

Code :RR320204

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III B.Tech II Semester(RR) Supplementary Examinations, April/May 2011

INSTRUMENTATION
(Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

1. Draw the block diagram of the measuring system and explain the each stage with their functions.
2. Describe the types of test signals by which physical system are studied and analyzed for their dynamic behavior.
3. (a) Why are the operating voltages of a cathode ray tube arranged so that the deflection plates are nearly ground potential?
(b) What is the velocity of electrons that have been accelerated through a potential of 2000v?
4. (a) With a neat block diagram explain the potentiometric type digital voltmeter.
(b) The lowest range on a 4 1/2 digit digital voltmeter is 10mv full scale. What is the sensitivity of this meter?
5. (a) Discuss in detail about the principle of operation of a capacitive transducer?
(b) What is the relation between sensitivity and area of plates?
6. Explain in detail about piezo electric transducer.
7. (a) A strain bridge comprises of two fixed resistors each of value 120 ohms one active gauge and an unstrained temperature compensation gauge. The two gauges are of unstrained resistance 120 ohms and gauge factor 2.2 Find the bridge output voltage for a supply voltage of 3V when the active gauge is subjected to 600 micro strain.
(b) A single strain gauge having resistance of 120Ω is mounted on a steel cantilever beam at a distance of 0.15m from the free end. An unknown force F applied to the free end produces a deflection of 12.7 mm of the free end. The change in gauge resistance is found to be 0.152Ω . The beam is 0.25m long with a width of 20 mm and a depth of 3mm. The young's modulus for steel is $200\text{GN}/\text{M}^2$. Calculate the gauge factor?
8. What is the principle of ultrasonic flow meter? Explain the operation of ultrasonic flow meter with neat sketch.
