ANSWER KEY & MARKING SCHEME · CBSE CLASS 12

Reproductive Health

Biology · Chapter 3 · Use this with the Board Paper · Companion to Quick Drill

HOW TO USE

Attempt the Board Paper first (closed-book, full time). Then come here. For 2-mark+ questions, compare your answer to the model. For 3-4 mark questions, also consult the **Topper Templates** below — these show the exact step-by-step structure that scores full marks per CBSE marking-scheme conventions.

MODEL ANSWERS · BOARD PAPER

Section A (1-mark questions)

Q1. Expand the abbreviation IUD and give one example of a copper-releasing IUD. [1 mark]

Ans: IUD = Intra-Uterine Device. Example of a copper-releasing IUD: Cu-T (or Cu-7 / Multiload-375).

Q2. Name the oral contraceptive pill developed in India that is non-steroidal and taken once a week. [1 mark]

Ans: Saheli (developed by CDRI, Lucknow).

Q3. Name the Act that bans the use of amniocentesis for foetal sex determination. [1 mark]

Ans: The PCPNDT Act (Pre-Conception and Pre-Natal Diagnostic Techniques Act).

Q4. Define infertility. [1 mark]

Ans: Infertility is the inability of a couple to conceive even after one year (or more) of unprotected sexual intercourse.

Q5. Name any one sexually transmitted infection that can also be transmitted through shared needles. [1 mark]

Ans: Hepatitis-B (or HIV/AIDS).

Section B (2-mark questions)

Q6. Name the technique of foetal sex-determination that is being misused, and state the social consequence of this misuse. [2 marks]

Ans: The technique is AMNIOCENTESIS, which analyses foetal cells/chromosomes from amniotic fluid. Its misuse to determine the sex of the foetus and carry out sex-selective abortion (female foeticide) leads to a declining child sex ratio and gender imbalance — hence it is banned under the PCPNDT Act.

Q7. Differentiate between ZIFT and GIFT. [2 marks]

Ans: ZIFT (Zygote Intra-Fallopian Transfer): a zygote or early embryo (up to 8 blastomeres), formed by IVF, is transferred into the fallopian tube. GIFT (Gamete Intra-Fallopian Transfer): an ovum collected from a donor is transferred into the fallopian tube of another female who cannot produce ova but can provide a suitable environment for fertilisation and development.

Q8. State any two natural methods of contraception and mention one advantage of natural methods. [2 marks]

Ans: Two natural methods: (i) periodic abstinence/rhythm method (avoiding coitus during the fertile period, roughly day 10-17), and (ii) coitus interruptus (withdrawal) or lactational amenorrhea. Advantage: natural methods have NO side effects, though their reliability is comparatively low.

Section C (3-mark questions)

Q9. Classify contraceptive methods into any THREE categories, giving one example and the mode of action for each. [3 marks]

Ans: (1) BARRIER methods — e.g., condoms (Nirodh): physically prevent the meeting of sperm and ovum. (2) IUDs — e.g., Cu-T (copper-releasing): Cu ions suppress sperm motility and fertilising capacity; hormonal IUDs make the uterus unsuitable for implantation. (3) SURGICAL/STERILISATION — e.g., vasectomy (vas deferens cut/tied in males) or tubectomy (fallopian tubes cut/tied in females): block gamete transport; terminal and

highly reliable. (Other acceptable categories: natural — rhythm/coitus interruptus; oral — Saheli, inhibits ovulation.)

Q10. Name any four sexually transmitted infections and list two measures to prevent STIs. [3 marks]

Ans: Four STIs: gonorrhoea, syphilis, genital herpes, and chlamydiasis (also acceptable: genital warts, trichomoniasis, hepatitis-B, HIV/AIDS). Preventive measures: (i) avoid sex with unknown/multiple partners and always use condoms during coitus; (ii) avoid sharing needles/syringes and, in case of doubt, seek early diagnosis and complete the full course of treatment.

