PHYSICS

BOOKS - PEARSON IIT JEE FOUNDATION

MEASUREMENTS AND MOTION

Example Solution

1. Categorize the following into fundamental and derived physical quantities.

(a) Weight (b) Mass (c) Density (d) Volume (e) Speed

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2. Which system of measurement is accepted worldwide?

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3. Write the correct representation for the below-mentioned units according to SI system.

(a) Density = $25 kgm^{-3}$ (b) Length = 100mm (c) Mass = 2 Kg

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4. Express 5 centimetres in metres.

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5. Express the following quantities in terms of multiples and submultiples.

Length = 0.000000002 m (b) Mass = 2000000 g

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6. What are the units of the following quantities in SI system?

(a) Force (b) Velocity

(c) Density (d) Relative density

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7. The unit of force in SI system is newton (N) and in CGS system is dyne. One newton is equal to 1 kg m s^{-2} and 1 dyne is equal to 1 g cm s^{-2}. How many dynes make one newton?

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8. The mass of a lorry is three metric tonnes. Find its mass in terms of quintals and kilograms.

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9. Rohan's father bought an oil can. Rohan wants to find the quantity of oil in litres. Help him find out the volume if the dimensions of the oil can are 20 cm, 10 cm and 5 cm.

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10. The volume of a single liquid drop can be measured using a_____.

(a) Measuring jar (b) Measuring flask (c) Pipette (d) Burette

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11. If the relative density of 'x' and 'y' is 3 and 2, respectively. Then the density of 'x' with respect to that of 'y' is_____.

(a) 6 (b) 5 (c) 1.5 (d) 1

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12. Compete the following table.

Train	Place	Arrival Time (24-hour clock)	Time (12-hour clock)
Charminar Express	secunderabad	18 : 50	
Krishna Express	Tirupathi	6 : 30	

13. Aishwarya is suffering from fever and her temperature is found to be $39°C$. What is her temperature in Fahrenheit and kelvin scale of temperature?

14. The cotton yielded from the crop of a farmer is given below. Find the average mass of cotton yielded per week.

Week 1 - 20 quintals

Week 2 - 15 quintals

Week 3 - 12 quintals

15. Find the temperature equivalent to $20°C$ in kelvin scale, if the relation between kelvin and celsius scale is given by K = C + 273.

16. Write any five units of time.

17. How may seconds make one day?

18. Find the time taken by the minutes hand to make a $45°$ angle at the centre of the clock.

19. If the angle between the hours hand and minutes hand is around $180°$ and the hours hand is midway between 12 and 1, then what is the time shown by the clock?
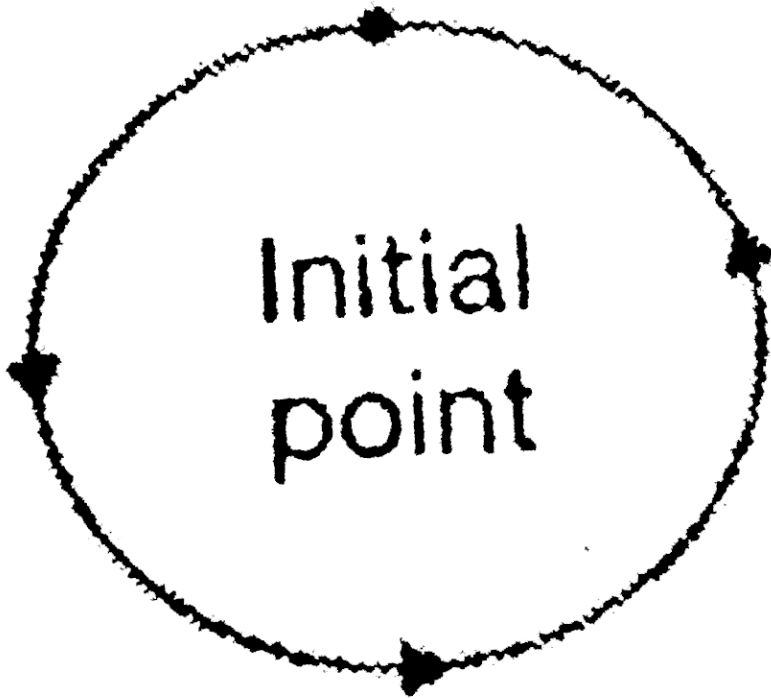
20. A boy travelled in a circular path and reached to the initial position 'O'. If the radius of the circle is 7 m. Find the distance covered and the

displacement of the body.

Final point

Initial point

21. Why would you not like to use a measuring tape made of an elastic material like rubber to measure distance? What would be some of the problems you would meet in telling someone about a distance you measured with such a tape?

22. A motorist started from a position of rest from Warangal and reached Hyderabad in 3 hours. If the distance between the cities is 200 kilometres, what is the average speed of the motorist?

Very Short Answer Questions

1. In SI System mass is measured in _____.

2. The physical quantity having the same unit in all the systems of unit is _____ .

3. In _____ system there are seven fundamental quantities.

4. Prefix used for factor 10^{-6} is _____.

5. Mega is used for a factor of _____.

6. Which of the following is a fundamental quantity?

A. Length

B. Area

C. Volume

D. Force

Answer: A

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7. Which of the following unit is a derived unit?

A. Cubic metre

B. Newton

C. Metre^2

D. All of these

Answer: D

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8. The unit of electric current is denoted by

A. I

B. E

C. A

D. a

Answer: C

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9. Prefix used for 10^{-3} is

A. Milli

B. Micro

C. Mega

D. Kilo

Answer: A

10. Prefixes used for negative powers of 10 are called

A. Units

B. Multiples

C. Submultiples

D. Standards.

Answer: C

11. To measure irregular areas _____ paper is used.

12. 2 decades are equal to _____ years.

