

CHAPTER

4

REPRODUCTIVE HEALTH

Syllabus

- **Reproductive Health** : Need for reproductive health and prevention of sexually transmitted diseases (STD); birth control—need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies—IVF, ZIFT, GIFT (elementary idea for general awareness).

Chapter Analysis

List of Topics		2016		2017		2018
		D	OD	D	OD	D/OD
Reproductive Health-Problems and Strategies	• Importance of sex education to create reproductively healthy society	1 Q (VBQ)				
Population explosion and Birth control	• Contraceptive pills		1 Q (3 M)			
Medical termination of pregnancy (MTP)				1 Q (1M)		
Infertility	Assisted reproductive technologies		1 Q (VBQ)			

- On the basis of above analysis, it can be concluded that MTP, Importance of sex education, contraceptive pills and assisted reproductive technologies like GIFT, ZIFT etc. are the most important topics from an exam point of view.

Revision Notes

- The term 'reproductive health' simply refers to healthy reproductive organs with normal functions. According to WHO (World Health Organisation), the word 'reproductive health' means a total well-being in all aspects of reproduction i.e., physical, emotional, behavioural and social.
- Thus, a society with people having physically and functionally normal reproductive organs and normal emotional and behavioural interactions among them in all sex-related aspects might be called reproductively healthy.
- **Problems Associated with Reproductive Health :**
 - Rapid increase in human population called population explosion.
 - Lack of awareness and sex education in people.
 - A number of myths and misconceptions about sex related aspects.
 - Common occurrence of sexually transmitted diseases due to lack of knowledge of hygiene of reproductive organs.
 - Illegal abortions and female foeticides.
 - Sex abuse and sex related crime.
 - Myths and misconceptions about sex related issues.
- **Strategies of Reproductive Health Programmes :** To ensure total reproductive health, several programmes like reproductive health programmes and family planning were started in 1951.
- **The aim of Reproductive and Child Care Programme was to :**

- (a) **Create awareness** in both males and females about various reproductive aspects with the help of audio-visual and print media by both Government and Non-Government agencies.
- (b) Provide sex education in schools to save the young generation from myths and misconceptions about sex related issues.
- (c) **Prevention and control of sexually transmitted diseases** by providing correct information about reproductive organs, adolescence and safe and hygienic sexual practices.
- (d) **Educate the fertile couples** and those in marriageable age about birth control devices, pre-natal and post-natal care of mother and child, importance of breast feeding etc.
- (e) Provide awareness about **ill-effects of population explosion, sexual abuses, sex discrimination and sex related crimes**.
- (f) **Provide medical facilities and support** like infrastructural facilities, professional expertise and material support to decrease maternal and infant mortality rates.
- (g) Lessen the **problem of infertility** by promoting the Assisted Reproductive Techniques (ARTs).
- **Steps Taken to Maintain a Reproductively Healthy Society**
 1. Imposing a statutory ban on amniocentesis (analysis of amniotic fluid-Foetal Sex Determination.)
 2. Rigorous implementation of immunization programs.
 3. Creation of specialized health centers like infertility clinic for diagnosis and corrective treatment of some infertility disorders.
 4. Better awareness about sex related matters and sex-related problems etc.
 5. Increase in the number of medically assisted deliveries and better post-natal care.
 6. Increase in number of couples with small families.
 7. Early detection and cure of STDs.
- **Reasons for Population Explosion** : Tremendous increase in size and growth rate of population is called population explosion. It is due to :
 1. Rapid decline in death rate.
 2. More longevity, longer life span.
 3. Advanced medical facilities.
 4. Prevention of diseases.
 5. Developed techniques in agriculture.
 6. Better transport facilities.
 7. Protection from natural factors.
 8. Increase in number of people in reproductive age.
- **Consequences of Population Explosion** : Poverty, unemployment, shortage of food, unhygienic conditions, education problems, residential problems, pollution, crime, excessive consumption of natural resources etc.
- **How to Control Over Population ?**
 1. People should be given education regarding advantages of small family and family planning methods.
 2. Increasing the age of marriage.
 3. Incentives to those families, which are adopting family planning methods.
 4. Birth control through vasectomy and tubectomy.
 5. Family planning programmes with the slogan '**Hum Do Hamare Do**'.
- **Birth Control Measures** :
The most important step to overcome this problem is to encourage smaller families by using various contraceptive methods. The contraceptive methods help to prevent unwanted pregnancies.
- **An ideal contraceptive should be**
 - User-friendly, easily available, effective and reversible.
 - With no or least side-effects.
 - Non-interfering with sexual drive, desire & sexual act.
- They are grouped as follows :
 1. **Natural or Traditional Methods** : These methods of birth control depend upon the natural rhythms of a woman. These include the following methods :
 - (a) **Coitus interruptus** : This involves withdrawing penis by male partner before ejaculation so that semen is not deposited in the vagina. It is the oldest method of voluntary fertility control. This method has certain limitations:
 - Some sperms may be deposited in the vagina even before the sexual climax.
 - May develop physiological and psychological problems to both the partners.
 - (b) **Periodic abstinence** A week before and a week after the menstrual phase are supposed to be safe periods for sexual intercourse. It reduces the chances of pregnancy by about 80 percent.
The period from 12th to 18th day (both days included) of the menstrual cycle is called danger or risk or fertile period and unprotected sexual intercourse should be avoided during this period.
 - (c) **Lactational amenorrhoea** : It has been noticed that during the period of intense lactation after the parturition, the mother does not undergo menstruation and ovulation so the chances of conception are nearly nil. It also has no side effects but is effective only upto a maximum period of six months after parturition.

