Ans. Amniocentesis is such a technique.

Q 16. Expand IUD and MTP.

Ans. IUD – Intra Uterine Device

MTP – Medical Termination of Pregnancy.

Q 17. Name the causative agent of AIDS.

Ans. Human Immunodeficiency Virus (HIV) is the causative agent of AIDS.

Q 18. Name two sexually transmitted diseases caused by bacteria.

Ans. Syphilis and gonorrhoea are the sexually transmitted diseases caused by bacteria.

Q 19. Mention early symptoms of STDs.

Ans. Early symptoms of STDs include itching, fluid discharge, slight pain and swellings in the genital region.

Q 20. Expand ZIFT and RTI.

Ans. ZIFT – Zygote Intra Falloplan Transfer

RTI – Reproductive Tract Infection.

Q 21. At what stage zygote can be introduced in the Falloplan tube in Zygote Intra Falloplan Transfer (ZIFT)?

Ans. Zygote can be introduced in the Falloplan tube in ZIFT at 8-celled stage.



Short Answer Type Questions

Q 1. At the time of Independence, the population of India was 350 million, which exploded to over 1 billion by May 2000. List any two reasons for this rise in population and any two steps taken by the government to check this population explosion.

Ans. Two reasons for increase in population are:

(i) A rapid decline in death rate, maternal mortality rate and infant mortality rate.

(ii) Increase in number of people in reproductive age.

Two steps for checking population explosion:

(i) Statutory rise of marriageable age of the female to 18 years and male to 21 years.

(ii) Incentives given to couples with small families.

Q 2. What is amniocentesis? Why has the government imposed a statutory ban in spite of its importance in the medical field?

Ans. Amniocentesis is a foetal sex determination test based on the chromosomal pattern in cells extracted from the amniotic fluid, surrounding the developing embryo.

Amniocentesis is used for sex determination, which most people go for, to kill female foetus. Therefore, it has been banned.

Q 3. Describe the lactational amenorrhea method of birth control.

Ans. Lactational amenorrhea is based on the principle that during the period of intense lactation after parturition, menstrual cycle or ovulation does not occur.

Q 4. Describe the chemical methods of birth control.

Ans. Chemical methods of birth control are as follows:

(i) Spermicidal creams, jellies and foams are introduced in the vagina just before coitus that kills sperms.

(ii) Pills are taken as oral contraceptive that inhibits ovulation and thus implantation.

Q 5. Bring out one main difference between Cu-T and LNG-20.

Ans. Cu-T is copper releasing IUDs.

Cu^{2+} ions released suppress sperm motility and thus the fertilising capacity of sperms decreases.

LNG-20 is hormone releasing IUDs.

While the hormone releasing IUDs make the uterus unsuitable for implantation and the cervix hostile to the sperms.

Q 6. Why is Cu-T considered a good contraceptive device to space children?

Ans. Cu-T is an ideal contraceptive device for human females because of the following reasons:

(i) Cu^{2+} ions released suppress sperm motility and fertilising capacity of sperms.

(ii) It increases phagocytosis of sperms within the uterus.

Q 7. How do copper and hormone releasing IUDs act as contraceptives? Explain.

Ans. Copper and hormone releasing IUDs act as contraceptives in the following ways:

(i) The copper releasing IUDs release Cu ions, which suppress sperm motility and the fertilising capacity of sperms.

(ii) The hormone releasing IUDs make the uterus unsuitable for implantation and the cervix hostile to the sperms.

Q 8. Explain how do the following act as contraceptives:

(i) 'Cu-T'

(ii) 'Saheli'

Ans. (i) Cu^{2+} ions released suppress sperm motility and lowers the fertilising capacity of sperms.

(ii) Saheli inhibits ovulation, implantation, as well as alter the quality of cervical mucus to prevent or retard the entry of sperms.

Q 9. Name an oral pill used as a contraceptive by human females. Explain how it prevents pregnancy.

Ans. 'Saheli' is an oral pill used as a contraceptive by females.

Oral pills inhibit ovulation and implantation, as well as, alter the quality of cervical mucus to prevent or retard entry of sperms. Thus, fertilisation and further pregnancy is prevented.

