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High School Teacher TGT PET Previous Year Question

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10 Toughest Physical Education Questions (2021 – 2023) with Full
Solutions



PET – 10 TOUGHEST PYQ

Hand-picked from 3 PET papers (DSE Odisha TGT PET 2021 & 2022 and OSSC RHT PET Main 2023) – with the same detailed solutions you get in the full pack.

Q-1 How many byes will be given if 21 teams are playing in a knock-out tournament?

[DSE Odisha TGT PET 2021]

- (A) 9
- (B) 12
- (C) 11
- (D) 10

ANS- (C) 11

Given:

→ Teams in the knock-out tournament $N = 21$

Concept:

→ A knock-out draw needs a power of 2 (2, 4, 8, 16, 32 ...) teams in the first round

→ Byes = (next higher power of 2) - N

Solution:

→ Powers of 2 around 21: $16 < 21 < 32$, so next higher power = 32

→ Byes = $32 - 21 = 11$

∴ Ans: (C) 11

Hint:

→ Check: $21 - 11 = 10$ teams play in round one (5 matches), so $5 + 11 = 16$ teams reach round two

Q-2 The type of muscle fibres which are primarily recruited during Marathon running is:

[DSE Odisha TGT PET 2021]

- (A) Type II X
- (B) Type I
- (C) Type II B
- (D) Type II A

ANS- (B) Type I

Explanation: Type I (slow-twitch) muscle fibres are mainly used in a marathon. They use oxygen to make energy, tire slowly and keep working for hours. They have many mitochondria and are rich in myoglobin, so they look red. A marathon is **42.195 km** long, and it needs this kind of steady effort.

Key Points:

♦ *First marathon:* the modern marathon began at the **1896** Athens Olympics



- ♦ *Distance fixed:* first run at the **1908** London Olympics and made standard in **1921**
- ♦ *Best for:* long races, cycling and swimming over long distances

Other Options:

- (A) **Type II X** — These fast-twitch fibres give the most power but tire quickly, so they are used in a **100 m** sprint.
- (C) **Type II B** — This is the older name for the fastest fibres; in humans they are now called **Type IIX**.
- (D) **Type II A** — These fast fibres use oxygen as well as stored energy, and they help in middle-distance races like **800 m**.

Q-3 According to FIVB, the lighting on the playing area should be
[DSE Odisha TGT PET 2021]

- (A) 1500 to 2000 lux measured at 2 m above the surface of the playing area.
- (B) 500 to 1000 lux measured at 1 m above the surface of the playing area.
- (C) 1000 to 1500 lux measured at 1 m above the surface of the playing area.
- (D) 1000 to 1500 lux measured at 2 m above the surface of the playing area.

ANS- (C) 1000 to 1500 lux measured at 1 m above the surface of the playing area.

Explanation: As per **FIVB** (the world volleyball body), the playing area needs **1000 to 1500 lux** of light. It is measured at **1 m** above the surface. The FIVB was founded in **1947** in Paris. A volleyball court is **18 m x 9 m**, and the net is **2.43 m** high for men and **2.24 m** for women.

Key Points:

- ♦ *Birth:* volleyball was invented in **1895** by **William G. Morgan** at Holyoke, Massachusetts
- ♦ *Olympics:* it joined the Games at Tokyo in **1964**
- ♦ *Sets:* a team needs **3 sets** to win in the best-of-five format

Other Options:

- (A) **1500 to 2000 lux measured at 2 m above the surface of the playing area.** — 1 lux equals 1 lumen per square metre.
- (B) **500 to 1000 lux measured at 1 m above the surface of the playing area.** — A level of about **500 lux** is common for ordinary office and classroom lighting.
- (D) **1000 to 1500 lux measured at 2 m above the surface of the playing area.** — A height of **2 m** is about the height of a tall volleyball blocker standing at the net.

Q-4 What is the name of the Asana in Yoga given in the picture below that usually modifies the blood flow in the lower pelvic region and increases the efficiency of the digestive system?

[DSE Odisha TGT PET 2022]





- (A) Chakrasana
- (B) Sukhasana
- (C) Vajrasana
- (D) Trikonasana

ANS- (C) Vajrasana

Explanation: The picture shows **Vajrasana**, the "thunderbolt" or "diamond" pose, done by sitting on the heels with the back straight. It changes the flow of blood to the lower pelvis and legs and helps digestion. It is one of the few asanas that can be done **after meals**, for about **5 to 10 minutes**. International Yoga Day is held on **21 June**, since **2015**.

