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Physiology and Injuries in Sport — CBSE Class 12 Physical Education Chapter Test

FREE CHAPTER TEST · CLASS XII · PHYSICAL EDUCATION (048) · PATTERN OF THE CBSE SAMPLE QUESTION PAPER 2026-27

TIME ALLOWED	MAXIMUM MARKS	QUESTIONS	NAME / ROLL NO.
1½ hours	35	17 (A 9 · B 3 · C 2 · D 1 · E 2)	

GENERAL INSTRUCTIONS

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 17 questions. All questions are compulsory.
2. This question paper is divided into five sections: A, B, C, D and E.
3. Section A (Q1–9) contains multiple choice questions of 1 mark each, including assertion-reason and match-the-following questions.
4. Section B (Q10–12) contains very short answer questions of 2 marks each; answer in about 60–90 words.
5. Section C (Q13–14) contains short answer questions of 3 marks each; answer in about 100–150 words.
6. Section D (Q15) contains a case study based question of 4 marks, with four sub-parts of 1 mark each; an internal choice is given in the last sub-part.
7. Section E (Q16–17) contains long answer questions of 5 marks each; answer in about 200–300 words. Each has an internal choice: attempt only one of the alternatives.
8. Draw neat diagrams wherever required.
9. This chapter test follows the section structure, question types and marks per question of the CBSE Class XII Physical Education (048) Sample Question Paper 2026-27, at half the length of the 70-mark board paper: 35 marks in 1½ hours. (In the board paper you attempt any 5 of 6 questions in Section B, any 5 of 6 in Section C and any 3 of 4 in Section E; here every question is compulsory.)
10. The answer key and the marking scheme are at the end of this booklet. Attempt the paper in 1½ hours before you look at them.

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Chapter: Physiology and Injuries in Sport · **Topics:** Physiological factors of fitness · Effects of exercise on muscles · Effects of exercise on heart and lungs · Changes due to ageing · Soft tissue injuries · Bone and joint injuries

SECTION A

This section comprises 9 multiple choice questions (MCQs) of 1 mark each, including assertion-reason and match-the-following questions.

1. Long-distance runners usually have a high percentage of 1

(A) fast-twitch (Type II) fibres (B) slow-twitch (Type I) fibres

(C) cardiac muscle fibres (D) smooth muscle fibres

2. The energy for an all-out activity lasting less than about 10 seconds, such as a 60 m sprint, comes mainly from the 1

(A) aerobic system (B) lactic acid (anaerobic glycolysis) system

(C) ATP-CP system (D) oxidation of fats

3. A long-term effect of regular exercise on the cardiovascular system is a 1

(A) rise in resting heart rate (B) fall in stroke volume

(C) decrease in resting heart rate (D) smaller capillary network

4. Overstretching or tearing of a ligament at a joint is called a 1

(A) Sprain (B) Strain

(C) Contusion (D) Abrasion

5. A fracture in a young, soft bone, in which the bone bends and partly breaks, is called 1

(A) Comminuted (B) Greenstick

(C) Impacted (D) Oblique

6. The increase in the size of muscles due to regular exercise is called 1

(A) atrophy (B) dystrophy

(C) hypotrophy (D) hypertrophy

7. Match the types of fracture in List I with their descriptions in List II. 1

List I	**List II**
A. Comminuted	(i) Diagonal break across the bone
B. Transverse	(ii) Bone broken into several pieces
C. Oblique	(iii) Broken ends jammed into each other
D. Impacted	(iv) Straight break right across the bone

Choose the correct option:

(A) A-(ii), B-(i), C-(iv), D-(iii) (B) A-(ii), B-(iv), C-(i), D-(iii)

(C) A-(iv), B-(ii), C-(i), D-(iii) (D) A-(ii), B-(iv), C-(iii), D-(i)

8. Which of the following changes takes place with ageing? 1

(A) Increase in bone mass (B) Decrease in reaction time

(C) Decrease in maximum heart rate (D) Increase in muscle mass

9. **Assertion (A):** A contusion is an injury in which the skin is not broken. 1

Reason (R): A contusion is caused by a blow that crushes the underlying muscle fibres and tissue without breaking the skin.