Q11. Explain the provisions of the MTP Act (1971, as amended in 2021) regarding the time limits for termination of pregnancy. [3 marks]

Ans: The Medical Termination of Pregnancy (MTP) Act was passed in 1971 to curb the menace of unsafe, illegal abortions and to aid population control. As amended in 2021: (i) a pregnancy may be terminated up to 20 weeks on the opinion of ONE registered medical practitioner (RMP); (ii) between 20 and 24 weeks for special categories (e.g., rape survivors, minors, differently-abled women) on the opinion of TWO RMPs. Most MTPs are performed in the safer first trimester. The Act must NOT be misused for sex-selective abortion, which is banned by the PCPNDT Act.

Section D (5-mark questions)

Q12. Describe the various assisted reproductive technologies (ART) used to help infertile couples. Expand each abbreviation and state where the gamete/embryo is transferred. [5 marks]

Ans: Infertility (inability to conceive after a year of unprotected intercourse) may be due to causes in either partner and can be treated with ART. (1) IVF (In Vitro Fertilisation, 'test-tube baby') — ova and sperm are collected and fused under simulated lab conditions to form a zygote; this is the basis of the other techniques. (2) ZIFT (Zygote Intra-Fallopian Transfer) — the zygote/early embryo up to the 8-blastomere stage is transferred into the FALLOPIAN TUBE; embryos beyond 8 blastomeres are placed in the UTERUS (IUT). (3) GIFT (Gamete Intra-Fallopian Transfer) — an OVUM collected from a donor is transferred into the FALLOPIAN TUBE of a female who cannot produce ova but can support development. (4) ICSI (Intra-Cytoplasmic Sperm Injection) — a SINGLE sperm is injected directly into the ovum in the lab; used for very low sperm count. (5) AI (Artificial Insemination)/IUI — semen from the husband or a donor is artificially introduced into the vagina or uterus; used for low sperm count or motility. NCERT urges that infertile couples be counselled to adopt these techniques or adoption rather than face social stigma.

Q13. Discuss the major causes and consequences of population explosion in India, and explain the role of contraception and the RCH programme in controlling it. [5 marks]

Ans: CAUSES: a rapid decline in death rate, maternal mortality rate and infant mortality rate (due to better healthcare) while the birth rate remained high, plus an increase in the number of people in the reproductive age group. CONSEQUENCES: alarming pressure on resources, food, jobs and the environment; India's population crossed the billion mark. CONTROL MEASURES: (i) raising the legal marriageable age (now 21 years); (ii) incentives to couples with small families; (iii) the 'Hum Do Hamare Do' awareness campaign. CONTRACEPTION: providing access to natural (rhythm, coitus interruptus, lactational amenorrhea), barrier (condoms, diaphragms), IUD (Cu-T, LNG-20), oral (Saheli) and surgical (vasectomy, tubectomy) methods, plus the statutory MTP Act for safe termination. THE RCH PROGRAMME (Reproductive and Child Health): provides education and counselling, awareness through audio-visual and print media, sex education in schools, contraceptive distribution, maternal and child healthcare, and STI/infertility support — making people responsible for reproductive decisions and helping stabilise the population.

★ TOPPER TEMPLATE — Classify the methods of contraception with one example and mode of action each.

Annual (3-5 marks)

Step 1 [1 mark]	**Natural + Barrier**	NATURAL methods avoid sperm-ovum meeting without devices — rhythm/periodic abstinence (avoid coitus during day 10-17 fertile window), coitus interruptus (withdrawal), and lactational amenorrhea (intense breastfeeding suppresses ovulation, reliable up to ~6 months). BARRIER methods physically block sperm-ovum meeting — condoms (Nirodh), diaphragms, cervical caps, vaults.
Step 2 [1 mark]	**IUDs**	INTRA-UTERINE DEVICES are inserted by a doctor into the uterus: non-medicated (Lippes loop) increase phagocytosis of sperm; copper-releasing (Cu-T, Cu-7, Multiload-375) release Cu ions that suppress sperm motility/fertilising capacity; hormone-releasing (LNG-20, Progestasert) make the uterus unsuitable for implantation and the cervix hostile to sperm. IUDs are India's most widely accepted reversible method.
Step 3 [1 mark]	**Oral pills**	ORAL CONTRACEPTIVES are progestogen or progestogen-estrogen combinations taken daily for 21 days — they inhibit ovulation and implantation and alter cervical mucus. SAHELI is an Indian non-steroidal, once-a-week pill (developed by CDRI Lucknow) with very few side effects.
Step 4 [1 mark]	**Surgical (sterilisation)**	SURGICAL/TERMINAL methods block gamete transport: VASECTOMY — the vas deferens is cut/tied in males; TUBECTOMY — the fallopian tubes are cut/tied in females. These are highly effective but generally irreversible.

