

**B.Tech. – VIEP – ELECTRICAL ENGINEERING
(BTELVI)****Term-End Examination****December, 2015****BIEE-019 : ELECTRICAL INSTRUMENTATION***Time : 3 hours**Maximum Marks : 70*

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

1. Discuss in detail any *two* of the following : 10
 - (a) Synchro Error Detector
 - (b) Ideal Operational Amplifier
 - (c) Active Band Pass Filter
 - (d) Binary Weighted Resistance D/A Converter
 - (e) Current Telemetry System

2. What is a transducer ? Discuss the factors influencing the choice of transducers. 10

3. (a) Classify the potentiometers used in electrical measurement. 5

- (b) A control potentiometer is rated as follows :
Resistance = 150Ω , power rating = 1 W.
Derate the potentiometer by $10 \text{ mW}/^\circ\text{C}$
above 65°C . Thermal resistance = $30^\circ\text{C}/\text{W}$.
Can this potentiometer be used with a 10 V
supply at 80°C ambient temperature ? 5
4. (a) Define a thermistor and also write the
applications of thermistors. 5
- (b) Draw the schematic diagram of a
thermocouple with bridge type
compensation. Explain in brief. 5
5. (a) Explain the working principle of an LVDT
with the help of circuit diagrams. 5
- (b) The output of an LVDT is connected to a
5 V voltmeter through an amplifier whose
amplification factor is 250. An output of
2 mV appears across the terminals of the
LVDT when the the core moves through a
distance of 0.5 mm. Calculate the
sensitivity of the LVDT and that of the
whole set-up. 5
6. Explain the role of transmission channels and
media in a telemetry system in detail. 10

7. Enumerate the comparative analysis of microsensors, smart sensors and smart transmitters. 10
 8. Explain the working principle of an X-Y recorder with the help of a schematic diagram. 10
 9. What are the elements of process control system ? Explain its characteristics. 10
 10. Draw the schematic diagram of a pneumatic controller and explain its working principle. 10
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