INI CET Paediatrics

Sample Paper – 2

Duration: 14 Minutes **Maximum Marks: 15**

Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Paediatrics content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- The **15-question** length matches the number of Paediatrics 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.

Neonatology

Q1. The single commonest organism causing early-onset neonatal sepsis (presenting within the first 72 hours of life) worldwide is:

(A) Staphylococcus aureus

(B) Group B Streptococcus (Streptococcus agalactiae)

(C) Listeria monocytogenes

(D) Candida albicans

Q2. Kernicterus (bilirubin encephalopathy) in the newborn is caused by:

(A) Deposition of unconjugated (indirect) bilirubin in the basal ganglia and brainstem nuclei

(B) Deposition of conjugated bilirubin within the liver

(C) Excess conjugated bilirubin appearing in the urine

(D) Iron overload within the cerebral cortex

Q3. The principal mechanism by which phototherapy lowers the serum bilirubin in neonatal jaundice is:

(A) Converting unconjugated bilirubin in the skin into water-soluble photoisomers (including lumirubin) that are excreted without needing conjugation

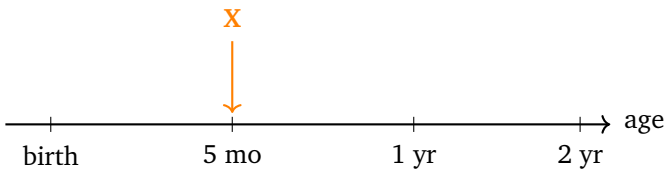
(B) Directly increasing hepatic glucuronyl transferase activity

(C) Destroying circulating red cells to reduce the bilirubin load

(D) Binding bilirubin more tightly to plasma albumin

Growth, Development and Nutrition

Q4. On the weight-gain timeline below, the arrow **X** marks the age by which a healthy term infant's birth weight has *doubled*. In normal growth the birth weight:



(A) Doubles by about 3 months and triples by about 6 months

(B) Doubles by about 5 months and triples by about 1 year

(C) Doubles by about 1 year and triples by about 2 years

(D) Doubles by about 6 weeks and triples by about 5 months

Q5. A toddler with bow legs, a 'rickety rosary' at the costochondral junctions, widened wrists and delayed closure of the anterior fontanelle has nutritional rickets. The underlying deficiency is of:

(A) Vitamin A

(B) Vitamin D

(C) Vitamin C

(D) Vitamin K

Q6. The WHO and the Indian Academy of Paediatrics recommend exclusive breastfeeding (no other food, water or fluids) for the first:

(A) 3 months

(B) 4 months

(C) 6 months

(D) 12 months

Immunisation and Infectious Disease

Q7. Regarding oral polio vaccine (OPV) and inactivated polio vaccine (IPV) in India's Universal Immunisation Programme, which statement is correct?

(A) OPV is a killed injectable vaccine

(B) IPV is a live attenuated oral vaccine

(C) OPV can never be given at birth

(D) OPV is a live attenuated oral vaccine, whereas IPV is a killed (inactivated) injectable vaccine

Q8. Which feature is characteristic of the rash of chickenpox (varicella)?

(A) All the lesions are at the same stage of evolution at any one time

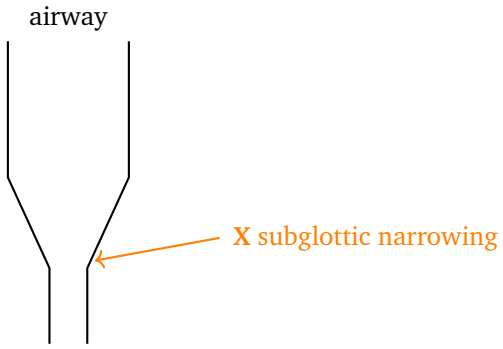
(B) The rash begins on the limbs and spreads centrally towards the trunk

(C) Lesions appear in successive crops so that macules, papules, vesicles, pustules and crusts are all seen together (pleomorphism)

