# C.U.SHAH UNIVERSITY
## Summer Examination-2016

**Subject Name: Automotive Measurement**

**Subject Code: 4TE03AMR1**            **Branch: B.Tech (Auto)**

**Semester: 3**          **Date: 28/04/2016**          **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 ability by which a measuring device can detect small differences in the quantity being measured by it, is called its          **01**
a. Damping
b. Sensitivity
c. Accuracy
d. None of the above

**b)** The following is an internationally recognized and accepted unit system          **01**
a. MKS
b. FPS
c. SI
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 'Wringing' is due to          **01**
a. Atmospheric pressure
b. Molecular attraction
c. both 'a' and 'b'
d. None of the above

**e)** The reliability of an instrument mean          **01**
a. The life of the instrument
b. The degree of repeatability within specified limits
c. The time interval between two responses of the instrument
d. None of these

**f)** A strain gauge should have a high value of gauge factor          **01**
a. To reduce hysteresis effects

b. To give a linear relation between applied strains and resistance change

c. To increase sensitivity

d. To reduce or eliminate the effect of variation in ambient temperature

**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)** In which of the following aspects vernier calliper is superior to micrometer?            **01**

a. It is easier and quicker to use

b. It is more accurate

c. It can be used to make both inside and outside measurements over a range of sizes

d. All of these

**i)** The use of a dead weight tester is to                                                                          **01**

a. Calibrate pressure measuring instruments

b. Produce high pressure

c. Measure the load accurately

d. Test the magnitude of given weight

**j)** The resolution of a system refers to                                                                           **01**

a. Difference between the true and measured value of the process variable

b. Smallest change of input for which there will be change of output

c. Retardation of the response

d. All of these

**k)** For a thermistor, its resistance                                                                                  **01**

a. Does not change with change in temperature

b. Increases with decrease in temperature

c. Decreases with decrease in temperature

d. None of these

**l)** 'Dead zone' of an instrument is                                                                                  **01**

a. The largest change of input quantity for which there is no output of instrument

b. Time required by instrument system to begin to respond to a change in measured

c. The unmeasured quantity which is more than the maximum range of the instrument

d. None of these

**m)** Which of the following is not a type of direct measuring instrument?                          **01**

a. micrometer

b. vernier caliper

c. divider

d. All of the above

**n)** Which type of tolerance does a slip gauge have?                                                          **01**

a. Unilateral tolerance

b. Bilateral tolerance

c. Both a. and b.

d. None of the above

**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 the differences between Static & Dynamic characteristic of measuring instrument.Explain any two. | **07** |

| Q-3 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **a)** | State the differences between sensors & transducer | **05** |
| | **b)** | Define metrology. State the objective of metrology | **05** |
| | **c)** | Enlist the terminology used for pressure measurement. Explain any one of it | **04** |

| Q-4 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **a)** | Explain working principle of U-tube manometer and Drive the equation for positive & negative pressure | **07** |
| | **b)** | Define Pyrometer. Explain optical pyrometer with neat sketch | **07** |

| Q-5 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **a)** | State various methods for Hardness test. Explain Brinell Hardness test in detail. | **07** |
| | **b)** | Draw neat sketch of Vernier caliper.Explain, how to calculate least count of standard Vernier caliper? | **07** |

| Q-6 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **a)** | Explain the working principle of piezoelectric accelerometer with neat sketch | **06** |
| | **b)** | Explain various causes of vibration in detail | **04** |
| | **c)** | What is calibration of instrument & why is it needed? | **04** |

| Q-7 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **a)** | Explain with neat sketch different technique used to measure angular parts by sine bar | **07** |
| | **b)** | Explain with neat diagram, working principle of micrometer | **07** |

| Q-8 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **a)** | Describe with sketch the construction and working of an Optical bevel protractor. Explain, how are readings taken? | **07** |
| | **b)** | Explain with neat diagram, working principle of dial indicator | **07** |