

INI CET Orthopaedics

Sample Paper – 5

Duration: 14 Minutes

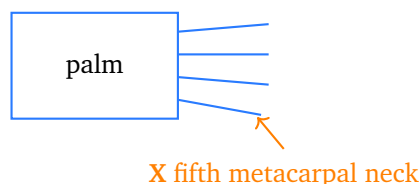
Maximum Marks: 15

Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Orthopaedics content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- The **15-question** length matches the number of Orthopaedics items you actually meet in the real 200-question paper.
- Each correct answer carries **+1 mark**. There is **negative marking of one-third (0.33) mark** for every incorrect answer; unattempted questions carry no penalty.
- Every question has **exactly one best answer**. Choose the single most appropriate option.
- Attempt this practice paper in one timed sitting of about **14 minutes**, the pace the real computer-based test demands.

Trauma and Fracture Principles

Q1. A young man attends after punching a wall. The radiograph shows a fracture of the neck of the fifth metacarpal, marked X in the schematic below. This injury is best known by which eponym?



- (A) Boxer's fracture
- (B) Bennett fracture
- (C) Rolando fracture



(D) Galeazzi fracture

Q2. The clavicle is one of the most frequently fractured bones in the body. The commonest site of a clavicle fracture is the:

- (A) Lateral (outer) third
- (B) Middle (middle) third
- (C) Medial (inner) third
- (D) Sternal articular surface

Q3. A high-energy valgus injury to the knee produces a split-depression fracture of the lateral tibial condyle. The classification most widely used to grade such tibial plateau fractures is the:

- (A) Garden classification
- (B) Weber classification
- (C) Schatzker classification
- (D) Neer classification

Fracture Complications and Emergencies

Q4. A patient trapped under a collapsed wall for several hours passes dark, tea-coloured urine and develops a rising serum potassium and acute kidney injury soon after release. This crush syndrome is caused by:

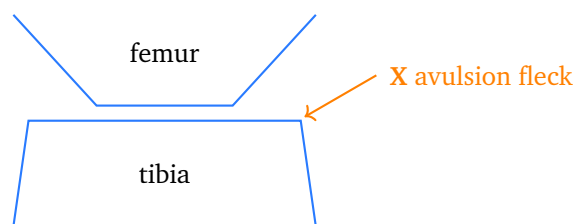
- (A) Air embolism from crushed veins
- (B) Fat embolism from exposed marrow
- (C) Rhabdomyolysis releasing myoglobin, causing myoglobinuria and acute kidney injury
- (D) Immune haemolysis of red blood cells

Q5. A mid-shaft (spiral) fracture of the humerus is complicated by an inability to extend the wrist and fingers (wrist drop). The nerve most likely injured is the:



- (A) Median nerve
- (B) Ulnar nerve
- (C) Axillary nerve
- (D) Radial nerve

Q6. The radiograph shows a small avulsion flake of bone from the lateral margin of the tibial plateau (marked X below), just below the lateral joint line. This Second fracture is strongly associated with which knee injury?



- (A) Posterior cruciate ligament rupture
- (B) Patellar tendon rupture
- (C) Anterior cruciate ligament tear
- (D) Quadriceps tendon rupture

Paediatric Orthopaedics

Q7. The commonest skeletal dysplasia causing short-limbed (rhizomelic) dwarfism, arising from a gain-of-function mutation in the FGFR3 gene, is:

- (A) Osteogenesis imperfecta
- (B) Achondroplasia
- (C) Marfan syndrome
- (D) Osteopetrosis

Q8. An adolescent girl has a lateral curvature of the spine. On the Adams forward-bend test a rib hump appears, and the curve on X-ray is measured by the Cobb angle. This describes:

- (A) Scheuermann kyphosis



- (B) Pott disease of the spine
- (C) Ankylosing spondylitis
- (D) Adolescent idiopathic scoliosis

