

INI CET Orthopaedics

Sample Paper – 4

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

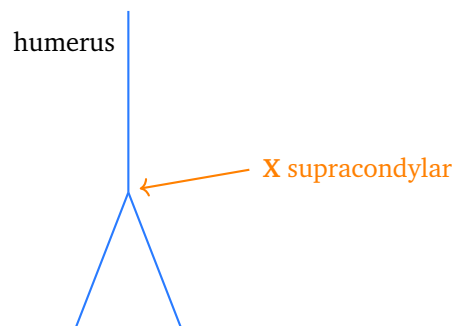
- Q1.** A boxer strikes a hard surface and sustains an intra-articular fracture-dislocation at the base of the first metacarpal, with the small volar fragment held in place while the shaft is pulled proximally. This injury is known as:
- (A) A Rolando fracture of the fifth metacarpal
(B) A Bennett fracture-dislocation of the thumb metacarpal base
(C) A boxer's fracture of the fifth metacarpal neck
(D) A Galeazzi fracture of the radius
- Q2.** An elderly woman falls and presents with a shortened, externally rotated limb; the X-ray shows an extracapsular fracture along the line between



the greater and lesser trochanters of the femur. The most appropriate fixation device is:

- (A) Simple skin traction alone as definitive treatment
- (B) Total hip replacement in every case
- (C) A dynamic hip screw (sliding hip screw)
- (D) A wrist volar locking plate

Q3. The elbow schematic below marks (X) the level of a supracondylar fracture of the humerus in a child. In the Gartland classification, a Type III injury is best described as:



- (A) An undisplaced fracture with an intact anterior humeral line
- (B) A completely displaced fracture with no cortical contact between the fragments
- (C) A greenstick fracture of the mid-shaft of the humerus
- (D) A fracture that never requires reduction

Fracture Complications and Emergencies

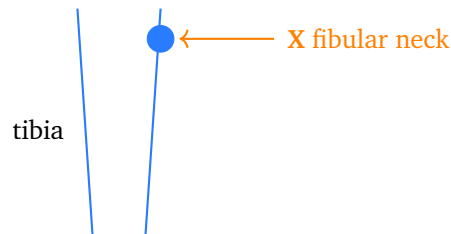
Q4. After major lower-limb orthopaedic surgery such as hip or knee replacement, the single most important measure to prevent deep vein thrombosis and fatal pulmonary embolism is:

- (A) Pharmacological thromboprophylaxis (low-molecular-weight heparin) with early mobilisation and mechanical measures
- (B) Prolonged strict bed rest with the legs immobilised
- (C) Routine high-dose aspirin as the sole and complete measure for every patient



(D) Withholding all anticoagulation until symptoms of embolism appear

Q5. A patient develops foot drop after a tight below-knee plaster. The nerve most likely compressed as it winds around the bony landmark marked (X) below is the:



- (A) Tibial nerve, causing loss of plantar flexion
- (B) Common peroneal (fibular) nerve, causing foot drop and loss of dorsiflexion
- (C) Femoral nerve, causing loss of knee extension
- (D) Sural nerve, causing complete leg paralysis

Q6. A young man sustains a posterior dislocation of the knee in a road traffic accident. The limb-threatening structure that must be assessed urgently, because its injury can lead to amputation if missed, is the:

- (A) Long saphenous vein
- (B) Medial meniscus
- (C) Patellar retinaculum
- (D) Popliteal artery

Paediatric Orthopaedics

Q7. A child presents with recurrent fractures after trivial injuries, blue sclerae and progressive deformity. The underlying defect responsible for this condition is:

- (A) A deficiency of dietary calcium alone
- (B) A defect in the androgen receptor
- (C) An abnormality of the dystrophin protein



(D) A defect in the synthesis of type I collagen

Q8. A 5-year-old boy develops a painful limp and refuses to bear weight a week after a viral upper respiratory illness; he is afebrile, blood counts are normal and symptoms settle within a few days with rest and analgesia. The most likely diagnosis is:

- (A) Acute septic arthritis of the hip
- (B) Transient synovitis of the hip
- (C) Slipped capital femoral epiphysis
- (D) Osteosarcoma of the femur