(A) A is true, but R is false.

(B) A is false, but R is true.

(C) Both A and R are true and R is the correct explanation of A.

(D) Both A and R are true, but R is not the correct explanation of A.

SECTION B

This section comprises 3 very short answer questions of 2 marks each (answer in about 60–90 words).

10. Write any two physiological factors that determine speed. 2

11. State any two long-term effects of exercise on the respiratory system. 2

12. Differentiate between a sprain and a strain, with one example of each. 2

SECTION C

This section comprises 2 short answer questions of 3 marks each (answer in about 100–150 words).

13. Explain any three long-term effects of exercise on the muscular system. 3

14. Explain the physiological changes in the muscular, skeletal and cardiovascular systems due to ageing. 3

SECTION D

This section comprises 1 case study based question of 4 marks, with four sub-parts of 1 mark each.

15. During a football match, Aman slides on a gravel patch and scrapes the skin off his knee. A little later his teammate Ishaan is kicked hard on the thigh: the area swells and turns blue, but the skin is not broken.

(i) Name Aman's injury. [1]

(ii) Name Ishaan's injury. [1]

(iii) Write the first aid for Aman's injury. [1]

(iv) Write the first aid for Ishaan's injury. [1]

OR

(iv) What is a laceration? [1]

SECTION E

This section comprises 2 long answer questions of 5 marks each (answer in about 200–300 words).

16. (a) Classify sports injuries. Explain any three soft tissue injuries and the first aid (PRICE) for them. 5

OR

(b) What is a fracture? Explain greenstick, comminuted, transverse, oblique and impacted fractures.

17. (a) Explain the effects of exercise on the cardiovascular system. 5

OR

(b) Explain the physiological factors that determine strength, speed, endurance and flexibility.

END OF THE QUESTION PAPER

ANSWER KEY — SECTION A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
(B)	(C)	(C)	(A)	(B)	(D)	(B)	(C)	(C)

MARKING SCHEME AND WORKED SOLUTIONS

Marks for each step are shown in brackets, as in the CBSE marking scheme. Any correct alternative method earns full marks.

Q1. Answer (B). Endurance depends on slow-twitch (Type I, red, aerobic) fibres; strength and speed on fast-twitch fibres.

Q2. Answer (C). The ATP-CP system supplies energy for activities under about 10 seconds.

Q3. Answer (C). Training enlarges and strengthens the heart, raises stroke volume and lowers the resting heart rate.

Q4. Answer (A). A sprain injures a ligament; a strain injures a muscle or tendon.

Q5. Answer (B). The greenstick fracture is common in children, whose bones are soft.

Q6. Answer (D). Muscle hypertrophy is a long-term effect of exercise.

Q7. Answer (B). Comminuted — several pieces (ii); transverse — straight across (iv); oblique — diagonal (i); impacted — ends jammed (iii).

Q8. Answer (C). Maximum heart rate (and so maximum cardiac output) falls with age; bone and muscle mass fall and reaction time becomes longer.

Q9. Answer (C). R describes how a contusion is caused, which is why the skin stays unbroken. Option (c).

Q10. (2 marks) Answer: fast-twitch fibres; quick nerve stimulation; ATP-CP system.
Any two [1 + 1]: a high percentage of fast-twitch (Type II) muscle fibres; quick stimulation of the motor neurons (nerve impulses); the ATP-CP energy system; muscle composition and elasticity; joint mobility.

Q11. (2 marks) Answer: for example stronger respiratory muscles and bigger lung volume.
Any two [1 + 1]: increased efficiency of the respiratory muscles; increased lung volume (vital capacity); increased pulmonary diffusion (gas exchange); lower resting respiratory rate; increased residual volume.

