

# BIOLOGY



## REPRODUCTIVE HEALTH

### Reproductive Health: Problem and Strategies

- India was amongst the first countries in the world to initiate the programmed “family planning” initiated in 1951.
- Reproductive health in a society forms a crucial part of general health.
- Improved programs covering wider reproduction-related areas are currently in operation under the popular name ‘Reproductive and child health care (RCH) program’.
- Health and education of young people and marriage and child bearing during more mature stages of life are important attributes to the reproductive health of a society.

### Measures taken by Government:

- Through the help of audio-visuals & print media.
- Even family members, close relations are involved in the awareness.
- Sex education was introduced in schools to provide awareness
- Proper information about reproductive organs, adolescence & related changes, safe & hygienic sexual practices, sexually transmitted diseases, AIDS etc.

### Amniocentesis:

It is a technique used to find out chromosomal abnormalities in developing embryo by using amniotic fluid. It is also misused to check foetal sex determination based on the chromosomal pattern in the amniotic fluid surrounding the developing embryo.

### Population Explosion and Birth Control:

Improved quality of life of people, increased health facilities and better living condition had an explosive impact on explosion of population. Rapid decline in death rate, MMR (maternal mortality rate) and IMR (infant mortality rate) along with increase in population of reproductive age is the main reason for population explosion.

### Steps to overcome population explosion:

- Using various contraceptive methods.
- Educating people about the demerits of large family.
- Increasing the marriageable age of female and male
- Providing incentive to parents having 1 or 2 children.

**Contraceptive methods:** Contraceptive methods are used to prevent the unwanted pregnancy and modifying the menstrual cycle.

**An ideal contraceptive should be:**

- User friendly
- Easily available
- Effective
- Reversible
- No side effects
- No way interferes with sexual desire and sexual act.

**Contraceptive methods could be divided into following categories:**

- Natural or traditional methods.
- Barrier methods.
- IUDs.
- Oral contraceptive methods.
- Injectable.
- Implants.
- Surgical methods.

**Natural methods:**

Natural methods work on the principle of avoiding chances of ovum and sperm meeting.

**It includes:**

**Periodic abstinence:** The couples avoid coitus from day 10 to 17 of menstrual cycle as chances of fertilization are very high during this period, it is called the fertile period.

**Withdrawal or coitus interruptus:** Male partner withdraws penis from vagina just before ejaculation to avoid insemination.

**Lactational Amenorrhea:** Absence of menstruation after parturition and due to intense milk feeding and no ovulation in this period, chances of fertilization is nil.

**In Barrier methods:**

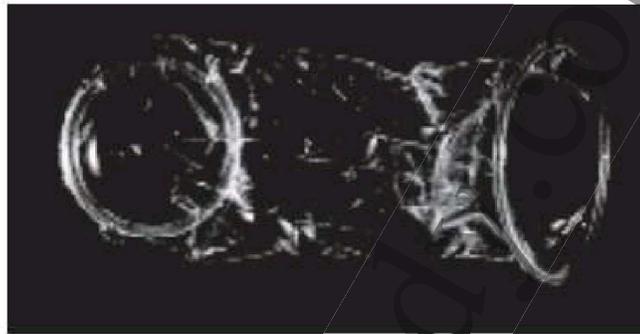
In Barrier methods, ovum and sperms are prevented from physical meeting with help of barrier.

**This includes:**

**Condoms for male:** Used by male, barrier made of rubber or latex sheet used to cover penis or vagina and cervix of female. It also prevents from STDs.



Condom for male



Condom for female

**Condom for female:** Diaphragms, cervical cap and vaults are barrier made of rubber that is inserted into the female reproductive tract during coitus. Spermicidal creams, jellies and foams are usually used along with these barriers to increase their contraceptive efficiency.