Bone and Joint Infection and Metabolic Bone Disease

- Q9.** A well-circumscribed, walled-off cavity of subacute localised osteomyelitis in the metaphysis of a long bone, surrounded by a sclerotic rim on X-ray, is called a:
- (A) Brodie abscess
 - (B) Sequestrum
 - (C) Involucrum
 - (D) Cloaca
- Q10.** A child presents with diffusely dense, brittle bones that fracture with minor trauma. The underlying defect is failure of osteoclasts to resorb bone ('marble bone disease'). The diagnosis is:
- (A) Osteopetrosis
 - (B) Osteomalacia
 - (C) Osteoporosis
 - (D) Osteogenesis imperfecta
- Q11.** A middle-aged man wakes with an acutely red, hot and exquisitely painful first metatarsophalangeal joint. Aspiration shows needle-shaped crystals that are negatively birefringent under polarised light. The diagnosis is:
- (A) Septic arthritis
 - (B) Pseudogout
 - (C) Rheumatoid arthritis
 - (D) Acute gout

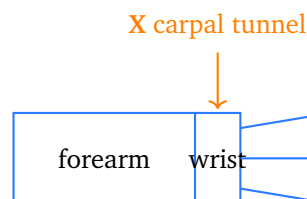
Bone Tumours



- Q12.** A benign, fluid-filled lucent lesion in the proximal humeral metaphysis of a child shows a 'fallen-fragment' sign after sustaining a pathological fracture. This lesion is a:
- (A) Simple (unicameral) bone cyst
 - (B) Aneurysmal bone cyst
 - (C) Giant cell tumour
 - (D) Osteosarcoma
- Q13.** A slow-growing, midline malignant tumour arising in the sacrum from embryonic notochord remnants is a:
- (A) Ewing sarcoma
 - (B) Giant cell tumour
 - (C) Chordoma
 - (D) Chondrosarcoma

Spine, Arthritis and Sports Injuries

- Q14.** A woman complains of numbness and tingling of the thumb, index and middle fingers, worse at night. Tapping over the wrist (marked X) and holding the wrist flexed both reproduce the symptoms. This median nerve compression is:



- (A) Cubital tunnel syndrome
- (B) Carpal tunnel syndrome
- (C) Cervical rib syndrome
- (D) Guyon canal syndrome



- Q15.** Degenerative disease of the cervical spine in an older adult, causing neck pain with radiculopathy or, when the cord is compressed, myelopathy, is termed:
- (A) Cervical disc space infection
 - (B) Cervical spondylosis
 - (C) Acute torticollis
 - (D) Klippel-Feil syndrome



Detailed Solutions**Q1.****Solution**

Concept – the boxer’s fracture: A punch delivered with a clenched fist transmits force along the fifth metacarpal.

Step 1 – localise the fracture: The break lies at the **neck of the fifth metacarpal** (marked X), typically with volar (palmar) angulation of the head.

Step 2 – name the injury: A fracture of the neck of the fifth metacarpal after a punch is the classic **boxer’s fracture**.

Why the other options are wrong:

- B, Bennett fracture: an intra-articular fracture-dislocation of the base of the first (thumb) metacarpal.
- C, Rolando fracture: a comminuted (Y or T shaped) intra-articular fracture of the thumb metacarpal base.
- D, Galeazzi fracture: a distal radial shaft fracture with dislocation of the distal radio-ulnar joint.

Final Answer: Fracture of the fifth metacarpal neck ⇒ A

Answer: (A) [Go Back to Q1](#)

Q2.**Solution**

Concept – clavicle fracture sites: The clavicle is divided into medial, middle and lateral thirds, each fracturing at different rates.

Step 1 – name the commonest site: About 80 per cent of clavicle fractures occur in the **middle third**, the thinnest part with no muscular or ligamentous protection.

Step 2 – the mechanism: The middle third is the transition zone between the two curvatures and bears the force of a fall onto the shoulder or outstretched hand.

Why the other options are wrong:

- A, lateral third: accounts for roughly 15 per cent of cases, less common than the middle third.
- C, medial third: the rarest site, only about 5 per cent.
- D, sternal articular surface: fractures here are very uncommon.