(D) The rash characteristically spares the trunk and face

Respiratory and Cardiovascular Paediatrics

Q9. A 2-year-old develops a barking, seal-like cough, hoarseness and inspiratory stridor after a two-day coryzal illness. A neck X-ray shows tapering subglottic narrowing (the arrow **X** on the 'steeple sign' below). The diagnosis is:



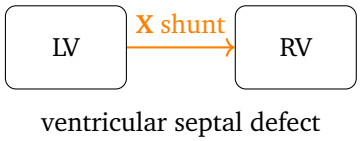
(A) Croup (acute laryngotracheobronchitis)

(B) Acute epiglottitis

(C) Inhaled foreign body in a bronchus

(D) Lobar bacterial pneumonia

Q10. The schematic below shows blood shunting from the high-pressure left ventricle into the right ventricle through a defect in the interventricular septum. This lesion is the commonest congenital heart defect overall, and its characteristic murmur is:



ventricular septal defect

(A) An ejection systolic murmur at the upper right sternal border

(B) A continuous machinery murmur below the left clavicle

(C) A mid-diastolic rumble heard best at the cardiac apex

(D) A pansystolic (holosystolic) murmur best heard at the left lower sternal border

Q11. In the modified Jones criteria used to diagnose acute rheumatic fever, which of the following is a **MAJOR** criterion?

(A) Fever

(B) Arthralgia

(C) Raised ESR or C-reactive protein

(D) Migratory polyarthritis

Haematology, Genetics and Systemic Disease

Q12. A 14-year-old girl with short stature, a webbed neck, widely spaced nipples and primary amenorrhoea is found to have a 45,X karyotype. The most likely diagnosis is:

(A) Turner syndrome

(B) Klinefelter syndrome

(C) Down syndrome

(D) Marfan syndrome

Q13. The commonest cause of idiopathic nephrotic syndrome in children, which typically responds well to corticosteroids and shows a normal glomerulus on light microscopy, is:

(A) Focal segmental glomerulosclerosis

(B) Membranous nephropathy

(C) Minimal change disease

(D) Membranoproliferative glomerulonephritis

Emergency, Fluids and Electrolytes

Q14. Using the WHO assessment of dehydration in a child with diarrhoea, which finding indicates **SEVERE** dehydration rather than 'some' dehydration?

(A) The child is restless and irritable

(B) The child is thirsty and drinks eagerly when offered fluid

(C) The child is lethargic or unconscious and the skin pinch goes back very slowly (longer than 2 seconds)

(D) The eyes are slightly sunken but the skin pinch goes back immediately

Q15. Which of the following best describes a *simple* febrile seizure?

(A) A focal seizure lasting more than 15 minutes

(B) A brief generalised seizure lasting under 15 minutes, occurring once in 24 hours, in a child aged 6 months to 5 years with fever but no central nervous system infection

(C) A seizure caused by an underlying meningitis or encephalitis

(D) Several seizures within 24 hours, each with a focal onset

Detailed Solutions

Q1.

Solution

Concept – organisms of early-onset neonatal sepsis: Early-onset sepsis (within 72 hours) is acquired from the maternal genital tract around the time of birth.

Step 1 – name the commonest organism: Worldwide the single commonest cause is **Group B Streptococcus (Streptococcus agalactiae)**, which colonises the maternal vagina and is transmitted during delivery.

Step 2 – the risk factors: Prolonged rupture of membranes, maternal fever or chorioamnionitis, prematurity and heavy maternal GBS colonisation all raise the risk.

Why the other options are wrong:

- A, Staphylococcus aureus: a typical cause of *late*-onset and hospital-acquired sepsis, not early-onset.
- C, Listeria monocytogenes: an important but far less common cause of neonatal sepsis.
- D, Candida albicans: causes late-onset fungal sepsis, mainly in very-low-birth-weight babies.

Final Answer: Group B Streptococcus $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q1

Q2.

Solution

Concept – pathogenesis of kernicterus: Kernicterus is the chronic, disabling form of bilirubin-induced brain injury.

Step 1 – identify the culprit pigment: It is caused by deposition of **unconjugated (indirect) bilirubin** in the basal ganglia, hippocampus and brainstem nuclei.