13. 5 centimetres are equal to _____ metres.

14. _____ grams make 0.2 kilograms.

15. 5 milliseconds is equal to _____.

16. The ratio of the SI unit of mass to its CGS unit is _____.

17. A thread of length 20 cm is made into square, then the length of its side is _____.

18. Ratio of the SI unit of volume to the SI unit of area is _____.

19. If the volume of a sphere is $\frac{4}{3}\pi r^3$ where $\pi = \frac{22}{7}$ and r is radius of the sphere, then the radius of the sphere of volume $\frac{704}{21}m^3$ is _____.

20. _____ grams make 20 milligrams.

21. What is the SI unit of mass ?

    A. kg

    B. gram

    C. second

    D. g cm^{-3}

Answer: A

22. Area is measured in

    A. m^2

    B. cm^2

    C. mm^2

D. All of these

Answer: D

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23. ____ is used to measure the length of a curved line.

A. A thread

B. A graph paper

C. Water

D. None of these.

Answer: A

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24. Relation between length (l), area (A), volume (V) is

A. V = Al

B. $V = \dfrac{A}{l}$

C. l = VA

D. $V = Al^2$

Answer: A

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25. If the length of a square is 2 cm, then its area in SI system is

A. $4 \ cm^2$

B. $4 \times 10^4 m^2$

C. $4 \times 10^{-4} m^2$

D. $40 cm^2$

Answer: C

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26. The smallest measurement that can be measure by using a wall clock is _____.

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27. The thermometer used to measure the minimum and maximum temperatures of a day is called _____ thermometer.

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28. The short hand of a clock is at 12 and the minutes hand is 3, then the time at that instant is _____.

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29. The relations between kelvin and celsius scales is K = C + 273. The temperature of a body in kelvin scale is 19 K, if its equivalent temperature in celsius scale is _____.

30. The shape of six's maximum and minimum thermometer is in the shape of the English alphabet _____.

31. The angle between the minutes hand and hours hand in a clock, at 12:30 p.m. is

A. $> 0°$

B. $> 30°$

C. $> 60°$

D. $> 90°$

Answer: D

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32. Temperature is a ____quantity.

    A. Derived

    B. Fundamental

    C. Physical

    D. Both (b) and (c)

Answer: D

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33. Time is a fundamental quantity

A. Since it is independent of other quantities.

B. Since it is measured in secondary scale.

C. Since it is dependent on other quantities.

D. Since it depends on the mass of the clock.

Answer: A

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34. The device used to measure temperature is

A. Metre scale

B. Barometer

C. Thermometer

D. Lactometer

Answer: C

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35. Which of the following units of temperature is not followed by the word 'degree'?

   A. Celsius

   B. Centigrade

   C. Fahrenheit

   D. Kelvin

Answer: D

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36. If a body does not change its position, it must be in a state of ____.

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37. The CGS unit of distance covered is _____.

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38. Acceleration is measured in _____ in SI system.

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39. A passenger in a moving bus appears to be in a state of rest with respect to _____.

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40. A body is said to be in a state of motion if it changes its _____.

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41. The CGS unit of velocity is

A. cm s^{-1}

B. mm s^{-1}

C. m s^{-1}

D. km h^{-1}

Answer: A

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42. Which of the following is different from the others?

A. Distance covered

B. Displacement

C. Velocity

D. Acceleration

Answer: A

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43. Centimetre per second is the unit of

    A. Distance covered

    B. Displacement

    C. Velocity

    D. Acceleration

Answer: C

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44. If the velocity of a body decreases gradually with time, then it is said to be in

A. Acceleration

B. Deceleration

C. Retardation

D. Both (b) and (c)

Answer: D

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45. A bus is moving with uniform velocity,

A. Then its acceleration is non-zero.

B. Then its acceleration is negative.

C. Then its acceleration is zero.

D. Then its acceleration is positive.

Answer: C

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1. Define physical quantity and give any two examples.

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2. Define derived physical quantity and give any two examples.

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3. Define multiple units.

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4. Define unit and write any three examples.

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5. What are fundamental and derived units? Give some examples.

6. What is the SI unit of the ratio of mass to area?

7. Write the correct notation for the following.

(a) 2 Kg

(b) 4 Newtons

(c) 6 metres

(d) 35 Gram

(e) 7 S

8. Match the entries in Column A with entries in Column B

	Column A		Column B
(A)	SI unit of electric current	(a)	Candela
(B)	CGS units of time	(b)	Ampere
(C)	SI unit of luminous intensity	(c)	Metre
(D)	SI unit of distance	(d)	second

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9. Assertion A: 1 metre can be written as 1 m and not as 1 M.

Reason R: If the unit of physical quantity is not named after a scientist, symbol of the unit should not be denoted with a capital letter.

A. A and R is correct and R is the correct explanation of A.

B. A and R is incorrect and R is the correct explanation of A.

C. Both A and R is true but 'R' is not the correct explanation of A.

D. A is true, R is not true and R is not the correct explanation of A.

Answer: A

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10. Write the following steps in sequential order to convert centimetres into millimetres.

A. Convert centimetres into metres by dividing the given value with 100.

B. Write the given value.

C. Multiply the result with 1000.

D. The result of the length given above is in millimetres.

Answer: b,a,c,d

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11. If the product of milli and micro is nano and the values of milli and nano are 10^{-3} and 10^{-9}, find the value of micro.

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12. If A, B and C are the units of time, length and speed, then find the relationship between them.