Final Answer: Middle third $\Rightarrow$

Answer: (B) [Go Back to Q2](#)

Q3.

Solution

Concept – classifying tibial plateau fractures: Fractures of the proximal tibial articular surface need a system that guides surgical planning.

Step 1 – name the classification: The **Schatzker classification** grades tibial plateau fractures into six types, from a simple lateral split (Type I) to bicondylar and shaft-dissociation patterns (Types V and VI).

Step 2 – the clinical use: A high-energy valgus injury producing a split-depression of the lateral condyle is a Schatzker Type II, a frequent pattern.

Why the other options are wrong:

- A, Garden classification: grades femoral neck fractures, not the tibial plateau.
- B, Weber classification: describes ankle (lateral malleolar) fractures by the level of the fibular break.
- D, Neer classification: grades proximal humeral fractures by the number of displaced parts.

Final Answer: Schatzker classification $\Rightarrow$

Answer: (C) [Go Back to Q3](#)

Q4.

Solution

Concept – crush syndrome: Prolonged compression of a large muscle mass causes systemic effects once the pressure is released.

Step 1 – identify the mechanism: Ischaemic muscle breaks down (**rhabdomyolysis**) and releases **myoglobin**, potassium and phosphate into the circulation on reperfusion.

Step 2 – link to the findings: Myoglobin gives the urine its dark, tea colour (**myoglobinuria**) and precipitates in the renal tubules, causing **acute kidney injury**; released potassium produces dangerous **hyperkalaemia**.

Why the other options are wrong:



- A, air embolism: causes cardiorespiratory collapse, not myoglobinuria and renal failure.
- B, fat embolism: presents with hypoxaemia, confusion and petechiae after long-bone fracture, not dark urine.
- D, immune haemolysis: releases haemoglobin, but the crush picture is driven by muscle (myoglobin) breakdown.

Final Answer: Rhabdomyolysis with myoglobinuria ⇒ C

Answer: (C) [Go Back to Q4](#)

Q5.

Solution

Concept – radial nerve and the humeral shaft: The radial nerve winds around the spiral groove on the back of the humeral shaft.

Step 1 – match the deficit: Injury to the **radial nerve** paralyses the wrist and finger extensors, producing the classic **wrist drop**.

Step 2 – the anatomy: Because the nerve lies directly on the bone in the spiral groove, a mid-shaft humeral fracture readily stretches or lacerates it.

Why the other options are wrong:

- A, median nerve: injury gives a ‘hand of benediction’ and loss of thumb opposition, not wrist drop.
- B, ulnar nerve: injury produces a ‘claw hand’ with sensory loss over the little finger.
- C, axillary nerve: injury (from shoulder dislocation) causes deltoid weakness and a regimental-badge sensory loss.

Final Answer: Radial nerve ⇒ D

Answer: (D) [Go Back to Q5](#)

Q6.

Solution

Concept – the Second fracture: A small cortical avulsion off the lateral tibial rim carries a well-known association.

Step 1 – read the film: The avulsion fleck (marked X) is pulled from the lateral capsule of the tibia during an internal-rotation, varus injury.



Step 2 – state the association: A Segond fracture is strongly associated with an **anterior cruciate ligament (ACL) tear** (and often a medial meniscal injury), so seeing the fleck should prompt a search for ACL rupture.

Why the other options are wrong:

- A, posterior cruciate ligament: linked with a posterior tibial avulsion, not the lateral Segond fleck.
- B, patellar tendon rupture: gives a high-riding patella, unrelated to a lateral tibial avulsion.
- D, quadriceps tendon rupture: causes a low-riding patella and loss of extension, not this fracture.

Final Answer: Anterior cruciate ligament tear ⇒ C

Answer: (C) [Go Back to Q6](#)

Q7.

Solution

Concept – achondroplasia: Achondroplasia is the commonest inherited skeletal dysplasia.

Step 1 – the genetics: It results from a gain-of-function mutation in the **FGFR3** gene, which over-inhibits endochondral ossification at the growth plate.