2. Artificial Methods : This involves mechanical or barrier methods.

- (a) **Condoms :** These are rubber or latex sheaths which are put on penis before starting coital activity (copulation). These are popularly called 'Nirodh'. These check pregnancy by preventing deposition of sperms in the vagina. These can be self-inserted so as to give privacy to the user. These also prevent the spread of sexually transmitted diseases (STDs) including AIDS, syphilis etc. Female condoms are also available called femidoms.
- (b) **Diaphragms and cervical caps :** These are mechanical barriers made of rubber and fitted in vagina of female to check the entry of sperms in uterus. These are reusable.
- (c) **Intra Uterine Devices (IUDs) :** These are inserted by doctors or expert nurses in the uterus through vagina. These include :
 - Non-medicated IUDs (e.g., Lippes loop)
 - Copper releasing IUDs (e.g., Copper T)
 - Hormone releasing IUDs (e.g., Progestasert) : Make the uterus unsuitable for implantation and the cervix hostile to the sperms.
 - IUDs increase phagocytosis of sperms. The Cu ions suppress motility and fertilising capacity of sperms.
 - IUDs are ideal contraceptives for the females who want to delay pregnancy or spacing in children.

3. Chemical Methods : These are of the following types :

- (i) **Spermicidal tablets, jellies, paste and creams** introduced in the vagina before coital activity. These kill sperms. Common spermicidal chemicals used are lactic acid, citric acid, potassium permanganate, zinc sulphate etc.
- (ii) **Physiological (Oral) Devices :** These are the hormonal preparation in the form of pills for females.
 - The pills are usually small doses of progestogens or progestogen-estrogen combinations in the form of tablets (pills).
 - Pills are taken daily for 21 days starting within the first five days of menstrual cycle. After a gap of 7 days (during which menstruation occurs) it has to be repeated in the same pattern as long as the female desires to prevent conception.
 - They inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent entry of sperms.
 - Pills are very effective with lesser side effects.
 - **Saheli :** It is a new oral contraceptive for the females. It was developed by **Central Drug Research Institute (CDRI)** Lucknow. It contains a non-steroidal preparation. It is a 'once a week' pill with very few side effects and high contraceptive value.
 - **Drawbacks of Oral Contraceptives :** Nausea, abdominal pain, breakthrough bleeding, irregular menstrual bleeding, breast cancer etc.
- (iii) **Injectables/Implants**
 - Progesterone alone or in combination with oestrogen is used by females as injections or implants under skin.
 - Their mode of action is similar to that of pills and they are effective within 72 hours of coitus.

4. Sterilization or Surgical Methods : These methods block the gamete transport and so prevent conception. These include the following measures :

- (a) **Male sterilization :** It is a permanent method of birth control in which either testes are surgically removed, called castration, or cutting of the vas deferens, called **Vasectomy**. The vas deferens is exposed and cut through a small incision on the scrotum to prevent the passage of sperms.
- (b) **Female sterilization :** Methods of female sterilization include :
 - (i) Ovariectomy involves surgical removal of ovaries.
 - (ii) Tubectomy involves cutting of fallopian tubes.
 - (iii) Tubal ligation involves blocking of fallopian tubes by an instrument called laparoscope.

➤ **Medical Termination of Pregnancy (MTP)**

- Intentional or voluntary termination of pregnancy before full term is called MTP or induced abortion.
- 45 to 50 million MTPs are performed in a year all over the world (i.e. 1/5th of total number of conceived pregnancies).
- MTP helps to decrease the population.
- Because of emotional, ethical, religious and social issues many countries have not legalised MTP.
- Government of India legalised MTP in 1971 with some strict conditions to check indiscriminate and illegal female foeticides which are reported to be high in India.

➤ **Importance of MTP**

- To avoid unwanted pregnancies due to casual intercourse or failure of the contraceptive used during coitus or rapes.
- Essential in cases where continuation of the pregnancy could be harmful to the mother or to the foetus or both.
- MTPs are safe during the first trimester, (up to 12 weeks of pregnancy). 2nd trimester abortions are very risky.

➤ **Problems Related with MTPs**

- Majority of the MTPs are performed illegally.
- Misuse of amniocentesis (a foetal sex determination test based on the chromosomal pattern in the amniotic fluid).
- MTP for female child causes sex imbalance in society.