Q12. (2 marks) Answer: sprain — ligament (twisted ankle); strain — muscle or tendon (pulled hamstring).
Sprain: overstretching or tearing of a **ligament** at a joint — for example a twisted ankle. [1]
Strain: overstretching or tearing of a **muscle or tendon** - for example a pulled hamstring. [1]

Q13. (3 marks) Answer: for example hypertrophy, more mitochondria, more myoglobin.
Any three, 1 mark each: **hypertrophy** - muscles grow in size and strength; **stronger tendons and ligaments**; **more and larger mitochondria** - more aerobic energy; **more myoglobin** - more oxygen stored in the muscle; **more glycogen stored**; **more fat burned** as fuel; **greater tolerance of lactic acid**.

Q14. (3 marks) Answer: loss of muscle, loss of bone mass, lower maximum heart rate.
Muscular [1]: muscle mass falls (by 40–50% between 25 and 80) through atrophy of fibres and loss of motor units, so strength declines.
Skeletal [1]: bone mass can fall by 30–50% after 60; bones become porous and brittle (osteoporosis); joints stiffen.
Cardiovascular [1]: maximum heart rate and maximum cardiac output fall; peripheral blood flow falls with the loss of muscle mass.

Q15. (4 marks) Answer: (i) abrasion; (ii) contusion; (iii) clean and dress; (iv) RICE, or a tear-like wound.
(i) Abrasion. [1]
(ii) Contusion (bruise). [1]
(iii) Clean the wound with clean water and an antiseptic, remove dirt and gravel, and cover it with a sterile dressing. [1]
(iv) Rest, ice (cold compress), compression and elevation of the thigh. [1]
OR (iv) An irregular, tear-like wound caused by a blunt blow or impact. [1]

Q16. (5 marks) Answer: soft tissue and bone/joint injuries; three explained; PRICE.
Classification [1]: soft tissue injuries (abrasion, contusion, laceration, incision, sprain, strain) and bone and joint injuries (dislocation and fractures); also direct/indirect and overuse injuries.
Any three soft tissue injuries [3]: **abrasion** - the top layer of skin is rubbed off by a rough surface; **contusion** - a bruise from a blow, without a break in the skin; **laceration** - an irregular tear-like wound from a blunt blow; **incision** - a clean cut by a sharp edge; **sprain** - injury to a ligament; **strain** - injury to a muscle or tendon.
PRICE [1]: Protection, Rest, Ice, Compression, Elevation.
OR A fracture is a break in a bone. [1] **Greenstick** - in a young, soft bone, the bone bends and partly breaks; **comminuted** - the bone breaks into several pieces; **transverse** - a straight break right across the bone; **oblique** - a diagonal break; **impacted** - the broken ends are jammed into each other. [4]

Q17. (5 marks) Answer: short-term and long-term effects.
Short-term [2]: heart rate rises; blood circulation increases; systolic blood pressure rises; stroke volume and cardiac output increase.
Long-term [3]: the heart becomes larger and stronger (cardiac hypertrophy); resting heart rate falls; stroke volume and cardiac output rise; the capillary network increases; blood pressure stays normal; less lactic acid builds up; recovery is faster.
OR Strength [1½]: muscle size (cross-section), a high share of fast-twitch fibres, nerve impulses. **Speed** [1]: fast-twitch fibres, quick nerve stimulation, the ATP-CP system. **Endurance** [1½]: slow-twitch fibres, the aerobic system, VO_2 max and lung ventilation, efficiency of heart and lungs. **Flexibility** [1]: elasticity and extensibility of muscles, the type of joint, ligaments and tendons.

All questions are original and © Master Testing Agency. Free to download and use for personal practice; not for resale. Every answer in this paper was checked against the CBSE Physical Education XII textbook and the 2026-27 sample paper marking scheme.