COMMON LOSS OF MARKS:

- Giving descriptions without NAMING an example (examiners want Cu-T, Saheli, Nirodh, etc.).
- Saying IUDs work in only one way — copper and hormonal IUDs have distinct mechanisms.
- Forgetting that sterilisation is terminal/irreversible.

★ TOPPER TEMPLATE — State the provisions of the MTP Act (1971, amended 2021).

Frequent (3 marks)

Step 1 [1 mark]	**Definition + purpose**	Medical Termination of Pregnancy (MTP) is the intentional/voluntary termination of pregnancy before full term. The Government legalised it through the MTP Act in 1971 (amended in 2021) to check the menace of UNSAFE, illegal abortions and the associated maternal mortality, and as an aid to control population growth.
Step 2 [1 mark]	**Time limits**	Under the amended Act, pregnancy may be terminated up to 20 WEEKS on the opinion of ONE registered medical practitioner (RMP), and between 20 and 24 WEEKS for special categories (e.g., rape survivors, minors, differently-abled women) on the opinion of TWO RMPs.
Step 3 [1 mark]	**Indications + caution**	MTPs are advised where continuation would harm the mother or foetus, in cases of rape, or where contraception has failed. Most MTPs are in the FIRST TRIMESTER (safer). However, MTP is sometimes MISUSED for illegal SEX-SELECTIVE abortion after foetal sex determination — which is banned by the PCPNDT Act.

COMMON LOSS OF MARKS:

- Quoting the old 'up to 12 weeks/one doctor, 12-20 two doctors' limits instead of the 2021 amendment (20 weeks / 20-24 special).
- Omitting the purpose (reducing unsafe abortions).
- Not linking MTP misuse to the PCPNDT Act.

★ TOPPER TEMPLATE — Name common STIs and state preventive measures.
Frequent (3 marks)

Step 1 [1 mark]	**Name STIs**	Common sexually transmitted infections include gonorrhoea, syphilis, genital herpes, chlamydiasis, genital warts, trichomoniasis, hepatitis-B, and HIV leading to AIDS. Early symptoms are often minor (itching, fluid discharge, pain), so infections may be ignored.
Step 2 [1 mark]	**Consequences**	If untreated, STIs may cause pelvic inflammatory disease (PID), infertility, ectopic pregnancies, abortions, stillbirths, and even cancer of the reproductive tract. Hepatitis-B and HIV also spread via shared needles, transfusion, and from infected mother to foetus.
Step 3 [1 mark]	**Prevention**	Preventive measures: (i) avoid sex with unknown/multiple partners; (ii) always use condoms during coitus; (iii) avoid sharing needles, syringes and blades; (iv) in case of doubt, seek early diagnosis and complete the full treatment course.

COMMON LOSS OF MARKS:
- Listing diseases that are NOT STIs.
- Forgetting non-sexual transmission routes for hepatitis-B / HIV.
- Vague prevention ('be careful') instead of the four NCERT measures.