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

Q9. A young adult presents with a chronic painful, stiff hip, night pain, a low-grade fever and a raised ESR; imaging shows juxta-articular osteopenia with gradual joint-space narrowing. The most likely diagnosis is:

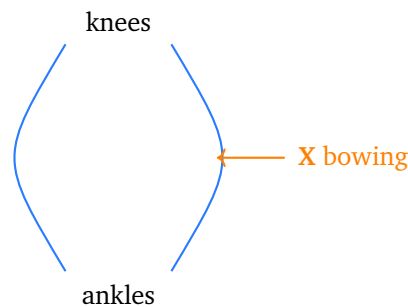
- (A) Tuberculosis of the hip joint
- (B) Acute gouty arthritis of the hip
- (C) An uncomplicated muscular strain
- (D) Osteochondroma of the femoral neck

Q10. An elderly man complains of bone pain, an enlarging skull and a bowed tibia. Blood tests show a markedly raised alkaline phosphatase with normal calcium and phosphate, and biopsy reveals a mosaic pattern of woven and lamellar bone. The diagnosis is:

- (A) Paget disease of bone
- (B) Simple osteoporosis
- (C) Acute osteomyelitis
- (D) Primary hyperparathyroidism



- Q11.** The leg schematic below (X marks the outward bowing) belongs to a toddler with widened, cupped and frayed metaphyses at the wrists and knees. The most likely underlying cause is:



- (A) An excess of vitamin A in the diet
- (B) A congenital dislocation of both hips
- (C) A defect in the type I collagen gene
- (D) Vitamin D deficiency causing rickets (defective mineralisation of growing bone)

Bone Tumours

- Q12.** A young adult is found on X-ray to have a well-defined lytic lesion with specks of calcification in the proximal phalanx of a finger, discovered incidentally after a minor pathological fracture. The most likely benign cartilage tumour is:
- (A) Osteosarcoma of the phalanx
 - (B) Ewing sarcoma of the hand
 - (C) Enchondroma
 - (D) Chondrosarcoma of the phalanx
- Q13.** A teenager has an eccentric, expansile, 'blown-out' lytic lesion in the metaphysis of a long bone; MRI shows multiple internal fluid-fluid levels. The most likely diagnosis is:
- (A) Osteoid osteoma
 - (B) Giant cell tumour of the epiphysis



- (C) Aneurysmal bone cyst
- (D) Osteochondroma

Spine, Arthritis and Sports Injuries

- Q14.** A 55-year-old diabetic woman has progressive shoulder pain and stiffness, with marked loss of both active and passive movement in all directions, especially external rotation. The most likely diagnosis is:
- (A) Adhesive capsulitis (frozen shoulder)
 - (B) An acute rotator cuff tear with preserved passive range
 - (C) Anterior shoulder dislocation
 - (D) Acromioclavicular joint sprain
- Q15.** A man with a large central lumbar disc prolapse develops bilateral sciatica, saddle (perineal) anaesthesia and acute urinary retention. The correct management is:
- (A) Reassurance and outpatient physiotherapy over several weeks
 - (B) A trial of bed rest for six weeks before any imaging
 - (C) Urgent MRI and emergency surgical decompression
 - (D) Long-term opioid analgesia alone



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

Concept – the Bennett fracture: A Bennett fracture is an intra-articular fracture-dislocation at the base of the first (thumb) metacarpal.

Step 1 – read the mechanism: An axial force along a partly flexed thumb splits off a small volar (beak) fragment, which is held by the strong anterior oblique ligament.

Step 2 – the displacement: The metacarpal shaft is then pulled **proximally and dorsally** by the abductor pollicis longus, subluxing the joint.

Why the other options are wrong:

- A, Rolando fracture: is a comminuted (Y- or T-shaped) intra-articular thumb base fracture, and it is at the thumb, not the fifth metacarpal.
- C, boxer's fracture: is a fracture of the fifth metacarpal neck, not the thumb base.
- D, Galeazzi fracture: is a radial shaft fracture with distal radio-ulnar joint disruption, unrelated to the thumb.

Final Answer: Bennett fracture-dislocation of the thumb metacarpal base ⇒ B

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

Q2.**Solution**

Concept – the intertrochanteric fracture: An intertrochanteric fracture runs along the extracapsular line between the greater and lesser trochanters of the femur.

