

INI CET Orthopaedics

Sample Paper – 1

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 wrist deformity shown below follows a fall on an outstretched hand. This 'dinner-fork' deformity is produced by a Colles fracture of the distal radius, in which the distal fragment is displaced:



- (A) Volar (palmar) and proximally
- (B) Medially towards the ulna
- (C) Dorsally and radially (dinner-fork deformity)



(D) There is no displacement

Q2. The correct chronological sequence of secondary (callus) fracture healing is:

- (A) Haematoma and inflammation, soft (fibrocartilaginous) callus, hard (bony) callus, then remodelling
- (B) Remodelling, hard callus, then haematoma
- (C) Hard callus, haematoma, then inflammation
- (D) Soft callus, remodelling, then haematoma

Q3. A fracture of the waist of the scaphoid is prone to avascular necrosis of its proximal pole because the bone's blood supply enters:

- (A) The proximal pole directly
- (B) Uniformly over the whole volar surface
- (C) Distally, so a waist fracture strips the proximal fragment of its retrograde supply
- (D) The scaphoid has no independent blood supply

Fracture Complications and Emergencies

Q4. The earliest and most reliable clinical sign of acute compartment syndrome in a fractured limb is:

- (A) Pain out of proportion to the injury, worsened by passive stretch of the compartment muscles
- (B) Absent distal pulses
- (C) Complete paralysis of the limb
- (D) Pallor of the skin

Q5. Fat embolism syndrome, arising most often 24 to 72 hours after a long-bone fracture, classically presents with the triad of:

- (A) Fever, arthritis and a malar rash



- (B) Hypoxaemia with dyspnoea, neurological changes and a petechial rash
- (C) Hypertension, bradycardia and headache
- (D) Jaundice, ascites and peripheral oedema

Q6. The single most important step to reduce deep infection in an open (compound) fracture is:

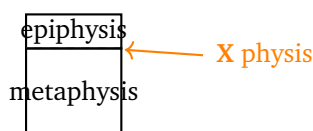
- (A) Delaying antibiotics until after 24 hours
- (B) Immediate primary skin closure without a washout
- (C) Plaster immobilisation alone with no wound care
- (D) Early intravenous antibiotics with prompt surgical debridement and irrigation

Paediatric Orthopaedics

Q7. The Ortolani and Barlow manoeuvres performed on a newborn are used to detect:

- (A) Congenital talipes equinovarus (club foot)
- (B) Developmental dysplasia of the hip
- (C) Perthes disease
- (D) Osteogenesis imperfecta

Q8. In the Salter-Harris classification of growth-plate injuries shown below, a Type I injury is:



- (A) A fracture through the metaphysis only
- (B) A fracture crossing physis, metaphysis and epiphysis together
- (C) A fracture through the epiphysis into the joint



- (D) A pure separation through the physis (growth plate) with no bony fragment

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

- Q9.** The commonest causative organism of acute haematogenous osteomyelitis in children is:
- (A) Escherichia coli
 - (B) Pseudomonas aeruginosa
 - (C) Staphylococcus aureus
 - (D) Mycobacterium tuberculosis
- Q10.** The single definitive investigation to confirm acute septic arthritis of a joint is:
- (A) Joint aspiration with synovial fluid cell count, Gram stain and culture
 - (B) A plain radiograph alone
 - (C) Serum uric acid level
 - (D) Nerve conduction studies
- Q11.** Tuberculosis of the spine (Pott disease) most commonly affects the thoracolumbar region and characteristically produces which deformity?
- (A) A cervical lordosis
 - (B) A lumbar scoliosis without collapse
 - (C) An angular kyphosis (gibbus) from anterior vertebral body collapse
 - (D) A flattened sacral curve

Bone Tumours

- Q12.** The commonest primary malignant bone tumour in adolescents, arising around the knee with a 'sunburst' periosteal reaction and a Codman triangle on X-ray, is:



- (A) Giant cell tumour
- (B) Osteochondroma
- (C) Chondrosarcoma
- (D) Osteosarcoma

Q13. A small round-blue-cell malignant bone tumour of childhood showing an 'onion-skin' periosteal reaction and the t(11;22) translocation is:

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

Spine, Arthritis and Sports Injuries

Q14. The most common site of a lumbar intervertebral disc prolapse causing sciatica is:

- (A) L1-L2
- (B) L4-L5 and L5-S1
- (C) T12-L1
- (D) L2-L3

Q15. A positive Lachman test and anterior drawer test at the knee indicate injury to the:

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



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

Concept – the Colles fracture: A Colles fracture is a fracture of the distal radius after a fall on an outstretched hand.

Step 1 – read the displacement: The distal fragment is displaced **dorsally and radially** (with supination and impaction), producing the classic ‘dinner-fork’ or ‘bayonet’ deformity marked X.

Step 2 – contrast: A Smith fracture is the reverse injury, with volar (palmar) displacement of the distal fragment.

Why the other options are wrong:

- A, volar displacement: this describes a Smith (reverse Colles) fracture.
- B, medial displacement: not the pattern of a Colles fracture.
- D, no displacement: a Colles fracture is by definition displaced.

Final Answer: Dorsal and radial displacement ⇒

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

Q2.**Solution**

Concept – stages of secondary fracture healing: Most fractures heal by secondary (callus) healing through an ordered sequence.

Step 1 – list the order: **Haematoma and inflammation**, then **soft (fibrocartilaginous) callus**, then **hard (bony) callus**, and finally **remodelling**.

Step 2 – the logic: Bleeding forms the fracture haematoma first; remodelling by Wolff’s law is necessarily last, restoring the normal architecture.

Why the other options are wrong:

- B, C and D: each places remodelling or hard callus before the haematoma, which reverses the true biological sequence.

Final Answer: Haematoma → soft callus → hard callus → remodelling ⇒

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



Q3.

Solution

Concept – scaphoid blood supply: The scaphoid receives a retrograde blood supply that determines its fracture complications.

Step 1 – trace the supply: Branches of the radial artery enter the scaphoid **distally** (at the dorsal ridge) and run proximally, so blood flows from distal to proximal.

Step 2 – the consequence: A waist fracture cuts off the proximal pole from this retrograde flow, causing avascular necrosis and non-union of the proximal fragment.

Why the other options are wrong:

- A, proximal entry: is the opposite of the true distal entry.
- B, uniform volar supply: the supply is not uniform; it is predominantly distal and dorsal.
- D, no blood supply: incorrect, the scaphoid is vascularised but in a vulnerable retrograde pattern.

Final Answer: Distal (retrograde) entry ⇒ C

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

Q4.

Solution

Concept – recognising compartment syndrome early: Acute compartment syndrome is a surgical emergency where the diagnosis must be clinical, not delayed for late signs.

Step 1 – name the earliest sign: **Pain out of proportion** to the injury, aggravated by passive stretching of the muscles in the compartment, is the earliest and most reliable feature.

Step 2 – why the others mislead: The classic '5 Ps' pulselessness, pallor, paraesthesia and paralysis are *late* signs; waiting for them risks irreversible muscle necrosis.

Why the other options are wrong:

- B, absent pulses: a very late sign, often present after muscle death.
- C, paralysis: a late sign of established ischaemia.
- D, pallor: also late and unreliable as an early marker.



Final Answer: Pain worsened by passive stretch $\Rightarrow$ **A**

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

Q5.

Solution

Concept – fat embolism syndrome: Fat globules from marrow enter the circulation after a long-bone fracture.

Step 1 – recall the triad: Hypoxaemia (respiratory distress), neurological changes (confusion) and a petechial rash form the classic triad, typically 24 to 72 hours after injury.

Step 2 – the mechanism: Fat emboli lodge in the pulmonary and cerebral microvasculature and release inflammatory free fatty acids.

