17798

BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(ME)-2021/B.Tech.(ME)-2023
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 center distance of the two roller of the sine bar.
a) 100 mm b) 25 mm
c) 10 mm d) 10 mm

(ii) Identify the principle that is related to Gauge design among the following.
a) Rankin principle b) Position principle
c) Taylor's principle d) Carnot Principle

(iii) Identify the type of thread formed on female screw gauge.
a) External thread b) Internal thread
c) Both internal and external d) Major screw thread

(iv) The provision for wear of 'Go' gauges is defined as
a) A margin greater than maximum metal limit of work b) A margin greater than tolerance zone of gauge
c) A margin lesser than maximum metal limit of work d) A margin between tolerance zone of gauge and maximum metal limit of work

(v) Select the option which is not a characteristic of an ideal transducer.
a) High dynamic range b) Low linearity
c) High repeatability d) Low noise

(vi) Identify the quantity of a strain gauge that varies with applied force.
a) Resistance b) Capacitance
c) Inductance d) Flux

(vii) Select the destructive method in measuring surface finish.
a) Gloss measurement b) Taper sectioning
c) Diffraction technique d) Micro interferometer

(viii) If the allowance of 0.05 mm for clearance is given and the shaft diameter is 30mm, then Calculate the design size is

a) 30.05 mm b) 29.05 mm
c) 29.95 mm d) 30.95 mm

(ix) Select the conditions of balanced bridge.

a) When no current flows b) When the temperature of the circuit is high
c) When power dissipation is high d) When no voltage drop across the circuit

(x) Select the rate of measurement cycles from the option given.

a) multivibrator b) oscillator
c) oscilloscope d) amplifier

(xi) The effective diameter (E) in three wire method is given by

a) E = M – C b) E = M + C
c) E = M / C d) E = M x C

(xii) Identify the full form of RMS.

a) Root Mean Square b) Root Mean Sum
c) Root Maximum sum d) Root Minimum Sum

(xiii) Select the wear allowance recommended by BSI for solid ring and plug gauges.

a) 0.1 b) 0.01
c) 0.5 d) 0.05

(xiv) Choose the correct option for diaphragms.

a) Used for measuring small forces b) Used for measuring large forces
c) Used for measuring dynamic forces d) None of the option

(xv) Select the correct option for Bourdon tubes.

a) very highly sensitive to shock b) not sensitive to shock
c) less sensitive to shock d) more sensitive to shock

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Classify the various main types of Fits. (3)
3. State the limitations of LVDT process. (3)
4. Distinguished between Instrumental errors and Environmental errors. (3)
5. A length was calculated to be 6.7 inch, but the absolute length was 6.52 inch. Calculate the percentage error. (3)
6. Distinguish between Hole basis and Shaft basis system with a neat sketch. (3)

OR

Distinguishe between R.M.S value and Ra 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. Describe Tomlinson surface meter with proper diagram. (5)
9. Write short note on Active and Passive transducers. (5)
10. Write the working principle of the bourdon tube pressure gauge with a neat sketch. (5)
11. With proper diagram explain the working principle of Vernier caliper. (5)
12. Write short note on GO and NO-GO Gauge. (5)

OR

Write a short note on Hysteresis. (5)

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