

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name : Mechanical Measurement & Metrology

Subject Code : 4TE04MMM1

Branch: B.Tech (Mechanical)

Semester : 4

Date: 08/05/2018

Time: 10:30 To 01:30

Marks: 70

Instructions:

- (1) Instructions written on main answer book are strictly to be obeyed.
 - (2) Draw neat diagrams and figures (if necessary) at right places.
 - (3) Assume suitable data if needed.
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Q-1

Attempt the following questions:

(14)

- a) One atmospheric pressure equals
 - (A) 1.00132 kgf/cm²
 - (B) 1.0132 bar
 - (C) 760 mm of Hg
 - (D) All of these
- b) A piezometer is used to measure the
 - (A) undisturbed fluid pressure
 - (B) gauge pressure in a static mass of fluid
 - (C) pressure difference between two fluids
 - (D) dynamic pressure of a moving stream
- c) The sensing element of a particular instrument may be a
 - (A) spring
 - (B) probe
 - (C) dead weight
 - (D) float
- d) Mercury is used in barometer because it
 - (A) does not stick to the walls of the tubing
 - (B) is shining
 - (C) has zero vapour pressure
 - (D) has high density enable to reduce barometer height
- e) A prony brake dynamometer measures
 - (A) crankshaft force
 - (B) crankshaft torque
 - (C) engine brake power
 - (D) all of these
- f) Dynamic quantities
 - (A) vary rapidly with time
 - (B) remain constant over a period of time
 - (C) are displayed from zero position
 - (D) are displayed from non-zero position



- g) The LVDT is an inductive transducer which functions due to
 (A) change in the air gap
 (B) change in the amount of core material
 (C) mutual inductance
 (D) variation in the position of the core
- h) The below figure shows



- (A) Anemometer
 (B) Pyrometer
 (C) Thermometer
 (D) gyroscope
- i) The reading on micrometer is



- (A) 1.5 mm
 (B) 2.00 mm
 (C) 1.00 mm
 (D) 1.10 mm
- j) A pitot-static tube measures
 (A) static pressure
 (B) dynamic pressure
 (C) total pressure
 (D) difference between total and static pressure
- k) Tachometers are used to measure
 (A) displacement
 (B) angular velocity
 (C) vibration
 (D) time
- l) Environmental errors may be due to changes in
 (A) pressure and temperature
 (B) wind velocity and gravity
 (C) humidity
 (D) any of these
- m) Orsat apparatus is used for the estimation of
 (A) mass flow of flue gases
 (B) density of smoke of flue gas



- (C) volumetric analysis of flue gases
 (D) gravimetric analysis of flue gases
- n) A high grade set of slip gauges preserved in a factory and not out into general use would be a standard of the type
 (A) international
 (B) primary
 (C) secondary
 (D) working
- Q-2** (a) Define the term systematic error. What are the main causes due to which systematic errors occur? 7
 (b) Draw and discuss the working of Type – A vernier caliper with neat sketch. Set the following readings using 0.02 mm caliper. 7
 (i) 46.78 mm (ii) 20.04 mm
- Q-3** (a) Draw a ring a balance manometer and derive the governing equation. 7
 (b) Draw and explain the construction and working of Hot wire anemometer. 7
- Q-4** (a) Draw and discuss the uses of angle gauges. 7
 (b) List and explain with neat sketches the uses of Sine bar. 7
- Q-5** (a) Discuss the working principal in detail for small bore diameter measurement by a ball on a wire. 7
 (b) Compare and differentiate the line standard and end standard. 7
- Q-6** (a) Draw and discuss construction and working of Total radiation pyrometers. 7
 (b) Discuss the laws of thermocouples. 7
- Q-7** (a) Define the following terms: 7
 (i) Range and span (ii) Threshold and resolution
 (b) Derive equations for depth and width for spur gear using constant chord method. 7
- Q-8** (a) Explain with neat sketches (i) Levelling of the lathe machine (ii) Axial slip of main spindle and true running of face of spindle nose. 7
 (b) Discuss in detail the zero, first and second order systems with suitable examples. 7

