

INI CET Orthopaedics

Sample Paper – 3

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.** The forearm injury sketched below shows a fracture of the proximal ulna combined with dislocation of the radial head at the elbow (marked X). This combined lesion is best described as a:



- (A) Monteggia fracture-dislocation
- (B) Galeazzi fracture-dislocation
- (C) Colles fracture

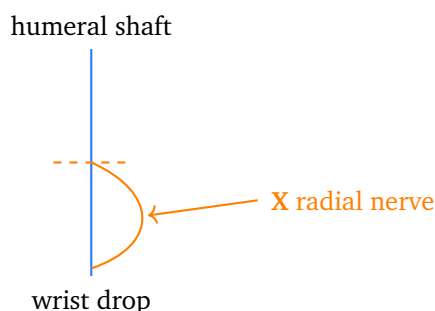


(D) Bennett fracture

Q2. A 68-year-old woman falls and sustains an intracapsular femoral neck fracture. On the anteroposterior radiograph the fracture is complete and the fragments are fully displaced. Using the Garden classification, this is:

- (A) Garden I (incomplete, impacted in valgus)
- (B) Garden II (complete, undisplaced)
- (C) Garden IV (complete, fully displaced)
- (D) Not covered by the Garden classification

Q3. A young man sustains a mid-shaft humeral fracture. Afterwards he cannot extend the wrist or the fingers and has lost sensation over the dorsum of the first web space (marked X). The nerve most likely injured is the:



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

Fracture Complications and Emergencies

Q4. Some weeks after an elbow injury a patient develops a hard, restricting mass of mature bone within the brachialis muscle, seen on X-ray as heterotopic ossification. This complication is called:

- (A) Osteomalacia



- (B) A stress fracture
- (C) Osteoporosis
- (D) Myositis ossificans

Q5. After a wrist fracture a patient develops persistent burning pain, swelling, shiny skin and patchy juxta-articular bone loss (Sudeck atrophy) out of proportion to the original injury. This is best described as:

- (A) Simple disuse osteoporosis alone
- (B) Acute osteomyelitis
- (C) Complex regional pain syndrome (reflex sympathetic dystrophy)
- (D) Gouty arthritis

Q6. A young man sustains an anterior dislocation of the shoulder. He now cannot abduct the arm and has lost sensation over a small patch on the lateral upper arm (the 'regimental badge' area). The nerve injured is the:

- (A) Axillary nerve, supplying deltoid and the regimental badge area
- (B) Musculocutaneous nerve
- (C) Long thoracic nerve
- (D) Median nerve

Paediatric Orthopaedics

Q7. An obese 13-year-old boy presents with a limp and knee pain. Radiographs show the femoral head slipping posteriorly off the neck, and Trethowan's line (drawn along the superior femoral neck) fails to intersect the epiphysis. The diagnosis is:

- (A) Slipped capital femoral epiphysis
- (B) Developmental dysplasia of the hip
- (C) Congenital talipes equinovarus
- (D) Osteosarcoma of the femoral neck



Q8. A newborn has a foot fixed in equinus, hindfoot varus, forefoot adductus and midfoot cavus. The recognised first-line treatment, using serial manipulation and casting, is:

- (A) Immediate extensive bony surgery in the neonatal period
- (B) The Ponseti method of serial casting for congenital talipes equinovarus
- (C) Observation alone until skeletal maturity
- (D) A Pavlik harness

**Bone and Joint Infection
and Metabolic Bone Disease**

Q9. An elderly patient has an acutely painful, swollen knee. Aspirated synovial fluid shows rhomboid, weakly positively birefringent crystals, and the X-ray reveals chondrocalcinosis. The diagnosis is:

- (A) Gout (monosodium urate deposition)
- (B) Septic arthritis
- (C) Rheumatoid arthritis
- (D) Pseudogout (calcium pyrophosphate deposition)

Q10. An adult with defective mineralisation of osteoid presents with bone pain, proximal muscle weakness and radiographs showing Looser zones (pseudofractures). The most likely diagnosis is:

- (A) Osteoporosis
- (B) Osteomalacia
- (C) Paget disease
- (D) Multiple myeloma

Q11. A patient with a raised serum calcium and low phosphate has radiographs showing subperiosteal bone resorption and cystic 'brown tumours' (osteitis fibrosa cystica). The underlying disorder is:



- (A) Hypoparathyroidism
- (B) Primary hyperparathyroidism
- (C) Vitamin D toxicity alone
- (D) Osteopetrosis

Bone Tumours

Q12. A young adult has well-localised night pain in the tibia that is dramatically relieved by NSAIDs. X-ray shows a small (under 1.5 cm) radiolucent nidus surrounded by dense reactive sclerosis. The lesion is:

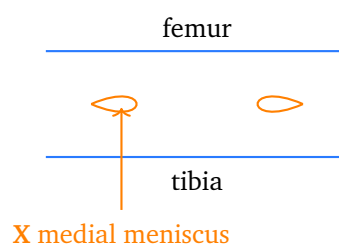
- (A) Osteosarcoma
- (B) Ewing sarcoma
- (C) Osteoid osteoma
- (D) Giant cell tumour

Q13. An older adult (over 50 years) has a slowly enlarging tumour of the pelvis with malignant cartilage and 'popcorn' (rings-and-arcs) calcification on imaging. The most likely malignant tumour is:

- (A) Osteoid osteoma
- (B) Osteochondroma
- (C) Chondrosarcoma
- (D) Ewing sarcoma

Spine, Arthritis and Sports Injuries

Q14. A footballer twists his knee and now reports it intermittently 'locking'. A positive McMurray test reproduces a painful click. The structure most likely torn (marked X) is the:



- (A) Anterior cruciate ligament
- (B) Medial meniscus
- (C) Patellar tendon
- (D) Posterior cruciate ligament

Q15. A 24-year-old man has months of low back pain and stiffness that is worse in the morning and eases with exercise. He is HLA-B27 positive, and the X-ray shows sacroiliitis with a 'bamboo spine'. The diagnosis is:

- (A) Ankylosing spondylitis
- (B) Mechanical (degenerative) low back pain
- (C) Osteoporotic vertebral collapse
- (D) Lumbar disc prolapse



Detailed Solutions

Q1.

Solution

Concept – Monteggia fracture-dislocation: Certain forearm injuries pair a single-bone fracture with dislocation of the other bone at the neighbouring joint.

Step 1 – read the picture: The sketch shows a fracture of the **proximal ulna** together with dislocation of the **radial head** (marked X) at the elbow. That combination is a **Monteggia** fracture-dislocation.

Step 2 – a memory aid: ‘MUGR’ helps: **Monteggia** = **U**lna fracture with radial head dislocation; **Galeazzi** = **R**adius fracture with distal ulna dislocation.

Why the other options are wrong:

- B, Galeazzi: is the reverse, a distal radius fracture with dislocation of the distal radio-ulnar joint.
- C, Colles: is a distal radius fracture, with no radial head dislocation.
- D, Bennett: is a fracture-dislocation at the base of the thumb metacarpal, not the forearm.

Final Answer: Proximal ulna fracture with radial head dislocation ⇒ A

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

Q2.

Solution

Concept – Garden classification of femoral neck fractures: The Garden system grades intracapsular femoral neck fractures by completeness and displacement.

Step 1 – apply the grades: Garden I is incomplete (valgus impacted); Garden II is complete but undisplaced; Garden III is complete and partially displaced; **Garden IV is complete and fully displaced.**

Step 2 – match the case: The fracture here is **complete and fully displaced**, which is **Garden IV**. High-grade displacement disrupts the retinacular vessels, raising the risk of avascular necrosis and non-union.

Why the other options are wrong:

- A, Garden I: is incomplete and impacted, not fully displaced.
- B, Garden II: is complete but undisplaced, again not this case.
- D, not covered: femoral neck fractures are precisely what the Garden system



classifies.

Final Answer: Complete, fully displaced $\Rightarrow$

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

Q3.

Solution

Concept – radial nerve in the spiral groove: The radial nerve winds around the mid-shaft of the humerus in the spiral (radial) groove.

Step 1 – link the injury: A mid-shaft humeral fracture can tether or contuse the radial nerve (marked X) as it lies against the bone.

Step 2 – explain the signs: Radial nerve palsy produces **wrist drop** (loss of wrist and finger extension) and sensory loss over the dorsal first web space, exactly as described.

Why the other options are wrong:

- A, median nerve: injury gives loss of thumb opposition and an ‘ape hand’, not wrist drop.
- B, ulnar nerve: injury gives a ‘claw hand’ with sensory loss over the little finger.
- C, axillary nerve: supplies deltoid and the shoulder, not wrist extension.

Final Answer: Radial nerve palsy with wrist drop $\Rightarrow$

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

Q4.

Solution

Concept – myositis ossificans: Injury to muscle can trigger abnormal formation of mature bone within the soft tissue.

Step 1 – name the process: Heterotopic bone forming in a muscle (classically brachialis after an elbow injury) after trauma is **myositis ossificans**.

Step 2 – the picture: It presents weeks later as a firm, restricting mass; X-ray shows mature ossification within the muscle, and forced passive stretching should be avoided.

Why the other options are wrong:



- A, osteomalacia: is defective mineralisation of bone, not new bone in muscle.
- B, stress fracture: is a fatigue fracture of bone, not soft-tissue ossification.
- C, osteoporosis: is reduced bone mass, the opposite of extra bone.