Q 10. Why is 'Saheli' considered to be an improved form of oral contraceptive for human female?

Ans. 'Saheli' contains a non-steroidal preparation and is once-a-week pill with high contraceptive value and very less side-effects. Therefore, it is considered an improved form of contraceptive pills.

Q 11. A couple where both husband and wife are producing functional gametes, but the wife is still unable to conceive, is seeking medical aid. Describe any one method that you can suggest to this couple to become happy parents.

Ans. Methods: IVF/ZIFT/AI

IVF (In Vitro Fertilisation): Ova from wife and sperm from the husband is collected. It is induced to form zygote under simulated laboratory conditions.

COMMON ERROR

Students give wrong explanation of the method or write incorrect procedure for the mentioned method.

Q 12. A childless couple has agreed for a test tube baby programme. List only the basic steps the procedure would involve to conceive the baby.

Ans. The steps involved to conceive the baby are:

- (i) Extraction of gametes from parents.
- (ii) In vitro fertilisation.
- (iii) Transfer of zygote (at 8 blastomere stage) into the Fallopian tube.

Q 13. Why is the term test tube baby a misnomer?

Ans. The term test tube is a misnomer because the baby is not developed in the test tube but only fertilisation is carried out in the laboratory conditions (in vitro). The fertilised egg (zygote) or early embryo is then transferred into the Fallopian tube or uterus of the mother where it develops and a normal baby is born.

Q 14. An infertile couple is advised to adopt test tube baby programme. Describe two principle procedures adopted for such technologies.

Ans. The two principle procedures adopted for such technologies are:

- (i) **IVF/In Vitro Fertilisation:** It is the fertilisation of gametes outside the body in almost similar conditions as that in the body.
- (ii) **ET/Embryo Transfer:** In it, the embryos formed by fusion of gametes is transferred into reproductive tract or uterus.



Long Answer Type-I Questions

Q 1. If implementation of better techniques and new strategies are required to provide more efficient care and assistance to people, then why is there a statutory ban on amniocentesis? Write the use of this technique and give reason to justify the ban.

Ans. There is a statutory ban on amniocentesis to legally check female foeticide. This sex determination technique has been misused to eliminate girl child before birth.

This technique is also used to detect the abnormal chromosomes or any genetic disorder.

The ban is justified to prevent female foeticide which could lead to change in sex ratio of the population.

Q 2. Answer the following questions:

(i) Mention the problems that are taken care of by Reproduction and Child Healthcare programme.

(ii) What is amniocentesis and why there is a statutory ban on it?

Ans. (i) Reproduction and Child Healthcare programmes take care of uncontrolled population growth, STDs and social evils like sex abuse and sex related crimes.

(ii) Foetal sex determination tests based on chromosomal pattern in the amniotic fluid to study chromosomal abnormalities in the foetus is called amniocentesis.

It is banned so as to legally check female foeticide.

Q 3. (i) Name any two copper releasing IUDs.

(ii) Explain how they act as effective contraceptives in human females.

Ans. (i) Cu-T, Cu-7 are copper releasing IUDs.

(ii) IUDs function by either of the following mechanism: suppress sperm motility or suppress fertilising capacity of sperms and increase phagocytosis of sperms within uterus.

Q 4. Name two hormones that are constituents of contraceptive pills. Why do they have high and effective contraceptive value? Name a commonly prescribed non-steroidal oral pill.

Ans. Progesterone-estrogen combination, Progesterone or Progesterone are present in contraceptive pills.

They inhibit ovulation, implantation and alter quality of cervical mucus to retard entry of sperm. Saheli is a commonly prescribed non-steroidal oral pill.

Q 5. Name and explain a surgical contraceptive method that can be adopted by the male partner of a couple. (CBSE 2023)

Ans. One surgical contraceptive method that can be adopted by male partner of a couple is vasectomy. In this procedure, the vas deferens, the tube that carries sperm from the testicles to the urethra, is cut or blocked. This prevents the release of sperm during

ejaculation and therefore, fertilisation does not occur. Vasectomy is a permanent form of contraception and is a simple and safe procedure that can be performed under local anaesthesia. It does not affect the sexual performance or libido of the male and has a very low failure rate.

Q 6. (i) Expand IUD.

