

SCO INTERNATIONAL PHYSICS OLYMPIAD

SAMPLE QUESTION PAPER

SCO International Physics Olympiad | Class 8 | Practice Set A

Designed from Class 8 Physics syllabus pathways and aligned with SCO Olympiad preparation, practice, reporting, and future-ready academic growth.

- class-fit physics reasoning for Grade 8 learners globally
- chapter-wise coverage: force, friction, sound, electricity, light, natural phenomena, astronomy
- case-study and achievers questions for Olympiad-level application
- answer key and explanations included for guided preparation

Force & Pressure	Friction	Sound	Electric Current
Natural Phenomena	Light	Solar System	Achievers

GRADE 8 | Sample Question Paper | PDF-READY WORD DOCUMENT

School Connect Online - SCO International Olympiad

Candidate Guidelines

Total Questions	50 questions Time: 60 minutes Total Marks: 60
Marking Pattern	Questions 1-40 carry 1 mark each. Questions 41-50 carry 2 marks each. No negative marking.
Sections	Section A: Concept & Application Section B: Assertion-Reason Section C: Case Study Section D: Achievers Section
Attempt Rule	Each question has one correct option. Choose only one option for every question.
Exam Conduct	Calculators and electronic devices are not permitted. Read diagrams and units carefully before answering.
PDF Use	This Word document is formatted for clean PDF conversion and website viewing.

Name
Registration ID School:
Set	Class 8 IPhO Set A

Section A: Concept & Application — Questions 1-30 | 1 mark each

1 A boy pushes a 10 kg box with a force of 25 N. What acceleration is produced if friction is ignored?

- | | |
|------------------------|------------------------|
| A. 0.4 m/s^2 | B. 2.5 m/s^2 |
| C. 15 m/s^2 | D. 250 m/s^2 |

Answer & Explanation: B. $a = F/m = 25/10 = 2.5 \text{ m/s}^2$.

2 A goalkeeper stops a fast football. Which effect of force is mainly shown?

- | | |
|---|---------------------------------------|
| A. Force can change the state of motion | B. Force can make objects transparent |
| C. Force can create stars | D. Force can stop gravity |

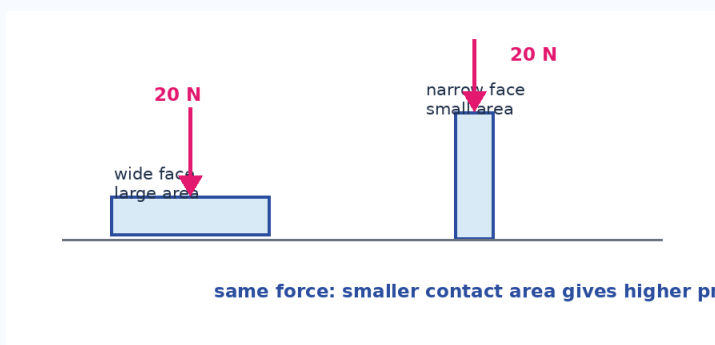
Answer & Explanation: A. The moving ball is brought to rest, so force changes its motion.

3 Why do school bags with broad straps feel more comfortable than bags with thin straps?

- | | |
|--|----------------------------------|
| A. Broad straps reduce pressure on shoulders | B. Broad straps increase gravity |
| C. Broad straps increase weight | D. Broad straps remove friction |

Answer & Explanation: A. For the same weight, larger area gives lower pressure.

4 A force of 300 N acts on an area of 0.06 m^2 . Calculate the pressure.



Pressure depends on both force and contact area.

- | | |
|-----------|--------------|
| A. 500 Pa | B. 5,000 Pa |
| C. 18 Pa | D. 18,000 Pa |

Answer & Explanation: B. Pressure = $300/0.06 = 5,000 \text{ Pa}$.

5 A balloon expands equally in all directions when air is filled into it because gas pressure acts:

- | | |
|----------------------|---------------------------------------|
| A. only downward | B. only upward |
| C. in all directions | D. only near the mouth of the balloon |

Answer & Explanation: C. Gas particles exert pressure on the balloon walls in all directions.

6 Which pair is an example of contact force and non-contact force respectively?

- | | |
|------------------------------------|--------------------------------|
| A. Friction and magnetic force | B. Gravity and magnetic force |
| C. Electrostatic force and gravity | D. Friction and muscular force |

Answer & Explanation: A. Friction needs contact; magnetic force can act without contact.

