

63/1 (SEM-3) SEC1/PHYSE3012

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(Held in 2023)

PHYSICS

Paper : PHYSE3012

(**Physics Workshop Skill**)

Full Marks : 50

Pass Marks : 20

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

1. Choose the correct options from the following : 1×5=5

(a) A Zener diode in reverse biased configuration is used as

(i) rectifier

(ii) amplifier

(iii) voltage regulator

(iv) None of the above

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(Turn Over)

(2)

(b) Which among the following is/are common casting material?

- (i) Iron
- (ii) Aluminium
- (iii) Steel
- (iv) All of the above

(c) 0–1 mA has a sensitivity of

- (i) 1 kilohm
- (ii) 1000 A
- (iii) 1 mA
- (iv) 1 kilohm/volt

(d) Which of the following is not a typical welding defect?

- (i) Gas inclusion
- (ii) Schottky
- (iii) Crank
- (iv) Lamellar tearing

(e) The gears are connected to connect two parallel shafts, *except*

- (i) double helical gear
- (ii) spur gear
- (iii) helical gear
- (iv) bevel gear

(3)

2. Answer the following questions : 2×5=10

(a) Write the difference between welding and soldering.

(b) Discuss the working principle of lathe machine.

(c) Draw the block diagram of a regulated power supply.

(d) How does a lever work?

(e) A screw gauge having 100 equal divisions and pitch of length 1 mm is used to measure the diameter of a wire of length 5.6 cm. The main scale reading is 1 mm and 47th circular division coincides with the main scale. Find the curved surface area of the wire in cm.

3. Answer any *five* of the following questions :

5×5=25

(a) What are fractional error, percentage error and relative error? Find the fractional error and percentage error in Z , if

$$Z = \frac{A^4 B^{\frac{1}{2}}}{C^2 D^{\frac{3}{2}}}$$

- (b) How does the braking system work?
How are the braking systems classified?
- (c) Explain the use of sextant to measure the height of a building.
- (d) Write down the properties of good lubricant.
- (e) The mass of a solid iron cube is 700 g and each edge has a length of 5 cm. Find out the density of the cube in SI unit.
- (f) Explain instrumental error or zero error in a screw gauge.
- (g) What are the common materials used for manufacturing steel and copper?

4. Answer the following questions (any one) : 10

- (a) Discuss different types of manufacturing methods.
- (b) What is a hacksaw? Draw a simple diagram of a hacksaw. Explain the different steps to be followed while cutting metal sheet by a hand hacksaw.

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