(ii) Why is hormone releasing IUD considered a good contraceptive to space children?

Ans. (i) IUD – Intra Uterine Devices.

(ii) Hormone releasing IUDs are considered a good contraceptive because of the following reasons:

- (a) They make the uterus unsuitable for implantation.
- (b) They increase the phagocytosis of sperms within uterus and the Cu ions released suppress sperm motility and the fertilising capacity of sperms.

Q 7. A woman has certain queries as listed below, before starting with contraceptive pills. Answer them.

(i) What do contraceptive pills contain and how do they act as contraceptives?

(ii) What schedule should be followed for taking these pills?

Ans. (i) Contraceptive pills contain progestogen or progestogen-estrogen combination.

They act as contraceptives by either of the following way:

- (a) inhibit ovulation
- (b) inhibit implantation
- (c) alter quality of cervical mucus to prevent or retard entry of sperms.

(ii) Contraceptive pills should be taken daily for a period of 21 days starting within first five days of menstrual cycle (to be repeated after a gap of 7 days).



TIP

Learn the correct schedule for contraceptives as well as their actions.

Q 8. A pregnant human female was advised to undergo MTP. It was diagnosed that the fetus she was carrying had developed from a zygote having 45 chromosomes with only one X chromosome.

(i) What is this condition called and how does it arise?

(ii) Why was she advised to undergo MTP?

(CBSE SQP 2023-24)

Ans. (i) The embryo has Turner's syndrome due to aneuploidy of the sex chromosome. Such a disorder is caused due to the absence of one of the X chromosomes, i.e., 45 with XO.

(ii) She was advised MTP as the child will have the following problems:

- (a) rudimentary ovaries
- (b) poorly developed breasts
- (c) lack of other secondary sexual characters
- (d) delayed or no onset of the menstrual cycle and infertile.

Q 9. Within what age group Sexually Transmitted Diseases (STDs) are reported to be very high? Mention three practices to avoid them.

Ans. In the age group of 15-24 years, STDs are reported to be very high. Following are the three practices to avoid them:

- (i) Abstain sexual contact with unknown partners or multiple partners.
- (ii) Always use condoms during coitus.
- (iii) In case of any doubt, medical help should be taken for early detection.

Q 10. Expand and explain the following techniques used in the Test Tube Baby programme: (CBSE 2023)

(a) GIFT (b) ZIFT (c) IUI

Ans. (i) **GIFT:** GIFT stands for Gamete Intra Falloplan Transfer. It is the transfer of an ovum collected from a donor into the Fallopan tube of another female, who cannot produce one but can provide suitable environment for fertilisation and further development of the embryo.

(ii) **ZIFT:** ZIFT stands for Zygote Intra Falloplan Transfer. In this process, the zygote or early embryo with up to 8 blastomeres is transferred into the Fallopan tube.

(iii) **IUI:** IUI stands for Intrauterine. It is also called artificial insemination. It is the process of injecting sperm directly into a woman's uterus using a catheter to assist conception in an infertile couple.



Long Answer Type-II Questions

Q 1. Describe the various methods of birth control.

Ans. **Methods of birth control:** The contraceptive methods or methods of birth control are divided into following categories:

- (i) Natural/traditional methods
- (ii) Barrier methods
- (iii) Intra Uterine Devices (IUDs)
- (iv) Oral contraceptives
- (v) Injections and implants
- (vi) Surgical methods.

Natural methods: These are methods that work on the principle of avoiding the meeting of ovum and sperm.

(i) **Periodic abstinence** is a method in which a couple avoids or abstains from coitus from day 10-17 of the menstrual cycle, when ovulation is expected to occur.

(ii) **Coitus Interruptus** or **withdrawal** is a method in which male partner withdraws his penis from the vagina just before ejaculation so as to avoid insemination.

(iii) **Lactational amenorrhea** is based on the principle that during the period of lactation after parturition, ovulation does not occur.

Barrier method: These methods prevent the contact of sperm and ovum with the help of barriers. Such methods are available for both males and females.

(i) **Condoms** are barriers made of thin rubber/latex sheath used to cover the penis in the male or vagina and cervix in females. It prevents the deposition of ejaculated semen into the vagina of the female.