Step 2 – the phenotype: The limbs are shortened most in their proximal segments (**rhizomelic** shortening), with a normal trunk length, frontal bossing and a trident hand.

Why the other options are wrong:

- A, osteogenesis imperfecta: a collagen defect causing brittle bones and blue sclerae, not short limbs from FGFR3.
- C, Marfan syndrome: a fibrillin defect producing tall stature with long limbs, the opposite picture.
- D, osteopetrosis: dense brittle bones from defective osteoclasts, not a short-limbed dysplasia.

Final Answer: Achondroplasia ⇒ B

Answer: (B) [Go Back to Q7](#)



Q8.

Solution

Concept – adolescent idiopathic scoliosis: A lateral curvature of the spine with rotation, arising in otherwise healthy adolescents.

Step 1 – read the clinical test: The **Adams forward-bend test** unmasks the vertebral rotation as a **rib hump**, the hallmark of a structural scoliosis.

Step 2 – measure the curve: The **Cobb angle**, drawn between the most tilted end-vertebrae on X-ray, quantifies the curve and guides bracing (above 20 to 25 degrees) or surgery (above 45 to 50 degrees).

Why the other options are wrong:

- A, Scheuermann kyphosis: a rigid thoracic kyphosis from anterior vertebral wedging, not a lateral curve.
- B, Pott disease: tuberculous destruction of vertebral bodies producing an angular kyphosis (gibbus).
- C, ankylosing spondylitis: an inflammatory arthropathy causing a fused 'bamboo spine', not adolescent scoliosis.

Final Answer: Adolescent idiopathic scoliosis ⇒ D

Answer: (D) [Go Back to Q8](#)

Q9.

Solution

Concept – the Brodie abscess: Subacute osteomyelitis can wall itself off into a localised bone abscess.

Step 1 – describe the lesion: A **Brodie abscess** is a well-circumscribed cavity of pus or granulation tissue in the metaphysis, ringed by reactive sclerotic bone on X-ray.

Step 2 – the clinical picture: It causes indolent, intermittent bone pain with few systemic signs, reflecting a contained, low-grade infection.

Why the other options are wrong:

- B, sequestrum: a fragment of dead, avascular bone within chronic osteomyelitis, not a walled-off abscess.
- C, involucrum: the new living bone laid down around a sequestrum.
- D, cloaca: an opening in the involucrum through which pus drains, not the abscess itself.



Final Answer: Brodie abscess $\Rightarrow$

Answer: (A) [Go Back to Q9](#)

Q10.

Solution

Concept – osteopetrosis: Osteopetrosis, or ‘marble bone disease’, is a failure of bone resorption.

Step 1 – the defect: Osteoclasts cannot resorb bone, so dense, immature bone accumulates and the marrow cavity is crowded out.

Step 2 – the consequence: Despite looking radiodense and thick, the bone is **brittle** and fractures easily; marrow crowding can cause anaemia and cranial nerve compression.

Why the other options are wrong:

- B, osteomalacia: defective mineralisation from vitamin D deficiency, giving soft (not dense) bones.
- C, osteoporosis: reduced bone mass and density, the opposite radiographic appearance.
- D, osteogenesis imperfecta: a type I collagen defect causing brittle bones with blue sclerae, not defective osteoclasts.

Final Answer: Osteopetrosis $\Rightarrow$

Answer: (A) [Go Back to Q10](#)

Q11.

Solution

Concept – acute gout: Monosodium urate crystals deposit in a joint and trigger acute inflammation.

Step 1 – read the crystals: Aspirate showing **needle-shaped, negatively birefringent** crystals under polarised light is diagnostic of **gout**.

Step 2 – the classic site: The first metatarsophalangeal joint (podagra) is the commonest first joint affected, presenting as a red, hot, exquisitely tender toe.

Why the other options are wrong:

- A, septic arthritis: the aspirate shows organisms and pus cells, not urate



crystals.