13. Find the units of density, $\dfrac{\text{density}}{\text{mass}}$ and $\dfrac{\text{electric currect}}{\text{time}}$

14. Write the unit of the physical quantity which is the ratio of density to area.

15. Find the unit of work if the work is the product of force and displacement, force = mass $\times$ acceleration, where acceleration = $\dfrac{\text{length}}{\text{time}^2}$

16. Define length.

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17. Define mass, weight and centre of gravity.

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18. Define volume.

 ▶ Watch Video Solution

19. Define area.

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20. Define measurement.

21. Find the unit of ratio of mass to area.

22. What is the physical quantity measured in cm^2?

23. find the volume of solid sphere having radius 2m?

24. Match the following.

Column A		Column B
(A) Area/length	( )	(a) metre^{-1}
(B) Mass/volume	( )	(b) No unit
(C) Length/area	( )	(c) metre
(D) Length^2/area	( )	(d) kg m^{-3}

25. Assertion (A): m^2 is a derived unit.

Reason (R): Area is a derived quantity.

A. A and R is correct and R is the correct explanation of A.

B. A and R is incorrect and R is the correct explanation of A.

C. A and R is true but 'R' is not the correct explanation A.

D. A is true, R is not true and R is not the correct explanation of A.

Answer: a

26. Pavan is measuring the area of a leaf by using a graph paper and he measured the sum of the areas of full boxes and more than half boxes inside the outline of the leaf which is 25 cm^2. Find the length of the square whose area is equal to the area of the leaf.

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27. Ram measured the length of a curved line using a thread. He made a right angled triangle, of base 10 cm and height 20 cm, with the same thread. Find the length of the curved line measured by him.

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28. Convert the unit of ratio $\dfrac{\text{mass} \times \text{area}}{\text{volume}}$ from SI system to CGS system.

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29. Abhi who is interested in physics measured the volume of an irregular shaped body with concepts given by his physics teacher. When he immersed the given body in water contained in a measuring jar, the level of water is increased from 500 ml to 1500 ml. Find the volume of the body and also find the length of the edge of the cube whose volume is equal to the volume of the given irregular shaped body.

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30. Find the area of a coloured paper used to stick to a sphere of radius 7 cm.

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31. Define time.

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32. Define temperature.

33. Match the following.

	Column A			Column B
(A)	Kelvin	( )	(a)	Hotness
(B)	Time	( )	(b)	Temperature
(C)	Temperature	( )	(c)	second

34. Assertion (A): Temperature is a fundamental quantity in SI system.

Reason (R): In other systems of measurement only mass, length and time are fundamental quantities.

A. A and R is correct and R is the correct explanation of A.

B. Both A and R is incorrect.

C. A is true, R is true and 'R' is not the correct explanation of A.

D. A is true, R is not true.

Answer: c

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35. Write the following steps in a sequential order to find the time at a given instant by using a clock.

(a) Observe the position of the hour hand.

(b) Observe the position of the minute hand.

(c) Multiply 1 hour with the number at which the hour hand is located.

(d) Note the number of minutes, considering the gap between two numbers of clocks as 5 minutes.

(e) Find the time.

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36. Raju started a piece of work when the hours hand and minutes hand in a wall clock are at 9 and 12, respectively. He completed his work when

the hours hand is at a midway between 11 and 12, while the position of the minutes hand is at 6. Find the time taken by him to do the work.

37. Keshav observed that the increase in the temperature of a body is given by $T_1 = 2t^2$ for the first 5 minutes and T_2 = 3t for the next 5 minutes, where T_1, T_2 and 't' are temperatures in Fahrenheit, Celsius scales and time in minutes, respectively. If the initial temperature of the body is $20° F$ and the relation between the Celsius and Fahrenheit scale is, then find the temperature of the body after 8 minutes in Celsius scale.

38. Define rest.

39. Define motion, What do you understand by the terms 'uniform motion' and 'non-uniform motion' ? Explain with examples.

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40. Define displacement.

▶ Watch Video Solution

41. Define velocty.

▶ Watch Video Solution

42. Define acceleration.

▶ Watch Video Solution

43. How can you differentiate between distance and displacement?

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44. If the distance covered by a body moving in a circular path of radius (r) is equal to $2\pi r$, find its displacement.

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45. How can you say that speed and velocity are different even through their units are the same?

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46. How can you say that the tree on the earth is in a state of rest and in a state of motion at the same time?

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47. Give any one example in which a body travels with retardation and give a reason for the same.

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48. A particle is movingin circular path of radius 7 cm. Find the ratio of its displacement to the distance covered after the completion of a half

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49. Find the minimum speed required by a person standing 5 m behind a bus, to catch the bus in one minute which is moving at a speed of 600 m $\min^{-1}$.

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50. If a bus moves from A to B and comes back to A, find the displacement and velocity of the body.

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51. What is the speed of a body if it covers a distance of 20 m in 4 seconds?

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52. Find the acceleration of the car, if it changes its velocity from $20ms^{-1}$ to $30ms^{-1}$ in 5 seconds.

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Concept

1. find the surface area of a cube ,if side of cube is 1.5m?

2. Find out the physical quantity in CGS unit that results on simplifying the expression 1000 $\dfrac{a^2 b^2 c^3}{d}$, where a - acceleration, b - displacement, c - time, d - velocity.

   A. 10000 cm^3

   B. 1000 cm^3

   C. 1000 l

   D. 1000 g

Answer: B

3. Jyoti created a temperature scale, in which the reading at room temperature divides the total length of the temperature scale in 2 : 3 ratio from LFP. Then find its value on Jyothi's scale, which is the same as Kelvin scale.