(ii) **Diaphragms, cervical caps and vaults** are the barriers made of rubber that are inserted into the female reproductive tract to cover the cervix during coitus. They prevent the entry of sperms through cervix.

(iii) **Spermicidal creams, jellies and foams** are used along with these barriers to increase their contraceptive efficiency.

Intra Uterine Devices (IUDs): These devices are inserted by doctors in the uterus through vagina. There are three types of IUDs available:

(i) **Non-medicated IUDs:** These increase phagocytosis of sperms within the uterus. e.g., Lippes' loop.

(ii) **Copper releasing IUDs:** Along with phagocytosis of sperms, the copper ions released suppress sperm motility and fertilising capacity of sperms. e.g., Cu-T, Cu-7, Multiload 375.

(iii) **Hormone releasing IUDs:** These make the uterus unsuitable for implantation and the cervix hostile to sperms. e.g., Progestasert, LNG-20.

Oral Contraceptives

(i) This involves uptake of hormonal preparations of either **progestogens** or **progestogen-estrogen combinations** in the form of pills by females.

(ii) They inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent entry of sperms.

(iii) **'Saheli'**, an oral contraceptive for females containing a non-steroidal preparation was developed by scientists at Central Drug Research Institute (CDRI) in Lucknow.

(iv) Pills have high contraceptive value and few side effects.

Injections and Implants

(i) Progestogens or progestogen-estrogen combination can also be used by females as injections or implants under the skin.

(ii) Their mode of action is similar to that of pills but their effective periods are longer.

Surgical Methods (Sterilisation)

(i) These are terminal and permanent methods which block the transport of gametes, thereby, preventing conception.

(ii) In males, a small part of the vas deferens is removed and tied up through a small incision on the scrotum. This is called vasectomy.

(iii) In females, a small part of the Fallopian tube is removed and tied up through a small incision in the abdomen or vagina. This is called tubectomy.



TiP

Students are advised to write the answer step by step.

Q 2. Suggest and explain any three Assisted Reproductive Technologies (ART) to an infertile couple.

Ans. The infertile couples could be assisted to have children through certain special techniques called Assisted Reproductive Technologies (ART), which are given below:

(i) Test Tube Baby Programmes

(a) In this method, ova from the wife/donor (female) and the sperms from the husband/donor (male) are collected and induced to form zygote under simulated conditions in the laboratory. This process is called In Vitro Fertilisation (IVF).

(b) The zygote or early embryo with up to 8 blastomeres is transferred into the Fallopian tube (process is called Zygote Intra Fallopian Transfer or ZIFT) and embryo with more than 8 blastomeres is transferred into the uterus (process is called Intra Uterine Transfer or IUT).

(c) In females who cannot conceive, embryos formed by fusion of gametes in another female (called in vivo fertilisation) are transferred.

(ii) Gamete Intra Fallopian Transfer (GIFT)

It is the transfer of an ovum collected from a donor into the Fallopian tube of another female who cannot produce one, but can provide suitable environment for fertilisation and further development of the embryo.

(iii) Intra Cytoplasmic Sperm Injection (ICSI)

It is a procedure to form an embryo in the laboratory by directly injecting the sperm into an ovum.

(iv) Artificial Insemination (AI)

(a) In this method, the semen collected either from the husband or a healthy donor is artificially introduced into the vagina or into the uterus (Intra Uterine Insemination or IUI).

- (b) This technique is used in cases where the male is unable to inseminate sperms in the female reproductive tract or due to very low sperm counts in the ejaculation.

Q 3. Placed below are case studies of some couples who were not able to have kids. These couples are not ready for adoption or taking gametes from donors. After thoroughly examining the cases, which Assisted Reproductive Technology will you suggest to these couples as a medical expert? Explain briefly with justification of each case.

(CBSE SQP 2023-24)

Couple	Test reports of Female partner	Test reports of male partner
Couple 1	Normal reports	Normal sperms in testes. Missing connection in epididymis and vas deferens
Couple 2	Blockage in the Fallopian tube	Normal reports
Couple 3	Normal reports	Poor semen parameters in terms of count, motility and morphology
Couple 4	Low ovarian reserve	Normal reports
Couple 5	Sterilization in male	Morphologically abnormal sperms

Ans. **Couple 1:** Normal reports of female. Normal sperms in testes. Missing connection in epididymis and vas deferens in male.

