Shiksha Classes Bhandara
CHAPTER TEST

Subject : Physics **Topic : Practical Physics** **M.M. : 100**

Marking Scheme:

(i) Each question is allotted 4 (four) marks for each correct response.

(ii) ¼ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.

Q.1 Let $y = \ell^2 - \frac{\ell^3}{z}$ where $\ell = 2.0 \pm 0.1, z = 1.0 \pm 0.1$ then the value of y is given by –

(A) + 2 ± 0.8 (B) – 4 ± 1.6

(C) – 4 ± 0.8 (D) None of these

Q.2 In a meter bridge set up, which of the following should be the properties of the one meter long wire ?

(A) High resistivity and low temperature coefficient

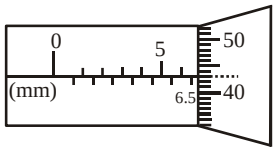
(B) Low resistivity and low temperature coefficient

(C) Low resistivity and high temperature coefficient

(D) High resistivity and high temperature coefficient.

Q.3 Read the screw-gauge, Main scale has $\frac{1}{2}$mm marks; Circular scale has 50 division.

In complete rotation, the screw advances by $\frac{1}{2}$mm .



(A) 6.93mm (B) 5.93mm

(C) 4.93mm (D) 7.93mm

Q.4 The resistance of a metal is given by R = $\frac{V}{I}$, where V is potential difference and I is the current. In a circuit the potential difference across resistance is V = (8 ± 0.5) V and current in resistance, I = (2 ± 0.2) A. What is the value of resistance with its percentage error ?

(A) 4Ω ± 16.25% (B) (4 ± 0.7) Ω

(C) 4Ω ± 0.7% (D) 4Ω ± 7%

Q.5 In a vernier calipers N divisions of vernier scale coincides with N-1 divisions of main scale (in which length of one division is 1mm). The least count of the instrument is (in mm)

(A) N (B) N – 1

(C) $\frac{1}{N}$ (D) $\frac{1}{N-1}$

Q.6 Mark the correct statement (s) –

(A) The reading of a particular physical quantity measured from an instrument having smaller least count is more accurate than measured from an instrument having larger least count.

(B) The last significant digit in the measurement is uncertain.

(C) In a particular measurement, the number of S.D.'s is more as compared to previous reading it means 2nd reading is more accurate.

(D) All of the above

Q.7 In a meter bridge, null point is at ℓ = 33.7cm. when the resistance S is shunted by 12Ω resistance the null point is found to be shifted by a distance of 18.2cm. The value of unknown resistance R should be –

(A) 13.5 Ω (B) 68.8 Ω (C) 3.42 Ω (D) None of these

Q.8 The main scale of a vernier callipers reads 10mm in 10 divisions. 10 divisions of Vernier scale coincide with 9 divisions of the main scale. When the two jaws of the callipers touch each other, the fifth division of the vernier coincides with 9 main scale divisions and the zero of the vernier is to the right of zero of main scale. When a cylinder is tightly placed between the two jaws, the zero of vernier scale lies slightly to the left of 3.2cm. and the fourth vernier division coincides with a main scale division the diameter of the cylinder is –

(A) 3.09cm. (B) 3.14cm.

(C) 3.04cm (D) none of these

Q.9 In a meter bridge experiment If we used 100 Ω and 200 Ω resistance, we get null deflection at ℓ_1 = 33.0cm. If we interchange the resistance, the null deflection was found to be at ℓ_2 = 67.0cm. The end correction α and β should be –

(A) α = 1cm, β = 1 cm. (B) α = 2cm, β = 1 cm.

(C) α = 1cm, β = 2 cm. (D) None of these

Q.10 The pitch of a screw gauge is 0.5mm and there are 50 divisions on the circular scale. In measuring the thickness of a metal plate, there are five divisions on the main scale and 34th divisions coincides with the reference line. Find the thickness of the metal plate.

(A) 2.48mm (B) 2.68mm

(C) 3.2mm (D) 2.84mm

Q.11 A body travels uniformly a distance of (13.8 ± 0.2)m in time (4.0 ± 0.3) s, the velocity of particle is –

(A) (3.45 ± 0.31) m/s (B) (3.4 ± 0.3) m/s

(C) (3.68 ± 0.4) m/s (D) (3.6 ± 0.42) m/s

Q.12 The measured value of a physical quantity measured with the help of an instrument, doesn't match with the calculated value of physical quantity using formula. The best reason for this is –

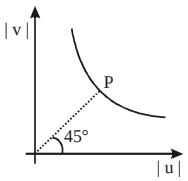
(A) due to instrumental error

(B) due to random error

(C) due to experimenter's carelessness

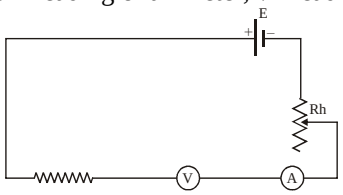
(D) due to limitation on the value of least count of instrument