**Advantages of barrier methods:**

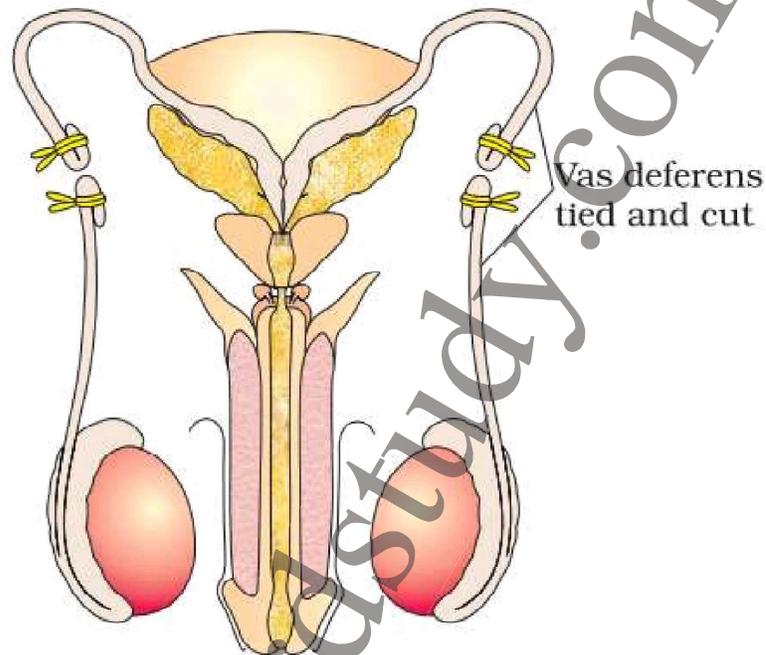
- They are disposable.
- They can be self-inserted.
- They are reusable.
- Prevents conception by blocking entry of sperm through cervix.

**Intra uterine Devices:** Inserted by doctor or trained nurse into the female uterus through vagina. IUCDs may be non-medicated IUDs (e.g., Lippes loop), copper releasing IUDs (CuT, Cu7, Multiload 375) and the hormone releasing IUDs (Progestasert, LNG-20). IUCDs increase the phagocytosis of sperm in uterus and copper reduce the motility and fertility capacity of sperms. The hormone releasing IUDs make the uterus unsuitable for implantation and the cervix hostile to the sperms. It is ideal for female who wants to delay pregnancy and spacing between two children.

**Oral Pills:** Oral Pills are progesterone or progesterone-estrogen combination used by females in form of tablets. They inhibit ovulation and implantation as well as change the quality of cervical mucus to prevent/ retard entry of sperms. Administration of progesterone or progesterone-estrogen combination within 72 hours of coitus is found to be very effective as emergency contraceptive.

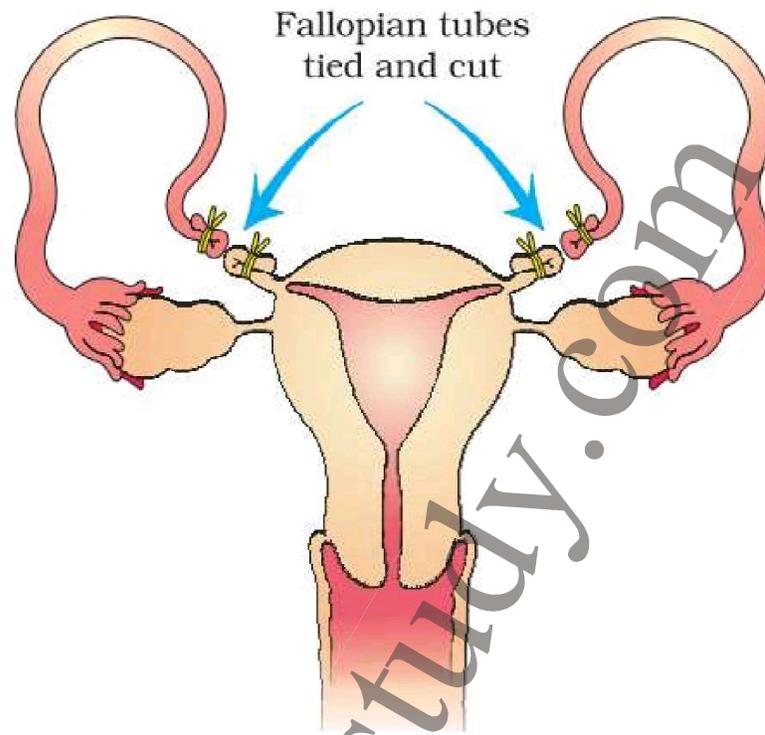
**Surgical method:** This method is also called sterilization. It is used as terminal method of contraception in male and female to prevent any more pregnancy.

