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BIEEE-004

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

December, 2016

00043

BIEEE-004 : MECHATRONICS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) Describe the components of a continuous sensing system with a neat block diagram.

(b) What are the main advantages of a capacitive proximity switch over the inductive proximity switch ? *5+5*

2. (a) What are the two types of data transfer techniques used in computer interfacing ? List out the main differences between them.

(b) Describe and compare the characteristics of proportional integral derivative control system. *5+5*

3. (a) Explain the principle of operation of an Ultrasonic Range Sensor with the help of a neat diagram.

(b) Explain the working of any transducer. *5+5*

4. (a) Discuss the measure features of mechatronics systems with the help of a typical example.

(b) Write down the important guidelines for the selection of a sensor. *5+5*

5. (a) Explain the process control system with the help of a block diagram.

(b) Why is feedback used in a process control system ? Describe the difference between open-loop and closed-loop control systems. *5+5*

6. (a) With a neat diagram, explain Programmable Logic Controller (PLC).

(b) A differential amplifier is to have a voltage gain of 100. What will be the feedback resistance, if the input resistances are both 1 kΩ ? *5+5*

7. (a) Describe various types of cams.

(b) Write about the mechatronics approach in a microprocessor controlled washing machine. *5+5*

8. An integral controller has a set point of 50% and a value of K_1 of 0·10/sec. The error starts at zero and changes at 4% per second for 2 seconds before becoming constant for 3 seconds. What will be the output after times of (a) 1 second, and (b) 3 seconds ? *10*

9. Write short notes on any ***two*** of the following : *2×5=10*

(a) Industrial Robot

(b) Computer Printer

(c) Timer

(d) Automatic Engine Control