- B, pseudogout: caused by calcium pyrophosphate crystals that are rhomboid and *positively* birefringent.
- C, rheumatoid arthritis: a symmetrical small-joint polyarthritis without birefringent crystals.

Final Answer: Acute gout ⇒ D

Answer: (D) [Go Back to Q11](#)

Q12.

Solution

Concept – simple (unicameral) bone cyst: A benign fluid-filled cavity in the metaphysis of a growing child.

Step 1 – the site and sign: It favours the **proximal humerus**, and after a pathological fracture a piece of cortex sinks to the dependent part of the fluid, the **fallen-fragment sign**.

Step 2 – why the sign matters: The fallen fragment confirms the lesion is truly fluid-filled (hollow), distinguishing a simple cyst from a solid tumour.

Why the other options are wrong:

- B, aneurysmal bone cyst: an expansile, blood-filled lesion with fluid-fluid levels, not a fallen fragment.
- C, giant cell tumour: an epiphyseal ‘soap-bubble’ lesion of young adults, not the metaphysis of a child.
- D, osteosarcoma: a malignant bone-forming tumour with a sunburst reaction, not a simple cyst.

Final Answer: Simple (unicameral) bone cyst ⇒ A

Answer: (A) [Go Back to Q12](#)

Q13.

Solution

Concept – chordoma: Chordoma is a rare malignant tumour of notochordal origin.

Step 1 – the origin and site: It arises from **embryonic notochord remnants** and occurs in the **midline**, most commonly the **sacroccocygeal** region and the skull



base (clivus).

Step 2 – the behaviour: It is slow-growing but locally destructive, and the histology shows characteristic vacuolated 'physaliphorous' cells.

Why the other options are wrong:

- A, Ewing sarcoma: a small round-blue-cell tumour of children with a t(11;22) translocation, not notochordal.
- B, giant cell tumour: a benign epiphyseal lesion of the long bones, not a midline sacral tumour.
- D, chondrosarcoma: a malignant cartilage tumour, not derived from the notochord.

Final Answer: Chordoma ⇒

Answer: (C) [Go Back to Q13](#)

Q14.

Solution

Concept – carpal tunnel syndrome: Compression of the median nerve as it passes deep to the flexor retinaculum at the wrist.

Step 1 – match the symptoms: Numbness and tingling in the **median nerve territory** (thumb, index, middle and half the ring finger), worse at night, points to compression at the wrist (marked X).

Step 2 – the provocative signs: Tapping over the nerve reproduces tingling (**Tinel sign**), and sustained wrist flexion does the same (**Phalen sign**), confirming **carpal tunnel syndrome**.

Why the other options are wrong:

- A, cubital tunnel syndrome: ulnar nerve compression at the elbow, affecting the little and ring fingers.
- C, cervical rib syndrome: thoracic outlet compression giving lower-trunk (ulnar) symptoms, not median.
- D, Guyon canal syndrome: ulnar nerve compression at the wrist, sparing the median distribution.

Final Answer: Carpal tunnel syndrome ⇒

Answer: (B) [Go Back to Q14](#)



Q15.

Solution

Concept – cervical spondylosis: Age-related degeneration of the cervical discs and facet joints.

Step 1 – name the condition: Degenerative disc narrowing and osteophyte formation in the neck of an older adult is **cervical spondylosis**.

Step 2 – the two clinical patterns: Osteophytes narrowing a foramen compress a nerve root (**radiculopathy**); central canal narrowing compresses the cord (**myelopathy**) with gait disturbance and hyper-reflexia.

Why the other options are wrong:

- A, cervical disc space infection: presents with fever and severe pain, an infective not degenerative process.
- C, acute torticollis: a transient painful wry-neck spasm, not chronic degeneration with myelopathy.
- D, Klippel-Feil syndrome: a congenital fusion of cervical vertebrae, present from birth, not degenerative.

Final Answer: Cervical spondylosis ⇒ **B**

Answer: (B) [Go Back to Q15](#)



Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	B	3	C	4	C	5	D
6	C	7	B	8	D	9	A	10	A
11	D	12	A	13	C	14	B	15	B