Why the other options are wrong:

- A, fever/arthritis/malar rash: suggests a connective-tissue disease, not fat embolism.
- C, hypertension/bradycardia/headache: is the Cushing response of raised intracranial pressure.
- D, jaundice/ascites/oedema: points to liver failure, unrelated to fracture.

Final Answer: Hypoxaemia, neurological change and petechiae $\Rightarrow$ **B**

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

Q6.

Solution

Concept – managing the open fracture: An open fracture communicates with the outside, so infection prevention is the priority.

Step 1 – name the key step: Early intravenous antibiotics together with prompt surgical debridement and irrigation of the wound is the single most important measure.

Step 2 – supporting care: Tetanus prophylaxis, fracture stabilisation and staged wound closure follow, but debridement plus early antibiotics drive the infection risk down.

Why the other options are wrong:



- A, delaying antibiotics: raises infection risk; antibiotics should be given as early as possible.
- B, primary closure without washout: traps contamination and invites infection.
- C, plaster alone: does not address the contaminated wound.

Final Answer: Early antibiotics with surgical debridement ⇒ **D**

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

Q7.

Solution

Concept – screening the newborn hip: Two provocative manoeuvres screen the neonatal hip for instability.

Step 1 – match the tests: The **Ortolani** (relocation) and **Barlow** (dislocation) tests detect **developmental dysplasia of the hip (DDH)**.

Step 2 – the mechanism: Barlow dislocates an unstable hip posteriorly; Ortolani relocates it with a palpable clunk.

Why the other options are wrong:

- A, club foot: diagnosed on inspection of the foot deformity, not by these hip tests.
- C, Perthes disease: affects older children (4 to 8 years), diagnosed on imaging.
- D, osteogenesis imperfecta: presents with fragile bones and blue sclerae, unrelated to these tests.

Final Answer: Developmental dysplasia of the hip ⇒ **B**

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

Q8.

Solution

Concept – Salter-Harris Type I: The Salter-Harris system grades physeal (growth-plate) injuries by the fracture path.

Step 1 – define Type I: A Type I injury is a **pure separation through the physis** (marked X) with no accompanying bony fragment.

Step 2 – the mnemonic (SALTR): II = Above (metaphysis), III = Lower (epiph-



ysis), IV = Through both, V = cRush of the physis; I = Slipped physis alone.

Why the other options are wrong:

- A, metaphysis only: this is Type II (a metaphyseal Thurston-Holland fragment).
- B, through physis, metaphysis and epiphysis: this is Type IV.
- C, through the epiphysis into the joint: this is Type III.

Final Answer: Pure physeal separation $\Rightarrow$

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

Q9.

Solution

Concept – acute osteomyelitis in children: Acute haematogenous osteomyelitis seeds the metaphysis of a long bone through the blood.

Step 1 – name the organism: *Staphylococcus aureus* is by far the commonest cause across all paediatric age groups.

Step 2 – the site: The rich, slow metaphyseal circulation near the growth plate favours bacterial lodgement.

Why the other options are wrong:

- A, *E. coli*: a cause in neonates or the immunocompromised, not the commonest overall.
- B, *Pseudomonas*: associated with puncture wounds through footwear and IV drug use.
- D, tuberculosis: causes chronic, indolent osteomyelitis, not the acute picture.

Final Answer: *Staphylococcus aureus* $\Rightarrow$

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

Q10.

Solution

Concept – confirming septic arthritis: Septic arthritis is a joint emergency that must be confirmed and drained quickly.

Step 1 – name the test: **Joint aspiration** with synovial fluid cell count, Gram stain and culture is the definitive confirmatory investigation (a high neutrophil



count and organisms clinch it).

Step 2 – why it is definitive: It both confirms infection and guides antibiotic choice, and precedes urgent joint washout.

Why the other options are wrong:

- B, plain X-ray alone: is normal early and cannot confirm infection.
- C, serum uric acid: relates to gout, not septic arthritis.
- D, nerve conduction studies: assess nerves, not joint infection.

