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325652(25)BE (6th Semester)

Examination, April-May, 2018

(New Scheme)

Modern Instrumentation Techniques

Time Allowed : 3 hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Answer all **five** questions. Part (a) is compulsory and carries 2 marks. Answer any **two** from remaining three carrying 7 marks each.

1. (a) Define gross error and random error.
- (b) Derive the expression for ratio error in potential transformer.
- (c) Enlist the testing methods for current transformer. Describe in brief Silsbe's method. csvtuonline.com
- (d) A circuit was tuned for resonance by eight different students and the values of resonant frequency in kHz were recorded as 532, 548, 543, 535, 546, 531, 543 and 536.

Calculate :

- (i) The arithmetic mean
 - (ii) Deviations from mean
 - (iii) The average deviation
 - (iv) The standard deviation
 - (v) Variance
2. (a) Enlist the factors that influence the selection of a transducer.
 - (b) Explain the working of strain gauge and derive the expression for gauge factor.
 - (c) Explain in brief the construction and working of LVDT.
 - (d) Compare performance of various transducers for measurement of temperature.
3. (a) What is a data logger?
 - (b) Describe multichannel analog multiplexed data acquisition system.
 - (c) Describe in brief the working of an R-2R ladder type D/A converter showing current division for a 4-bit converter.
 - (d) Explain in brief the working of a X-Y recorder with the help of suitable block diagram.

4. (a) Draw the block diagram of a PLC.
- (b) Discuss the steps involved in proper construction of PLC ladder diagrams. ✓
- (c) Describe in brief the PLC programming procedure.
- (d) What are the various devices that can be connected to input and output modules of a PLC? Explain in brief.
5. (a) Give two advantages of PLC timer.
- (b) Draw and explain the PLC logic to realize the following digital logic gate operations :
- (i) 4 input AND gate
- (ii) 4 input NOR gate
- (iii) NOT gate
- (c) Make a ladder diagram for the following sequence and explain the steps :
- (i) When SW_1 (switch) is closed CR_1 (Control relay) goes ON
- (ii) After CR_1 goes ON, SW_2 can turn CR_2 ON
- (iii) When CR_2 goes ON, PL_1 (Pilot light) goes off
- (d) Describe in brief the function of each of register types of PLC.