**Vasectomy:** Vasectomy is the surgical method in male; a small part of the vas deferens is removed or tied up through a small incision on the scrotum to prevent release of sperms.



## Vasectomy

**Tubectomy:** Tubectomy is the surgical method in females in which small part of fallopian tube is removed surgically.



## Tubectomy

These techniques are highly effective, but their reversibility is very poor.

### Side effects of contraceptive method:

It is very important that the selection of contraceptive method should be taken under the consultation of the doctors.

They have ill-effects like nausea, abdominal pain, breakthrough bleeding, irregular menstrual bleeding or even breast cancer.

### Medical Termination of Pregnancy (MTP):

- Voluntary termination of pregnancy before full term is called MTP (medical termination of pregnancy) or induced abortion. It plays important role in decreasing population by aborting unwanted pregnancy.
- In India, MTP is legalized in 1971 with some restriction to prevent its misuse such as indiscriminate and illegal female foeticides.
- MTP is used to Get rid of unwanted pregnancy due to unprotected intercourse or failure of contraceptives used during coitus or rapes.
- When pregnancy continuation could be harmful or even fatal to mother or foetus.

- MTPs are considered relatively safe during first trimester or up to 12 weeks of pregnancy. Second trimester MTPs are much riskier.

### Sexually Transmitted Disease (STDs):

Diseases or infections which are transmitted through sexual intercourse are collectively called sexually transmitted disease or venereal disease (VD) or reproductive tract infection (RTI).

Some common STDs are Gonorrhoea, syphilis, genital herpes, chlamydia, genital warts, trichomoniasis, hepatitis-Ba and AIDS.

Hepatitis-B and HIV is also transmitted by sharing of injection needles, surgical instruments with infected person, transfusion of blood, or from infected mother to foetus.

Except genital herpes, HIV and hepatitis-B are completely curable if detected earlier and treated properly.

Timely detection and proper treatment of STDs are very important otherwise it could lead to complications later, which include pelvic inflammatory diseases (PID), abortions, still births, ectopic pregnancies, infertility or even cancer of the reproductive tract.

### Infections of STDs can be prevented by:

- Avoid sex with unknown partners/ multiple partners.
- Always use condoms during coitus.
- Go to a qualified doctor in case of doubt for early detection and get complete treatment if diagnosed.

### Infertility:

The couples which are unable to reproduce children in spite of unprotected sexual cohabitation are called infertile. The reasons for this could be many-physical, congenital, diseases, drugs, Immunological or even Psychological.

### Assisted reproductive technologies (ART):

Infertile couples can be assisted to have children through certain special techniques commonly called assisted reproductive technologies (ART),

### Which includes:

**In vitro fertilization (IVF):** In vitro fertilization (IVF) fertilization outside the body followed by embryo transfer, which is commonly called test tube baby program. The ovum from wife/ donor and sperms from husband/ donor are collected and induced to fertilize in laboratory conditions.

**ZIFT (zygote infra fallopian transfer):** The zygote or early embryo (8 blastomeres) could be transferred into fallopian tube called ZIFT (zygote infra fallopian transfer) and embryo with more than 8 blastomeres.

**IUT (intra uterine transfer):** IUT (intra uterine transfer) into the uterus to complete the further development. Embryos formed by in-vivo fertilization (fusion of gametes within the female) also could be used for such transfer to assist those females who cannot conceive.

**GIFT (gamete intra fallopian transfer):** Transfer of gametes collected from a donor into fallopian tube of another female who do not produce ovum.

