

L 1171

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Fourth Semester

Textile Technology

TT 1252 — ELECTRONICS AND INSTRUMENTATION

(Common to Textile Technology (Textile Chemistry))

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Explain the terms intrinsic and extrinsic semiconductor.
2. What are the units of sensitivities of LVDT, thermocouple, strain gauge and potentiometer?
3. Explain the electrical characteristics of operational amplifier.
4. What is meant by 'holding current' in SCR?
5. Brief the principle used for humidity measurement in textile industry.
6. Illustrate the opto-electronic method of angular measurement.
7. What are active filters? Where are they used?
8. Mention the principle and various applications of dielectric heating process.
9. Differentiate between open loop and closed loop control with example.
10. Define volatile and non-volatile memory. Give example.

PART B — (5 × 16 = 80 marks)

11. (i) Define 'unidirectional' and 'bidirectional' as they apply to thyristors. (4)
- (ii) Describe the operation of SCR. Draw its switching Input-Output waveforms. (8)
- (iii) List advantages and disadvantages of triac as compared to SCR. (4)
12. (a) (i) Mention the various standards in measurement. (4)
- (ii) With neat sketches explain the principle of proximity sensors. How is it used in Textile Industry process?

Or

- (b) (i) Discuss various storage devices and its application. (6)
- (ii) Describe in detail the working principle of CRO. (10)
13. (a) (i) What are the properties of strain gauges? (3)
- (ii) Derive an expression for gauge factor of a strain gauge. (10)
- (iii) How is temperature compensated in strain measurement? (3)

Or

- (b) Write in detail the functions of :
- (i) Spectro-photometry
- (ii) Calorimetry
- (iii) Gas chromatography and
- (iv) Anemometers. (4 × 4 = 16)
14. (a) (i) What is meant by impedance matching? (4)
- (ii) Draw the circuit diagram of a wheatstone bridge and explain. (9)
- (iii) How is loading error minimised? (3)

Or

- (i) What are the properties of capacitive sensors? (4)
- (ii) Explain how capacitive sensor can be used for differential pressure measurement. (6)
- (iii) Describe how an inductive pick up used for speed measurement of spindle motors. (6)
- (a) (i) Draw RS flipflop using NAND gates and explain. (6)
- (ii) Show the block diagram, working and waveforms of a down counter with a capacity of 16 counts. (10)

Or

- (b) (i) Describe the principle of semiconductor diode. (4)
- (ii) What type of feedback employed in amplifiers and why? (3)
- (iii) For the circuit shown, prove that $l_0 = (l_1 + l_2) - (l_3 + l_4)$. (9)

