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Barasat, Kolkata - 700125

BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Tech.(ME)-2021
Course Name – Metrology and Instrumentation
Course Code - PCC-ME405
(Semester IV)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :
 - (i) Select the category of Slip gauges among the following
 - a) End standard
 - b) Line standard
 - c) wave standard
 - d) none of the option
 - (ii) The algebraic difference between upper and lower deviations is defined as
 - a) Tolerance
 - b) Allowance
 - c) Limit
 - d) Fit
 - (iii) Chose the correct option- '50' represents in 50H8/g7
 - a) Basic size
 - b) Actual size
 - c) maximum limit of size
 - d) Minimum limit of size
 - (iv) Select the analog transducer
 - a) Encoders
 - b) Strain gauge
 - c) Digital tachometers
 - d) Limit switches
 - (v) Identify the instrument that can measure the amplitude of a vibrating body
 - a) Vibrometers
 - b) Seismometer
 - c) Both (a) and (b)
 - d) None of the option
 - (vi) Select the option that can be used to measure by strain gauge.
 - a) Tension
 - b) Compression
 - c) Both of these
 - d) None of these
 - (vii) The negative lead of a thermocouple is always selected by following colour
 - a) Blue
 - b) yellow
 - c) white
 - d) red
 - (viii) Choose the Gauge factor of thick film resistors
 - a) 1
 - b) 100
 - c) 1000
 - d) 10

- (ix) Choose important parameter for specifying surface roughness among the option given below
- a) Size of irregularity
b) Spacing of irregularity
c) Height of irregularities
d) Height, spacing and form of irregularities
- (x) Define bilateral tolerance among the following option
- a) Total tolerance is in one direction only
b) Total tolerance is in both the directions
c) May or may not be in one direction
d) Tolerance provided all over the component body
- (xi) Choose the option which represent active transducer
- a) Strain gauge
b) Thermistor
c) LVDT
d) Thermocouple
- (xii) Select the alternative name of functional diameter from the given option.
- a) Cone diameter
b) Virtual diameter
c) Root diameter
d) Inside diameter
- (xiii) An instrument's degree of repeatability is defined as
- a) Resolution
b) Accuracy
c) Range
d) Precision
- (xiv) Select the option which is used for measuring torque in rotating parts in machines.
- a) Accelerometer
b) Dynamometer
c) Tachometer
d) None of the option
- (xv) Where will be the vernier scale is present?
- a) 0-90°
b) 0-180°
c) 0-360°
d) 90-270°

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Discuss the uses of Bevel protector and Feeler gauge. (3)
3. Define the term Hysteresis (3)
4. Select the criteria for the selection of a gauge (3)
5. Calculate the diameter of best size of a wire for an M20X2.5 screw. (3)
6. Briefly explain the progressive pitch error. (3)

OR

Explain RMS value. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Describe the two weir method for measuring the effective diameter of screw thread with proper diagram (5)
8. Explain the working principle of Strain Gauge with proper sketch (5)
9. Explain unilateral and bilateral tolerance system with proper sketch. (5)
10. Explain reasons for controlling surface texture (5)
11. Write short note on Hole basis and Shaft basis system (5)
12. Write short note on Measuring lag and Fidelity (5)

OR

Write the limitation and advantages of LVDT (5)