A. 40 K

B. 313 K

C. 200 K

D. 73 K

Answer: B

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4. Dev is a 12-year-old, studying in 6th class, and has a younger brother Surya whose age is 7-years. Surya is playing by dipping balls in water tub. Dev observed that the level of the water increases when Surya starts dipping the balls one after the other in the water. Then Dev remembered

his 6th class topic measurement of volume. He poured water up to the brim of the tub and set up another bigger tub at the bottom of the first tub. He then asked his brother Surya to dip ten identical balls in it so that the overflowed water is collected in the tub at the bottom. Dev calculated volume of overflowed water and found that it was 2 litres. Dev calculated volume of each ball. Which of the following options matches with Dev's calculations?

    A. 2000 l

    B. 200 l

    C. 20 l

    D. 0.2 l

Answer: D

▶ **Watch Video Solution**

5. Abhi, Vasu, Maahi and Lucky are good friends. During summer vacation they met at Vasu's home to play. Vasu's father is good at mathematics

and physics, so he used to play with Vasu and his friends by asking subject-related questions in the middle of their play. He asked a question, "how will you write the weight of you 1 litre water bottle in physics?" Select the correct form of writing the weight from the answer given by the four.

A. Abhi wrote 10 n

B. Vasu wrote 10 newtons

C. Maahi wrote 10 N

D. Lucky wrote 10, N.

Answer: b

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Test 1

1. Derive the units of area and volume.

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2. If speed is the ratio of distance to time, then write its CGS unit.

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3. Find the unit of ratio of area to length.

Watch Video Solution

4. What is the relation between CGS and SI unit of volume?

Watch Video Solution

5. The mass of mercury is 13.6 grams. Find its value in microgram.

Watch Video Solution

6. Find the ratio of the smallest measurements possible on a screw gauge to verneir calipers.

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7. An object 'X' of volume 200 cm^3 and another object Y of volume 250 cm^3 are taken. If their area is the same, then determine the ratio of their heights.

▶ Watch Video Solution

8. Four spheres made of different materials but having the same mass, have a radii of 100 mm, 2×10^{-2}m, 30 cm and 10^{-5}km then arrange them in ascending order of their volumes.

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9. 1 km = _____ millimetre

10. Given the volume of air is $1.29m^{+3}$. Then express it in c.c.

11. Given that the time taken by an oil dropper to drop 100 oil drops is 800 min, find the time taken to drop 10 oil drops in hours.

12. On dropping 3 identical bullets into a measuring jar containing a liquid, the level of the liquid increased from $280cm^3$ to $316cm^3$. Then the volume of each bullet is _____ m^3.

13. Express $50°C$ in kelvin and Fahrenheit scale temperature.

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Test 2

1. What is the relation between CGS and SI unit of distance?

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2. What are the different branches of mechanic?

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3. How, do you represent a vector geometrically?

> ▶ **Watch Video Solution**

4. When can we say that a particle in motion is moving with uniform speed?

▶ **Watch Video Solution**

5. What are fundamental and derived units? Give some examples.

▶ **Watch Video Solution**

6. Define distance, displacement and sped.

▶ **Watch Video Solution**

7. What is kinematics?

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8. What will be the displacement of a body when it travels along the following paths?
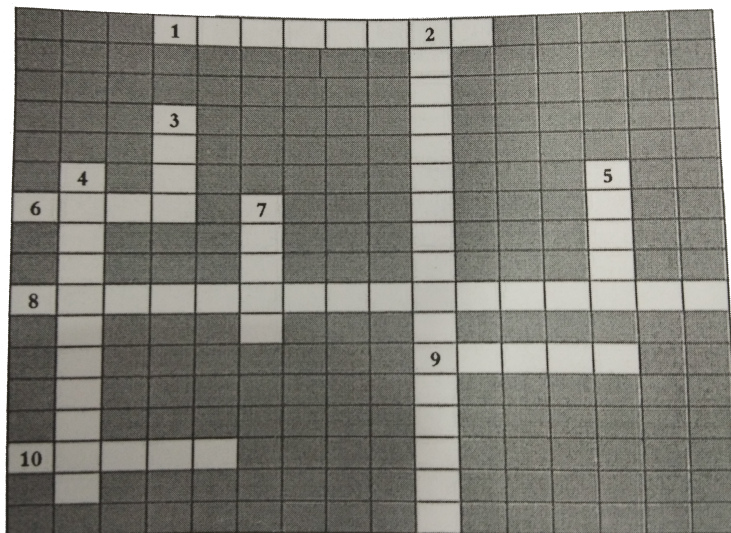
(a) Half circle

(b) Full circular path?

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9. What are the physical quantities that can be measured in m s^{-1}, km and km h^{-2}?

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Crossword

1.

Across

1. Prefix used instead of a 10 power positive number.

6. A body does not change its position.

8. The quantity that depends on other quantities.

9. Unit of electric current

10. Paper used to measure the area of irregular lamina.

Down

2. Only these quan

3. Standard refere

4. Kelvin is the un

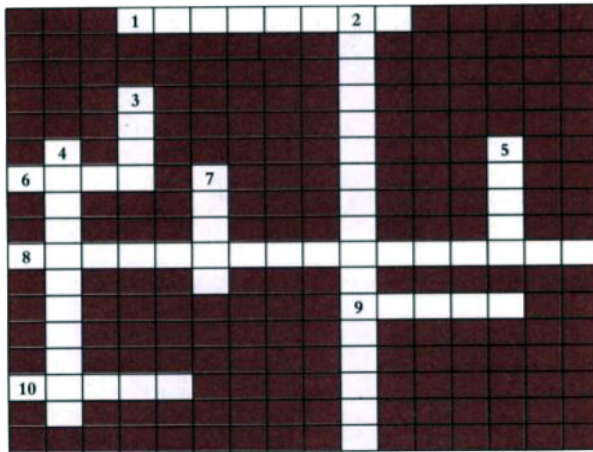5. Prefix used to re

7. Distance covere

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2. CROSSWORD

Across

1. Prefix used instead of a 10 power positive number.
6. A body does not change its position.
8. The quantity that depends on other quantities.
9. Unit of electric current
10. Paper used to measure the area of irregular lamina.

