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.

Marks

1. (A) Attempt any THREE of the following : **3 × 4 = 12**

(i) Define the term magnetic flux and magnetic flux density. State their units.

(ii) Draw construction diagram of DC motor. State function of any four parts.

(iii) Describe function of wiring harness and cable connectors with diagram.

(iv) Compare between intrinsic and extrinsic semiconductor.

(B) Attempt any ONE of the following : **1 × 6 = 6**

(i) Two resistances of 8 Ω and 24 Ω respectively are connected in parallel. Another resistance of 10 Ω is connected in series with the combination. Calculate respective voltages which should be applied across the whole circuit :

(1) To pass 6 A current through 10 Ω resistance.

(2) To pass 6 A current through 24 Ω resistance.

(ii) Draw the graphic symbol for following :

(1) Ground

(2) Switch

(3) Capacitor

(4) Battery

(5) Induction coil

(6) Ammeter

2. Attempt any FOUR of the following : **4 × 4 = 16**

(i) Compare between insulator and conductor.

(ii) Draw the wiring diagram of Horn and Stop light.

(iii) With the help of diagram, explain working of shaded pole single phase AC motor.

(iv) Draw symbolic representation of SCR. State meaning of following terms related SCR characteristic :

(1) holding current

(2) breakdown voltage

(3) forward current rating.

(v) State the principle of pirani vacuum gauge. Draw a labelled block diagram of pirani gauge.

(vi) Draw symbol of photodiode. Explain its working and write its two applications.

3. Attempt any FOUR of the following : **4 × 4 = 16**

(i) Describe the working of ultrasonic flow meter using neat diagram.

(ii) With the help of a neat diagram, explain working of PNP transistor.

(iii) Draw symbol and truth table of NAND and NOR logic gate.

(iv) Define active, reactive, apparent power and form factor.

(v) Explain the working of stroboscope.

4. (A) Attempt any THREE of the following : **3 × 4 = 12**

(i) Compare between core and shell transformer.

(ii) What are advantages of positive return system over negative return system ?

(iii) Explain the working of piezoelectric transducer. State its application.

(iv) A 200 kVA, 50 Hz, 12000/400 V single phase transformer has low voltage winding turns 25. Calculate (1) Full load current on L.V. side (2) Number of turns of high voltage side.

(B) Attempt any ONE of the following : **1 × 6 = 6**

(i) Draw neat circuit diagram of full wave rectifier. Describe how current flow in both half cycles. Draw input output voltage waveform.

(ii) Explain multiplexer and demultiplexer. Draw schematic of 4:1 multiplexer.

5. Attempt any FOUR of the following : **4 × 4 = 16**

(i) Compare electrical and mechanical instrument.

(ii) Describe working of any one type of stepper motor. State its application.

(iii) Draw V-I characteristic of zener diode and state its applications.

(iv) Draw the wiring diagram of windshield wiper. State how speed is controlled in wiper.

(v) State Fleming Right hand and Left hand rules and their use.

(vi) Define the term gate and flip-flop. Draw symbol of R-S and D Flip-flop.

6. Attempt any FOUR of the following : **4 × 4 = 16**

(i) Describe the working of seven segment LED display.

(ii) Explain working principle of alternator with neat diagram.

(iii) What is mean by doping ? Draw energy band diagram for p-type semiconductor.

(iv) Define accuracy, sensitivity, precision and speed of response.

(v) List the transducers which are used for temperature measurement. Explain working of any one.

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