

INI CET Orthopaedics

Sample Paper – 7

Duration: 14 Minutes

Maximum Marks: 15

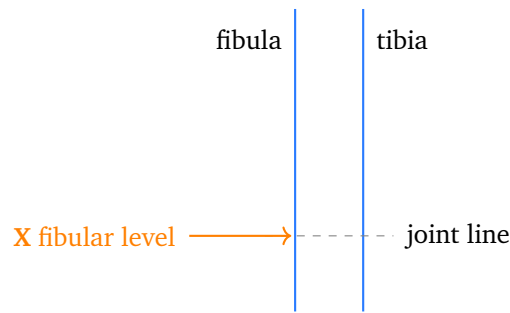
Instructions

- 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 footballer twists his foot and develops pain over the lateral border of the midfoot. The X-ray shows a transverse fracture at the base of the fifth metatarsal, an injury notorious for poor healing and non-union. This lesion is known as a:
- (A) Jones fracture at the base of the fifth metatarsal
(B) Bennett fracture of the thumb
(C) Pott fracture of the ankle
(D) Bosworth fracture of the leg
- Q2.** The Weber (Danis-Weber) classification of ankle fractures, illustrated below, groups injuries according to which single anatomical feature?





- (A) The level of the fibular fracture relative to the ankle syndesmosis
- (B) The number of malleoli involved only
- (C) The patient's age at the time of injury
- (D) The direction of talar tilt alone

Q3. A patient who fell onto a flexed knee cannot actively straight-leg raise and has a palpable gap over the front of the knee. The X-ray confirms a displaced transverse patella fracture. The inability to lift the extended leg is explained by disruption of the:

- (A) Posterior cruciate ligament
- (B) Extensor mechanism of the knee
- (C) Medial collateral ligament
- (D) Common peroneal nerve

Fracture Complications and Emergencies

Q4. Which statement best distinguishes fracture non-union from delayed union?

- (A) Both terms mean exactly the same thing
- (B) Delayed union has permanently ceased healing, while non-union heals faster than expected
- (C) Delayed union is healing that is slower than expected but still progressing, whereas non-union is the permanent failure of healing with no prospect of bony union without intervention
- (D) Non-union always heals within the expected time frame



- Q5.** A posterior dislocation of the hip, classically after a dashboard injury, most commonly damages which nerve?
- (A) Femoral nerve
 - (B) Sciatic nerve
 - (C) Obturator nerve
 - (D) Superior gluteal nerve
- Q6.** A surgical tourniquet left inflated for a prolonged period during limb surgery is most likely to cause which complication?
- (A) Accelerated fracture healing
 - (B) Permanent lengthening of the limb
 - (C) Improved distal perfusion after release
 - (D) Post-tourniquet nerve palsy and ischaemic muscle injury

Paediatric Orthopaedics

- Q7.** A mother is worried that her healthy 18-month-old toddler is bow-legged, and that her 3-year-old is knock-kneed. Regarding physiological genu varum and genu valgum, the correct advice is:
- (A) Both findings always indicate rickets and need urgent treatment
 - (B) Genu valgum in a toddler is normal but genu varum is never physiological
 - (C) Both children require corrective osteotomy immediately
 - (D) Mild genu varum is normal up to about 2 years and physiological genu valgum peaks around 3 to 4 years, both correcting spontaneously with growth
- Q8.** A 3-week-old neonate is irritable, febrile and holds the right lower limb still, refusing to move it (pseudoparalysis), with pain on any hip movement. The most important diagnosis to exclude urgently is:
- (A) Septic arthritis of the hip, a surgical emergency



- (B) A simple nappy rash
- (C) Physiological flexion posture of the newborn
- (D) Benign transient synovitis needing no action