Key Points:

- ✦ *Word root:* **vajra** is Sanskrit for thunderbolt or diamond
- ✦ *Posture:* knees together, hands on thighs, back straight
- ✦ *Use:* it is often used for **meditation** and breathing practice (pranayama)

Other Options:

- (A) Chakrasana** — It is the "wheel" pose, a back-bend in which the body forms an arch, done on the hands and feet.
- (B) Sukhasana** — It is the "easy pose", a simple cross-legged seat for breathing and meditation.
- (D) Trikonasana** — It is the "triangle pose", a standing side-bend with the legs about **3 to 4 feet** apart.

Q-5 AGGRESSION IN SPORT IS GENERALLY DISTINGUISHED BETWEEN

[DSE Odisha TGT PET 2022]

- (A) Contentment and Gaiety
- (B) Rookie and Gorilla
- (C) Jock and Superjock
- (D) Instrumental and Hostile

ANS- (D) Instrumental and Hostile

Explanation: Aggression in sport is generally divided into **instrumental** and **hostile** aggression. In **instrumental aggression**, a player uses force as a means to win, such as a hard but legal tackle. In **hostile aggression**, the aim is to hurt the other player, and it is driven by anger. Hostile acts break rules and are



punished with cards or bans.

Key Points:

- ✦ *Frustration–aggression*: **Dollard** and colleagues proposed this idea in **1939**
- ✦ *Social learning*: **Albert Bandura** ran the Bobo doll experiment in **1961**
- ✦ *Penalty*: hostile acts bring a yellow card (warning) or a **red card** (sent off) in football

Other Options:

(A) Contentment and Gaiety — These are happy feelings of peace and cheer, which psychologists call **positive emotions**.

(B) Rookie and Gorilla — A rookie is a first-year professional player in leagues such as the **NBA**, while a gorilla is the largest ape.

(C) Jock and Superjock — "Jock" is a slang word used in the **USA** for a sporty student.

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Q-6 This type of body tends to be athletic and strong due to their high muscle-to-fat ratio, which might give them a muscular chest, shoulders, and limbs. Choose among the given options the body type

[DSE Odisha TGT PET 2022]

- (A) ENDOMORPH
- (B) ECTOMORPH
- (C) MESOMORPH
- (D) BOTH ENDOMORPH AND ECTOMORPH

ANS- (C) MESOMORPH

Explanation: A **mesomorph** has an athletic, strong body with a high muscle-to-fat ratio, a muscular chest, broad shoulders and strong limbs. **William Sheldon** described three body types (**somatotypes**) in the **1940s**: endomorph, mesomorph and ectomorph. Mesomorphs often do well in sports needing strength and speed, such as sprinting, wrestling and gymnastics.

Key Points:

- ✦ *Sheldon's book*: **The Varieties of Human Physique** (1940)
- ✦ *Temperament*: he linked mesomorphs with an active, bold nature (**somatotonia**)
- ✦ *Earlier idea*: **Ernst Kretschmer** gave three types in **1921**: pyknic, athletic and asthenic





Other Options:

(A) Endomorph — This body is soft and round with a high fat level and a wide waist, suited to **shot put** or sumo.

(B) Ectomorph — This body is thin and light with long limbs and low muscle, suited to **long-distance running** and high jump.

(D) Both endomorph and ectomorph — These two types are at the soft and the lean ends of Sheldon's scale, which rates each type from **1 to 7**.

Q-7 Cardiac Output is

[OSSC RHT PET Main 2023 By TCS]

(A) Heart rate X Stroke volume.

(B) Stroke volume/ Heart rate.

(C) Heart rate/ Stroke volume

(D) Tidal volume X Heart rate

ANS- (A) Heart rate X Stroke volume.

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Explanation:

Cardiac output is the volume of blood pumped by each ventricle in one minute, and it equals **heart rate × stroke volume**. At rest, about 72 beats per minute × about 70 mL per beat gives roughly 5 L per minute, as the equation on the figure shows.

