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CLASS X · HEALTH CARE (413) · SKILL SUBJECT · CBSE BOARD EXAMINATION 2027

PART B · UNIT 3

Sterilization and Disinfection

Unit Booklet · Short Notes · Board-Pattern Questions · Model Answers

Part B · 5 of 40 theory marks | 26 questions with model answers | Ram Sir | Taught: Wed 25 Nov

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STUDENT DETAILS

NAME _____

CLASS & SECTION _____

ROLL NO. _____

UNIT FINISHED ON _____

OBJECTIVE SELF-CHECK _____ / 14

1

READ THIS FIRST · SHORT NOTES

Unit Notes

Microorganisms and how infection spreads, the epidemiological triangle, the germs behind common diseases, COVID-19, hospital-acquired infection and the GDA's part in preventing it, and the difference between antiseptics, disinfectants and sterilization.

THIS UNIT IN THE BOARD PAPER

5 / 40

Unit 3 carries **5 marks**. In the CBSE sample paper it gave **4 one-mark MCQs**, a **2-mark** note on fungi and a **4-mark** road-accident scenario. Causal agents of diseases and antiseptic / disinfectant / sterilization are favourites.

SYLLABUS 2026–27 · WHAT CBSE LISTS FOR THIS UNIT

- Disease, infection, pathogen; the infection process
- Epidemiological triangle; types of microorganisms; COVID-19
- Common human diseases and their causal agents
- Hospital-acquired infection (HAI); role of hospital staff and the GDA
- Antiseptic, disinfectant, sterilization; physical and chemical agents
- Methods of disinfecting wards and equipment

HOW THE CBSE SKILL-SUBJECT PAPER IS SET (THEORY 50 MARKS · 2 HOURS)

1 mark
Objective: MCQ, assertion–reason, fill in the blank, true/false, match. Q1 is Part A; Q2–Q5 (answer 5 of 6 in each) are Part B.

2 marks
Short answer in **20–30 words**: two clear points. Part B: answer any 4 of 6 (Q11–Q16).

4 marks
Long answer in **50–80 words**: four points, or 2 + 2. Answer any 3 of 5 (Q17–Q21); often case-based.

Part B = 40
Objective 20 + short 8 + long 12. Part A (Employability Skills) = 10. Practical = 50.

Write in points, start each point with the key word, and stay inside the word limit. Objective answers: write the option letter **and** the answer.

1 Disease, infection, pathogen

- **Disease:** any condition in which the body or mind does not work normally.
- **Infection:** entry and multiplication of a germ in the body, causing harm.
- **Pathogen:** a microorganism that causes disease.
- **Communicable disease:** one that spreads from person to person (TB, COVID-19). **Non-communicable:** does not spread (diabetes).

Chain of infection (the infection process):

1. **Infectious agent** – the germ
2. **Reservoir** – where it lives (person, animal, water, soil)
3. **Portal of exit** – how it leaves (cough, blood, stool)
4. **Mode of transmission** – how it travels
5. **Portal of entry** – how it enters (mouth, nose, cut skin)
6. **Susceptible host** – a person who can fall ill

Breaking **any one link** (e.g. hand washing breaks transmission) stops the infection.

2 The epidemiological triangle

Disease happens when three things meet – the three **vertices** of the triangle:

Vertex	Meaning	Example (malaria)
Agent	The cause – a germ (or a chemical)	Plasmodium parasite
Host	The person; age, immunity, nutrition, habits matter	A person without protection
Environment	Surroundings that help the agent reach the host	Stagnant water, mosquitoes, rainy season

3 Types of microorganisms

Type	Features	Diseases
Bacteria	Single-celled, no nucleus; some are useful (curd)	TB, typhoid, cholera, tetanus, pneumonia
Viruses	Very tiny; live and multiply only inside living cells; antibiotics do not work	Cold, flu, measles, polio, hepatitis, AIDS, COVID-19, dengue
Fungi	Yeasts and moulds; grow in warm, moist places; some are useful (penicillin, yeast in bread)	Ringworm, athlete's foot, oral thrush
Protozoa	Single-celled with a nucleus; often spread by insects or dirty water	Malaria, amoebic dysentery, kala-azar
Worms (helminths)	Many-celled parasites	Roundworm, tapeworm, filaria (elephantiasis)