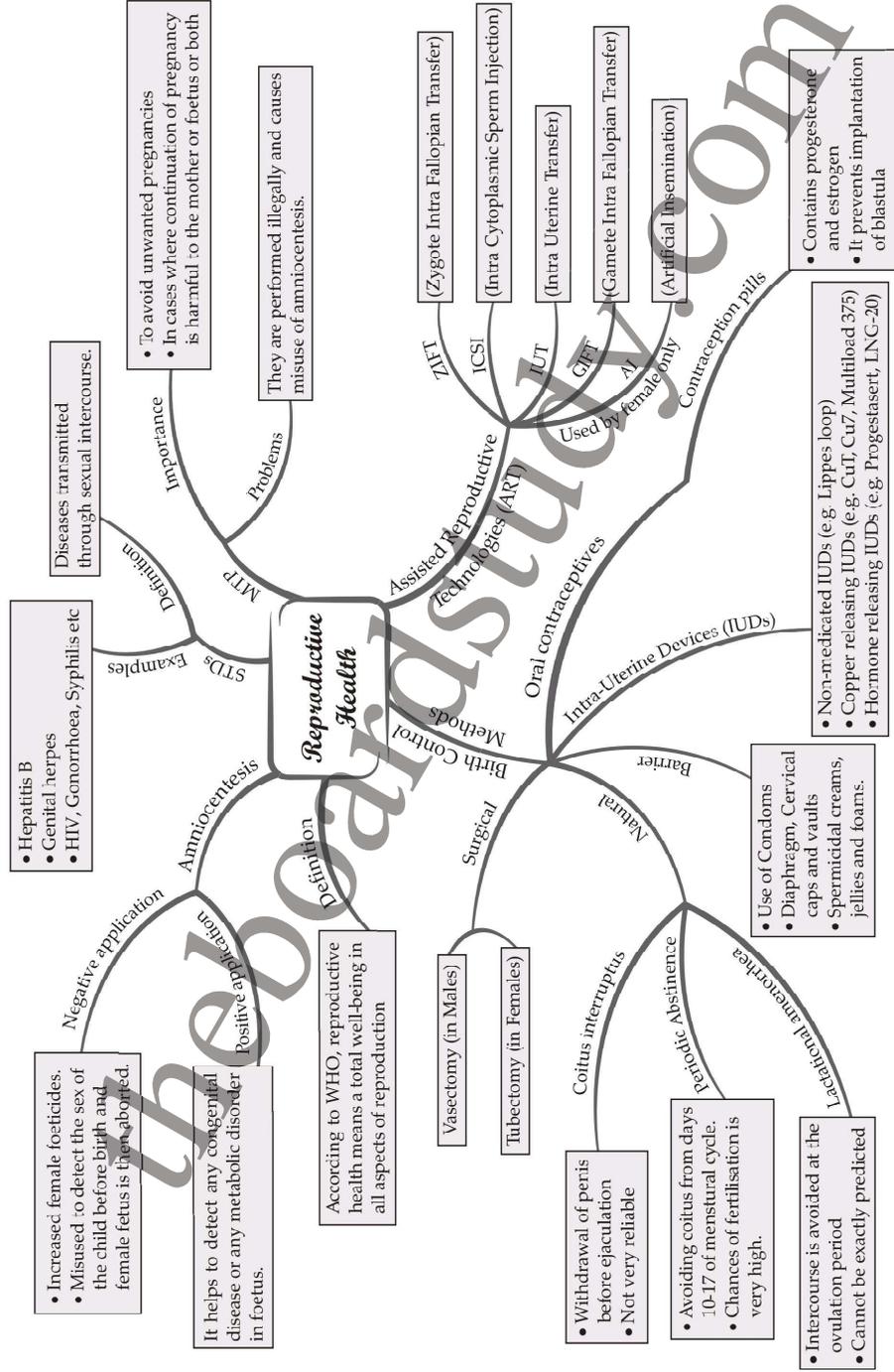
**Intra cytoplasmic sperm injection (ICSI):** Specialized procedure to form an embryo in laboratory in which sperm is directly injected into ovum.

**Artificial insemination:** Infertility cases in which male partner is unable to produce healthy sperms are treated by this technique in which semen collected from donor is artificially introduced into vagina or into uterus, IUI (intra uterine insemination) of the female.

All these techniques require extremely high precision handling by specialized professional and expensive instruments. Therefore, their benefits are limited to certain countries and people. Emotional, religious, and social factors also prevent the adoption of these methods.

