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

PART B · UNIT 5

Body Structure, Functions and Nutrition

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

Part B · 5 of 40 theory marks | 26 questions with model answers | Ram Sir | Taught: Fri 27 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

Anatomy and physiology words, direction terms, the levels of body organisation, the cell and its functions, the four tissues, bones and their functions, the main organ systems, and the nutrients, vitamins, minerals and balanced diet a GDA must know.

THIS UNIT IN THE BOARD PAPER

5 / 40

Unit 5 carries **5 marks**. In the CBSE sample paper it gave **4 one-mark MCQs**, a **2-mark** question on direction terms (anterior / posterior, proximal / distal) and a **4-mark** question on the functions of the cell.

SYLLABUS 2026–27 · WHAT CBSE LISTS FOR THIS UNIT

- Anatomy and physiology: key terms; direction terms
- Cell, tissues, organs and organ systems; functions of tissues
- Bones: number and functions
- Identifying organs on a human model
- Nutrients and vitamins: their role in growth and development
- Balanced diet: meaning and importance

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.

PRACTICAL WORK FOR THIS UNIT

Identify the main organs on a human body model or chart · plan a balanced diet for one day for a patient or a teenager.

1 Anatomy and physiology

- **Anatomy:** study of the **structure** of the body and its parts (what it is made of, where it lies).
- **Physiology:** study of how the body parts **work** (their functions).
- **Anatomical position:** standing upright, face forward, arms by the sides, palms forward, feet together. All direction terms are described from this position.

2 Direction terms

Term	Meaning	Example
Anterior (ventral)	Towards the **front**	The nose is anterior to the ears
Posterior (dorsal)	Towards the **back**	The spine is posterior to the heart
Superior	Towards the **head**, above	The head is superior to the neck
Inferior	Away from the head, below	The feet are inferior to the knees
Medial	Towards the **midline**	The nose is medial to the eyes
Lateral	Away from the midline	The ears are lateral to the eyes
Proximal	Nearer the point where a limb joins the trunk	The elbow is proximal to the wrist
Distal	Farther from that point	The fingers are distal to the wrist

3 Levels of organisation

1. **Cell** – the basic unit of life
2. **Tissue** – a group of similar cells doing one job
3. **Organ** – different tissues working together (heart, stomach)
4. **Organ system** – organs working together (digestive system)
5. **Organism** – the whole human body

4 The cell and its functions

Parts: cell membrane (outer cover, controls entry and exit), **cytoplasm** (jelly-like fluid where work happens), **nucleus** (control centre; contains DNA), **mitochondria** (make energy).

- **Growth** – cells grow and increase in number.
- **Metabolism** – use food to make energy (respiration).
- **Reproduction** – divide to make new cells and repair injuries.
- **Protein synthesis** – make proteins for the body.
- **Excretion** – remove wastes.
- **Response** – react to changes around them.

5 Four types of tissue

Tissue	Job	Found in
Epithelial	Covers and lines; protects, absorbs, secretes	Skin, lining of mouth and stomach
Connective	Joins and supports other tissues; carries materials	Bone, cartilage, blood, fat
Muscular	Contracts to produce movement	Skeletal muscles, heart (cardiac), stomach wall (smooth)
Nervous	Carries messages (impulses)	Brain, spinal cord, nerves

6 Bones and their functions

An adult skeleton has **206 bones**. The longest bone is the **femur** (thigh bone).

- **Support** and **shape** to the body.
- **Protection** – skull protects the brain; ribs protect the heart and lungs.
- **Movement** – muscles pull on bones at joints.
- **Blood formation** – red bone marrow makes blood cells.
- **Storage** of minerals such as calcium and phosphorus.

7 Main organ systems

System	Main organs	Work
Digestive	Mouth, stomach, intestines, liver	Breaks down and absorbs food
Respiratory	Nose, windpipe, lungs	Takes in oxygen, gives out carbon dioxide
Circulatory	Heart, blood vessels, blood	Carries oxygen and food to cells
Nervous	Brain, spinal cord, nerves	Controls and coordinates
Excretory (urinary)	Kidneys, bladder	Removes wastes as urine
Skeletal and muscular	Bones, joints, muscles	Support and movement

8 Nutrients and their roles

Nutrient	Role	Sources
Carbohydrates	Main source of **energy** (4 kcal per g)	Rice, wheat, potato, sugar
Proteins	**Growth and repair** of body tissues (4 kcal per g)	Dal, milk, eggs, paneer, soybean
Fats	Concentrated energy (9 kcal per g); keep the body warm	Ghee, oil, butter, nuts
Vitamins and minerals	**Protect** from disease; help body work	Fruits, vegetables, milk
Water and fibre	Water carries nutrients; fibre prevents constipation	Water, salad, whole grains

9 Vitamins and minerals

Nutrient	Source	Lack causes
Vitamin A	Carrot, green leafy vegetables, milk	Night blindness
Vitamin B1	Whole grains, pulses	Beriberi
Vitamin C	Amla, lemon, orange, guava	Scurvy (bleeding gums)
Vitamin D	Sunlight, milk, eggs	Rickets (soft, bent bones)
Iron	Green leafy vegetables, jaggery, dates	Anaemia
Iodine	Iodised salt, sea food	Goitre
Calcium	Milk, curd, ragi	Weak bones and teeth

10 Balanced diet

> **Balanced diet:** a diet that gives all the nutrients in the **right amounts** for a person's age, sex, work and health.