➤ **Amniocentesis**

- It is a pre-natal diagnostic method to determine the sex of the developing baby. This method has both positive and negative application. This method is legally banned in India.

(a) **Positive application**

- It helps to detect any genetically controlled congenital disease or any metabolic disorders in foetus.

(b) **Negative application**

- People use this method for female foeticide, which causes a sex--imbalance in the society.

➤ **Sexually Transmitted Diseases (STDs)**

- Diseases transmitted through sexual intercourse are called Sexually transmitted diseases (STDs)/Venereal diseases (VD) or Reproductive tract infections (RTI). *E.g.* Gonorrhoea, syphilis, genital herpes, chlamydiasis, genital warts, trichomoniasis, hepatitis-B and HIV leading to AIDS.
- **Hepatitis-B and HIV are also transmitted:**
 - (a) By sharing of injection needles, surgical instruments etc.
 - (b) By transfusion of blood.
 - (c) From infected mother to foetus.
- Except Hepatitis B, genital herpes, HIV and other diseases are completely curable if detected early and treated properly.
- **Early symptoms :** Itching, fluid discharge, slight pain, swellings, etc., in the genital region.
- Absence or less significant early symptoms and the social stigma deter the infected persons to consult a doctor. This leads to pelvic inflammatory diseases (PID), abortions, still births, ectopic pregnancies, infertility, cancer of the reproductive tract etc.
- All persons are vulnerable to STDs. These are very high among persons in the age group of 15-24 years.
- **Prevention :**
 - (a) Avoid sex with unknown partners/multiple partners.
 - (b) Always use condoms during coitus.
 - (c) In case of doubt, go to a qualified doctor for early detection and get complete treatment.

➤ **Infertility**

- It is the inability of male or female to produce children.
- The reasons for this may be physical, congenital, diseases, drugs, immunological or even psychological.

➤ **Assisted Reproductive Technologies (ART)**

- (1) **In vitro fertilisation (IVF—test tube baby programme) :** In this method, ova from the wife/donor and sperms from the husband/donor are collected and are induced to form zygote under simulated conditions in the laboratory. This is followed by Embryo transfer (ET). It is of 2 types :
 - (a) **Zygote Intra Fallopian Transfer (ZIFT) :** Transfer of zygote or early embryos (with up to 8 blastomeres) into fallopian tube.
 - (b) **Intra Uterine Transfer (IUT) :** Transfer of embryos with more than 8 blastomeres into the uterus. Embryo formed by in vivo fertilisation (fertilisation within the female) is also used for such transfer to assist those females who cannot conceive.
- (2) **Gamete Intra Fallopian Transfer (GIFT) :** Transfer of an ovum from a donor into the fallopian tube of another female who cannot produce ovum, but can provide suitable environment for fertilization and development.
- (3) **Intra Cytoplasmic Sperm Injection (ICSI) :** A laboratory procedure in which a single sperm (from male partner) is injected directly into an egg (from female partner). Then the fertilised egg is implanted into the woman's uterus.
- (4) **Artificial Insemination (AI) technique:**
 - The semen collected from the husband or a healthy donor is artificially introduced into the vagina or the uterus (IUI— intra-uterine insemination) of the female.
 - This technique is useful for the male partner having inability to inseminate female or low sperm counts etc.
- (5) **Surrogacy**
 - Here, a woman (surrogate mother) bears a child for a couple unable to produce children, because the wife is infertile or unable to carry.
 - The surrogate is impregnated either through artificial insemination or through implantation of an embryo produced by in vitro fertilisation.

➤ **Problems of ART**

- It requires high precision handling by specialized professionals and expensive instrumentation. Therefore, these facilities are available only in very few centres.
- Emotional, religious and social problems.
- Legal adoption is one of the best methods for couples looking for parenthood.



Very Short Answer Type Questions

(1 mark each)

Q. 1. In case of an infertile couple, the male partner can inseminate normally but the mobility of sperms is below 40 percent. Judge, which kind of ART is suitable in this situation to form an embryo in the laboratory, without involving a donor ?

[C] [CBSE SQP, 2016-17]

Ans. Intra Cytoplasmic Sperm Injection
(No marks for abbreviation—ICSI) 1
[CBSE Marking Scheme, 2016]

Commonly Made Error

- Students often write abbreviation like ICSI. This may deduct your marks. So, always, write expanded form.

AI Q. 2. Govt. 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.

[R] [CBSE SQP 2015]

Ans. (i) Incentives should be given to couples with small families.
(ii) Media Publicity, Posters of happy couples with two children.
(iii) Motivate families to use contraceptive measures. (Any two)
[CBSE Marking Scheme, 2015] $\frac{1}{2} + \frac{1}{2}$

Answering Tip

- The answer should be crisp and precise.