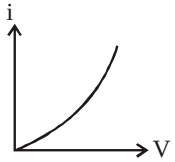
Q.13 The | u | , | v | graph for a concave mirror is as shown in figure. Here | u | > | f |. A line passing through origin of slope 1 cuts the graph at point P. Then coordinates of point P are



(A) (|2f |, | 2f |) (B) (|2f |, | f |)
(C) (|f |, | 2f |) (D) (|f |, | f |)

Q.14 If by mistake, voltmeter is connected in series with the resistance then i-v curve expected is
(Here i=reading of ammeter, v= reading of voltmeter)



(A)


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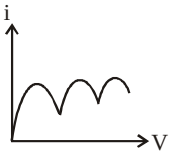

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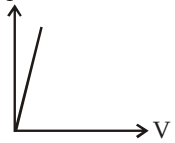
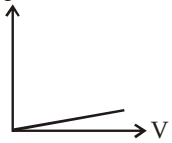
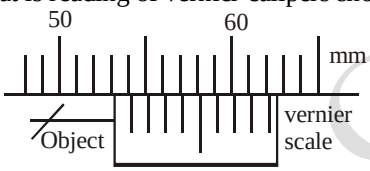


(D)


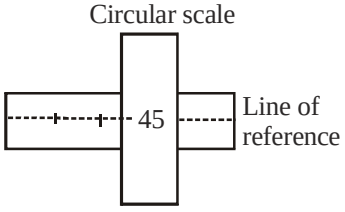
Q.15 What is reading of vernier calipers shown in figure ?



(A) 54.6mm (B) 53.1mm
(C) 52.7cmm (D) 54.7cmm

Q.16 In the experiment of Ohm's law. When potential difference 10.0V is applied, current measured is 1.00A. If length of wire is 10.0cm, and diameter of wire is 2.50mm, then the maximum permissible error in resistivity will be
(A) 1.8% (B) 10.2%
(C) 3.8% (D) 5.75%

Q.17 Consider a screw gauge without any zero error. What will be the final reading corresponding to the final state as shown ? It is given that the circular head translated P msd in N rotations. One msd is equal to 1mm.



The circular scale has 100 divisions

(A) (P/N) (2 = 45/100) mm
(B) (N/P) (2 + 45/N) mm
(C) P (2/N + 45/100) mm
(D) $\left(2+\frac{45}{100}\times\frac{P}{N}\right)$

Q.18 To find the value of g using simple pendulum. T=2.00 s, $\ell = 50.0$cm. was measured. The maximum permissible error in g is :
(A) 1.4% (B) 1.1%
(C) 1.5% (D) 1.2%

For Q.19-Q.20

A brass ball of mass 100g is heated to 100°C and then dropped into 200g of turpentine in a calorimeter at 15°C. The final temperature is found to be 23°C. Determine the specific heat of turpentine. Take specific heat of brass as 0.092 cal/g°C and water equivalent of calorimeter as 4g.

Q.19 Heat lost by the ball is approximately –
(A) 810 cal (B) 610cal
(C) 710cal (D) 510cal

Q.20 Specific heat of the brass is –
(A) 0.62 cal/g°C (B) 0.52 cal/g°C
(C) 0.42 cal/g°C (D) 0.32 cal/g°C

For Q.21-Q.25 :

The answer to each question is a NUMERICAL VALUE.

Q.21 The mass, specific heat capacity and initial temperature of the sphere was 1000gm, 1/2 cal/gm°C and 80°C respectively. The mass of the liquid and the calorimeter are 900gm and 200gm, and initially both were at room temperature 20°C. Both calorimeter and the sphere are made of same material. If the steady-state temperature after mixing is found to be 40°C, then the specific heat capacity (in cal/g°C) of unknown liquid, is

Q.22 In Ohm's law reading of voltmeter across the resistor is 15V and reading of current is 0.20A. The resistance (in ohm) of the resistor in correct significant figure is –

Q.23 The dimensions of a rectangular block measured with a vernier calliper is 10mm × 20mm × 5mm. The LC of vernier calliper is 0.1mm. The maximum percentage error in measurement of volume of the block is (X + 0.5). Find the value of X.

Q.24 The values of kinetic energy K and potential energy U are measured as follows :
K = 100.0 ± 2.0 J, U = 200.0 ± 1.0 J. Then the percentage error in the measurement of mechanical energy is –

Q.25 An experimenter first takes 50 observations in an experiment. In 2nd experiment he took 300 observations. The error is 2nd experiment is x times the error in experiment 1 then value of x is (1/X). Find the value of X.