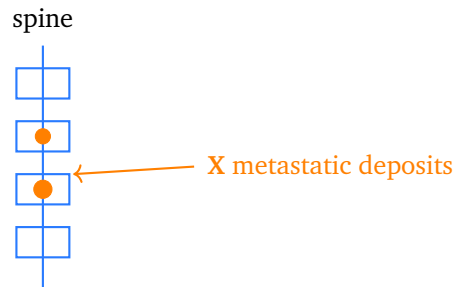
**Bone and Joint Infection
and Metabolic Bone Disease**

- Q9.** A swollen, hot knee is aspirated. Which synovial fluid finding best distinguishes septic arthritis from an acute rheumatoid flare?
- (A) A clear, straw-coloured fluid with a very low cell count
 - (B) A turbid, purulent aspirate with a very high neutrophil count and organisms on Gram stain or culture
 - (C) Negatively birefringent urate crystals
 - (D) A bloody aspirate with fat globules
- Q10.** The radiograph of a patient with osteomalacia shows symmetrical transverse lucent bands (pseudofractures) across the medial femoral necks and pubic rami. These are called:
- (A) Looser zones (pseudofractures)
 - (B) Codman triangles
 - (C) Sunburst spicules
 - (D) Sequestra
- Q11.** A middle-aged man develops sudden agonising pain and swelling of the first metatarsophalangeal joint overnight. Which of the following most typically precipitates such an acute gouty attack from hyperuricaemia?
- (A) A low-purine vegetarian meal
 - (B) Regular gentle stretching
 - (C) A heavy alcohol binge with a purine-rich (red meat and seafood) meal
 - (D) Drinking plenty of water



Bone Tumours

Q12. An elderly woman with known breast cancer develops back pain, and imaging (below) shows several deposits in the vertebrae and pelvis. Regarding bone malignancy in adults, the single commonest source of a bone tumour is:



- (A) A primary osteosarcoma of the vertebra
 - (B) Metastasis, chiefly from breast, prostate, lung, kidney and thyroid primaries
 - (C) A benign osteochondroma
 - (D) A simple bone cyst
- Q13.** An elderly man has bone pain, anaemia, hypercalcaemia and renal impairment. His skull X-ray shows multiple discrete ‘punched-out’ lytic lesions, and his urine contains Bence Jones protein. The diagnosis is:
- (A) Paget disease of bone
 - (B) Osteoporosis
 - (C) Fibrous dysplasia
 - (D) Multiple myeloma

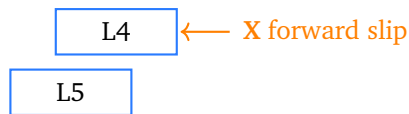
Spine, Arthritis and Sports Injuries

- Q14.** A woman with a long history of symmetrical polyarthritis has both hands affected. Which cluster of findings is most characteristic of rheumatoid arthritis of the hand?
- (A) Isolated distal interphalangeal (DIP) nodes with sparing of the MCP joints



- (B) A single hot, red first metatarsophalangeal joint
- (C) Symmetrical metacarpophalangeal (MCP) involvement with ulnar deviation of the fingers and swan-neck deformities
- (D) Unilateral wrist trauma with no joint swelling

Q15. The lateral radiograph below shows one vertebral body slipped forwards on the one beneath it. This forward slip of one vertebra relative to the next is termed:



- (A) Scoliosis
- (B) Ankylosing spondylitis
- (C) Spondylolisthesis
- (D) Kyphosis



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

Concept – the Jones fracture: A Jones fracture is a fracture at the base of the fifth metatarsal, in the zone between the metaphysis and the diaphysis.

Step 1 – locate the injury: It sits at the **base of the fifth metatarsal**, a few centimetres from the tip, in a watershed area of relatively poor blood supply.

Step 2 – the consequence: That watershed vascularity is why the Jones fracture is prone to **delayed union and non-union**, unlike the more distal avulsion fracture of the tuberosity, which heals well.

Why the other options are wrong:

- B, Bennett fracture: an intra-articular fracture-dislocation at the base of the thumb metacarpal, not the foot.
- C, Pott fracture: an old term for a bimalleolar ankle fracture.
- D, Bosworth fracture: a rare fracture-dislocation of the ankle with the fibula trapped behind the tibia.