Q. 3. Name an IUD that you would recommend to promote the cervix hostility to the sperms.

[R] [Delhi Set-I, Comptt., 2014]

Ans. Cu-T (Copper releasing IUD), suppress sperm motility and fertilizing capacity of sperms. 1

Q. 4. State one reason why breast feeding the baby acts as a natural contraceptive for the mother.

[R] [Outside Set-I, Comptt. 2014]

Ans. Breast feeding the child particularly after parturition fully prevents conception, because during this period there is high level of progesterone which prevents menstruation flow. Just after parturition there is a phase of lactational amenorrhoea characterized by absence of menstruation and immense lactation. Breast feeding during this period approximately upto six months acts as a

natural contraceptive for the mother. 1

Q. 5. Name any two assisted reproductive technologies that help infertile couples to give children.

[R] [Delhi Set-I, Comptt. 2012]

Ans. (i) GIFT (Gamete Intra Fallopian Transfer)
(ii) ICSI (Intra Cytoplasmic Sperm Injection) $\frac{1}{2} + \frac{1}{2}$

Answering Tip

- Avoid writing in abbreviated form. Sometimes, there is no marks for abbreviation.

Q. 6. Mention one positive and one negative application of amniocentesis.

[U] [Delhi Set-I, 2010]

Ans. **Positive application :** It helps to detect any genetically controlled congenital disease or any metabolic disorder in foetus.

Negative application : People use this method for female foeticide. $\frac{1}{2} + \frac{1}{2}$

[CBSE Marking Scheme, 2010]

Commonly Made Error

- Students often forget to mention about the purpose of amniocentesis. Some write only about "sex determination", which is actually misuse point.

Q. 7. Our government has intentionally imposed strict conditions for M. T. P. in our country. Justify giving a reason.

[A] [Delhi 2017, Set - I, II, III]

Ans. To prevent female foeticide / to maintain sex ratio / to avoid any danger for (young) mother (and foetus) [CBSE Marking Scheme, 2017] 1

Commonly Made Error

- Many students fail to write the correct explanation. Some are unaware of the concept of M.T.P (Medical Termination Pregnancy).

Q. 8. Why is tubectomy considered a contraceptive method ? [R] [Foreign, 2010]

Ans. In tubectomy, a piece of fallopian tube is cut and the cut ends are tied. Therefore, the sperms are not able to reach the egg. Thus, tubectomy is considered as a contraceptive method. 1



Short Answer Type Questions-I

(2 marks each)

Q. 1. The alarming population growth is leading to scarcity of basic requirements. Suggest with reason, any two population control measures other than contraception to address the situation.

[C] [CBSE SQP, 2016-17, 2018]

Ans. Population control measures other than contraception are :

- (i) Advertisements in the media, to generate awareness. People particularly those in reproductive age group should be given

education regarding the advantages of small family and family planning methods. Mass media and educational institutes can play an important role in this campaign, posters exhibiting a happy couple with a slogan "Hum Do Hamare Do"

(ii) **Marriageable age** : Statutory raising of marriageable age of the female to 18 years and that of males to 21 years, is more effective means to control population. It help to delay the number of births.

(iii) **Incentives** : This will certainly help to check population growth. Incentives should be given to couples with small families and to families adopting family planning methods and motivate others to comply.

(Any two of the above measures with explanation) 1 + 1

Answering Tip

- Write answers in points.

Q.2. An infertile couple is advised to adopt test-tube baby programme. Describe two principal procedures adopted for such technologies.

[A] [Delhi Set-III, 2015]

Ans. The test-tube baby programme involves mainly following two principal procedures:

(i) **In-vitro fertilization (IVF)** : It is the fertilization outside the body in the conditions almost similar to those which exist in the body. The ova and sperms from the donor parents are taken and fused to form the zygote in the laboratory outside the body of female. Then the zygote is transferred into the fallopian tube.

(ii) **Embryo transfer (ET)** : The embryo is transferred into the reproductive tract. The zygote is allowed to divide so as to form about 8-blastomeres. The zygote or the embryo in early stage of development is transferred into the fallopian tube by Zygote Intra Fallopian Transfer (ZIFT) technique. If the embryo is in a bit later stage having about 8 blastomeres it is transferred into uterus by intra uterine transfer (IUT) of infertile female partner or into that of surrogate mother for giving birth to the baby.

1 + 1

[AI] Q. 3. Why there is a statutory ban on amniocentesis ? Why is this technique so named ?

[U] [Delhi Set-I, Comptt. 2012]

OR

What is amniocentesis ? Why has the government imposed a statutory ban inspite of its importance in medical field. [CBSE, Foreign, 2015]

Ans. Amniocentesis is a technique of foetal sex determination based on the pattern of chromosome, in the amniotic fluid surrounding the developing embryo. A statutory ban has been imposed on this to stop its misuse and therefore to check the increasing cases of female foeticides resulting in the imbalance of sex ratio in human population. It is so called because it is basically a technique of investigating the

genetic and metabolic disorders if any of the foetus by taking out a small quantity of amniotic fluid. 2

Commonly Made Error

- Many students fail to write the correct explanation.