7 A nail has a pointed tip mainly to:

- | | |
|--------------------------------------|--|
| A. increase area and reduce pressure | B. decrease area and increase pressure |
| C. increase friction only | D. make it heavier |

Answer & Explanation: B. A smaller tip area produces greater pressure for the same hammer force.

8 When a box starts sliding on a floor, the friction force acts:

- | | |
|------------------------------------|--|
| A. in the same direction as motion | B. opposite to the direction of motion |
| C. vertically upward only | D. only inside the box |

Answer & Explanation: B. Friction opposes relative motion between surfaces.

9 Which situation needs high friction?

- | | |
|-------------------------------|--|
| A. Oil in machine bearings | B. Soles of sports shoes gripping the ground |
| C. Smooth ice skating surface | D. Polished wooden drawer sliding |

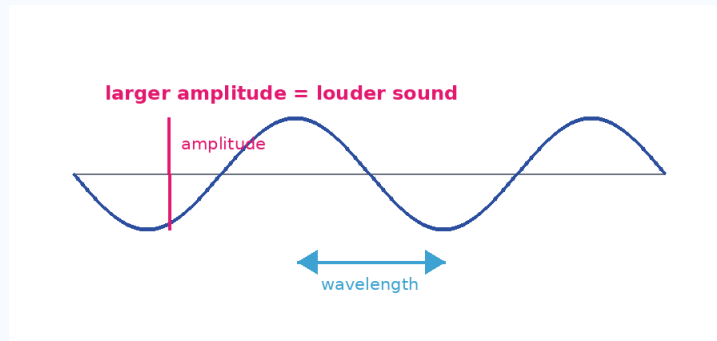
Answer & Explanation: B. Sports shoes need grip to prevent slipping.

10 Tyres have grooves mainly because grooves:

- | | |
|--|----------------------------|
| A. increase useful friction and channel water away | B. make tyres lighter only |
| C. stop air resistance completely | D. make vehicles float |

Answer & Explanation: A. Treads improve grip and help remove water from the contact patch.

11 In the wave diagram, what does amplitude mainly affect in sound?



Amplitude and wavelength in a sound wave.

- | | |
|-------------|----------------|
| A. Loudness | B. Medium only |
| C. Colour | D. Magnetism |

Answer & Explanation: A. Greater amplitude means louder sound.

12 Which instrument produces sound by vibrating strings?

- | | |
|-----------|-----------------------|
| A. Flute | B. Tabla membrane |
| C. Guitar | D. Whistle air column |

Answer & Explanation: C. A guitar string vibrates to produce sound.

13 The audible range for a healthy young human ear is approximately:

- | | |
|-----------------------------|-------------------------|
| A. 2 Hz to 20 Hz | B. 20 Hz to 20,000 Hz |
| C. 20,000 Hz to 2,00,000 Hz | D. Only above 20,000 Hz |

Answer & Explanation: B. Humans generally hear sounds from about 20 Hz to 20 kHz.

14 A sound wave has speed 330 m/s and wavelength 3 m. What is the frequency?

- | | |
|-----------|-----------|
| A. 90 Hz | B. 100 Hz |
| C. 110 Hz | D. 990 Hz |

Answer & Explanation: C. Frequency = speed/wavelength = $330/3 = 110$ Hz.

15 A soft sound and a loud sound of the same note differ mainly in:

- | | |
|------------------------------|----------------------|
| A. amplitude | B. speed in air |
| C. number of ears hearing it | D. need for a medium |

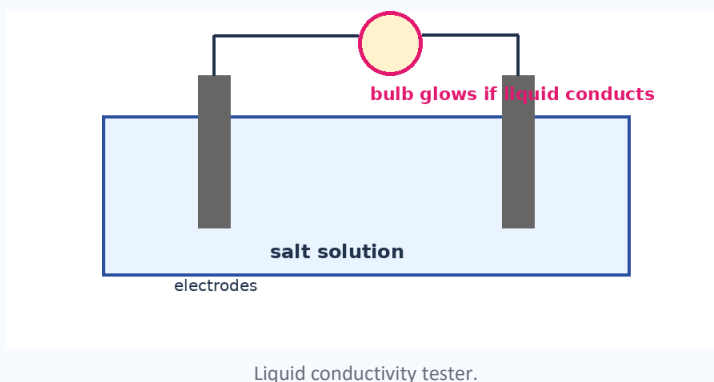
Answer & Explanation: A. Loudness is related to amplitude.

16 Which material generally allows sound to travel fastest?

- | | |
|----------|-----------|
| A. Air | B. Water |
| C. Steel | D. Vacuum |

Answer & Explanation: C. Sound usually travels fastest in solids because particles are closely packed.