Step 2 – why unconjugated bilirubin: Unconjugated bilirubin is fat-soluble, so once it exceeds albumin binding it crosses the blood-brain barrier and stains and damages neurones.

Why the other options are wrong:

- B, conjugated bilirubin in the liver: conjugated bilirubin is water-soluble and does not cross into the brain.

- C, conjugated bilirubin in urine: this reflects obstructive jaundice, not brain injury.
- D, iron overload in the brain: this is unrelated to bilirubin encephalopathy.

Final Answer: Unconjugated bilirubin in the basal ganglia $\Rightarrow$ A

Answer: (A) Go Back to Q2

Q3.

Solution

Concept – how phototherapy works: Phototherapy uses blue light (around 460 nm) to change the bilirubin molecule in the skin.

Step 1 – the key mechanism: Light converts unconjugated bilirubin into **water-soluble photoisomers**, chiefly lumirubin and configurational isomers, which can be excreted in bile and urine *without* hepatic conjugation.

Step 2 – the practical effect: This provides an alternative excretion route, so the serum bilirubin falls even though the liver's conjugating capacity is still immature.

Why the other options are wrong:

- B, increasing glucuronyl transferase: this is the action of phenobarbitone, not phototherapy.
- C, destroying red cells: phototherapy does not cause haemolysis; that would raise bilirubin.
- D, tighter albumin binding: phototherapy acts on bilirubin in the skin, not on its albumin binding.

Final Answer: Forms water-soluble photoisomers (lumirubin) $\Rightarrow$ A

Answer: (A) Go Back to Q3

Q4.

Solution

Concept – normal infant weight gain: Birth weight follows a predictable doubling and tripling pattern in the first year.

Step 1 – read the timeline: The arrow **X** points to the 5-month mark, the age of doubling.

Step 2 – state the rule: A healthy term baby's birth weight **doubles by about 5 months and triples by about 1 year** (and roughly quadruples by 2 years).

Why the other options are wrong:

- A, doubles by 3 months: too early; gain is fastest but not this rapid.
- C, doubles by 1 year: far too slow; the weight has already tripled by then.
- D, doubles by 6 weeks: much too fast for normal growth.

Final Answer: Doubles by about 5 months, triples by about 1 year $\Rightarrow$ B

Answer: (B) Go Back to Q4

Q5.

Solution

Concept – nutritional rickets: Rickets is defective mineralisation of the growing bone (the growth plate).

Step 1 – identify the deficiency: Nutritional rickets is most often due to **vitamin D** deficiency, which lowers calcium and phosphate available for bone mineralisation.

Step 2 – match the signs: Bow legs, a rickety rosary, widened wrists, frontal bossing and delayed fontanelle closure are the classic skeletal features.

Why the other options are wrong:

- A, vitamin A: its deficiency causes night blindness and Bitot spots, not rickets.
- C, vitamin C: its deficiency causes scurvy with bleeding gums and subperiosteal haemorrhage.
- D, vitamin K: its deficiency causes bleeding (haemorrhagic disease), not bone deformity.

Final Answer: Vitamin D deficiency $\Rightarrow$ B

Answer: (B) Go Back to Q5

Q6.

Solution

Concept – duration of exclusive breastfeeding: Exclusive breastfeeding means only breast milk, with no other food, water or fluids.

Step 1 – recall the recommendation: The WHO and the Indian Academy of Paediatrics recommend exclusive breastfeeding for the first **6 months** of life.

Step 2 – what follows: Complementary feeding is then started at 6 months while

breastfeeding continues up to 2 years or beyond.

Why the other options are wrong:

- A, 3 months: too short; early complementary feeding raises the risk of infection.
- B, 4 months: shorter than the current recommendation.
- D, 12 months: too long for *exclusive* feeding; complementary foods are needed from 6 months for adequate energy and iron.

Final Answer: 6 months $\Rightarrow$ C

Answer: (C) Go Back to Q6

Q7.

Solution

Concept – OPV versus IPV: The two polio vaccines differ in preparation and route.

Step 1 – state the correct distinction: OPV is a live attenuated oral vaccine, whereas **IPV is a killed (inactivated) injectable vaccine** given intramuscularly or subcutaneously.