Down

2. Only these quantities can be measured.
3. Standard reference of a physical quantity.
4. Kelvin is the unit of
5. Prefix used to represent 10^{-2} is
7. Distance covered by the body in unit time.

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Examples

1. Categorize the following into fundamental and derived physical quantities.

(a) Weight (b) Mass (c) Density (d) Volume (e) Speed

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(a) Weight (b) Mass (c) Density (d) Volume (e) Speed

3. Categorize the following into fundamental and derived physical quantities.

(a) Weight (b) Mass (c) Density (d) Volume (e) Speed

4. Categorize the following into fundamental and derived physical quantities.

(a) Weight (b) Mass (c) Density (d) Volume (e) Speed

5. Categorize the following into fundamental and derived physical quantities.

(a) Weight (b) Mass (c) Density (d) Volume (e) Speed

6. Which system of measurement is accepted worldwide?

7. Write the correct representation for the below-mentioned units according to SI system.

(a) Density = $25 kgm^{-3}$ (b) Length = 100mm (c) Mass = 2 Kg

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10. Express 5 centimetres in metres.

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▶ Watch Video Solution

13. What are the units of the following quantities in SI system?

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▶ Watch Video Solution

17. The unit of force in SI system is newton (N) and in CGS system is dyne. One newton is equal to 1 kg m s^{-2} and 1 dyne is equal to 1 g cm s^{-2}. How many dynes make one newton?

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18. The mass of a lorry is three metric tonnes. Find its mass in terms of quintals and kilograms.

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19. Rohan's father bought an oil can. Rohan wants to find the quantity of oil in litres. Help him find out the volume if the dimensions of the oil can are 20 cm, 10 cm and 5 cm.

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20. The volume of a single liquid drop can be measured using a____.

(a) Measuring jar (b) Measuring flask (c) Pipette (d) Burette

    A. Measuring jar

    B. Measuring flask

    C. Pipette

    D. Burette

Answer:

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21. If the relative density of 'x' and 'y' is 3 and 2, respectively. Then the density of 'x' with respect to that of 'y' is____.

(a) 6 (b) 5 (c) 1.5 (d) 1

    A. 6

    B. 5

C. 1.5

D. 1

Answer:

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22. Complete the following table.

Train	Place	Arrival Time (24-hour clock)	Time (12-hour clock)
Charminar Express	Secunderabad	18:50	
Krishna Express	Tirupathi	6:30	

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23. Aishwarya is suffering from fever and her temperature is found to be $39°C$. What is her temperature in Fahrenheit and kelvin scale of temperature?

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24. The cotton yielded from the crop of a farmer is given below. Find the average mass of cotton yielded per week.

Week 1 - 20 quintals

Week 2 - 15 quintals

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25. Find the temperature equivalent to $20°C$ in kelvin scale, if the relation between kelvin and celsius scale is given by K = C + 273.

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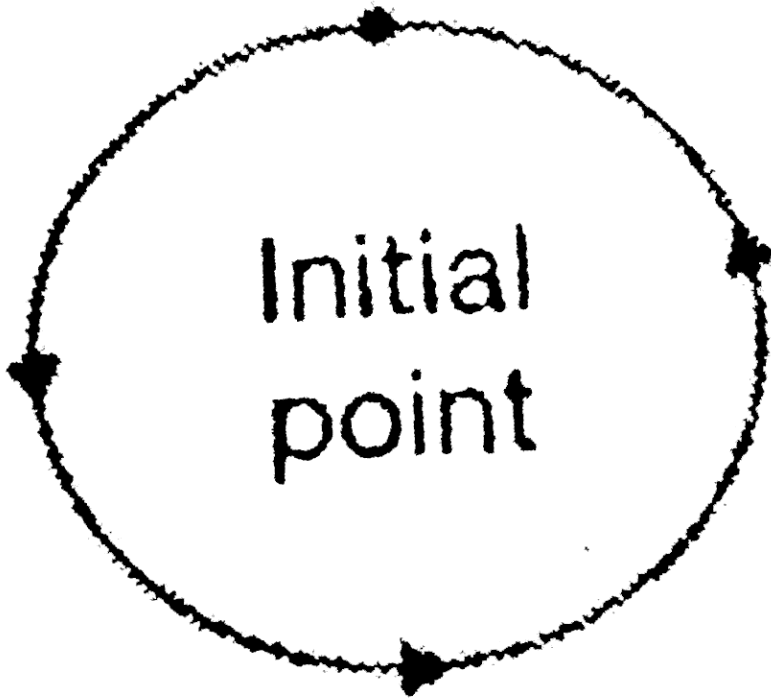
30. A boy travelled in a circular path and reached to the initial position 'O'. If the radius of the circle is 7 m. Find the distance covered and the
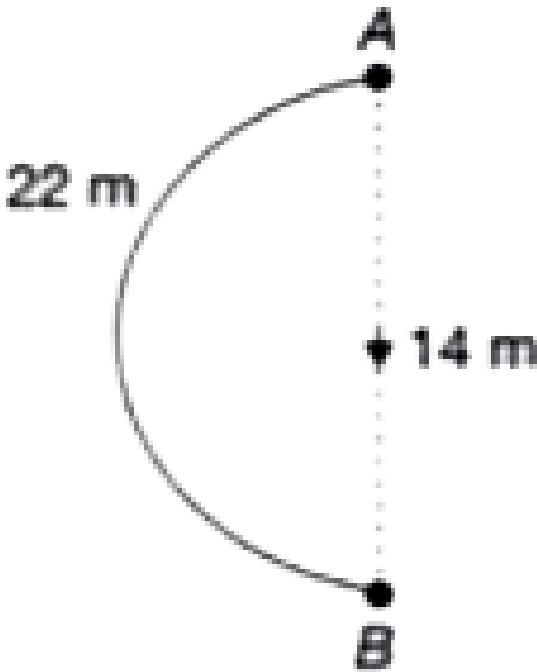
displacement of the body.