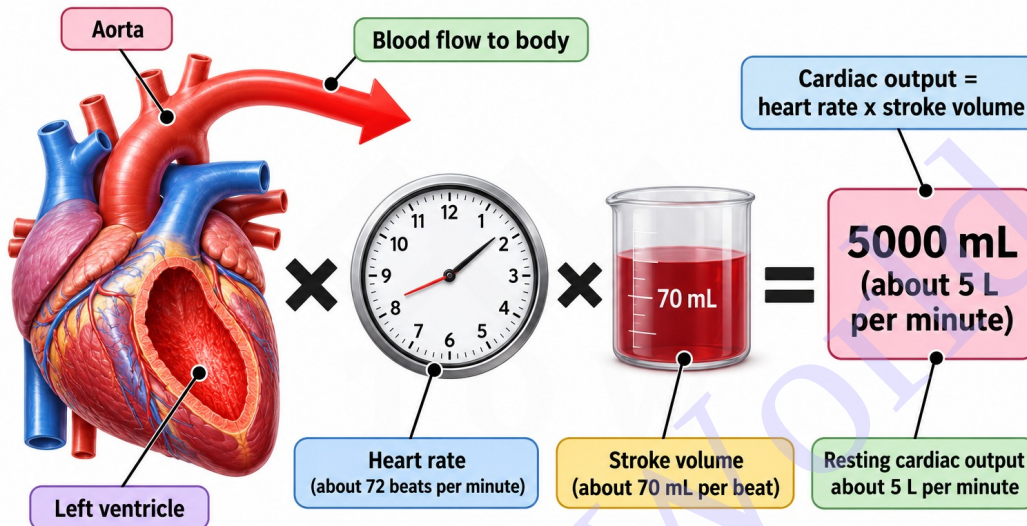


Fig. Cardiac output equals heart rate × stroke volume, with resting values of about 72 beats per minute, 70 mL per beat and 5 L per minute (asked part: Cardiac output).

Key Points:

- ♦ **Stroke volume:** The blood pushed out by one ventricle in a single beat.
- ♦ **Heart rate:** The number of heartbeats in one minute, felt as the pulse at the wrist.
- ♦ **Exercise:** Heart rate and stroke volume both rise, so an athlete's cardiac output can be much higher than an ordinary person's.
- ♦ **Unit check:** mL per beat × beats per minute gives mL per minute, the unit of cardiac output.

Other Options:

- (B) Stroke volume / Heart rate - stroke volume is ejected during ventricular systole, and cardiac output multiplies it by the heart rate.
- (C) Heart rate / Stroke volume - heart rate is set by the SA node, the pacemaker, and cardiac output multiplies it by the stroke volume.
- (D) Tidal volume × Heart rate - tidal volume is about 500 mL of air per breath; tidal volume × breathing rate gives pulmonary ventilation, about 6000-8000 mL per minute.

Memory Hook:

Cardiac output = Rate × Stroke, about 5 L every minute.





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Q-8 From out of the following muscles, identify the primary muscle of respiration:

[OSSC RHT PET Main 2023 By TCS]

- (A) Pectoralis.
- (B) Diaphragm
- (C) External intercostals
- (D) Abdominals

ANS- (B) Diaphragm

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Explanation:

The **diaphragm** is the primary muscle of respiration. When it contracts it becomes flat, the thoracic cavity enlarges and air flows into the lungs, while the **external intercostal muscles** between the ribs help it by lifting the rib cage.