Step 1 – note the blood supply: Because it is extracapsular, the femoral head keeps its blood supply, so union is usually good and fixation (not replacement) is the aim.

Step 2 – choose the device: A **dynamic (sliding) hip screw** allows controlled impaction at the fracture and is the standard fixation for a stable intertrochanteric fracture.

Why the other options are wrong:

- A, skin traction alone: is not definitive treatment; prolonged recumbency



carries high mortality in the elderly.

- B, total hip replacement in every case: is reserved mainly for displaced intracapsular fractures, not routine intertrochanteric ones.
- D, wrist volar locking plate: is a distal radius implant, irrelevant to the hip.

Final Answer: Dynamic hip screw $\Rightarrow$ C

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

Q3.

Solution

Concept – the supracondylar humerus fracture: This is the commonest elbow fracture in children, occurring at the level marked X just above the condyles.

Step 1 – recall the Gartland grades: Type I is undisplaced (anterior humeral line intact), Type II is displaced with an intact posterior cortex (hinge), and **Type III is completely displaced with no cortical contact.**

Step 2 – the implication: A Type III fracture needs urgent closed reduction and percutaneous pinning, and mandates a check of the brachial artery and median (anterior interosseous) nerve.

Why the other options are wrong:

- A, undisplaced with an intact anterior humeral line: describes Type I, not Type III.
- C, greenstick of the mid-shaft: is a different injury at a different level.
- D, never requires reduction: is false; a displaced Type III always requires reduction.

Final Answer: Complete displacement with no cortical contact $\Rightarrow$ B

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

Q4.

Solution

Concept – venous thromboembolism prophylaxis: Major lower-limb orthopaedic surgery is a high-risk setting for deep vein thrombosis and pulmonary embolism.

Step 1 – name the key measure: Pharmacological thromboprophylaxis (low-molecular-weight heparin), combined with early mobilisation and mechanical



methods such as compression devices, is the single most important preventive strategy.

Step 2 – the rationale: Stasis, endothelial injury and hypercoagulability (Virchow's triad) all peak after joint replacement, so both chemical and mechanical prophylaxis are used together.

Why the other options are wrong:

- B, prolonged bed rest with immobilised legs: increases stasis and clot risk, the opposite of what is needed.
- C, aspirin alone for every patient: is weaker than anticoagulation and not adequate as the sole measure for all high-risk cases.
- D, withholding anticoagulation until embolism appears: abandons prevention entirely and risks a fatal event.

Final Answer: Pharmacological prophylaxis with early mobilisation and mechanical measures ⇒ A

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

Q5.

Solution

Concept – common peroneal nerve injury: The common peroneal (fibular) nerve is the most commonly injured nerve in the lower limb.

Step 1 – locate the vulnerable point: It winds superficially around the **neck of the fibula** (marked X), where a tight plaster, a splint or direct pressure can compress it.

Step 2 – the deficit: Injury causes **foot drop** (loss of dorsiflexion and eversion) and sensory loss over the dorsum of the foot, so the patient develops a high-stepping gait.

Why the other options are wrong:

- A, tibial nerve: supplies plantar flexion; it lies deep and is not compressed at the fibular neck.
- C, femoral nerve: acts at the thigh (knee extension), far from the fibular neck.
- D, sural nerve: is purely sensory over the lateral foot and does not cause paralysis.

Final Answer: Common peroneal (fibular) nerve, causing foot drop ⇒ B



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

Q6.

Solution

Concept – knee dislocation and the popliteal artery: A knee dislocation is a true orthopaedic emergency because of the vessel lying directly behind the joint.

Step 1 – name the structure at risk: The **popliteal artery** is tethered at the adductor hiatus and the soleal arch, so a dislocation can stretch or tear it.

Step 2 – the consequence: An unrecognised popliteal injury threatens the limb; pulses, ankle-brachial pressure index and often CT angiography must be checked urgently, as delayed revascularisation can end in amputation.

Why the other options are wrong:

- A, long saphenous vein: is superficial and not limb-threatening if injured.
- B, medial meniscus: injury causes pain and locking, not a vascular emergency.
- C, patellar retinaculum: relates to patellar stability, not limb viability.