17 In the tester setup, why does the bulb glow in salt solution?



- | | |
|---------------------------------------|---------------------------------------|
| A. The solution has mobile ions | B. The battery becomes heavier |
| C. The liquid reflects the bulb light | D. The electrodes disappear instantly |

Answer & Explanation: A. Mobile ions conduct electricity through the solution.

18 Which of these is a chemical effect of electric current?

- | | |
|---------------------------------|---------------------------------|
| A. Heating of a bulb filament | B. Electroplating a metal spoon |
| C. Attraction of iron by magnet | D. Reflection in a mirror |

Answer & Explanation: B. Electroplating is deposition of metal due to electric current through a solution.

19 During electrolysis, the electrode connected to the positive terminal is called:

- | | |
|--------------|------------|
| A. anode | B. cathode |
| C. insulator | D. mirror |

Answer & Explanation: A. The positive electrode in an electrolytic cell is called the anode.

20 Which solution is likely to be the poorest conductor?

- | | |
|-----------------------------|---------------------------------------|
| A. Salt water | B. Acidic lemon juice |
| C. Copper sulphate solution | D. Sugar dissolved in distilled water |

Answer & Explanation: D. Sugar does not form conducting ions in water.

21 Why should electrical switches not be touched with wet hands?

- | | |
|--------------------------------|---|
| A. Water always turns into ice | B. Impure water can conduct electricity and cause shock |
| C. Wet hands reflect light | D. Wet hands remove gravity |

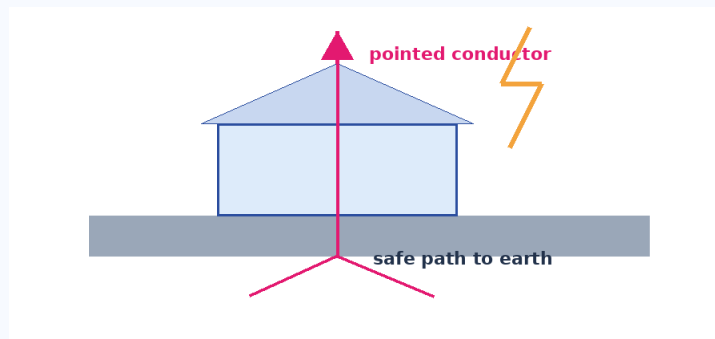
Answer & Explanation: B. Water with dissolved salts can conduct electricity, increasing shock risk.

22 Clouds can become electrically charged mainly due to:

- | | |
|--|------------------------------|
| A. movement and collisions among particles inside clouds | B. planetary revolution only |
| C. reflection from the Moon | D. lack of air |

Answer & Explanation: A. Collisions and movement of water droplets/ice particles separate charges.

23 The diagram shows a lightning conductor. What is its purpose?



Lightning conductor safely connects a building to earth.

- | | |
|------------------------------|--|
| A. To attract birds | B. To conduct lightning safely into the ground |
| C. To increase roof pressure | D. To produce sound waves |

Answer & Explanation: B. A conductor connected to Earth offers a safe path for the discharge.

24 Which action is unsafe during a thunderstorm?

- | | |
|------------------------------|----------------------------------|
| A. Staying inside a building | B. Going under a lone tall tree |
| C. Avoiding open fields | D. Keeping away from metal poles |

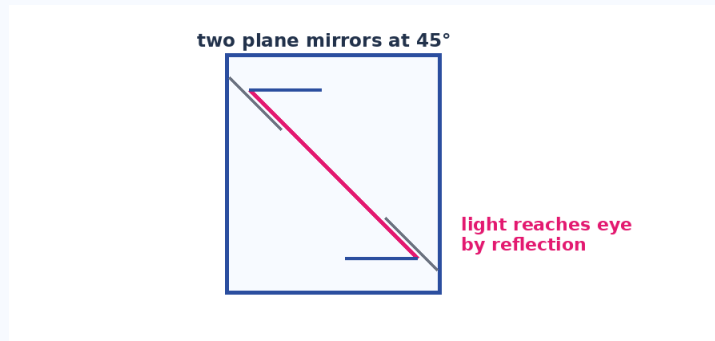
Answer & Explanation: B. A lone tall tree may be struck by lightning and is unsafe shelter.

25 A charged glass rod attracts tiny paper pieces because of:

- | | |
|------------------------|------------------------|
| A. electrostatic force | B. friction force only |
| C. sound force | D. pressure in liquids |

Answer & Explanation: A. Charged objects can attract neutral light objects by electrostatic effects.