Final Answer: Heterotopic bone in muscle after injury ⇒ D

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

Q5.

Solution

Concept – complex regional pain syndrome: Some limbs develop disproportionate pain and autonomic changes after a relatively minor injury.

Step 1 – recognise the pattern: Burning pain, swelling, shiny skin and patchy juxta-articular bone loss (**Sudeck atrophy**) out of proportion to the injury describe **complex regional pain syndrome** (reflex sympathetic dystrophy).

Step 2 – the management: Early mobilisation, analgesia and physiotherapy are the mainstays; prolonged immobilisation worsens it.

Why the other options are wrong:

- A, simple disuse osteoporosis: does not explain the burning pain and autonomic (skin, swelling) changes.
- B, acute osteomyelitis: would show fever and infective markers, not this dystrophic picture.
- D, gouty arthritis: causes crystal-driven joint inflammation, not this diffuse limb syndrome.

Final Answer: Complex regional pain syndrome (Sudeck atrophy) ⇒ C

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

Q6.

Solution

Concept – axillary nerve and anterior shoulder dislocation: The axillary nerve runs close to the surgical neck of the humerus and is vulnerable when the shoulder dislocates anteriorly.

Step 1 – identify the nerve: Loss of abduction (deltoid) and sensory loss over the regimental badge area of the lateral upper arm point to the **axillary nerve**.

Step 2 – the anatomy: The axillary nerve supplies deltoid and teres minor and



gives the upper lateral cutaneous nerve of the arm, so it must be tested after every shoulder dislocation.

Why the other options are wrong:

- B, musculocutaneous nerve: supplies the arm flexors and forearm sensation, not the badge area.
- C, long thoracic nerve: injury causes winging of the scapula, not this pattern.
- D, median nerve: is a forearm and hand nerve, unrelated to shoulder abduction.

Final Answer: Axillary nerve injury ⇒ A

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

Q7.

Solution

Concept – slipped capital femoral epiphysis: In adolescence the proximal femoral epiphysis can slip through the growth plate.

Step 1 – read the clues: An **obese adolescent** boy with a limp and referred knee pain, a posteriorly slipped femoral head, and a positive **Trethowan sign** (the line along the superior neck missing the epiphysis) indicates **slipped capital femoral epiphysis (SCFE)**.

Step 2 – the management: It is treated by in-situ fixation with a screw to prevent further slip and avascular necrosis.

Why the other options are wrong:

- B, developmental dysplasia of the hip: presents in infancy, not adolescence.
- C, congenital talipes equinovarus: is a foot deformity present at birth.
- D, osteosarcoma: would show an aggressive bone-forming lesion, not epiphyseal slip.

Final Answer: Slipped capital femoral epiphysis ⇒ A

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



Q8.

Solution

Concept – Ponseti method for clubfoot: Congenital talipes equinovarus (club-foot) is corrected by staged non-operative manipulation.

Step 1 – match the treatment: The described foot (equinus, hindfoot varus, forefoot adductus, cavus) is clubfoot, treated first line by the **Ponseti method** of serial manipulation and casting, usually with a percutaneous tenotomy of the tendo-Achilles and bracing.

Step 2 – the principle: Gentle weekly casting gradually corrects each element of the deformity, avoiding early major surgery.

Why the other options are wrong:

- A, immediate extensive bony surgery: is not first line and is reserved for resistant or neglected cases.
- C, observation alone: allows the deformity to become fixed.
- D, Pavlik harness: is used for developmental dysplasia of the hip, not club-foot.

Final Answer: Ponseti serial casting ⇒ **B**

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

Q9.

Solution

Concept – pseudogout (CPPD): Calcium pyrophosphate dihydrate crystals can deposit in cartilage and provoke acute arthritis.

Step 1 – read the crystals: Rhomboid, weakly positively birefringent crystals with chondrocalcinosis on X-ray identify **pseudogout (CPPD deposition disease)**.

Step 2 – contrast with gout: Gout gives needle-shaped, strongly *negatively* birefringent monosodium urate crystals, the opposite appearance.

Why the other options are wrong:

- A, gout: shows negatively birefringent needles, not positively birefringent rhomboids.
- B, septic arthritis: would show organisms and a high neutrophil count, not crystals.
- C, rheumatoid arthritis: is an inflammatory synovitis without these crystals.



Final Answer: Calcium pyrophosphate deposition $\Rightarrow$ **D**

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

Q10.

Solution

Concept – osteomalacia: Osteomalacia is defective mineralisation of the bone matrix (osteoid) in adults, usually from vitamin D deficiency.

Step 1 – match the features: Bone pain, proximal muscle weakness and **Looser zones (pseudofractures)** on X-ray are classic for **osteomalacia**.

Step 2 – the biochemistry: Low vitamin D leads to low calcium and phosphate with a raised alkaline phosphatase and secondary hyperparathyroidism.

