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**RN-6269**

**B. E. (Sem. III) (Mech.) Examination**

**May / June - 2010**

**Mech. Measurement**

Time : 3 Hours]

[Total Marks : 100

**Instruction :**

(1)

नीचे दर्शाविए निशानीवाणी विगतो उत्तरवही पर अवश्य लખवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. (Sem. 3) (Mech.)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="Mech. Measurement"/>	<input type="text"/>
Subject Code No. : <input type="text" value="6"/> <input type="text" value="2"/> <input type="text" value="6"/> <input type="text" value="9"/>	<input type="text"/>
Section No. (1, 2,.....) : <input type="text" value="1&amp;2"/>	
Student's Signature	

- (2) Attempt all questions.
- (3) Figures to the **right** indicate full marks.
- (4) Assume suitable data if required.
- (5) Answers to the **two** sections must be written in **separate** answer books.

- 1 (a) Fill in the blanks with appropriate words: 5
  - (i) The indirect measurement involving two translation are called \_\_\_\_\_ measurements.
  - (ii) Odometer of an automobile is an example of \_\_\_\_\_ instrument.
  - (iii) \_\_\_\_\_ pressure is defined as the pressure below the atmospheric pressure.
  - (iv) \_\_\_\_\_ gauge operates on pressure or force balance principle.
  - (v) \_\_\_\_\_ correction is the difference between the true value and the measured value of a quantity.
- (b) Explain the following terms : 5
  - (i) Direct and Indirect measurement :
  - (ii) Accuracy
  - (iii) Static correction
  - (iv) Absolute pressure
  - (v) Hysteresis
- (c) Write short notes on following with sketch: 10
  - (i) Piezometer
  - (ii) Dead weight type pressure gauge tester
  - (iii) Liquid in glass thermometer.

- 2 (a) Answer the following questions : (any **three**) 9
- (i) How instruments can be classified? Write detail classification of instruments.
  - (ii) Write advantages and disadvantages of electrical and electrical instruments.
  - (iii) Briefly explain Manometric liquids.
  - (iv) Write the difference between line and end standards.
- (b) Attempt any **two** : 6
- (i) Explain calibration process of instruments.
  - (ii) Draw a neat sketch of McLeod gauge.
  - (iii) How bimetallic thermometer will work? Explain with neat sketch.

- 3 (a) Attempt the following : 8
- (i) Explain total radiation pyrometer with neat sketch.
  - (ii) Write a short note on Ring Balance Manometer.
- (b) How thermocouple will work? Explain in detail. 4

**OR**

- (b) With block diagram explain Generalised Measurement System. 4
- (c) Write a short note on Pirani gauge. 3

## SECTION - II

- 4 (a) Answer the following : 10
- (i) What is transducer?
  - (ii) What is least count? What is its value for vernier caliper?
  - (iii) What is the application of planimeter?
  - (iv) Which are the obstruction type flow meters?
  - (v) What is coefficient of discharge?
  - (vi) What is proving ring?
  - (vii) Define gauge factor?
  - (viii) What is the principle of rotameter?
  - (ix) Angular velocity can be measured by \_\_\_\_\_.
  - (x) Name the various strain gauge grid materials.
- (b) Explain pneumatic load cell. 5
- (c) Briefly explain rope brake dynamometer. 5
- 5 (a) Name the different instruments used to measure vibration. 2

- (b) Enlist the flow visualization methods. 2
- (c) Enlist the methods to measure viscosity. 2
- (d) A pitot static tube is used to measure a speed of air plane. If the pressure difference indicated by U-tube differential manometer is equivalent to  $x$  mm of water, establish an equation relating the manometer deflection.  $x$  in mm and the velocity  $v$  in m/sec. 2  
(Take air density =  $1.22 \text{ kg/m}^3$ , water density =  $1000 \text{ kg/m}^3$ )  
If  $x = 100$  mm of water find airplane velocity ( $C_v = 0.98$ ).
- (e) Explain pitot static tube. 5

**OR**

- (e) Explain orsat apparatus. 5
- 6** Attempt any **three** : **15**
- (i) Measurement procedure of resistance strain gauge.
- (ii) Piezoelectric accelerometer
- (iii) pH measurement method.
- (iv) Gas Sampling technique
- (v) Rotameter.