4 Common diseases and their causes

Disease	Causal agent	Spread by
Tuberculosis	Bacterium *Mycobacterium tuberculosis*	Air (cough, sneeze)
Typhoid	Bacterium *Salmonella typhi*	Contaminated food and water
Cholera	Bacterium *Vibrio cholerae*	Contaminated water
Tetanus	Bacterium *Clostridium tetani*	Soil entering wounds
Malaria	Protozoan *Plasmodium*	Female *Anopheles* mosquito
Dengue	Dengue virus	*Aedes* mosquito
AIDS	HIV (virus)	Blood, unsafe sex, mother to child
Hepatitis B	Hepatitis B virus	Blood, needles, body fluids
Ringworm	Fungus	Contact with skin, towels, combs

5 COVID-19

- Caused by the **SARS-CoV-2** virus; declared a **pandemic** by the WHO in March 2020.
- **Spread:** droplets and tiny particles from coughing, sneezing, talking; touching contaminated surfaces then the face.
- **Symptoms:** fever, dry cough, tiredness, sore throat, loss of taste or smell, breathlessness in serious cases.
- **Prevention:** vaccination, well-fitting masks, washing hands for at least **20 seconds** or using an alcohol sanitiser, distance, fresh air, isolation of patients.

6 Hospital-acquired infection (HAI)

HAI (nosocomial infection): an infection a patient **gets in the hospital**, which was not present at admission – usually appearing **48 hours or more** after admission.

- **Common HAIs:** urinary infection from catheters, wound (surgical site) infection, pneumonia in patients on ventilators, bloodstream infection from IV lines, diarrhoea.
- **Causes:** unwashed hands, unclean instruments, tubes and catheters, weak patients, crowded wards, poor waste disposal.

7 GDA's role in preventing HAI

- **Hand hygiene** at the WHO's 5 moments: before touching a patient; before a clean procedure; after contact with body fluids; after touching a patient; after touching the patient's surroundings.
- Use **PPE** – gloves, mask, gown, goggles – as needed; change gloves between patients.
- Clean and disinfect the patient's unit, bed rails, trolleys and equipment.
- Handle soiled linen carefully; never shake it; bag it at once.
- **Segregate biomedical waste** into the right colour bin.
- Follow isolation rules; report fever, wound pus or diarrhoea to the nurse; keep personal hygiene; get vaccinated (hepatitis B).

Bin	Waste
Yellow	Body parts, soiled dressings and cotton, expired medicines
Red	Contaminated plastic: tubes, IV sets, catheters, urine bags, gloves
White (puncture-proof)	Sharps: needles, blades, scalpels
Blue	Glassware: broken vials, ampoules; metal implants

8 Antiseptic, disinfectant, sterilization

	Antiseptic	Disinfectant	Sterilization
Used on	**Living** tissue (skin, wounds)	**Non-living** objects and surfaces	Instruments and supplies
Effect	Reduces germs	Kills most germs, not all spores	Destroys **all** microbes, **including spores**
Examples	Spirit (70% alcohol), povidone-iodine, Dettol, chlorhexidine	Bleach (sodium hypochlorite), phenol, Lysol	Autoclave, hot air oven, gas, radiation

9 Physical and chemical agents; hospital methods

Physical agents	Chemical agents
Moist heat: autoclave (steam at 121 °C, 15 lb pressure, 15–20 min), boiling	**Alcohols:** 70% spirit for skin and small surfaces
Dry heat: hot air oven (160 °C for 2 hours), incineration of waste	**Chlorine:** 1% sodium hypochlorite for floors and spills
Radiation: UV light, sunlight	**Aldehydes:** 2% glutaraldehyde for scopes
Filtration of fluids and air	**Phenol**, hydrogen peroxide, iodine

Disinfecting wards: damp dusting and mopping with disinfectant (never dry sweeping); wiping beds, rails and trolleys with hypochlorite; cleaning spills at once; terminal cleaning of the unit after discharge; sending instruments to the **CSSD** for autoclaving.