26 The periscope diagram works because light undergoes:



A simple periscope uses two mirrors.

- | | |
|----------------------|------------------------|
| A. chemical reaction | B. multiple reflection |
| C. electroplating | D. charging by rubbing |

Answer & Explanation: B. Periscopes use reflection at plane mirrors to change the path of light.

27 When a ray of light falls normally on a plane mirror, the angle of incidence is:

- | | |
|--------|--------|
| A. 0° | B. 30° |
| C. 45° | D. 90° |

Answer & Explanation: A. The ray along the normal makes zero angle with the normal.

28 The image formed by a plane mirror shows left-right reversal. This is called:

- | | |
|----------------------|-----------------|
| A. lateral inversion | B. electrolysis |
| C. friction | D. amplitude |

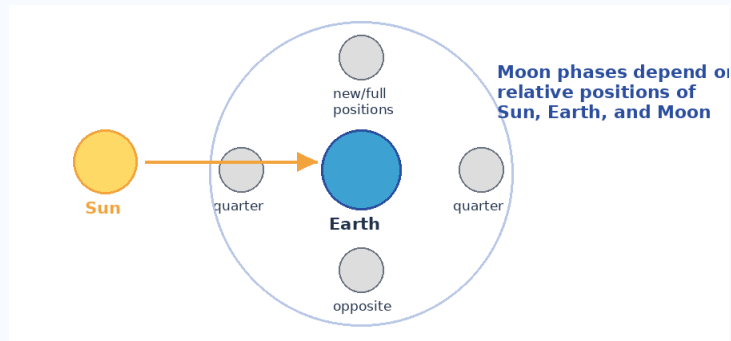
Answer & Explanation: A. Plane mirror images show lateral inversion.

29 White light splitting into seven colours through a prism is called:

- | | |
|-----------------|----------------|
| A. dispersion | B. evaporation |
| C. condensation | D. combustion |

Answer & Explanation: A. Dispersion is splitting of white light into its component colours.

30 The Moon phase diagram helps explain that phases are due to:



Sun-Earth-Moon positions and phases.

- | | |
|--|--|
| A. the Moon producing different colours of light | B. the changing visible sunlit portion of the Moon |
| C. the Sun going around the Moon | D. Earth stopping its rotation |

Answer & Explanation: B. Moon phases depend on how much of the sunlit half is visible from Earth.

Section B: Assertion and Reason — Questions 31-40 | 1 mark each

Use the options: A: Both A and R are true, and R correctly explains A | B: Both true, but R does not explain A | C: A true, R false | D: A false, R true.

31 Assertion (A): A camel can walk more easily on sand than many animals with narrow feet. Reason (R): Broad feet reduce pressure on soft sand.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. Broad feet spread weight over a larger area.

32 Assertion (A): Rolling a suitcase is easier than dragging it. Reason (R): Rolling friction is usually less than sliding friction.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. Wheels reduce friction by replacing sliding with rolling.

33 Assertion (A): A loudspeaker cone vibrates when it produces sound. Reason (R): Sound is produced by vibrating bodies.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. The vibrating cone sets air particles into vibration.

34 Assertion (A): Distilled water is a poor conductor of electricity. Reason (R): It has very few dissolved ions.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. Conduction through liquids usually requires ions.

35 Assertion (A): We see lightning before hearing thunder. Reason (R): Light travels much faster than sound in air.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. Light reaches our eyes almost instantly compared with sound.

36 Assertion (A): A plane mirror can form a real image on a screen. Reason (R): Plane mirror images are normally virtual.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: D. The assertion is false; a plane mirror image is virtual and cannot be obtained on a screen.

37 Assertion (A): The Sun is a star. Reason (R): It produces its own light and heat.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. Stars are luminous bodies; the Sun is the nearest star to Earth.

38 Assertion (A): Friction can produce heat. Reason (R): Rubbing hands converts some mechanical work into thermal energy.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. The reason explains why hands warm up when rubbed.

39 Assertion (A): Earthquakes can be predicted exactly several days in advance. Reason (R): Seismographs record earthquake waves.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: D. Exact prediction is not possible; seismographs detect and record seismic waves.

40 Assertion (A): Electroplating is useful for improving appearance and preventing corrosion. Reason (R): A thin layer of another metal can be deposited on an object.

- | | |
|--|--|
| A. Both A and R are true, and R correctly explains A | B. Both A and R are true, but R does not explain A |
| C. A is true, R is false | D. A is false, R is true |

Answer & Explanation: A. The deposited layer can protect and beautify the object.