Final point

Initial point

31. Find the speed and velocities for the case given below.

22 m

A

14 m

B

32. A motorist started from a position of rest from Warangal and reached Hyderabad in 3 hours. If the distance between the cities is 200 kilometres, what is the average speed of the motorist?

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1. In SI System mass is measured in _____.

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2. Unit of _____ is the same in all the systems of measurements.

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3. In _____ system there are seven fundamental quantities.

4. Prefix used for factor 10^{-6} is _____.

5. Mega is used for a factor of _____.

6. Which of the following is a fundamental quantity?

A. Length

B. Area

C. Volume

D. Force

Answer: A

7. Which of the following unit is a derived unit?

    A. Cubic metre

    B. Newton

    C. Metre^2

    D. All of these

Answer: D

8. The unit of electric current is denoted by

    A. I

    B. E

    C. A

D. a

Answer: C

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9. Prefix used for 10^{-3} is

A. Milli

B. Micro

C. Mega

D. Kilo

Answer: A

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10. Prefixes used for negative powers of 10 are called

A. Units

B. Multiples

C. Submultiples

D. Standards

Answer: C

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11. To measure irregular areas _____ paper is used.

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12. 2 decades are equal to _____ years.

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13. 5 centimetres are equal to ____ metres.

14. ____ grams make 0.2 kilograms.

15. 5 milliseconds is equal to ____.

16. The ratio of the SI unit of mass to its CGS unit is ____.

17. A thread of length 20 cm is made into square, then the length of its side is _____.

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18. Ratio of the SI unit of volume to the SI unit of area is _____.

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19. If the volume of a sphere is $\frac{4}{3}\pi r^3$ where $\pi = \frac{22}{7}$ and r is radius of the sphere, then the radius of the sphere of volume $\frac{704}{21}m^3$ is _____.

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20. _____ grams make 20 milligrams.

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21. What is the SI unit of mass ?

A. kg

B. gram

C. second

D. gcm^{-3}

Answer: A

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22. Area is measured in

A. m^2

B. cm^2

C. mm^2

D. All of these

Answer: D

23. ____ is used to measure the length of a curved line.

A. A thread

B. A graph paper

C. Water

D. None of these

Answer: A

24. Relation between length (l), area (A), volume (V) is

A. $V = Al$

B. $V = \dfrac{A}{l}$

C. $l = VA$

D. $V = Al^2$

Answer: A

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25. If the length of a square is 2 cm, then its area in SI system is

A. $4cm^2$

B. $4 \times 10^4 m^2$

C. $4 \times 10^{-4} m^2$

D. $40cm^2$

Answer: C

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26. The least measurement of time in a wall clock is _____

27. The thermometer used to measure the minimum and maximum temperatures of a day is called _____ thermometer.

28. The short hand of a clock is at 12 and the minutes hand is 3, then the time at that instant is _____.

29. The relations between kelvin and celsius scales is K = C + 273. The temperature of a body in kelvin scale is 19 K, if its equivalent temperature in celsius scale is _____.

30. The shape of six's maximum and minimum thermometer is in the shape of the English alphabet ____.

31. The angle between the minutes hand and hours hand in a clock, at 12:30 p.m. is

A. $> 0°$

B. $> 30°$

C. $> 60°$

D. $> 90°$

Answer: D

32. Temperature is a _____ quantity.

A. Derived

B. Fundamental

C. Physical

D. Both (b) and (c)

Answer: D

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33. Time is a fundamental quantity

A. Since it is independent of other quantities.

B. Since it is measured in secondary scale.

C. Since it is dependent on other quantities.

D. Since it depends on the mass of the clock.

Answer: A

---

34. The device used to measure temperature is

    A. Metre scale

    B. Barometer

    C. Thermometer

    D. Lactometer

Answer: C

---

35. Which of the following units of temperature is not followed by the word 'degree'?

A. Celsius

B. Centigrade

C. Fahrenheit

D. Kelvin

Answer: D

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36. If a body does not change its position, it must be in a state of ____.

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37. The CGS unit of distance covered is ____.

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38. Acceleration is measured in ____ in SI system.

39. A passenger in a moving bus appears to be in a state of rest with respect to ____.

40. A body is said to be in a state of motion if it changes its ____.

41. SI unit of velocity is

(i) m/s

(ii) m/s^2

(iii) m

(iv) s

A. $cms^{-1}s$

B. mms^{-1}

C. ms^{-1}

D. kmh^{-1}

Answer: C

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42. Which of the following is different from the others?

A. Distance covered

B. Displacement

C. Velocity

D. Acceleration

Answer: A

43. Centimetre per second is the unit of

   A. Distance covered

   B. Displacement

   C. Velocity

   D. Acceleration

Answer: C

44. If the velocity of a body decreases gradually with time, then it is said to be in

A. Acceleration

B. Deceleration

C. Retardation

D. Both (b) and (c)

Answer: D

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45. A bus is moving with uniform velocity,

A. Then its acceleration is non-zero.

B. Then its acceleration is negative.

C. Then its acceleration is zero.

D. Then its acceleration is positive.

Answer: C

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1. Define physical quantity and give any two examples.