# MIND MAP : LEARNING MADE SIMPLE

## CHAPTER - 4



## Important Questions

### ➤ Multiple Choice Questions:

- The method of directly injecting a sperm into ovum in assisted reproductive technology is called:
  - GIFT
  - ZIFT
  - ICSI
  - ET
- 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.
- Intensely lactating mothers do not generally conceive due to the:
  - Suppression of gonadotropins
  - Hyper secretion of gonadotropins
  - Suppression of gametic transport
  - Suppression of fertilisation.
- Sterilisation techniques are generally foolproof methods of contraception with least side effects. Yet, this is the last option for the couples because:
  - It is almost irreversible
  - Of the misconception that it will reduce sexual urge/drive
  - It is a surgical procedure
  - Of lack of sufficient facilities in many parts of the countryChoose the correct option:
  - i and iii
  - ii and iii
  - ii and iv
  - i, ii, iii and iv
- A national level approach to build up a reproductively healthy society was taken up in our country in:
  - 1950s
  - 1960s
  - 1980s
  - 1990s.
- Emergency contraceptives are effective if used within:
  - 72 hrs of coitus

- (b) 72 hrs of ovulation  
(c) 72 hrs of menstruation  
(d) 72 hrs of implantation
7. Choose the right one among the statements given below:
- (a) IUDs are generally inserted by the user herself  
(b) IUDs increase phagocytosis reaction in the uterus  
(c) IUDs suppress gametogenesis  
(d) IUDs once inserted need not be replaced.
8. The following statements are given regarding MTP. Choose the correct options given below:
- (i) MTPs are generally advised during first trimester  
(ii) MTPs are used as a contraceptive method  
(iii) MTPs are always surgical  
(iv) MTPs require the assistance of qualified medical personnel
- (a) i and iii  
(b) ii and iii  
(c) i and iv  
(d) i and ii
9. 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
10. 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.
11. Choose the correct statement regarding the ZIFT procedure:
- (a) Ova collected from a female donor are transferred to the fallopian tube to facilitate zygote formation  
(b) Zygote is collected from a female donor and transferred to the fallopian tube  
(c) Zygote is collected from a female donor and transferred to the uterus  
(d) Ova collected from a female donor and transferred to the uterus

12. The correct surgical procedure as a contraceptive method is:

- (a) Ovariectomy
- (b) Hysterectomy
- (c) Vasectomy
- (d) Castration.

13. Diaphragms are contraceptive devices used by females. Choose the correct option from the statements given below:

- (i) They are introduced into the uterus
  - (ii) They are placed to cover the cervical region
  - (iii) They act as physical barriers for sperm entry
  - (iv) They act as spermicidal agents
- (a) i and ii
  - (b) i and iii
  - (c) i, ii and iii
  - (d) iii and iv

14. A procedure that finds use in testing for genetic disorders, but is also misused for female foeticide is:

- (a) Lactational amenorrhea
- (b) Amniocentesis
- (c) Artificial insemination
- (d) Parturition

➤ **Very Short Question:**

1. Give the term for prenatal diagnostic technique aimed to know the sex of developing foetus and to detect congenital disorders.
2. After a successful in vitro fertilisation, the fertilised egg begins to divide. Where is this egg transferred before it reaches the 8-celled stage and what is this technique called?
3. Give the term for rapid population growth.
4. Name the fluid from which foetal cells are extracted for chromosomal analysis.
5. Give technical name of female used to bring up in vitro fertilized egg to maturity.
6. Name the oral contraceptive developed by CDRI, Lucknow.
7. What is the WHO's interpretation of reproductive health?
8. Why has the Government imposed a statutory ban on amniocentesis?
9. Expand MTP and ICSI.
10. What is lactational amenorrhoea?

**➤ Short Questions:**

1. What are implants? How do they help in preventing fertilisation?
2. Briefly explain two natural barriers for birth control.
3. Enlist any four possible reasons for infertility in human beings.
4. What does GIFT represent?
5. How does Cu- T act as a contraceptive?
6. Mention any four probable reasons for the rapid rise of population in our country?
7. Identify the device used for the following methods of birth control: Barrier, IUD, Surgical technique and Administering hormone.
8. What are STDs? Mention any two of it.

**➤ Long Questions:**

1. Suggest the aspects of reproductive health that need to be given special attention in the present scenario.
2. Briefly give an account of various intra-uterine contraceptive (IUD) measures. What are their advantages? How do they function?
3. What are the measures one has to take to prevent contracting STDs?

**➤ Assertion and Reason Questions:**

**1)** For two statements are given-one labelled Assertion and the other labelled Reason. 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) Both assertion and reason are false.

