17563

16172

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **20**

a) Define active component and passive components. Write one example of active and passive component.

b) Compare intrinsic and extrinsic semiconductor on the basis of

(i) Defination

(ii) materials

(iii) purity

(iv) conductivity

c) Explain the principle of displacemet measurement using LVDT with diagram.

d) Define transducer. What is actuator and signal conditioning? Write one example of sensor and actuator.

Marks

e) List the classification of control system. Draw the block diagram of open loop and closed loop control system.

f) Convert the following:

(i) $(47)_{10}$ into binary number

(ii) $(10010101)_2$ into decimal number

g) Compare RAM and ROM (four points)

2. Attempt any <u>TWO</u> of the following: **16**

a) Explain the Yarn-Evenness Tester using block diagram.

b) Draw the architecture diagram of 8051 and write any four features of 8051.

c) What is operational amplifier? Draw the pin-out diagram of 741. Draw the block diagram of OPAMP and write the function of each block.

3. Attempt any <u>FOUR</u> of the following: **16**

a) Draw the V.I. characteristics of diode. What is forward bias and reverse bias w.r.t. diode.

b) List the different temperature sensors. Explain the working of any one.

c) Write the colour code for the resistor of value:

(i) 810 Ω

(ii) 27 K Ω

d) Draw the symbol of AND gate and D-flip-flop. Write one uses of gates and flip-flop.

e) Compare open loop and closed loop control system.

f) Draw the symbol of NPN and PNP transistor. Draw the characteristics of transistor showing the different operating regions.

Marks

4. Attempt any FOUR of the following: **16**

a) What is flip-flop? Write the truth table of J-K and D-flip-flop.

b) Explain the application of transistor as a switch.

c) List the different pressure sensors. Explain the working principle of any one with neat diagram.

d) List the sensors and devices used in blow room. Write the working of any one.

e) State types of Inductors. State specification of Inductor. (Any four)

f) Explain the working of automatic textile control system.

5. Attempt any FOUR of the following: **16**

a) Draw the circuit diagram of full-wave rectifier. Write one application of :

(i) Rectifier

(ii) Differential amplifier

b) What is PLC? Draw its block diagram.

c) Draw the symbol of:

(i) LED

(ii) Photodiode

Explain the working principle of optocoupler.

d) Compare conductor and semiconductor. (any four points)

e) Explain the working of automatic weft straighting with diagram.

f) Explain the working of card autoleveller.

Marks

6. Attempt any FOUR of the following: **16**

a) Explain the working principle of strain gauge and how it is used for weight measurement.

b) With neat diagram, explain the working of any one actuator.

c) Draw the circuit of up-counter. Write its truth table. What is the meaning of asynchronous counter?

d) Draw the circuit diagram of inverting amplifier using Op-amp. Compare inverting amplifier and noninverting amplifier using Op-amp (any two points)

e) What is the need of data converter? List its types.

f) State different types of capacitors. List any four specifications of capacitors.