- **Importance:** proper growth and development, energy for work, strong immunity, healthy weight, quick recovery for patients.
- **Plate idea:** fill about **half** the plate with vegetables and fruits; the rest with cereals and pulses, eggs or meat; add milk or curd and a little oil and nuts.
- Drink enough water; limit sugar, salt, fried and packaged food.

Key terms

15 terms

- **Anatomy:** study of body structure
- **Physiology:** study of body functions
- **Anterior:** front
- **Posterior:** back
- **Proximal:** nearer the limb's attachment
- **Distal:** farther from the attachment
- **Medial:** towards the midline
- **Lateral:** away from the midline
- **Cell:** basic unit of life
- **Tissue:** group of similar cells
- **Organ system:** organs working together
- **Femur:** thigh bone; longest bone
- **Nutrient:** substance in food the body needs
- **Deficiency disease:** illness from lack of a nutrient
- **Balanced diet:** all nutrients in right amounts

Common mistakes and exam tips

AVOID THESE

- Proximal and distal are used for **limbs**: the elbow is proximal to the wrist.
- Anatomy = **structure**; physiology = **function**.
- Order: cell → tissue → organ → organ system → organism.
- Carbohydrates = energy; proteins = growth and repair; vitamins and minerals = protection.
- Vitamin C – scurvy; vitamin D – rickets; iron – anaemia; iodine – goitre.

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 study of the structure of the body is called: [1]

(a) Physiology (b) Anatomy
(c) Pathology (d) Nutrition

A2. The fingers are ___ to the elbow. [1]

(a) proximal (b) distal
(c) medial (d) superior

A3. The spine lies on the ___ side of the body. [1]

(a) anterior (b) posterior
(c) lateral (d) superior

A4. Arrange in order from smallest to largest: [1]
P. Organ Q. Cell R. Organ system S. Tissue

(a) Q, S, P, R (b) S, Q, P, R
(c) Q, P, S, R (d) P, S, Q, R

A5. Which tissue carries messages in the body? [1]

(a) Epithelial (b) Connective
(c) Muscular (d) Nervous

A6. The number of bones in an adult human body is: [1]

(a) 206 (b) 300
(c) 106 (d) 212

A7. Blood cells are made in the: [1]

(a) Kidneys (b) Red bone marrow
(c) Lungs (d) Stomach

A8. The main energy-giving nutrient is: [1]

(a) Protein (b) Carbohydrate
(c) Vitamin (d) Mineral

A9. Match the deficiency disease with its cause: [1]
P. Scurvy Q. Rickets R. Anaemia S. Goitre
1. Iron 2. Vitamin D 3. Iodine 4. Vitamin C

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

A10. The control centre of the cell is the: [1]

(a) Cell membrane (b) Cytoplasm
(c) Nucleus (d) Mitochondria

A11. FILL IN THE BLANK [1]
The longest bone of the human body is the _____.

A12. FILL IN THE BLANK [1]
Proteins are needed for the growth and _____ of body tissues.

A13. TRUE OR FALSE [1]
Fats give more energy per gram than carbohydrates.

A14. TRUE OR FALSE [1]
Lateral means towards the midline of the body.

B — Short Answer Questions

PART B · 2 MARKS EACH

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

B1. Distinguish between anterior and posterior, and between proximal and distal. MUST DO [2]

B2. Differentiate between anatomy and physiology. [2]

B3. State any four functions of bones. [2]

B4. Name two vitamins with their deficiency diseases. [2]

B5. What is a balanced diet? Why is it important? MUST DO [2]

B6. Name the four types of tissue. [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. Explain any four functions of the cell. MUST DO [4]

C2. Describe the four types of tissue with one place where each is found. [4]

C3. Explain the role of carbohydrates, proteins, fats and vitamins with one source each. MUST DO [4]

C4. Name four organ systems with their main organs and work. [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 · Arm injury in the ward [4]

A nurse asks a GDA to place an ice pack on a patient's injury, which is on the **front** of the forearm, just above the wrist. The patient also complains of pain near the elbow.

(i) Which direction term describes the front of the forearm? [1]

(ii) Is the elbow proximal or distal to the wrist? [1]

(iii) Give two functions of the bones of the arm. [2]

D2. Competency-Based · Riya's tiredness [4]

Riya, 15, feels tired and breathless while climbing stairs. Her lips and nails look pale. She skips breakfast, eats mostly chips and noodles, and rarely eats green vegetables or fruits.