Final Answer: Fracture at the base of the fifth metatarsal ⇒ A

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

Q2.**Solution**

Concept – the Weber classification: The Danis-Weber system classifies ankle fractures by the level of the fibular fracture.

Step 1 – read the marker: The point marked X is the **level of the fibular fracture** relative to the syndesmosis (the tibiofibular joint at the ankle mortise).

Step 2 – the three grades: Weber A lies below the syndesmosis, Weber B at its level, and Weber C above it; the higher the fibular fracture, the greater the risk of syndesmotic instability.

Why the other options are wrong:

- B, number of malleoli: describes uni-, bi- or trimalleolar patterns, a separate descriptive system.
- C, patient's age: is not part of the Weber classification.
- D, talar tilt alone: reflects instability but is not the basis of the Weber grades.



Final Answer: Level of the fibular fracture $\Rightarrow$ **A**

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

Q3.

Solution

Concept – the extensor mechanism and the patella: The patella is a sesamoid bone within the extensor mechanism of the knee.

Step 1 – trace the mechanism: The quadriceps tendon, the patella and the patellar tendon together form the **extensor mechanism**, which straightens the knee.

Step 2 – explain the sign: A displaced transverse patella fracture breaks this continuous lever, so the quadriceps can no longer extend the knee and the patient cannot perform a **straight-leg raise**; a palpable gap is felt over the patella.

Why the other options are wrong:

- A, posterior cruciate ligament: provides stability, not active extension.
- C, medial collateral ligament: resists valgus stress and does not extend the knee.
- D, common peroneal nerve: injury causes foot drop, not loss of knee extension.

Final Answer: Disruption of the extensor mechanism $\Rightarrow$ **B**

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

Q4.

Solution

Concept – delayed union versus non-union: Both describe fractures that fail to heal on schedule, but they differ in prognosis.

Step 1 – define each term: **Delayed union** is healing that is slower than expected for that bone but is still progressing; **non-union** is the permanent failure of healing, where the fracture will not unite without intervention.

Step 2 – the risk factors: Poor blood supply, infection, inadequate immobilisation, wide fracture gaps, smoking and diabetes all push a fracture from delayed union towards frank non-union.

Why the other options are wrong:



- A, identical meaning: false, the two terms carry different prognoses.
- B, reversed definitions: swaps the meanings of the two terms.
- D, non-union heals on time: contradicts the definition of non-union.

Final Answer: Delayed union is slow but progressing; non-union has permanently failed ⇒

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

Q5.

Solution

Concept – posterior hip dislocation: A posterior hip dislocation drives the femoral head backwards, close to the sciatic nerve.

Step 1 – name the nerve: The **sciatic nerve** runs just behind the hip joint and is the nerve most commonly injured in a posterior dislocation.

Step 2 – the clinical picture: The limb lies flexed, adducted and internally rotated; a sciatic (usually common peroneal division) palsy causes foot drop and sensory loss, so prompt reduction is essential.

Why the other options are wrong:

- A, femoral nerve: lies anteriorly and is spared in a posterior dislocation.
- C, obturator nerve: passes medially and is not typically injured.
- D, superior gluteal nerve: injured in other procedures, not classically here.

Final Answer: Sciatic nerve injury ⇒

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

Q6.

Solution

Concept – tourniquet complications: A tourniquet gives a bloodless field but stops perfusion to the whole distal limb.

Step 1 – name the harm: Prolonged inflation causes **post-tourniquet nerve palsy and ischaemic muscle injury** through direct pressure on nerves and oxygen deprivation of muscle.

Step 2 – safe practice: Keeping cuff pressures and inflation times within recommended limits, and releasing periodically, minimises these ischaemic and compressive injuries.



Why the other options are wrong:

- A, faster healing: a tourniquet does not accelerate fracture healing.
- B, limb lengthening: is not a tourniquet effect.
- C, improved distal perfusion: the opposite occurs; perfusion is cut off during inflation.