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2. Define derived physical quantity and give any two examples.

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3. Define multiple units.

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4. Define unit and write any three examples.

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5. Define fundamental unit and write any two examples.

6. What is the SI unit of the ratio of mass to area?

7. Write the correct notation for the following.

(a) 2 Kg

(b) 4 Newtons

(c) 6 metres

(d) 35 Gram

(e) 7 S

8. Write the correct notation for the following.

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(a) 2 Kg

(b) 4 Newtons

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(d) 35 Gram

(e) 7 S

> ▶ Watch Video Solution

10. Write the correct notation for the following.

(a) 2 Kg

(b) 4 Newtons

(c) 6 metres

(d) 35 Gram

(e) 7 S

▶ Watch Video Solution

11. Write the correct notation for the following.

(a) 2 Kg

(b) 4 Newtons

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(d) 35 Gram

(e) 7 S

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12. Match the entries in Column A with entries in Column B.

Column A		Column B	
(A)	SI unit of electric current	(a)	Candela
(B)	CGS unit of time	(b)	Ampere
(C)	SI unit of luminous intensity	(c)	Metre
(D)	SI unit of distance	(d)	Second

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13. Assertion A: 1 metre can be written as 1 m and not as 1 M.

Reason R: If the unit of physical quantity is not named after a scientist, symbol of the unit should not be denoted with a capital letter.

A. A and R is correct and R is the correct explanation of A.

B. A and R is incorrect and R is the correct explanation of A.

C. Both A and R is true but 'R' is not the correct explanation of A.

D. A is true, R is not true and R is not the correct explanation of A.

Answer: A

14. Write the following steps in sequential order to convert centimetres into millimetres.

15. If the product of milli and micro is nano and the values of milli and nano are 10^{-3} and 10^{-9}, find the value of micro.

16. If A, B and C are the units of time, length and speed, then find the relationship between them.

17. Find the units of density, $\dfrac{\text{density}}{\text{mass}}$ and $\dfrac{\text{electric currect}}{\text{time}}$

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18. Write the unit of the physical quantity which is the ratio of density to area.

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19. Find the unit of work if the work is the product of force and displacement, force = mass $\times$ acceleration, where acceleration = $\dfrac{\text{length}}{\text{time}^2}$

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20. Define length.

▶ Watch Video Solution

21. Define mass.

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22. Define volume.

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23. Define area.

▶ **Watch Video Solution**

24. Define measurement.

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25. Find the unit of ratio of mass to area.

26. What is the physical quantity measured in cm^2?

27. Arrange the following steps in a sequence to find the area of a leaf.

(a) Find the number of complete boxes and half boxes inside the boundary.

(b) As the area of one box is 1 m^2, the total area is equal to the sum of full boxes and half boxes areas.

(c) Place it on a graph paper.

(d) Take an irregular shaped leaf.

(e) Draw the outline and remove it from the graph paper.

28. Match the following.

	Column A			Column B
(A)	Area/length	( )	(a)	metre^{-1}
(B)	Mass/volume	( )	(b)	No unit
(C)	Length/area	( )	(c)	metre
(D)	Length^2/area	( )	(d)	kg m^{-3}

29. Assertion (A): m^2 is a derived unit.

Reason (R): Area is a derived quantity.

A. A and R is correct and R is the correct explnation of A.

B. A and R is incorrect and R is the correct explanation of A.

C. A and R is true but 'R' is not the correct explanation of A.

D. A is true, R is not true and R is not the correct explanation of A.

Answer: A

30. Pavan is measuring the area of a leaf by using a graph paper and he measured the sum of the areas of full boxes and more than half boxes inside the outline of the leaf which is 25 cm^2. Find the length of the square whose area is equal to the area of the leaf.

31. Ram measured the length of a curved line using a thread. He made a right angled triangle, of base 10 cm and height 20 cm, with the same thread. Find the length of the curved line measured by him.

32. Convert the unit of ratio $\dfrac{\text{mass} \times \text{area}}{\text{volume}}$ from SI system to CGS system.

33. Abhi who is interested in physics measured the volume of an irregular shaped body with concepts given by his physics teacher. When he immersed the given body in water contained in a measuring jar, the level of water is increased from 500 ml to 1500 ml. Find the volume of the body and also find the length of the edge of the cube whose volume is equal to the volume of the given irregular shaped body.

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34. Find the area of a coloured paper used to stick to a sphere of radius 7 cm.

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35. Define time.

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36. Define temperature.

37. Match the following.

Column A			Column B	
(A)	Kelvin	( )	(a)	Hotness
(B)	Time	( )	(b)	Temperature
(C)	Temperature	( )	(c)	Second

38. Assertion (A): Temperature is a fundamental quantity in SI system.

Reason (R): In other systems of measurement only mass, length and time are fundamental quantities.

A. A and R is correct and R is the correct explanation of A.

B. Both A and R is incorrect.

C. A is true, R is true and 'R' is not the correct explanation of A.

D. A is true, R is not true.

Answer: C

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39. Write the following steps in a sequential order to find the time at a given instant by using a clock.

(a) Observe the position of the hour hand.

(b) Observe the position of the minute hand.

(c) Multiply 1 hour with the number at which the hour hand is located.

(d) Note the number of minutes, considering the gap between two numbers of clocks as 5 minutes.

(e) Find the time.