Answering Tip

- Give importance to the reason for removal of amniotic fluid i.e. to detect genetic abnormalities.

Q. 4. A childless couple has agreed for a test-tube baby programme. List only the basic steps the procedure would involve to conceive the baby.

[A] [Delhi Set-I, Comptt. 2015]

Ans. Extraction of gametes from the parent donors. in-vitro fertilisation, transfer of the zygote/early embryo into the fallopian tube.

[CBSE Marking Scheme, 2015] 1 + ½ + ½ = 2

Detailed Answer :

Refer to SATO, FQ. No.2

Q. 5. Why is ZIFT a boon to childless couples ? Explain the procedure. [U] [Delhi Set-I, Comptt. 2013]

Ans. ZIFT (Zygote Intra Fallopian Transfer) method helps the infertile couples to have babies.

The ZIFT is considered as a boon to childless couples because it enables them to attain the parent hood. In this technique, fusion of the ovum from the donor female (wife) and the sperm from the donor male (husband) is done outside the body, in the laboratory. Then the zygote or early embryo (with up to 8 blastomeres) is transferred into the fallopian tube of the woman. Implantation takes place at this early embryo stage in the uterus where further development of the embryo takes place. 2

Commonly Made Error

- Students confuse ZIFT with GIFT.

Answering Tip

- Learn different reproductive technologies carefully. Understand the differences between these technologies (like IVF, IUT, ICSI, ZIFT, GIFT, AI etc.) Use charts or interactive boards to learn their full forms and procedure.

[AI] Q. 6. Why is 'Saheli' considered an effective contraceptive for women to space children ?

[A] [Outside Delhi Set-I, Comptt. 2013]

Or

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

[A] [CBSE, Foreign, 2010]

Ans. 'Saheli' is considered as an improved form of contraceptive for human females because :

- It is a non-steroidal preparation.
- It has lesser or no side effects.
- It has a high contraceptive value.
- It is once a week pill.

2

Answering Tip

- Use charts to learn the names of contraception method, their examples and their methods of actions.

Q. 7. How do 'implants' act as an effective method of contraception in human females ? Mention their one advantage over contraceptive pills.

[R] [Delhi Set-III, Comptt. 2012]

Ans. The contraceptives in the form of progestogen or progestogen-estrogen combination are used by females as injections or implants under the skin. These implants are an effective contraceptive method as they check ovulation and sperm transport. They prevent the fertilization of the egg or implantation of the embryo. They make the egg to move down the fallopian tube and uterus quickly before fertilization.

Advantage : The advantage of implants is their effective periods for longer duration. 2

Q. 8. Why are copper containing intra-uterine devices considered an ideal contraceptive for human females ? [R] [Delhi Set-II, Comptt. 2012]

Ans. Cu-T is a copper releasing IUD that increases phagocytosis of sperms within the uterus. Cu ions

released by some IUDs suppress sperm motility and fertilizing capacity of sperms. 2

Q. 9. Describe the Lactational Amenorrhea method of birth control. [U] [Delhi Set-I, 2011]

Ans. It has been noticed that during the period of intense lactation after the parturition, the mother does not undergo menstruation and ovulation so the chances of conception are nearly nil. It also has no side effects but is effective only upto a maximum period of six months after parturition.

[CBSE Marking Scheme, 2011] 2

Q. 10. Why is Cu-T considered a good contraceptive device to space children ?

[U] [Delhi Set-I, 2011], (DDE)

Ans. Cu-T is a non-hormonal, and non-medicated contraceptive device which increases phagocytosis of sperms. The Cu ions suppress motility and fertilising capacity of sperms. 1+1

[CBSE Marking Scheme, 2011]



Short Answer Type Questions-II

(3 marks each)

Q. 1. Describe any three steps taken up by our government to check population growth rate.

[U] [Outside Delhi Set I & III, Comptt. 2016]

Ans. (i) Motivate smaller families.
(ii) Use media/poster showing a happy couple with two children with slogan 'hum do hamare do'.
(iii) Statutory raising of marriageable age of the female to 18 years and male to 21 years. 1 × 3

[CBSE Marking Scheme, 2016]

Commonly Made Error

- Students sometimes write incorrect marriageable age of the male and female.

AT Q. 2. Explain any three contraceptive devices that can be used by women for their family planning.

[R] [Delhi Set-II, Comptt. 2016]

Ans. **Copper releasing IUDs**—suppress sperm motility/fertilizing capacity of sperms

Hormone releasing IUDs—make uterus unsuitable for implantation/cervix hostile to sperms

(Female) Condoms—provide physical barrier and prevent meeting of sperm and ovum

Oral pills—inhibit ovulation and implantation/alter quality of cervical mucus and prevent entry of sperms.