Final Answer: Post-tourniquet nerve palsy and ischaemic muscle injury ⇒ D

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

Q7.

Solution

Concept – physiological angular variation of the legs: Toddlers pass through a normal, self-correcting sequence of bow legs then knock knees.

Step 1 – state the pattern: Mild **genu varum** (bow legs) is normal up to about **2 years**, then the legs swing into physiological **genu valgum** (knock knees) that peaks around **3 to 4 years**, before settling to the adult alignment by about 7 years.

Step 2 – reassure: Because this is a normal developmental variation, symmetrical painless deformity within these age windows needs only observation, not treatment.

Why the other options are wrong:

- A, always rickets: pathological causes exist but most cases at these ages are physiological.
- B, varum never physiological: false, mild varum in infancy is normal.
- C, immediate osteotomy: unnecessary for a self-correcting physiological pattern.

Final Answer: Varum normal to ~2 years, valgum peaks ~3 to 4 years, both self-correct ⇒ D

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



Q8.

Solution

Concept – neonatal septic arthritis of the hip: A hot, irritable neonate who will not move a limb has an orthopaedic emergency until proven otherwise.

Step 1 – read the clues: Fever, irritability and **pseudoparalysis** (holding the limb still because movement hurts) in a neonate point to **septic arthritis of the hip**, a surgical emergency.

Step 2 – act quickly: The hip must be aspirated and washed out urgently, because pus under pressure rapidly destroys the growing femoral head and cartilage.

Why the other options are wrong:

- B, nappy rash: a skin problem that does not cause fever with pseudoparalysis.
- C, physiological flexion: a normal resting posture, not painful refusal to move.
- D, transient synovitis: a self-limiting condition of older children, not this toxic neonate.

Final Answer: Septic arthritis of the hip, a surgical emergency ⇒ **A**

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

Q9.

Solution

Concept – reading the joint aspirate: Synovial fluid analysis is the key to separating infection from an inflammatory flare.

Step 1 – identify septic fluid: Septic arthritis gives a **turbid, purulent aspirate with a very high neutrophil count and organisms on Gram stain or culture**; this is what distinguishes it from a rheumatoid flare.

Step 2 – contrast the flare: A rheumatoid flare shows inflammatory but sterile fluid with a lower cell count and no organisms, so culture is the decisive discriminator.

Why the other options are wrong:

- A, clear low-count fluid: describes a non-inflammatory effusion, not sepsis.
- C, urate crystals: indicate gout, not septic arthritis.
- D, bloody aspirate with fat globules: suggests an intra-articular fracture (lipohaemarthrosis).



Final Answer: Purulent fluid, high neutrophils and positive Gram stain or culture
⇒ **B**

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

Q10.

Solution

Concept – osteomalacia and Looser zones: Osteomalacia is defective mineralisation of bone matrix in adults, usually from vitamin D deficiency.

Step 1 – name the sign: The symmetrical transverse lucent bands across the medial femoral necks, pubic rami and scapulae are **Looser zones (pseudofractures)**, also called Milkman lines.

Step 2 – the mechanism: They are bands of unmineralised osteoid at sites of stress, appearing as incomplete fractures perpendicular to the cortex.

Why the other options are wrong:

- B, Codman triangle: a periosteal reaction seen in aggressive bone tumours.
- C, sunburst spicules: another malignant periosteal pattern, as in osteosarcoma.
- D, sequestra: dead bone fragments seen in chronic osteomyelitis.

Final Answer: Looser zones (pseudofractures) ⇒ **A**

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

Q11.

Solution

Concept – precipitants of acute gout: Gout is caused by monosodium urate crystals; attacks are triggered by swings in the urate level.

Step 1 – pick the trigger: A heavy alcohol binge with a purine-rich (red meat and seafood) meal raises the serum urate and precipitates an acute attack, classically in the first metatarsophalangeal joint (podagra).

Step 2 – the biology: Alcohol and high-purine foods increase urate production and reduce its renal excretion, tipping supersaturated fluid into crystal formation.