Final Answer: Joint aspiration and synovial fluid analysis ⇒ A

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

Q11.

Solution

Concept – tuberculosis of the spine (Pott disease): Spinal TB is the commonest form of skeletal tuberculosis.

Step 1 – site and deformity: It favours the **thoracolumbar** spine and causes an **angular kyphosis (gibbus)** as the anterior vertebral bodies collapse.

Step 2 – the sequence: Infection begins in the vertebral body, destroys the disc space and can track as a cold (paravertebral) abscess.

Why the other options are wrong:

- A, cervical lordosis: not the typical site or deformity.
- B, lumbar scoliosis without collapse: TB causes anterior collapse and kyphosis, not a pure scoliosis.
- D, flattened sacral curve: not a recognised feature of Pott disease.

Final Answer: Thoracolumbar spine with a gibbus ⇒ C

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

Q12.

Solution

Concept – osteosarcoma: Osteosarcoma is the commonest primary malignant bone tumour of adolescents.

Step 1 – read the clues: A tumour **around the knee** (distal femur or proximal



tibia) with a **sunburst** periosteal reaction and a **Codman triangle** is osteosarcoma.

Step 2 – the biology: It arises from primitive bone-forming mesenchyme and produces malignant osteoid.

Why the other options are wrong:

- A, giant cell tumour: a locally aggressive but usually benign epiphyseal 'soap-bubble' lesion.
- B, osteochondroma: the commonest benign bone tumour, a cartilage-capped bony outgrowth.
- C, chondrosarcoma: a malignant cartilage tumour of older adults, not adolescents.

Final Answer: Osteosarcoma $\Rightarrow$ D

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

Q13.

Solution

Concept – Ewing sarcoma: Ewing sarcoma is a highly malignant small round-blue-cell tumour of childhood.

Step 1 – match the features: An **onion-skin** (lamellated) periosteal reaction with the **t(11;22)** translocation (EWS-FLI1) identifies Ewing sarcoma, often in the diaphysis of long bones or the pelvis.

Step 2 – the presentation: It can mimic infection with fever, raised inflammatory markers and a painful swelling.

Why the other options are wrong:

- B, osteosarcoma: shows a sunburst reaction and produces osteoid, without the t(11;22).
- C, giant cell tumour: a benign epiphyseal lesion of young adults.
- D, osteoid osteoma: a small benign lesion with night pain relieved by NSAIDs.

Final Answer: Ewing sarcoma $\Rightarrow$ A

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



Q14.

Solution

Concept – lumbar disc prolapse: A prolapsed lumbar disc compresses a nerve root and causes sciatica.

Step 1 – name the site: The commonest levels are **L4-L5 and L5-S1**, the most mobile and loaded segments of the lumbar spine.

Step 2 – the clinical effect: An L5-S1 prolapse typically compresses the S1 root (loss of ankle jerk), and an L4-L5 prolapse the L5 root (weak great-toe dorsiflexion).

Why the other options are wrong:

- A, L1-L2; C, T12-L1; D, L2-L3: all are far less commonly involved than the lower two levels.

Final Answer: L4-L5 and L5-S1 ⇒ **B**

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

Q15.

Solution

Concept – testing the cruciate ligaments: Specific knee tests localise ligament injury.

Step 1 – match the tests: A positive **Lachman** and **anterior drawer** test (anterior tibial translation on the femur) indicate an **anterior cruciate ligament (ACL)** tear.

Step 2 – the mechanism: The ACL restrains anterior tibial movement, so its rupture allows the tibia to slide forwards.

Why the other options are wrong:

- A, posterior cruciate ligament: injured with a positive *posterior* drawer test.
- C, medial meniscus: tested by the McMurray test, giving a click rather than translation.
- D, patellar tendon: rupture causes a high-riding patella and inability to extend, not anterior laxity.

Final Answer: Anterior cruciate ligament ⇒ **B**

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



Answer Key

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