Key terms

15 terms

- **Pathogen:** germ that causes disease
- **Infection:** germ enters and multiplies in the body
- **Reservoir:** where the germ lives
- **Vector:** carrier such as a mosquito
- **Epidemiological triangle:** agent, host and environment
- **HAI / nosocomial:** infection caught in hospital
- **Hand hygiene:** hand washing or rub at the right moments
- **PPE:** gloves, mask, gown, goggles
- **Antiseptic:** chemical safe for living tissue
- **Disinfectant:** chemical for non-living objects
- **Sterilization:** kills all microbes including spores
- **Autoclave:** steam under pressure at 121 °C
- **Spore:** tough resting form of some bacteria
- **Biomedical waste:** waste from patient care
- **Pandemic:** disease spread across many countries

Common mistakes and exam tips

AVOID THESE

- Antiseptic = **skin**; disinfectant = **objects**; sterilization = **all** microbes including spores.
- Boiling is **disinfection**, not sterilization – it may not kill all spores.
- Malaria is caused by **Plasmodium** (a protozoan), not by the mosquito – the mosquito is only the **vector**.
- Antibiotics do **not** work against viruses.
- Needles go in the **white** puncture-proof box, never in a plastic bag.

A

PART A · 1 MARK EACH

Objective Questions

14 questions: MCQs, assertion–reason, fill in the blanks and true/false, like Q2–Q5 of the board paper. Answers in Part E.

A1. The three vertices of the epidemiological triangle are: [1]

(a) Agent, host, environment (b) Bacteria, virus, fungus
(c) Doctor, nurse, patient (d) Air, water, food

A2. Malaria is caused by: [1]

(a) a virus (b) a bacterium
(c) the protozoan Plasmodium (d) a fungus

A3. Ringworm and athlete's foot are caused by: [1]

(a) Bacteria (b) Fungi (c) Viruses (d) Worms

A4. A patient admitted for a fracture develops a urinary infection from a catheter on the fifth day. This is a(n): [1]

(a) Hereditary disease (b) Hospital-acquired infection
(c) Non-communicable disease (d) Deficiency disease

A5. Which process destroys all microorganisms including spores? [1]

(a) Antisepsis (b) Disinfection (c) Sterilization (d) Hand washing

A6. An autoclave sterilises instruments using: [1]

(a) Dry heat at 60 °C (b) Steam under pressure at about 121 °C
(c) UV light only (d) Cold water

A7. Which is an antiseptic? [1]

(a) Povidone-iodine on a cut (b) Bleach on the floor
(c) Phenol for drains (d) Autoclave

A8. Used needles must be put in the: [1]

(a) Yellow bag (b) Red bag
(c) White puncture-proof container (d) Blue box

A9. Match the disease with its causal agent: [1]

P. Typhoid Q. Dengue R. Tuberculosis S. Amoebic dysentery
1. Virus 2. *Salmonella* 3. Protozoan 4. *Mycobacterium*

(a) P-2, Q-1, R-4, S-3 (b) P-1, Q-2, R-4, S-3
(c) P-2, Q-4, R-1, S-3 (d) P-3, Q-1, R-4, S-2

A10. Hand washing breaks which link of the chain of infection? [1]

(a) Reservoir (b) Mode of transmission
(c) Susceptible host (d) Infectious agent

A11. FILL IN THE BLANK [1]

COVID-19 is caused by the virus called _____.

A12. FILL IN THE BLANK [1]

Floors and blood spills are disinfected with 1% _____.

A13. TRUE OR FALSE [1]
Antibiotics are effective against viral diseases such as the common cold.

A14. TRUE OR FALSE [1]
Contaminated plastic items such as IV sets and catheters go into the red bin.

B — Short Answer Questions

PART B · 2 MARKS EACH

Answer in 20–30 words: two clear points. Model answers in Part E.

B1. Write a short note on fungi. MUST DO [2]

B2. What is a hospital-acquired infection? Give one example. [2]

B3. Differentiate between an antiseptic and a disinfectant. MUST DO [2]

B4. Name the three vertices of the epidemiological triangle. [2]

B5. Name the causal agent of tuberculosis and malaria. [2]

B6. State any four steps to prevent COVID-19. [2]

C — Long Answer Questions

PART C · 4 MARKS EACH

Answer in 50–80 words: four points, or two points with an example each. Model answers in Part E.

