

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Automotive Measurement

Subject Code: 4TE03AMR1

Branch: B.Tech (Automobile)

Semester: 3

Date: 28/03/2018

Time: 02:30 To 05:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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- Q-1** **Attempt the following questions:** **(14)**
- a) The following is an internationally recognized and accepted unit system **(01)**
a. MKS
b. FPS
c. SI
d. All of the above
- b) Systematic errors are... **(01)**
a. Environmental errors
b. Observational errors
c. Instrument errors
d. All of the above.
- c) The following is a line standard of measurement **(01)**
a. Measuring tape
b. Slip gauge
c. Micrometer
d. End bars
- d) The smallest change in measured variable to which instrument will respond is **(01)**
a. Resolution
b. Accuracy
c. Precision
d. Sensitivity
- e) Define sensor **(01)**
- f) A pressure measurement instrument is calibrated between 10 bar and 260 bar. **(01)**
The scale span of the instrument is
a. 10 bar.
b. 250 bar.
c. 260 bar.
d. 270 bar.
- g) is measured by a piezometer tube. **(01)**



- a. Dynamic pressure of a moving stream
 - b. Undisturbed fluid pressure
 - c. Gauge pressure in static mass of fluid
 - d. Pressure difference between two fluids
- h) The least count of a vernier caliper used in industries is generally (01)
- a. 0.001 mm
 - b. 1 mm
 - c. 0.02 mm
 - d. None of the above
- i) Define repeatability (01)
- j) Which of the following can be used as thermal detector (01)
- a. Thermistor
 - b. Pyrometer
 - c. Thermocouple
 - d. Any of the above
- k) Define least count (01)
- l) A pitot tube converts (01)
- a. Pressure head into velocity head
 - b. Velocity head into pressure head
 - c. Pressure head into temperature rise
 - d. Velocity head into temperature rise
- m) Show with sketch 7.37 mm reading on micrometer scale with least count of 0.01 mm (01)
- n) Show with sketch 13.42 mm reading on vernier scale with least count of 0.02 mm (01)

Attempt any four questions from Q-2 to Q-8

- Q-2 Attempt all questions (14)**
- (a) Explain with a block diagram generalized measuring system and its four functional elements (07)
 - (b) State various factors to be considered for selection of measuring instruments Differentiate between Precision & Accuracy (07)
- Q-3 Attempt all questions (14)**
- (a) Explain working principle of U-tube manometer and Drive the equation for positive & negative pressure (05)
 - (b) Explain working principle & construction of Resistance Temperature Detector with neat sketch (05)
 - (c) State the various methods for Hardness test & Explain Brinell Hardness test in detail. (04)
- Q-4 Attempt all questions (14)**
- (a) Define Pyrometer & Explain Total radiation pyrometer with neat sketch (07)
 - (b) Explain in brief working of McLeod gauge for pressure measurement with neat sketch (07)
- Q-5 Attempt all questions (14)**



- (a) State causes of vibration in any mechanical system. What are the harmful effects of it? (07)
- (b) Explain with neat sketch different technique used to measure angular parts by sine bar (07)

Q-6 Attempt all questions (14)

- (a) State the techniques used for acceleration measurement & explain any one of it (05)
- (b) State the differences between Line standard & End standard (05)
- (c) Enlist dynamic characteristic of measuring instrument & explain any two of it? (04)

Q-7 Attempt all questions (14)

- (a) State various sources of errors. What are the differences between Systematic error & Random error? (07)
- (b) Explain working principle of Optical Bevel Protractor with neat sketch. How to calculate least count of it? (07)

Q-8 Attempt all questions (14)

- (a) Explain working principle of dial indicator with neat sketch and state its practical application of the use of dial indicator (07)
- (b) Calculate the angle of taper and minimum diameter of internal taper from following readings: (07)
- Diameter of bigger ball = 10.25 mm
- Diameter of smaller ball = 6.07 mm
- Height of bigger ball from datum = 30.13 mm
- Height of smaller ball from datum = 10.08 mm