Injections/Implants—inhibit ovulation and implantation/alter quality of cervical mucus and prevent entry of sperms. (Effect is same as that of pills but lasts much longer). (Any three) 3

[CBSE Marking Scheme, 2016]

Q. 3. (i) Explain MTP.

(ii) Give two situations when MTP is advised.

(iii) Write when amniocentesis and MTP can be misused.

[U] [Outside Delhi Set-II, Comptt. 2016]

Ans. (i) **Medical Termination of Pregnancy :** Intentional or voluntary termination of pregnancy before full term with help of an expert doctor is called MTP

(ii) **MTP is advised in the following situations—**

- When there is an unwanted pregnancy.
- When continuation of pregnancy is harmful or fatal to either mother or foetus or both.
- When there is failure of contraceptive used during coitus or rapes, in either case it is advisable to go for MTP during first trimester *i.e.*, up to 12 weeks of pregnancy.
- MTP is also advised if the foetus suffers from incurable genetic and metabolic disorder.

(iii) **Amniocentesis** is a prenatal technique of studying genetic disorders of foetus by taking out amniotic fluid. But however amniocentesis and MTP has been misused for knowing the sex of the foetus and destroying the same if the foetus is female. 3

[CBSE Marking Scheme, 2016]

Answering Tip

- Stress upon learning the abbreviations listed in the syllabus along with correct spellings.

Q. 4. (i) Mention the problems that are taken care of by Reproduction and Child Health Care programme.

(ii) What is amniocentesis and why there is a statutory ban on it ? [U] [Outside Delhi Set-I, 2016]

Ans. (i) Uncontrolled population growth/social evil like sex abuse/sex related crime/STDs.

(Any two) $\frac{1}{2} \times 2$

- (ii) Foetal sex determination tests based on chromosomal pattern in the amniotic fluid/to study chromosomal abnormalities in the foetus is banned to prevent female foeticide. 2

[CBSE Marking Scheme, 2016]

Detailed Answer :

- (i) **The problems that are taken care of by Reproduction and Child Health (RCH) care programme are:** Uncontrolled population growth, STD and social evils like sex abuse, sex related crimes, belief in myths and misconceptions about sexual aspects.
- (ii) Amniocentesis is a technique of determination of sex of the foetus based on chromosomal pattern in the amniotic fluid surrounding the developing embryo. This is infact done to find out the chromosomal abnormalities if any in the foetus. But this is being misused now-a-days. Therefore, the government has imposed a statutory ban on it so as to step down the increasing cases of female foeticides resulting in imbalance of the sex ratio.

Q. 5. (i) List any four characteristics of an ideal contraceptive.

- (ii) **Name two intrauterine contraceptive devices that affect the motility of sperms.**

[R] [Outside Delhi Set-II, 2016]

Ans. (i) User friendly, no side effect, reversible, effective, should not interfere with sexual drive and desire of the user, easily available.

(Any four) $\frac{1}{2} \times 4$

- (ii) Copper T / Multiload 375

(Any two) $\frac{1}{2} \times 2$

[CBSE Marking Scheme, 2016]

Detailed Answer :

- (i) **An ideal contraceptive should be :**
- User-friendly and easily available.
 - It should be effective and reversible.
 - No or least side-effects.
 - It should not interfere with sexual drive, desire and sexual act.
- (ii) Cu-T and Multiload 375 are copper releasing IUDs that suppress motility and fertilising capacity of sperms. $2 + 1 = 3$

Q. 6. List any two types of IUDs that are available for human females and state their mode of action.

[A] [Outside Delhi Comptt. 2017 Set - I, II]

Ans. (i) Non medicated IUDs, increase phagocytosis of sperms within the uterus.

- (ii) Copper releasing IUDs, Cu ions suppress sperm motility and fertilising capacity of sperms.

- (iii) Hormone releasing IUDs, Make uterus unsuitable for implantation/makes cervix hostile to sperms. (Any two) $1\frac{1}{2} + 1\frac{1}{2}$

[CBSE Marking Scheme 2017]

Q. 7. Name two hormones that are constituents of contraceptive pills. Why do they have high and effective contraceptive value ? Name a commonly prescribed non-steroidal pill.

[R] [Outside Delhi Set-II, 2016]

Ans. Progestogen-estrogen / Progesterone-estrogen combination, Progestogen-Progesterone.

$\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$

They inhibit ovulation, inhibit implantation, alter quality of cervical mucus to retard entry of sperm.

$\frac{1}{2} \times 3 = 1\frac{1}{2}$

[CBSE Marking Scheme, 2016]

Detailed Answer :

Contraceptive pills contain hormones either progestogens or progestogen-estrogen combinations.

1

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

1

Saheli is a non-steroidal preparation used as oral contraceptive pills.

1

Q. 8. 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 contraceptive ?**

- (ii) **What schedule should be followed for taking these pills.** [U, E + A] [Outside Delhi Set-I, 2014]

Ans. (i) The contraceptive pills contain little amounts of hormones like progesterone or a combination of progesterone and oestrogen. They act bringing about the inhibition of ovulation and implantation.