C1. Describe the role of a GDA in preventing hospital-acquired infections. MUST DO [4]

C2. Explain the types of microorganisms with one disease caused by each. [4]

C3. Compare antiseptic, disinfectant and sterilization. MUST DO [4]

C4. Explain the chain of infection. [4]

D — Case-Based Questions

PART D · CASE AND COMPETENCY BASED

Read the situation, then answer from it and from the unit. These are the 4-mark board questions that test application.

D1. Case-Based · Road accident in the emergency ward [4]

A young man is brought to the emergency ward after a road accident. He has a deep cut on his leg with mud in it and is bleeding. A GDA helps the nurse. Later the used gauze, gloves, IV set and needles must be disposed of.

(i) Which serious bacterial disease can enter through a dirty wound? Name its agent. [1]

(ii) What should be used to clean the skin around the wound – an antiseptic or a disinfectant? Why? [1]

(iii) Into which bins should the gauze, IV set and needles go? [2]

D2. Competency-Based · Fever in Ward 5 [4]

Three patients in Ward 5 develop fever and wound infection a week after their operations. An inspection finds that staff often go from one patient to the next without washing hands and that the floor is dry-swept every morning.

(i) What type of infection is this? [1]

(ii) Which two practices are spreading it? [1]

(iii) Suggest two corrective steps. [2]

E

PART E · ANSWERS IN CBSE MARKING-SCHEME STYLE

Answers

Objective key with a reason, then model answers: numbered value points, key word first, the mark for each point in orange, and the word count under each answer. Any other correct, relevant point also earns the mark.

Objective questions – answer key

Part A

Write the option letter **and** the answer, as the marking scheme does.

Q	Answer	Why (one line)
A1	**(a) Agent, host, environment**	Disease needs all three.
A2	**(c) the protozoan Plasmodium**	The Anopheles mosquito only carries it.
A3	**(b) Fungi**	Fungal skin infections.
A4	**(b) Hospital-acquired infection**	Caught in hospital after 48 h.
A5	**(c) Sterilization**	E.g. autoclaving.
A6	**(b) Steam under pressure at about 121 °C**	Moist heat under pressure.
A7	**(a) Povidone-iodine on a cut**	Used on living tissue.
A8	**(c) White puncture-proof container**	Sharps go in the white container.
A9	**(a) P-2, Q-1, R-4, S-3**	Typhoid bacterium; dengue virus; TB bacterium; Entamoeba protozoan.
A10	**(b) Mode of transmission**	Stops germs travelling on hands.
A11	**SARS-CoV-2**	A coronavirus.
A12	**sodium hypochlorite (bleach)**	A chlorine disinfectant.
A13	**False**	Correct: antibiotics act only on bacteria; viruses are not killed by them.
A14	**True**	Recyclable contaminated plastic.

Short answers

Part B · 2 marks

B1. Write a short note on fungi. [2]

1. **Nature:** yeasts and moulds that grow in warm, moist places; some are useful, like penicillin. 1
2. **Diseases:** cause ringworm, athlete's foot and oral thrush. 1

23 words · CBSE asks 20–30 words | Marking: 1 + 1 = 2 | 1 + 1 | MUST DO

B2. What is a hospital-acquired infection? Give one example. [2]

1. **Meaning:** infection caught in hospital, not present at admission, appearing after 48 hours. 1
2. **Example:** urinary infection from a catheter. 1

19 words · CBSE asks 20–30 words | Marking: 1 + 1 = 2 | 1 + 1

B3. Differentiate between an antiseptic and a disinfectant. [2]

1. **Antiseptic:** used on living tissue to reduce germs, e.g. spirit. 1
2. **Disinfectant:** used on non-living objects to kill germs, e.g. bleach. 1

20 words · CBSE asks 20–30 words | Marking: 1 + 1 = 2 | 1 + 1 | MUST DO

B4. Name the three vertices of the epidemiological triangle. [2]

1. **Agent:** the cause, such as a germ. ½
2. **Host:** the person who can fall ill. ½
3. **Environment:** surroundings that bring agent and host together. 1