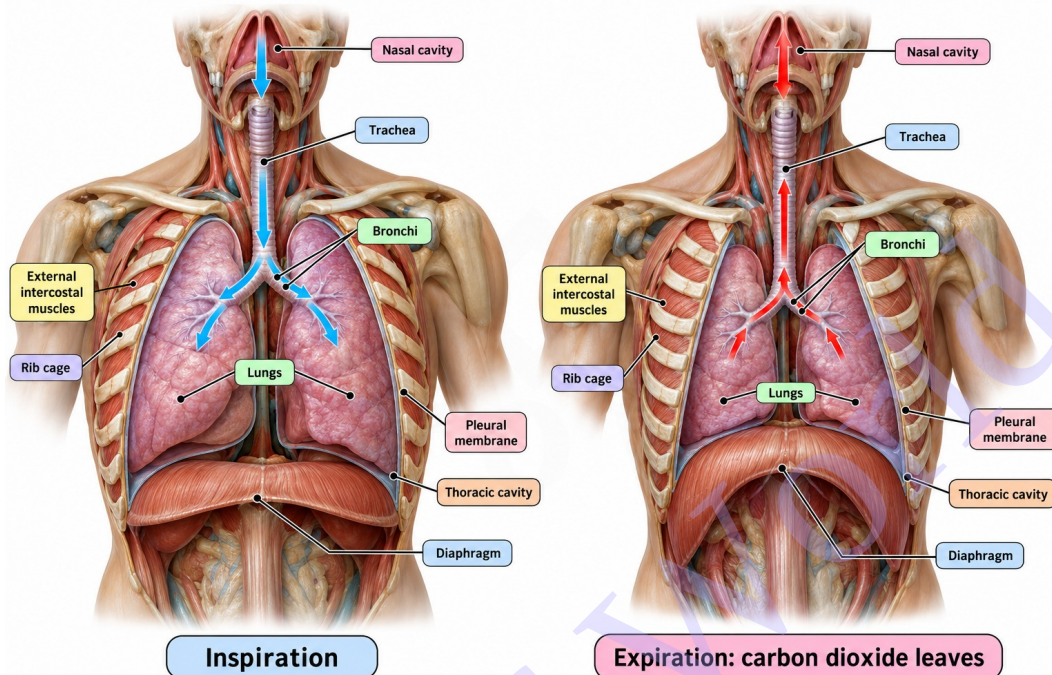


Fig. Mechanism of breathing showing the diaphragm flat in inspiration and domed in expiration (asked part: Diaphragm).

Key Points:

- ✦ **Position:** At rest the diaphragm is a dome-shaped sheet of muscle that separates the thoracic cavity from the abdominal cavity
- ✦ **Expiration:** The diaphragm relaxes and returns to its dome shape, so air moves out of the lungs
- ✦ **Nerve:** The phrenic nerve controls the movement of the diaphragm
- ✦ **Quiet breathing:** Most of the work in normal, calm breathing is done by the diaphragm

Other Options:

- (A) Pectoralis - a chest muscle that moves the arm and acts as a helper (accessory) muscle in deep, forced breathing.
- (C) External intercostals - muscles between the ribs that lift the rib cage upward and outward in inspiration, and they assist the diaphragm.
- (D) Abdominals - belly muscles that squeeze the abdomen and push the diaphragm up in forced expiration.

Memory Hook:

Diaphragm flattens, lungs fill.

Q-9 Identify the correct sequence of four swimming strokes in an individual medley:

[OSSC RHT PET Main 2023 By TCS]

(A) backstroke - freestyle - breaststroke- butterfly



- (B) freestyle - breaststroke - backstroke - butterfly
(C) butterfly - backstroke - breaststroke - freestyle
(D) breaststroke - butterfly - backstroke - freestyle

ANS- (C) butterfly - backstroke - breaststroke - freestyle

Explanation: In an **individual medley (IM)**, one swimmer swims all four strokes in the order **butterfly, backstroke, breaststroke, freestyle**. A **200 m IM** has **50 m** of every stroke. The IM was added to the Olympic Games in **1964** at Tokyo.

Order	Stroke	Body position
1	Butterfly	Face down, arms together
2	Backstroke	Swim on the back
3	Breaststroke	Face down, frog kick
4	Freestyle	Any stroke, mostly crawl

Key Points:

- ✦ *Distances:* IM races are swum over **200 m** and **400 m** in a 50 m pool
- ✦ *Medley relay:* four swimmers swim in the order **backstroke, breaststroke, butterfly, freestyle**
- ✦ *Short course:* the **100 m IM** is swum only in a 25 m pool
- **Memory Hook:** **Fly** first, **Free** last.

Other Options:

- (A) **backstroke - freestyle - breaststroke - butterfly** — Backstroke is the only competitive stroke started **in the water**, with the swimmer facing the wall.
(B) **freestyle - breaststroke - backstroke - butterfly** — The men's **50 m freestyle**, the shortest Olympic swimming race, was added in **1988** at Seoul.
(D) **breaststroke - butterfly - backstroke - freestyle** — Butterfly was first swum as a separate Olympic event at **Melbourne in 1956**.

Q-10 Turning the sole of the foot inward is known as

[OSSC RHT PET Main 2023 By TCS]

- (A) Inversion.
(B) Eversion
(C) Pronation
(D) Supination

ANS- (A) Inversion.

Explanation: **Inversion** is turning the sole of the foot inward, so that the sole faces the other foot. It happens at the ankle and the joint under it (subtalar joint). The opposite movement is **eversion**. A sprain from sudden inversion is the most common ankle injury, and it hurts the **lateral ligaments** on the outer side of the ankle.

Key Points:

- ✦ *Bending:* pointing the toes down is **plantar flexion**; pulling the toes up is





dorsiflexion

- ♦ *Arch*: the foot has **3** arches that act as shock absorbers
- ♦ *Bones*: the ankle joint joins the tibia, fibula and **talus**

Other Options:

(B) Eversion — It turns the sole of the foot outward, away from the midline of the body.

(C) Pronation — In the forearm it turns the palm **downward**; in the foot it means the arch flattens as weight shifts.

(D) Supination — In the forearm it turns the palm **upward**; the radius and ulna are parallel in this position.

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