They also act by altering the quality of cervical mucus to prevent or retard entry of sperms.

- (ii) These pills have to be taken regularly for 21 days starting within the first five days of menstruation, to be repeated after a gap of seven days. 3

Q. 9. (i) Name two copper releasing IUDs.

- (ii) **Explain how they act as effective contraceptives in human females.** [R] [Outside Delhi Set-III, 2014]

Ans. (i) Intra Uterine Devices-CuT, Cu7, Multiload 375. 1

- (ii) Suppress sperm motility, suppress fertilizing capacity of sperms, increase phagocytosis of sperms within uterus. $1 + 1$

[CBSE Marking Scheme, 2014]

[AI] Q. 10. Name and explain the surgical method advised to human males and females as a means of birth control. Mention its one advantage and one disadvantage. [U] [Delhi Set-III, 2014]

Ans. Vasectomy in males & Tubectomy in females.

$\frac{1}{2} + \frac{1}{2}$

Devoid of ill effects of contraceptive (like nausea, abdominal pain, breakthrough bleeding, irregular menstruation or breast cancer),

Reversibility is very poor.

1 + 1

[CBSE Marking Scheme, 2014]

Detailed Answer :

The surgical methods of birth control are the operative procedures which block the passage of semen in males and ova in females and thus prevent conception.

The techniques are also called as sterilization procedures. These include:

- (i) Vasectomy—Male sterilization
- (ii) Tubectomy—Female sterilization

Advantage : These are permanent methods of birth control and family planning and are devoid of ill effects of contraceptives like nausea, abdominal pain, etc.

Disadvantage : The process is irreversible or very poorly irreversible.

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.

[A] [Outside Delhi Set-I, 2014]

Ans. Methods IVF/ZIFT/AI :

- (i) **IVF :** Ova from wife and sperm from the husband is collected. It is induced to form zygote under laboratory conditions. 1
- (ii) **ZIFT :** Zygote or early embryo are then transferred to the fallopian tube (ZIFT) or into uterus (IUT) to complete further development. 1
- (iii) **AI :** Semen collected from the husband is artificially introduced either into the vagina or into the uterus (IUI) of the wife. 1

[CBSE Marking Scheme, 2014]

Q. 12. Suggest and explain any three assisted reproductive technologies (ART) to an infertile couple.

[R] [Outside Delhi Set-I, II, III, 2013], (KVS)
OR

Explain the Zygote Intra Fallopian Transfer (ZIFT). How is Intra Uterine Transfer Technique (IUT) different from it ? [Outside Delhi 2010]

- Ans.**
- (i) **ZIFT (Zygote Intra Fallopian Transfer)** is related to embryo transfer in the test-tube programme. In this technique, the zygote or embryo up to 8 blastomeres is transferred into the fallopian tube.
 - (ii) **IUT (Inter Uterine Transfer)** is the technique in which the semen of the husband or a healthy donor is introduced into the uterus of a female.
 - (iii) **GIFT (Gamete Intra Fallopian Transfer)**. It is the technique in which the ovum collected from the donor female is transferred into the fallopian tube of another female, who cannot produce an ovum but can provide suitable conditions for fertilization and pregnancy. 1 + 1 + 1

Commonly Made Error

- Students get confused between different technologies of ART. They miss out some of the important terms. Sometimes, they write only abbreviated forms. Carefully learn their full forms and their method of working. Emphasize on the keywords.

Q. 13. Suggest and explain the assisted reproductive techniques which will help a couple to have children, where the female had a blockage in the fallopian tube and the male partner had a low sperm count. [R] [CBSE, SQP, 2018]

- Ans.**
- (a) As the male partner is suffering from low sperm count, Intracytoplasmic sperm injection technique should be used to directly inject sperm into the ovum.
 - (b) As the female partner is having blockage in the fallopian tube, In vitro fertilization, followed by embryo transfer (ET) will help her to conceive.
 - (c) In this case, sperms from the male partner will be collected and injected into the ovum of the female partner to form zygote under simulated conditions in the laboratory and embryo with more than 8 blastomeres will be transferred into the uterus IUT (intra uterine transfer), to complete its further development. 1 × 3
- [CBSE Marking Scheme, 2018]

Q. 14. Explain how do the following act as contraceptives :

(i) Cu-T

(ii) "Saheli"

[U] [Delhi Set-III, 2012]

- Ans.**
- (i) **CU-T** is a Copper-releasing intra uterine device (IUDs). It prevents pregnancy in the following ways :
 - (a) By increasing phagocytosis of sperms within the uterus.
 - (b) By suppressing sperm motility due to copper ion release and thereby its fertilizing ability.
 - (c) By making the uterus unsuitable for implantation.
 - (d) By making the cervix hostile to sperms.
 - (ii) **Saheli** is an example of oral contraceptive that contains a non-steroidal component called 'Centchroman'; it is a once-a-week pill.