22 words · CBSE asks 20–30 words | Marking: ½ + ½ + 1 = 2 | ½ + ½ + 1 (with meanings)

B5. Name the causal agent of tuberculosis and malaria. [2]

1. **Tuberculosis:** bacterium Mycobacterium tuberculosis. 1
2. **Malaria:** protozoan Plasmodium. 1

7 words · CBSE asks 20–30 words | Marking: 1 + 1 = 2 | 1 + 1

B6. State any four steps to prevent COVID-19. [2]

1. **Vaccination:** take the vaccine. ½
2. **Mask:** wear a well-fitting mask. ½
3. **Hands:** wash for 20 seconds. ½
4. **Distance:** keep distance; ventilate rooms. ½

19 words · CBSE asks 20–30 words | Marking: ½ + ½ + ½ + ½ = 2 | 4 × ½ = 2

Long answers

Part C · 4 marks

C1. Describe the role of a GDA in preventing hospital-acquired infections. [4]

1. **Hand hygiene:** washes hands at the five moments. 1
2. **PPE:** uses gloves, mask and gown; changes gloves between patients. 1
3. **Cleaning:** disinfects the patient's unit and equipment. 1
4. **Waste:** segregates biomedical waste into colour bins. 1

32 words · CBSE asks 50–80 words | Marking: 1 + 1 + 1 + 1 = 4 | Any four, 1 mark each | MUST DO

C2. Explain the types of microorganisms with one disease caused by each. [4]

1. **Bacteria:** single-celled, no nucleus – typhoid. 1
2. **Viruses:** grow only in living cells – measles. 1
3. **Fungi:** moulds and yeasts – ringworm. 1
4. **Protozoa:** single-celled with nucleus – malaria. 1

22 words · CBSE asks 50–80 words | Marking: 1 + 1 + 1 + 1 = 4 | ½ feature + ½ disease, × 4

C3. Compare antiseptic, disinfectant and sterilization. [4]

1. **Antiseptic:** on living tissue; reduces germs; e.g. povidone-iodine. 1
2. **Disinfectant:** on objects; kills most germs; e.g. bleach. 1
3. **Sterilization:** kills all microbes including spores. 1
4. **Method:** autoclave at 121 °C or hot air oven. 1

31 words · CBSE asks 50–80 words | Marking: 1 + 1 + 1 + 1 = 4 | 1 mark each | MUST DO

C4. Explain the chain of infection. [4]

1. **Agent and reservoir:** a germ lives in a person, animal, water or soil. 1
2. **Exit and transmission:** it leaves by cough or blood and travels. 1
3. **Entry:** enters through mouth, nose or broken skin. 1
4. **Host:** a susceptible person falls ill; breaking any link stops infection. 1

43 words · CBSE asks 50–80 words | Marking: 1 + 1 + 1 + 1 = 4 | 1 mark each

Case-based answers

Part D

D1. Case-Based · Road accident in the emergency ward (passage printed in Part D) [4]

(i) Which serious bacterial disease can enter through a dirty wound? Name its agent. [1]

Tetanus, caused by *Clostridium tetani*.

(ii) What should be used to clean the skin around the wound – an antiseptic or a disinfectant? Why? [1]

An **antiseptic**, because it is safe on **living tissue**.

(iii) Into which bins should the gauze, IV set and needles go? [2]

Gauze with blood – **yellow**; IV set and gloves – **red**; needles – **white** puncture-proof container.

Marking: 1 + 1 + 2 = 4 | 1 + 1 + 2

D2. Competency-Based · Fever in Ward 5 (passage printed in Part D) [4]

(i) What type of infection is this? [1]

Hospital-acquired (nosocomial) infection.

(ii) Which two practices are spreading it? [1]

No hand hygiene between patients and **dry sweeping**, which raises dust and germs.

(iii) Suggest two corrective steps. [2]

(1) Hand hygiene at the WHO **five moments**, with gloves changed between patients. (2) **Damp mopping** with disinfectant and disinfecting beds and trolleys daily.

Marking: 1 + 1 + 2 = 4 | 1 + 1 + 2