Why the other options are wrong:

- A, low-purine vegetarian meal: reduces rather than provokes hyperuricaemia.



- B, gentle stretching: does not affect urate levels.
- D, drinking water: encourages urate excretion and is protective.

Final Answer: Alcohol binge with a purine-rich meal ⇒ **C**

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

Q12.

Solution

Concept – skeletal metastases: In adults, most malignant bone lesions are secondary deposits, not primary bone tumours.

Step 1 – name the commonest source: Metastasis is the commonest bone malignancy in adults, chiefly from **breast, prostate, lung, kidney and thyroid** primaries (the marker X shows deposits in the spine).

Step 2 – the pattern: Prostate deposits are typically sclerotic, kidney and thyroid deposits lytic, and the axial skeleton (spine, pelvis, ribs) is favoured by the red-marrow blood supply.

Why the other options are wrong:

- A, primary osteosarcoma: far rarer than metastasis in adults and typical of adolescents.
- C, osteochondroma: a benign outgrowth, not a malignant deposit.
- D, simple bone cyst: a benign lesion of children, not a metastasis.

Final Answer: Metastasis from breast, prostate, lung, kidney and thyroid ⇒ **B**

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

Q13.

Solution

Concept – multiple myeloma: Multiple myeloma is a malignant proliferation of plasma cells in the marrow of older adults.

Step 1 – match the features: Bone pain, anaemia, hypercalcaemia and renal impairment with ‘**punched-out**’ lytic skull lesions and **Bence Jones protein** in the urine identify **multiple myeloma**.

Step 2 – the biology: Clonal plasma cells secrete monoclonal immunoglobulin (M-band) and activate osteoclasts, producing purely lytic lesions without a sclerotic rim.



Why the other options are wrong:

- A, Paget disease: causes mixed lytic and sclerotic bone with a raised alkaline phosphatase, not punched-out lesions.
- B, osteoporosis: reduces bone density diffusely without focal lytic deposits or paraprotein.
- C, fibrous dysplasia: gives a 'ground-glass' lesion, typically in younger patients.

Final Answer: Multiple myeloma ⇒

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

Q14.

Solution

Concept – rheumatoid arthritis of the hand: Rheumatoid arthritis is a symmetrical inflammatory polyarthritis with characteristic hand deformities.

Step 1 – recall the pattern: It causes **symmetrical metacarpophalangeal (MCP) involvement** with **ulnar deviation** of the fingers and **swan-neck** (and boutonnière) deformities, typically sparing the distal interphalangeal joints.

Step 2 – the biology: Synovial pannus erodes cartilage and bone around the MCP and proximal interphalangeal joints, and lax supporting structures allow the tendons to drift ulnarwards.

Why the other options are wrong:

- A, isolated DIP nodes: are Heberden nodes of osteoarthritis; rheumatoid arthritis spares the DIP joints.
- B, single hot first MTP joint: describes acute gout, not rheumatoid arthritis.
- D, unilateral wrist trauma: is a mechanical injury, not a symmetrical inflammatory arthritis.

Final Answer: Symmetrical MCP disease with ulnar deviation and swan-neck deformity ⇒

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



Q15.

Solution

Concept – spondylolisthesis: Spondylolisthesis is a forward slip of one vertebra on the one below it.

Step 1 – define the term: The lateral film (marked X) shows the upper vertebral body displaced forwards on the lower one, which is **spondylolisthesis**, most often at L5 on S1.

Step 2 – the effect: Depending on the degree of slip it can narrow the canal or stretch the exiting nerve roots, producing back pain and sometimes radicular symptoms.

Why the other options are wrong:

- A, scoliosis: is a lateral (sideways) curvature, not a forward slip.
- B, ankylosing spondylitis: fuses the spine into a rigid 'bamboo' column rather than slipping it.
- D, kyphosis: is an exaggerated forward (sagittal) curve, not a translational slip.

Final Answer: Forward slip of one vertebra on another ⇒ C

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



Answer Key

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