Other oral contraceptive pills have to be taken daily for a period of 21 days, starting within the first five days of a menstrual cycle. 1½ + 1½

Q. 15. (i) Name a terminal method to prevent pregnancy in humans.

(ii) Describe the procedure of the terminal method carried in human male and female.

[R] [Delhi Comptt. 2017 Set - I, II, III]

- Ans.**
- (i) **Surgical methods / Sterilisation**
 - (ii) **Males :** Vasectomy, a small part of vas deferens is removed or tied up through a small incision on the scrotum.
 - Females :** Tubectomy, a small part of the fallopian tube is removed or tied up through a small incision in abdomen or through vagina. 1 + 1 + 1

Commonly Made Error

- Students gets confused between vasectomy and tubectomy. They often write opposite definitions.

Q. 16. After a brief medical examination a healthy couple came to know that both of them are unable to produce functional gametes and should look for an 'ART' (Assisted Reproductive Technique). Name the 'ART' and the procedure involved that you can suggest to them to help them bear a child. [C] [Delhi Set-I, 2015]

Ans. Test-tube baby programme

Collection of ova and sperm from donor
(Corresponding procedure correctly explained)

Explanation :

- IVF** : Fertilisation outside the body in almost similar conditions as that in the body.
- ICSI** : Sperm is directly injected into the ovum. ET-Embryo is transferred into reproductive tract/uterus.
- ZIFT** : Zygote or early embryos (upto eight blastomeres) transferred into fallopian tube.
- IUT** : Early embryos (with more than eight blastomeres) transferred into uterus.

[CBSE Marking Scheme, 2015] 3

Detailed Answer :

Test-tube baby should be preferred in case when both the partners are unable to produce functional gametes. In this, the sperms from donor male and ova from donor female are induced to form zygote in laboratory (test-tube). Then zygote is

allowed to divide forming 8 blastomeres. The zygote is transferred into the fallopian tube and then normal developmental process go on. It is also called ZIFT.

Q. 17. 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.

[E & A] [Outside Delhi Set-I, III, 2014]

Ans. To legally check female foeticide/Misuse of sex determination technique. 1

To detect the abnormal chromosomes/genetic disorder. 1

Justify : Prevent (female foeticide) change in sex ratio of the population. 1

[CBSE Marking Scheme, 2014]

Detailed Answer :

Amniocentesis is a prenatal diagnostic technique that is used to determine the sex and metabolic disorders of the developing foetus in the mother's uterus through the observation of the chromosomal patterns. This method was developed so as to determine any kind of genetic disorder present in the foetus.

However, unfortunately, this technique is being misused to detect the sex of the child before birth and the female foetus is then aborted. Thus, to prevent the increasing female foeticides, it is necessary to ban the usage of amniocentesis technique for determining the sex of a child. 3

? Long Answer Type Questions

(5 marks each)

Q. 1. A village health worker was taking a session with women. She tells the women that one has to be very careful while using oral pills as method of birth control. Wrong usage can actually promote conception.

(i) Analyze the statement and compare the merits and

Ans. (i)

	Contraceptive pills	Surgical method
Merits	<ul style="list-style-type: none"> • Pills are effective with lesser side effects and well accepted by females. • Reversible method 	<ul style="list-style-type: none"> • Surgical intervention block gamete transport. • Highly effective
Demerits	<ul style="list-style-type: none"> • If not taken on right days they can promote conception. • Can have side effects if taken for a long time. 	<ul style="list-style-type: none"> • Not Reversible • Can affect health of a person if performed in unhygienic condition.

(ii) **Mode of action of IUDs:**

- Increase phagocytosis of sperms within the uterus.
- Cu^{++} released suppress sperms motility/fertility capacity of sperm.
- Hormone releasing IUDs make uterus unsuitable for implantation/cervix hostile to the sperms.

3

Know the Terms

- **Medical Termination of Pregnancy** : The Intentional or voluntary termination of pregnancy before full term is known as MTP.
- **Amniocentesis** : It is a prenatal diagnostic technique that is used to determine the sex and metabolic disorders of the developing foetus in the mother's uterus through the observation of the chromosomal pattern.
- **Sexually transmitted diseases** : Diseases transmitted through sexual intercourse are called sexually transmitted diseases (STDs).
- **Infertility** : It is the inability of couple to produce baby even after unprotected intercourse.
- **Zygote Intra Fallopian Transfer (ZIFT)** : It involves transfer of zygote or early embryos (with up to 8 blastomeres) into fallopian tube.
- **Intra Uterine Transfer (IUT)** : It involves transfer of embryos with more than 8 blastomeres into the uterus.
- **Artificial insemination (AI) technique** : It is the method of transferring semen (sperm) collected from the husband or a healthy donor into the vagina or the uterus (IUI – intra-uterine insemination) of the recipient female.

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