(i) Which deficiency disease may Riya have? Lack of which mineral causes it? [1]

(ii) Name two foods rich in this mineral. [1]

(iii) Suggest two changes to make her diet balanced. [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	**(b) Anatomy**	Physiology studies functions.
A2	**(b) distal**	Farther from the shoulder.
A3	**(b) posterior**	Back side.
A4	**(a) Q, S, P, R**	Cell → tissue → organ → system.
A5	**(d) Nervous**	Nerve impulses.
A6	**(a) 206**	A baby has more, which fuse.
A7	**(b) Red bone marrow**	Inside bones.
A8	**(b) Carbohydrate**	Rice, wheat, potato.
A9	**(a) P-4, Q-2, R-1, S-3**	Standard pairs.
A10	**(c) Nucleus**	Contains DNA.
A11	**femur (thigh bone)**	In the thigh.
A12	**repair**	Body-building food.
A13	**True**	9 kcal vs 4 kcal per gram.
A14	**False**	Correct: medial means towards the midline; lateral means away from it.

Short answers

Part B · 2 marks

B1. Distinguish between anterior and posterior, and between proximal and distal. [2]

1. **Anterior / posterior:** front of the body / back of the body. 1
2. **Proximal / distal:** nearer to / farther from where a limb joins the trunk. 1

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

B2. Differentiate between anatomy and physiology. [2]

1. **Anatomy:** study of body structure, e.g. shape of the heart. 1
2. **Physiology:** study of how parts work, e.g. how the heart pumps. 1

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

B3. State any four functions of bones. [2]

1. **Support:** gives shape. ½
2. **Protection:** skull guards the brain. ½
3. **Movement:** with muscles at joints. ½
4. **Blood formation:** red marrow makes blood cells. ½

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

B4. Name two vitamins with their deficiency diseases. [2]

1. **Vitamin C:** lack causes scurvy. 1
2. **Vitamin D:** lack causes rickets. 1

10 words · CBSE asks 20–30 words | Marking: 1 + 1 = 2 | 1 + 1 (any two correct pairs)

B5. What is a balanced diet? Why is it important? [2]

1. **Meaning:** diet giving all nutrients in right amounts for age, work and health. 1
2. **Importance:** growth, energy, immunity and quick recovery. 1

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

B6. Name the four types of tissue. [2]

1. **Epithelial:** covers. ½
2. **Connective:** supports. ½
3. **Muscular:** moves. ½
4. **Nervous:** carries messages. ½

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

Long answers

Part C · 4 marks

C1. Explain any four functions of the cell. [4]

1. **Growth:** cells grow and increase in number. 1
2. **Metabolism:** use food to release energy. 1
3. **Reproduction:** divide to form new cells and repair injuries. 1
4. **Excretion and response:** remove wastes; react to changes. 1

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

C2. Describe the four types of tissue with one place where each is found. [4]

1. **Epithelial:** covers and lines – skin. 1
2. **Connective:** supports and joins – bone, blood. 1
3. **Muscular:** contracts for movement – heart. 1
4. **Nervous:** carries messages – brain. 1

20 words · CBSE asks 50–80 words | Marking: 1 + 1 + 1 + 1 = 4 | ½ job + ½ place, × 4

C3. Explain the role of carbohydrates, proteins, fats and vitamins with one source each. [4]

1. **Carbohydrates:** energy – rice. 1
2. **Proteins:** growth and repair – dal. 1
3. **Fats:** concentrated energy – ghee. 1
4. **Vitamins:** protect from disease – fruits. 1

17 words · CBSE asks 50–80 words | Marking: 1 + 1 + 1 + 1 = 4 | ½ role + ½ source, × 4 | MUST DO

C4. Name four organ systems with their main organs and work. [4]

1. **Digestive:** stomach, intestines – digests food. 1
2. **Respiratory:** lungs – gas exchange. 1
3. **Circulatory:** heart – carries blood. 1
4. **Excretory:** kidneys – remove wastes. 1

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

Case-based answers

Part D

D1. Case-Based · Arm injury in the ward (passage printed in Part D) [4]

(i) Which direction term describes the front of the forearm? [1]

Anterior (ventral).

(ii) Is the elbow proximal or distal to the wrist? [1]

Proximal – it is nearer the shoulder, where the arm joins the trunk.

(iii) Give two functions of the bones of the arm. [2]

(1) **Support** and shape to the arm. (2) **Movement** – muscles pull on them at the elbow and wrist joints. (Blood formation and mineral storage also accepted.)

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

D2. Competency-Based · Riya's tiredness (passage printed in Part D) [4]

(i) Which deficiency disease may Riya have? Lack of which mineral causes it? [1]

Anaemia, caused by lack of **iron**.

(ii) Name two foods rich in this mineral. [1]

Any two: **green leafy vegetables** (spinach), **jaggery**, dates, pulses.

(iii) Suggest two changes to make her diet balanced. [2]

(1) Eat a proper **breakfast** and fill half the plate with **vegetables and fruits**. (2) Add **pulses, milk or eggs** and cut down chips and noodles.

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