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40. Raju started a piece of work when the hours hand and minutes hand in a wall clock are at 9 and 12, respectively. He completed his work when the hours hand is at a midway between 11 and 12, while the position of the minutes hand is at 6. Find the time taken by him to do the work.

41. Keshav observed that the increase in the temperature of a body is given by $T_1 = 2t^2$ for the first 5 minutes and T_2 = 3t for the next 5 minutes, where T_1, T_2 and 't' are temperatures in Fahrenheit, Celsius scales and time in minutes, respectively. If the initial temperature of the body is $20° F$ and the relation between the Celsius and Fahrenheit scale is, then find the temperature of the body after 8 minutes in Celsius scale.

42. Define rest.

43. Define motion.

44. Define displacement.

45. Define velocity of an object

46. Define acceleration.

47. How can you differentiate between distance and displacement?

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48. If the distance covered by a body moving in a circular path of radius (r) is equal to $2\pi r$, find its displacement.

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49. How can you say that speed and velocity are different even through their units are the same?

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50. How can you say that the tree on the earth is in a state of rest and in a state of motion at the same time?

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51. Give any one example in which a body travels with retardation and give a reason for the same.

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52. A particle is movingin circular path of radius 7 cm. Find the ratio of its displacement to the distance covered after the completion of a half

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53. Find the minimum speed required by a person standing 5 m behind a bus, to catch the bus in one minute which is moving at a speed of 600 m $\min^{-1}$.

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54. If a bus moves from A to B and comes back to A, find the displacement and velocity of the body.

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55. What is the speed of a body if it covers a distance of 20 m in 4 seconds?

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56. Find the acceleration of the car, if it changes its velocity from $20ms^{-1}$ to $30ms^{-1}$ in 5 seconds.

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Concept Application

1. When one of the passengers was traveling on a city bus, his mobile phone slipped from his hands and that fell out of the bus through the window. This was observed by a school boy standing on the road. The path of the mobile phone observed by the school boy is _____.

    A. circular

    B. parabolic

    C. linear

    D. elliptical

Answer: B

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2. Find out the physical quantity in CGS unit that results on simplifying the expression $1000 \dfrac{a^2 b^2 c^3}{d}$, where a - acceleration, b - displacement, c - time, d - velocity.

A. $10000cm^3$

B. $1000cm^3$

C. $1000l$

D. $1000g$

Answer: B

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3. Jyoti created a temperature scale, in which the reading at room temperature divides the total length of the temperature scale in 2 : 3 ratio from LFP. Then find its value on Jyothi's scale, which is the same as Kelvin scale.

A. 40 K

B. 313 K

C. 200 K

D. 73 K

Answer: B

4. Dev is a 12-year-old, studying in 6th class, and has a younger brother Surya whose age is 7-years. Surya is playing by dipping balls in water tub. Dev observed that the level of the water increases when Surya starts dipping the balls one after the other in the water. Then Dev remembered his 6th class topic measurement of volume. He poured water up to the brim of the tub and set up another bigger tub at the bottom of the first tub. He then asked his brother Surya to dip ten identical balls in it so that the overflowed water is collected in the tub at the bottom. Dev calculated volume of overflowed water and found that it was 2 litres. Dev calculated volume of each ball. Which of the following options matches with Dev's calculations?

A. 2000 l

B. 200 l

C. 20 l

D. 0.2 l

Answer: D

5. Abhi, Vasu, Maahi and Lucky are good friends. During summer vacation they met at Vasu's home to play. Vasu's father is good at mathematics and physics, so he used to play with Vasu and his friends by asking subject-related questions in the middle of their play. He asked a question, "how will you write the weight of you 1 litre water bottle in physics?" Select the correct form of writing the weight from the answer given by the four.

A. Abhi wrote 10 n

B. Vasu wrote 10 newtons

C. Maahi wrote 10.N

D. Lucky wrote 10, N.

Answer: B

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1. Derive the units of area and volume.

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2. If speed is the ratio of distance to time, then write its CGS unit.

> ▶ **Watch Video Solution**

3. Find the unit of ratio of area to length.

> ▶ **Watch Video Solution**

4. What is the relation between CGS and SI unit of volume?

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5. The mass of mercury is 13.6 grams. Find its value in microgram.

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6. Find the ratio of the smallest measurements possible on a screw gauge to verneir calipers.

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7. An object 'X' of volume 200 cm^3 and another object Y of volume 250 cm^3 are taken. If their area is the same, then determine the ratio of their heights.

8. Four spheres made of different materials but having the same mass, have a radii of 100 mm, 2×10^{-2}m, 30 cm and 10^{-5}km then arrange them in ascending order of their volumes.

9. 1 km = _____ millimetre

10. Given the volume of air is $1.29m^{+3}$. Then express it in c.c.

11. Given that the time taken by an oil dropper to drop 100 oil drops is 800 min, find the time taken to drop 10 oil drops in hours.

12. On dropping 3 identical bullets into a measuring jar containing a liquid, the level of the liquid increased from $280cm^3$ to $316cm^3$. Then the volume of each bullet is _____ m^3.

13. Express $50°C$ in kelvin and Fahrenheit scale temperature.

14. Differentiate between speed and velocity.

15. What are the different branches of mechanics?

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16. How, do you represent a vector geometrically?

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17. When can we say that a particle in motion is moving with uniform speed?

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18. Give some examples for fundamental quantities and derived quantities related to motion.

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19. Define distance, displacement and speed.

20. What is kinematics?

21. What will be the displacement of a body when it travels along the following paths?

(a) Half circle

(b) Full circular path?

22. What will be the displacement of a body when it travels along the following paths?

(a) Half circle

(b) Full circular path?

23. What are the physical quantities that can be measured in m s^{-1}, km and km h^{-2}?