**Assertion:** Generally, a woman does not conceive during the lactation period.

**Reason:** The hormone 'prolactin' initiates and maintains lactation in a postpartum woman.

**2)** For two statements are given-one labelled Assertion and the other labelled Reason. 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. Both assertion and reason are false.

**Assertion:** In GIFT, fertilisation takes place in vivo.

**Reason:** The results of GIFT are less better than in vitro fertilisation.

### ➤ Case Study Questions:

1. Read the following and answer any four questions from (i) to (v) given below:

A woman unable to conceive after many years of regular unprotected coitus went to specialised infertility clinic. On complete examination, woman was found to be normal, while male partner was diagnosed with infertility. Male partner is unable to copulate the female. Couple was advised to opt for assisted reproductive technology (ART).

(i) Which ART could have been useful for this couple?

- a. ZIFT
- b. IUT
- c. AI
- d. GIFT

(ii) In which of the following infertility issues could this technique be used?

- a. Anovulation.
- b. Oligospermia.
- c. Low fructose content in seminal fluid.
- d. All of these.

(iii) Which among the following techniques is useful to conceive when there is very low sperm count?

- a. GIFT
- b. Test-tube baby
- c. IUT
- d. JCSI

(iv) **Assertion:** Artificial insemination (AI) is intra-uterine insemination.

**Reason:** In AI, sperms collected from donor are introduced into the uterus.

- 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

(v) Success rate of artificial insemination technique is:

- a. 20-40%
- b. 60-70%
- c. 40-50%

d. 5-7%

2. Read the following and answer any four questions from (i) to (v) given below:

Oral administration of small doses of hormones is contraceptive method used by the females. They are used in the form of tablets and hence called the pills. The oral pills are two types; mini pills and combined pills.

(i) Mini pills contain:

- a. Estrogen only.
- b. Progestin only.
- c. Combination of progesterone-estrogen.
- d. Inhibin.

(ii) How do hormonal pills prevent pregnancy?

- a. By phagocytosing the sperms.
- b. By inhibiting ovulation.
- c. By preventing sperms from entering the vagina.
- d. All of these.

(iii) Pill containing non-steroidal preparation, centchroman is:

- a. Mala D.
- b. Mala N.
- c. I-Pill.
- d. Saheli.

(iv) Which among the following is incorrect for oral contraceptives?

- a. Oral pills alter the uterine endometrium and make it unsuitable for implantation.
- b. Oral pills have to be taken daily for 7 days starting within first five days of menstrual cycle.
- c. Oral pills increase the risk of intravascular clotting.
- d. Oral pills contain either progestin alone or combination of progestogen and estrogen.

(v) **Assertion:** Mala D, a combined contraceptive pill, have to be taken daily without a break.

**Reason:** Mala D contains synthetic progesterone and estrogen.

- 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.

## ✓ Answer Key-

## ➤ Multiple Choice Answers:

1. (c) ICSI
2. (c) Not cause significant change in growth rate
3. (a) Suppression of gonadotropins
4. (d) i, ii, iii and iv
5. (a) 1950s
6. (a) 72 hrs of coitus
7. (b) IUDs increase phagocytosis reaction in the uterus
8. (c) i and iv
9. (b) AIDS
10. (d) All of the above.
11. (b) Zygote is collected from a female donor and transferred to the fallopian tube
12. (c) Vasectomy
13. (c) i, ii and iii
14. (b) Amniocentesis

## ➤ Very Short Answers:

1. Amniocentesis.
2. Fallopian tube; Zygote intra fallopian transfer (ZIFT)
3. Population explosion.
4. Amniotic fluid.
5. Surrogate mother.
6. Saheli
7. WHO defines reproductive health as total well being in all respects of reproduction including physical, emotional, behavioural and social.
8. The Government has banned amniocentesis to check on the incidences of female foeticides.
9. MTP: Medical Termination of Pregnancy.  
ICSI: Intra Cytoplasmic Sperm Injection.
10. It refers to absence of menstruation during period of intense lactation.