Assisted Reproductive Technology

Semen will be devoid of sperms in this case. So, In Vitro Fertilisation (IVF) by collecting the sperms from epididymis, followed by ZIFT or IUT (Test Tube Baby) is suggested. ZIFT is transfer of zygote or early

embryo up to 8 blastomeres in Fallopian tube and IUT refers to transfer of embryos with more than 8 blastomeres in uterus.

Couple 2: Blockage in the Fallopian tube in the female. Normal reports of male.

Assisted Reproductive Technology

Blockage of Fallopian Tube will not allow transfer of sperms to the site of fertilisation. In Vitro fertilisation (IVF) followed by IUT (Test Tube Baby). It would involve transfer of embryo with more than 8 blastomeres in uterus.

Couple 3 : Normal reports of female. Poor semen parameters in terms of count, motility and morphology in male partner.

Assisted Reproductive Technology

Intra Cytoplasmic Sperm Injection (ICSI) in which sperm is directly injected into the ovum. Artificial Insemination procedure is used mainly when sperms have poor characteristic or low sperm count.

Couple 4: Low ovarian reserve in female. Normal reports in male

Assisted Reproductive Technology

In Vitro Fertilisation (IVF) by selection of normal blastocysts from ovary followed by Zygote Intra Fallopian transfer involving transfer of zygote or early embryos up to 8 blastomeres (ZIFT) or transfer of embryo with more than 8 blastomeres in the uterus (IUT).

Couple 5: Poor ovarian reserve in female. morphologically abnormal sperms in male partner.

Assisted Reproductive Technology

ICSI (Intracytoplasmic sperm injection) in which selected normal sperms will be injected into the selected blastocyst. Intracytoplasmic sperm injection (ICSI) procedure is used mainly when sperms have poor characteristic or low sperm count.

Q 4. Given below are certain situations. Analyse the situation and suggest the name of suitable contraceptive device along with mode of action.

(CBSE SQP 2023-24)

Situation No.	Requirement of contraceptive for	Name of contraceptive device	Mode of action
1.	blocking the entry of sperms through cervix		
2.	spacing between children		
3.	effective emergency contraceptive		
4.	terminal method to prevent any more pregnancy in female		
5.	Sterilisation in male		

Ans.

Situation No.	Requirement of contraceptive for	Name of contraceptive device	Mode of action
1.	blocking the entry of sperms through cervix	Diaphragms/cervical caps/vaults	Cover the cervix during coitus
2.	spacing between children	Cu or hormone releasing IUDs such as Cu T/Cu-7/Multiload-375/Progestasert/LNG-20	Cu ions from Cu containing IUDs <u>increase phagocytosis</u> of sperms within uterus. suppress sperm motility and fertilising capacity/hormone releasing IUDs make uterus unsuitable for implantation.
3.	effective emergency contraceptive	Pills containing Progestogens or progestogen-estrogen combination or IUDs within 72 hours of coitus	Pills inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent the entry of sperms/IUDs-Cu ions increase phagocytosis of sperms within uterus. suppress sperm motility and fertilising capacity/hormone releasing IUDs make uterus unsuitable for implantation.
4.	terminal method to prevent any more pregnancy in female	Tubectomy	Block gamete transport and prevent conception.
5.	sterilisation in male	Vasectomy	Blocks sperm transport.

Q 5. A large number of married couples the world over are childless. It is shocking to know that in India the female partner is often blamed for the couple being childless.

- Why in your opinion, the female partner is often blamed for such situations in India?
- State any two reasons responsible for the cause of infertility.
- Suggest a technique that can help the couple to have a child where the problem is with the male partner.

Ans. (i) Female partner is often blamed due to the following reasons:

- Social mind set
- Inequality of sexes
- Lack of awareness/male dominated society.

(d) Awareness to be created that abnormality can occur in both males and females and infertility issues with suitable examples.

(e) Mutual respect towards both the partners in case of the problem and to find the remedy from medical experts.

(f) Educate them to find the reason and not believe in superstitions.