Final Answer: Popliteal artery ⇒ **D**

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

Q7.

Solution

Concept – osteogenesis imperfecta: Osteogenesis imperfecta is the classic ‘brittle bone disease’ of childhood.

Step 1 – match the features: Recurrent fractures from trivial trauma, **blue sclerae** and progressive deformity point to a defect in **type I collagen** synthesis.

Step 2 – the biology: Most cases arise from an autosomal dominant mutation in the COL1A1 or COL1A2 genes, giving fragile bone, thin sclerae (which appear blue) and, in some types, dentinogenesis imperfecta and early deafness.

Why the other options are wrong:

- A, dietary calcium deficiency alone: causes rickets or osteomalacia, not blue sclerae with a collagen defect.
- B, androgen receptor defect: causes androgen insensitivity, unrelated to bone fragility.



- C, dystrophin abnormality: causes Duchenne muscular dystrophy, a muscle disorder.

Final Answer: Defect in type I collagen synthesis $\Rightarrow$ D

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

Q8.

Solution

Concept – transient synovitis of the hip: Transient synovitis (irritable hip) is the commonest cause of an atraumatic painful limp in a young child.

Step 1 – read the clues: A limp following a **viral illness**, with the child afebrile, normal blood counts and rapid settling over a few days, is typical of transient synovitis.

Step 2 – exclude the danger: The key task is to distinguish it from septic arthritis using the Kocher criteria (fever, refusal to bear weight, raised ESR and white cell count); here those markers are normal, favouring a benign self-limiting course.

Why the other options are wrong:

- A, septic arthritis: causes a febrile, unwell child with raised inflammatory markers, absent here.
- C, slipped capital femoral epiphysis: affects overweight adolescents, not a 5-year-old.
- D, osteosarcoma: presents with a persistent mass and progressive pain, not a self-limiting limp.

Final Answer: Transient synovitis of the hip $\Rightarrow$ B

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

Q9.

Solution

Concept – tuberculosis of the hip: The hip is a common site of skeletal tuberculosis, second only to the spine.

Step 1 – match the picture: A chronic painful, stiff hip with **night pain**, low-grade fever and a raised ESR, alongside juxta-articular osteopenia and gradual joint-space narrowing, is characteristic of tuberculous arthritis.

Step 2 – the course: TB of the hip passes through stages of synovitis, early and



late arthritis, and can end in a fixed flexion, adduction and internal rotation deformity with wasting.

Why the other options are wrong:

- B, acute gout of the hip: is rare and presents as sudden severe attacks, not a slow chronic course with osteopenia.
- C, muscular strain: does not cause a raised ESR, night pain or radiographic joint-space loss.
- D, osteochondroma: is a benign bony outgrowth, not a painful destructive arthritis.

Final Answer: Tuberculosis of the hip joint ⇒ A

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

Q10.

Solution

Concept – Paget disease of bone: Paget disease is a disorder of disordered bone turnover in the elderly.

Step 1 – read the biochemistry: A markedly **raised alkaline phosphatase** with normal calcium and phosphate, together with bone pain, skull enlargement and a bowed tibia, points to Paget disease.

Step 2 – the pathology: Excessive osteoclastic resorption followed by chaotic osteoblastic new bone produces a **mosaic** pattern of woven and lamellar bone, giving thick but weak, deformity-prone bone.

Why the other options are wrong:

- B, osteoporosis: has normal alkaline phosphatase and no mosaic bone or bowing.
- C, acute osteomyelitis: is an acute febrile infection, not a chronic remodelling disorder.
- D, primary hyperparathyroidism: raises serum calcium, whereas calcium is normal here.

Final Answer: Paget disease of bone ⇒ A

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



Q11.

Solution

Concept – rickets from vitamin D deficiency: Rickets is defective mineralisation of the growing skeleton before the physes have fused.

Step 1 – read the signs: Outward **bowing** of the legs (marked **X**) with widened, cupped and frayed metaphyses at the wrists and knees is the classic radiographic picture of rickets.

Step 2 – the mechanism: **Vitamin D deficiency** lowers calcium and phosphate available for mineralisation, so unmineralised osteoid accumulates and soft growing bone bends under load.