Step 2 – how they are used: In the UIP, OPV is given as a birth (zero) dose and at 6, 10 and 14 weeks with boosters, while fractional IPV is given alongside at 6 and 14 weeks.

Why the other options are wrong:

- A, OPV is a killed injectable vaccine: wrong; OPV is live and given orally.
- B, IPV is a live oral vaccine: wrong; IPV is killed and injected.
- C, OPV cannot be given at birth: wrong; a zero (birth) dose of OPV is in fact recommended.

Final Answer: OPV is live oral, IPV is killed injectable $\Rightarrow$ D

Answer: (D) Go Back to Q7

Q8.

Solution

Concept – the rash of chickenpox: Varicella produces a distinctive, evolving rash.

Step 1 – name the hallmark: Lesions appear in **successive crops**, so at any moment macules, papules, vesicles ('dew drop on a rose petal'), pustules and crusts coexist. This pleomorphism is the classic feature.

Step 2 – the distribution: The rash is centripetal, being denser on the trunk and face than on the limbs, and it is intensely itchy.

Why the other options are wrong:

- A, all lesions at the same stage: this is true of smallpox, not chickenpox.
- B, starts on limbs and spreads centrally: the opposite of the centripetal varicella pattern.
- D, spares trunk and face: wrong; these areas are the most heavily involved.

Final Answer: Successive crops (pleomorphic rash) $\Rightarrow$ C

Answer: (C) Go Back to Q8

Q9.

Solution

Concept – croup (acute laryngotracheobronchitis): Croup is a viral upper-airway infection causing subglottic inflammation.

Step 1 – match the clinical picture: A barking, seal-like cough, hoarseness and inspiratory stridor after a coryzal prodrome, with a *steeple sign* (subglottic narrowing) on the neck X-ray, is classic for **croup**.

Step 2 – the cause and management: It is usually caused by parainfluenza virus; treatment is oral or nebulised steroids, with nebulised adrenaline for severe stridor.

Why the other options are wrong:

- B, acute epiglottitis: presents with high fever, drooling and a toxic child sitting forward, with a 'thumb sign', not a barking cough.
- C, inhaled foreign body: gives sudden choking and unilateral signs, without a coryzal prodrome or steeple sign.
- D, lobar pneumonia: causes fever, tachypnoea and focal crepitations, not stridor or a barking cough.

Final Answer: Croup ⇒ A

Answer: (A) Go Back to Q9

Q10.

Solution

Concept – the murmur of a ventricular septal defect (VSD): A VSD is the commonest congenital heart defect overall and produces a typical murmur.

Step 1 – trace the shunt: Blood flows from the high-pressure left ventricle into the right ventricle throughout systole, producing a **pansystolic (holosystolic) murmur** best heard at the left lower sternal border.

Step 2 – the associated features: A small VSD is often loud but haemodynamically trivial, while a large VSD can cause heart failure and, if untreated, pulmonary hypertension.

Why the other options are wrong:

- A, ejection systolic at the upper right sternal border: this is the murmur of aortic stenosis.
- B, continuous machinery murmur: this is characteristic of a patent ductus arteriosus.
- C, mid-diastolic apical rumble: this suggests mitral stenosis or increased mitral flow.

Final Answer: Pansystolic murmur at the left lower sternal border ⇒ D

Answer: (D) Go Back to Q10

Q11.

Solution

Concept – modified Jones criteria for acute rheumatic fever: Diagnosis needs major and minor criteria plus evidence of a preceding streptococcal infection.

Step 1 – recall the major criteria: The five major criteria are carditis, migratory polyarthritis, Sydenham chorea, erythema marginatum and subcutaneous nodules. So **migratory polyarthritis** is a major criterion.

Step 2 – the minor criteria: Fever, arthralgia, raised ESR or C-reactive protein and a prolonged PR interval are minor criteria.

Why the other options are wrong:

- A, fever: a minor criterion, not major.
- B, arthralgia: joint pain without swelling is a minor criterion (and cannot be counted if polyarthritis is already used).
- C, raised ESR or CRP: an acute-phase reactant, counted only as a minor criterion.