(ii) Infertility is caused due to physical abnormality in reproductive system, congenital, immunological or psychological problems.

(iii) Intra Cytoplasmic Sperm Injection (ICSI), Artificial Insemination (AI), Intra Uterine Insemination (IUI) can help couples where the problem is with the male partner.



Chapter Test

Multiple Choice Questions

Q 1. Amniocentesis is a technique used to:

- determine errors in amino acid metabolism in embryo.
- pinpoint specific cardiac ailments in embryo.
- determine any hereditary genetic abnormality in embryo.
- All of the above.

Q 2. Increased IMR and decreased MMR in a population will:

- cause rapid increase in growth rate.
- result in decline in growth rate.

- not cause significant change in growth rate.
- result in an explosive population.

Q 3. Which of the following is non-medicated Intra Uterine Device (IUD)?

- Cu-T
- Lippes' Loop
- Cu-7
- LNG-20

Assertion and Reason Type Questions

Directions (Q.Nos. 4-5): Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Select the correct answer to these questions from the codes a, b, c and d as given below.

- Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- Assertion is true but Reason is false.
- Both Assertion and Reason are false.

Q 4. Assertion (A): Amniocentesis technique is frequently used in foetal disease treatment in India.

Reason (R): This technique can be used for sex-determination of child.

Q 5. Assertion (A): IVF is fertilisation outside the body of woman.

Reason (R): The zygote upto 8 blastomeres could be transferred into the Falloplan tube.

Case Based Questions

Case Study 1

Q 6. Population is defined as the total number of individuals of a species present in a particular area at a given time. The scientific study of human population is called demography. The rapid increase in population over a relatively short period is called population explosion. Four basic processes are involved in increase or decrease in the population size. Population shows two types of growth; exponential and logistic.

(i) Which of the following factors are responsible for population explosion?

- Decrease in number of people of reproducible age
- Decline in infant mortality rate
- Increase in maternal mortality rate
- Rapid decline in death rate

- A and B
- B and C
- B and D
- A and D

(ii) What is the shape of curve showing logistic growth?

- Sigmoid
- J-shape
- Linear
- Hyperbola

(iii) What is immigration?

- Number of individuals of the population who left the habitat.
- Number of individuals that have come into the habitat.
- Number of individuals of a species per unit area at given time.
- Number of births per 1000 individuals.

(iv) Equation of Verhulst-Pearl logistic growth is:

- $\frac{dN}{dt} = rN$
- $\frac{dN}{dt} = \frac{K-N}{k}$
- $\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$
- $\frac{dN}{dt} = \left(1 - \frac{N}{K} \right) r$

Case Study 2

Q 7. The Medical Termination of Pregnancy (MTP) legalised by Government of India in 1971 with some strict conditions to avoid its misuse. MTP Amendment Act, 2017 was enacted by the government of India with the intension of reducing the incidence of illegal abortion and consequent maternal mortality and morbidity. According to this act, a pregnancy may be terminated on certain grounds with in the first 12 weeks of pregnancy on the opinion of one registered medical practitioner. If the pregnancy has lasted more than 12 weeks, but fewer than 24 weeks, two registered medical practitioners must be of the opinion, formed in good faith, that the required ground exist. The grounds for such termination of pregnancies are:

- The continuation of the pregnancy would involve a risk to the life of the pregnant woman or of grave injury physical or mental health; or
- There is a substantial risk that of the child were born, it would suffer from such physical or mental abnormalities as to be seriously handicapped.

Read the given passage carefully and give the answer of the following questions:

- Expand MTP.
- When was MTP Amendment Act enacted?
- After how much period MTP is advisable?
- By MTP act which two programme will succeed?

Very Short Answer Type Questions

- Why do some women use Saheli pills?
- During which duration the emergency contraceptives are proved to be effective?
- Give the name of the STD, which can be transmitted through contaminated blood.

Short Answer Type Questions

- Amniocentesis for sex-determination is banned in our country. Is this ban necessary? Comment.
- Enlist the common causes of Infertility in males. How this problem can be solved?

Long Answer Type-I Question

- Describe the technique by which genetic disorder in a developing foetus can be detected.

Long Answer Type-II Question

- What are the traditional methods of contraception, which have been in use since ancient times?