★ TOPPER TEMPLATE — Explain ART techniques used to assist infertile couples (IVF, ZIFT, GIFT, ICSI, AI).
Frequent (3-5 marks)

Step 1 [1 mark]	**IVF + embryo transfer**	IN VITRO FERTILISATION (IVF, 'test-tube baby') — ova from the wife/donor and sperm from the husband/donor are collected and fused under simulated lab conditions to form a zygote. Embryos up to the 8-blastomere stage are transferred into the fallopian tube (ZIFT) and those beyond 8 blastomeres into the uterus (IUT — intra-uterine transfer).
Step 2 [1 mark]	**ZIFT vs GIFT**	ZIFT (Zygote Intra-Fallopian Transfer) — the zygote or early embryo (up to 8 blastomeres) is transferred into the fallopian tube. GIFT (Gamete Intra-Fallopian Transfer) — the transfer of an OVUM collected from a donor into the fallopian tube of another female who cannot produce ova but can provide a suitable environment for fertilisation and development.
Step 3 [1 mark]	**ICSI + AI**	ICSI (Intra-Cytoplasmic Sperm Injection) — a SINGLE sperm is injected directly into the cytoplasm of the ovum to form an embryo in the lab; used when the male has very low sperm count/motility. ARTIFICIAL INSEMINATION (AI) — semen collected from the husband or a donor is artificially introduced into the vagina or uterus (IUI) of the female; used when the male has low sperm count or low motility.

COMMON LOSS OF MARKS:
- Swapping ZIFT and GIFT definitions.
- Not specifying WHERE the gamete/embryo is transferred (fallopian tube vs uterus).
- Confusing ICSI (single sperm into ovum) with IVF (fusion in a dish).

★ TOPPER TEMPLATE — What is amniocentesis? How is it being misused and which Act bans the misuse?
Occasional (2-3 marks)

Step 1 [1 mark]	**Definition + legitimate use**	AMNIOCENTESIS is a foetal sex- and genetic-disorder-determination test based on the analysis of cells and chromosomes in the amniotic fluid surrounding the developing foetus. Its legitimate use is to detect chromosomal abnormalities (e.g., Down syndrome), sex-linked disorders and metabolic/congenital defects.
Step 2 [1 mark]	**Misuse**	It is grossly MISUSED to determine the SEX of the foetus, and if female, to carry out an illegal SEX-SELECTIVE ABORTION (female foeticide) — a major cause of the declining child sex ratio in India.
Step 3 [1 mark]	**Legal ban**	To curb this misuse, amniocentesis for foetal sex determination is statutorily BANNED under the PCPNDT Act (Pre-Conception and Pre-Natal Diagnostic Techniques Act). Creating social awareness and 'Beti Bachao' messaging supplement the legal ban.

COMMON LOSS OF MARKS:
- Saying amniocentesis itself is banned (only the sex-disclosure misuse is).
- Not naming the PCPNDT Act.
- Omitting the legitimate diagnostic purpose.

MARKING SCHEME — GENERAL NOTES
- Contraception classification: full marks require a NAMED example for each category (e.g., Cu-T, Saheli, Nirodh) plus its mode of action — vague descriptions without examples lose 1 mark.
- MTP Act: the 2021 time limits (20 weeks / 1 RMP; 20-24 weeks special / 2 RMPs) must be stated — quoting the old pre-2021 limits loses 1 mark.

- STIs: the named infections must be genuine STIs — naming a non-STI (e.g., malaria, typhoid) earns zero for that name. Both sexual and non-sexual transmission routes (hepatitis-B, HIV) are credited.
- ART: each abbreviation must be correctly expanded AND the site of transfer stated. Swapping ZIFT and GIFT is the most common 1-2 mark loss.
- Amniocentesis: the answer must clarify that the technique itself is legal for disorder detection and that only its sex-determination misuse is banned (PCPNDT Act).
- Saheli must be identified as non-steroidal and once-a-week; calling it a daily steroidal pill loses the mark.
- Sterilisation answers must mention that vasectomy/tubectomy are terminal/generally irreversible methods.
- Acceptable variations: 'Nirodh' for condom, 'IUI' for one form of artificial insemination, and 'Cu-7 / Multiload-375' as alternative copper IUD examples are all accepted.