Why the other options are wrong:

- A, osteoporosis: is reduced bone *quantity* with normal mineralisation and no Looser zones.
- C, Paget disease: shows disordered bone turnover with a very high alkaline phosphatase and bony expansion.
- D, multiple myeloma: causes punched-out lytic lesions, not pseudofractures.

Final Answer: Defective mineralisation with Looser zones $\Rightarrow$ **B**

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

Q11.

Solution

Concept – primary hyperparathyroidism: Excess parathyroid hormone drives bone resorption and characteristic skeletal changes.

Step 1 – read the biochemistry and X-ray: **High calcium** with **low phosphate**, **subperiosteal resorption** and cystic **brown tumours** (osteitis fibrosa cystica) point to **primary hyperparathyroidism**.

Step 2 – the mechanism: A parathyroid adenoma raises PTH, which increases osteoclastic resorption and renal phosphate loss.

Why the other options are wrong:

- A, hypoparathyroidism: gives *low* calcium, the opposite biochemistry.
- C, vitamin D toxicity alone: raises calcium but does not produce brown tu-



mours and subperiosteal resorption.

- D, osteopetrosis: is dense, brittle bone from defective osteoclasts, not resorptive cysts.

Final Answer: Primary hyperparathyroidism ⇒ B

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

Q12.

Solution

Concept – osteoid osteoma: Osteoid osteoma is a small benign bone-forming tumour with a characteristic pain pattern.

Step 1 – match the clues: Well-localised **night pain relieved by NSAIDs** with a small (under 1.5 cm) radiolucent **nidus** surrounded by reactive sclerosis is **osteoid osteoma**.

Step 2 – the biology: The nidus produces prostaglandins, which explains why the pain responds so well to NSAIDs.

Why the other options are wrong:

- A, osteosarcoma: is a large aggressive malignant tumour with a sunburst reaction.
- B, Ewing sarcoma: shows an onion-skin reaction and a large diaphyseal lesion.
- D, giant cell tumour: is a lytic epiphyseal ‘soap-bubble’ lesion, not a small sclerotic nidus.

Final Answer: Small nidus with NSAID-relieved night pain ⇒ C

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

Q13.

Solution

Concept – chondrosarcoma: Chondrosarcoma is a malignant cartilage-forming tumour, typically of older adults.

Step 1 – read the clues: An adult **over 50 years** with a pelvic tumour showing **malignant cartilage** and ‘popcorn’ (rings-and-arcs) calcification has a **chondrosarcoma**.

Step 2 – the behaviour: It grows slowly, is relatively radio- and chemo-resistant,



and is treated primarily by wide surgical excision.

Why the other options are wrong:

- A, osteoid osteoma: is a small benign lesion of young adults, not a malignant cartilage tumour.
- B, osteochondroma: is a benign cartilage-capped outgrowth, not a malignancy.
- D, Ewing sarcoma: is a small round-cell tumour of children, not cartilage-forming.

Final Answer: Malignant cartilage tumour of older adults ⇒ **C**

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

Q14.

Solution

Concept – medial meniscus tear: A twisting knee injury commonly tears the medial meniscus, giving mechanical symptoms.

Step 1 – match the signs: Intermittent **locking** with a positive **McMurray test** (a painful click on rotation) indicates a tear of the **medial meniscus** (marked X).

Step 2 – the mechanism: A displaced meniscal fragment jams between the femur and tibia, blocking full extension and causing the locking.

Why the other options are wrong:

- A, anterior cruciate ligament: gives instability with a positive Lachman test, not true locking.
- C, patellar tendon: rupture causes inability to extend and a high patella, not a click.
- D, posterior cruciate ligament: injury gives a positive posterior drawer, not McMurray locking.

Final Answer: Medial meniscus tear ⇒ **B**

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



Q15.

Solution

Concept – ankylosing spondylitis: Ankylosing spondylitis is a seronegative spondyloarthropathy strongly linked to HLA-B27.

Step 1 – read the pattern: A young man with **inflammatory back pain** (worse in the morning, eased by exercise), **HLA-B27** positivity, sacroiliitis and a **bamboo spine** has **ankylosing spondylitis**.

Step 2 – the pathology: Chronic inflammation at the entheses leads to syndesmophytes bridging the vertebrae, fusing the spine.

Why the other options are wrong:

- B, mechanical low back pain: is worse with activity and better with rest, the reverse pattern, and is not HLA-B27 linked.
- C, osteoporotic vertebral collapse: affects the elderly with acute wedge fractures, not a young HLA-B27 man.
- D, lumbar disc prolapse: causes radicular sciatica, not sacroiliitis and a bamboo spine.

Final Answer: Ankylosing spondylitis ⇒ A

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



Answer Key

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