Why the other options are wrong:

- A, excess vitamin A: causes hyperostosis and other toxicity, not rachitic metaphyses.
- B, congenital hip dislocation: causes gait and limb-length problems, not widened metaphyses.
- C, type I collagen defect: causes osteogenesis imperfecta with fractures, not defective mineralisation.

Final Answer: Vitamin D deficiency causing rickets ⇒ D

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

Q12.

Solution

Concept – enchondroma: An enchondroma is a benign tumour of mature hyaline cartilage within the medulla of a bone.

Step 1 – read the site and X-ray: A well-defined lytic lesion with speckled or 'popcorn' calcification in a **phalanx of the hand**, often found after a minor pathological fracture, is the classic enchondroma.

Step 2 – the behaviour: The small bones of the hand are the commonest site; it is usually asymptomatic and treated by curettage with bone grafting when needed.

Why the other options are wrong:

- A, osteosarcoma: is an aggressive malignant bone-forming tumour, rare in the phalanx, with a sunburst reaction.
- B, Ewing sarcoma: is a malignant diaphyseal tumour with an onion-skin reaction, not a benign calcified lesion.



- D, chondrosarcoma of the phalanx: is very rare; a small phalangeal cartilage lesion is far more likely to be a benign enchondroma.

Final Answer: Enchondroma $\Rightarrow$

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

Q13.

Solution

Concept – aneurysmal bone cyst: An aneurysmal bone cyst is an expansile, benign but locally aggressive lesion filled with blood.

Step 1 – match the imaging: An eccentric, expansile ‘blown-out’ lytic metaphyseal lesion with **fluid-fluid levels** on MRI (blood settling into layers) is characteristic of an aneurysmal bone cyst.

Step 2 – the behaviour: It typically arises in the second decade, can thin and balloon the cortex, and is treated by curettage with bone grafting, though it may recur.

Why the other options are wrong:

- A, osteoid osteoma: is a small sclerotic lesion with a nidus and night pain, not an expansile blood-filled cyst.
- B, giant cell tumour: is epiphyseal and lytic but lacks the multiple fluid-fluid levels of an aneurysmal bone cyst.
- D, osteochondroma: is a cartilage-capped bony outgrowth, not a fluid-filled lytic lesion.

Final Answer: Aneurysmal bone cyst $\Rightarrow$

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

Q14.

Solution

Concept – adhesive capsulitis (frozen shoulder): Adhesive capsulitis is inflammation and contracture of the glenohumeral joint capsule.

Step 1 – read the hallmark: Loss of **both active and passive** movement in all directions, especially external rotation, in a **diabetic** middle-aged patient is typical of a frozen shoulder.

Step 2 – the course: It passes through freezing (painful), frozen (stiff) and thaw-



ing (recovery) phases over months to a couple of years, and is strongly associated with diabetes mellitus.

Why the other options are wrong:

- B, rotator cuff tear: limits active movement but usually preserves passive range, unlike the global passive loss here.
- C, anterior dislocation: presents acutely after trauma with a deformed, held shoulder, not chronic global stiffness.
- D, acromioclavicular sprain: causes local joint-line tenderness, not a globally restricted shoulder.

Final Answer: Adhesive capsulitis (frozen shoulder) ⇒ A

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

Q15.

Solution

Concept – cauda equina syndrome: Cauda equina syndrome is compression of the lumbosacral nerve roots below the cord and is a surgical emergency.

Step 1 – recognise the red flags: Bilateral sciatica, **saddle (perineal) anaesthesia** and **urinary retention** from a large central disc prolapse are the warning features.

Step 2 – act on them: The correct step is **urgent MRI and emergency surgical decompression**; delay risks permanent bladder, bowel and sexual dysfunction, so it must not be treated conservatively.

Why the other options are wrong:

- A, reassurance and outpatient physiotherapy: dangerously delays decompression of a true emergency.
- B, six weeks of bed rest before imaging: allows irreversible nerve damage to develop.
- D, opioids alone: treats pain but ignores the compression that threatens permanent deficits.

Final Answer: Urgent MRI and emergency surgical decompression ⇒ C

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



Answer Key

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