## ➤ Short Answer:

1. The structures which contain hormones like progesterone and estrogen and are placed under the skin.
2. Periodic abstinence – couple should avoid coitus from 10th to 17th day of menstrual cycle. Coitus interruptus – Male partner withdraws his penis from the vagina just before ejaculation of semen.
3. Physical, congenital disease, Drugs, Immunological and even psychological (any four).
4. It is the introduction of two unfertilized oocytes and several sperms into the fallopian tube of a woman desirous to be a mother through laproscope. The eggs may be hers or a donor's. The sperms may be of her husband's or of a donor. Fertilisation occurs in vivo and the development of the foetus takes place through natural process.
5. It is an intrauterine device having ionized copper. The copper diffuses into the uterus and brings about the release of toxic cytokines. They inhibit sperm motility and therefore fertilization of ovum.
6. The probable reasons could be:
  - Steady decline in the death rate due to improved health services.
  - Early marriages especially in certain rural areas.
  - Lack of education among the poor and they fail to understand the ill effects of a large family.
  - Longer life span.
7. Barrier: Condom, IUD: Copper –T, Surgical technique: Vasectomy or Tubectomy, Administering Hormone : Oral Pill.
8. Diseases or infections transmitted through sexual intercourse are collectively called Sexually Transmitted Diseases or STDs. Ex: Syphilis and Gonorrhoea.

### ➤ Long Answer:

1. Conferring upon the demands of the present situation of our country, the following aspects of reproductive health should be given special attention:
  - i. Control of the human population.
  - ii. Creation of awareness about reproduction-related aspects among people including sex education to the students.
  - iii. Implementation of various action plans to attain reproductive health and building a reproductively healthy society.
  - iv. Continued research on reproduction-related areas.
  - v. Providing medical assistance and care to people especially during pregnancy, delivery, STDs, abortions, contraception, menstrual problems, infertility, etc.
  - vi. Measures of birth control.

2. Different types of IUDs are presently available such as the non-medicated IUDs (e.g. Lippes loop), copper releasing IUDs (CUT, CU 7, Multiload 375), and the hormone-releasing ones (Progestasert, LNG-20). Functions. IUDs increase phagocytosis of sperms within the uterus and the Cu ions released by some suppress sperm motility and the fertilizing capacity of the sperms. The hormone-releasing IUDs, in addition, make the uterus unsuitable for implantation and the cervix hostile to the sperms. Advantages. LEDs are ideal contraceptives for females who want to delay pregnancy and/or space children. It is one of the most widely accepted methods of contraception in India.
3. STDs are sexually transmitted diseases that are transmitted from an infected person to a normal person through sexual intercourse. STDs are a major threat to a healthy society and can be prevented by adopting the following practices:
  - i. Avoidance of sex with multiple partners.
  - ii. Avoidance of sex with unknown partners.
  - iii. Complete abstinence from sex with infected individuals.
  - iv. Use of condoms during sexual intercourse.
  - v. In case of doubt, a qualified doctor should be consulted.

#### ➤ Assertion and Reason Answers:

**1) (b)** Both assertion and reason are true, but reason is not the correct explanation of assertion.

**Explanation:**

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 gonadotrophins 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 new born child by providing it with milk.

**2) (c)** Assertion is true, but reason is false.

**Explanation:**

GIFT is a more expensive and invasive procedure than IVF (in vitro fertilisation) but its results are better than IVF.

#### ➤ Case Study Answers:

1.

(i) (c) AI

**Explanation:**

Artificial Insemination (AI) is done in infertility cases, either due to inability of male partner to copulate the female or due to very low sperm count in the semen of male partner.

(ii) (b) Oligospermia.

**Explanation:**

Oligospermia is very low sperm count.

(iii) (d) ICSI

**Explanation:**

ICSI is intra cytoplasmic sperm injection.

(iv) (a) Both assertion and reason are true, and reason is the correct explanation of assertion.

(v) (a) 20-40%

2.

(i) (b) Progestin only.

**Explanation:**

Mini pills contain progestin only, with no estrogen.

(ii) (b) By inhibiting ovulation.

**Explanation:**

Oral contraceptive pills inhibit ovulation and implantation.

(iii) (d) Saheli.

**Explanation:**

Saheli contains non-steroidal preparation called centchroman.

(iv) (b) Oral pills have to be taken daily for 7 days starting within first five days of menstrual cycle.

**Explanation:**

Oral pills have to be taken daily for 21 days starting within first five days of menstrual cycle.

(v) (b) Both assertion and reason are true, but reason is not the correct explanation of assertion.