Section C: Case Study — Questions 41-45 | 2 marks each

41 **Case Study:** Passage: A school laboratory has four objects: a sharp pin, a blunt pencil, a wide eraser, and a school bag strap. Which object produces the greatest pressure for the same applied force?

- | | |
|--------------------|------------------|
| A. Sharp pin | B. Wide eraser |
| C. Broad bag strap | D. Flat notebook |

Answer & Explanation: A. The sharp pin has the smallest contact area, so pressure is greatest.

42 **Case Study:** Passage: A student hears an echo from a cliff after 3 seconds. The speed of sound is 340 m/s. What is the distance of the cliff?

- | | |
|------------|------------|
| A. 340 m | B. 510 m |
| C. 1,020 m | D. 1,500 m |

Answer & Explanation: B. Round trip distance = $340 \times 3 = 1,020$ m; one-way distance = 510 m.

43 **Case Study:** Passage: A copper plate and iron key are dipped in copper sulphate solution. The iron key must be copper plated. How should the key be connected?

- | | |
|-------------------------------|-------------------------------|
| A. To the negative terminal | B. To the positive terminal |
| C. To both terminals directly | D. It should not be connected |

Answer & Explanation: A. The object to be plated is connected to the negative terminal so copper ions deposit on it.

44 **Case Study:** Passage: A child stands 2 m in front of a plane mirror. How far is the child from the image?

- | | |
|--------|--------|
| A. 1 m | B. 2 m |
| C. 4 m | D. 8 m |

Answer & Explanation: C. The image is 2 m behind the mirror; total distance from child to image is $2 + 2 = 4$ m.

45 Case Study: Passage: A planet rotates once in 16 hours and revolves around the Sun once in 4 Earth years. Which statement is correct?

- | | |
|-----------------------------|-------------------------|
| A. Its day is 16 hours | B. Its year is 16 hours |
| C. Its day is 4 Earth years | D. It has no rotation |

Answer & Explanation: A. The period of rotation gives the length of a day.

Section D: Achievers Section — Questions 46-50 | 2 marks each

46 Achievers: A hydraulic lift has a small piston of area 0.02 m^2 and a large piston of area 0.5 m^2 . A force of 100 N is applied to the small piston. What force is produced on the large piston?

- | | |
|------------|------------|
| A. 250 N | B. 1,000 N |
| C. 2,500 N | D. 5,000 N |

Answer & Explanation: C. Pressure = $100/0.02 = 5,000 \text{ Pa}$. Large force = $5,000 \times 0.5 = 2,500 \text{ N}$.

47 Achievers: A 40 kg bicycle and rider slow down from 6 m/s to rest in 3 seconds. What average braking force acts?

- | | |
|---------|----------|
| A. 40 N | B. 60 N |
| C. 80 N | D. 120 N |

Answer & Explanation: C. Deceleration = $6/3 = 2 \text{ m/s}^2$. Force = $40 \times 2 = 80 \text{ N}$.

48 Achievers: A wave in a string has frequency 20 Hz and wavelength 0.5 m. What is its speed?

- | | |
|-----------|-----------|
| A. 5 m/s | B. 10 m/s |
| C. 20 m/s | D. 40 m/s |

Answer & Explanation: B. Speed = frequency \times wavelength = $20 \times 0.5 = 10 \text{ m/s}$.

49 Achievers: Two plane mirrors are placed at 45° . If an object is placed between them, how many images are formed?

- | | |
|------|------|
| A. 3 | B. 5 |
| C. 7 | D. 8 |

Answer & Explanation: C. Number of images = $360/45 - 1 = 8 - 1 = 7$.

50

Achievers: A student sees Mars looking reddish and Jupiter brighter in the night sky. Which statement is scientifically best?

A. Planets shine mainly by reflecting sunlight

B. All planets produce their own light like stars

C. Mars is a star

D. Jupiter is visible only during eclipses

Answer & Explanation: A. Planets are seen because they reflect sunlight; they do not produce light like stars.

Answer Key

Compact answer grid for quick checking and web/PDF use.

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1: B	2: A	3: A	4: B	5: C	6: A	7: B	8: B	9: B	10: A
11: A	12: C	13: B	14: C	15: A	16: C	17: A	18: B	19: A	20: D
21: B	22: A	23: B	24: B	25: A	26: B	27: A	28: A	29: A	30: B
31: A	32: A	33: A	34: A	35: A	36: D	37: A	38: A	39: D	40: A
41: A	42: B	43: A	44: C	45: A	46: C	47: C	48: B	49: C	50: A