Final Answer: Migratory polyarthritis ⇒ D

Answer: (D) Go Back to Q11

Q12.

Solution

Concept – Turner syndrome (45,X): A single X chromosome in a phenotypic female produces a recognisable clinical picture.

Step 1 – match the features: Short stature, a webbed neck, widely spaced nipples (shield chest) and primary amenorrhoea with a **45,X** karyotype define **Turner syndrome**.

Step 2 – the associations: Ovarian dysgenesis (streak ovaries), coarctation of the aorta, a bicuspid aortic valve and lymphoedema of the hands and feet at birth are commonly linked.

Why the other options are wrong:

- B, Klinefelter syndrome: a 47,XXY karyotype in tall phenotypic males with hypogonadism, not girls.
- C, Down syndrome: trisomy 21 with facial dysmorphism and learning difficulty, not a 45,X karyotype.
- D, Marfan syndrome: a connective-tissue disorder with tall stature and arachnodactyly, not short stature.

Final Answer: Turner syndrome ⇒ A

Answer: (A) Go Back to Q12

Q13.

Solution

Concept – childhood nephrotic syndrome: Most idiopathic nephrotic syndrome in children has a single common, steroid-responsive cause.

Step 1 – name the disease: The commonest cause is **minimal change disease**, which shows a normal glomerulus on light microscopy and only podocyte foot-process effacement on electron microscopy.

Step 2 – the clinical course: It typically presents with heavy proteinuria, hypoalbuminaemia and generalised oedema, and usually responds well to oral corticosteroids.

Why the other options are wrong:

- A, focal segmental glomerulosclerosis: a commoner cause of *steroid-resistant* nephrotic syndrome.
- B, membranous nephropathy: a typical cause in adults, uncommon in children.
- D, membranoproliferative glomerulonephritis: usually presents with a mixed nephritic-nephrotic picture and low complement.

Final Answer: Minimal change disease ⇒ C

Answer: (C) Go Back to Q13

Q14.

Solution

Concept – WHO grading of dehydration: The WHO separates 'some' dehydration from 'severe' dehydration by a set of clinical signs.

Step 1 – identify the severe signs: Severe dehydration is diagnosed when two or more of the following are present: the child is **lethargic or unconscious**, has sunken eyes, is unable to drink or drinks poorly, and the **skin pinch goes back very slowly** (longer than 2 seconds).

Step 2 – contrast with some dehydration: In 'some' dehydration the child is restless or irritable, drinks eagerly, has sunken eyes, and the skin pinch goes back slowly (but under 2 seconds).

Why the other options are wrong:

- A, restless and irritable: a sign of 'some' dehydration, not severe.

- B, drinks eagerly (thirsty): also a feature of 'some' dehydration; in severe dehydration the child drinks poorly.
- D, slightly sunken eyes with immediate skin pinch: this is closer to no or mild dehydration.

Final Answer: Lethargic child with a very slow skin pinch $\Rightarrow$ C

Answer: (C) Go Back to Q14

Q15.

Solution

Concept – simple febrile seizure: Febrile seizures are divided into simple and complex types by their features.

Step 1 – define the simple type: A simple febrile seizure is a **brief generalised seizure lasting under 15 minutes, occurring only once in 24 hours**, in a child aged **6 months to 5 years** with a fever but no central nervous system infection or metabolic cause.

Step 2 – the management: It is managed by controlling the fever and reassuring the parents; it carries an excellent prognosis and does not usually need long-term anticonvulsants.

Why the other options are wrong:

- A, focal seizure over 15 minutes: these features (focal, prolonged) define a *complex*, not simple, febrile seizure.
- C, seizure with CNS infection: an intracranial infection excludes the diagnosis of a febrile seizure.
- D, multiple focal seizures in 24 hours: recurrence within 24 hours and focal onset make it complex.

Final Answer: Brief generalised seizure, once in 24 hours, age 6 months to 5 years $\Rightarrow$ B

Answer: (B) Go Back to Q15

Answer Key

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