

17524

21819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Figures to the right indicate full marks.
  - (4) Assume suitable data, if necessary.
  - (5) 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 resistance and conductance also state their units.
- (b) Series combination of  $10\ \Omega$ ,  $20\ \Omega$  and  $30\ \Omega$  are connected across 120 volts DC supply. Find current and voltage across each resistance.
- (c) Explain Fleming right hand rule and left hand rule.
- (d) Define RMS value, Average value, Frequency and Time period of an AC quantity.
- (e) Compare series and parallel circuit.
- (f) Draw the wiring diagram of turn indicator.
- (g) Draw symbols of zener diode, photodiode and mention their two applications.

**2. Attempt any TWO of the following : 16**

- (a) Mention different types of DC motor and explain its working principle with constructional diagram.
- (b) Explain working principle of capacitor split phase induction motor with schematic diagram.
- (c) Mention different types of stepper motors. Explain working principle of any one type with the help of diagram.

**3. Attempt any TWO of the following : 16**

- (a) State Faraday's law of Electromagnetic induction with diagram and equation.
- (b) Compare positive and negative return systems.
- (c) Draw the symbol of NPN and PNP transfer and explain working of any one with neat diagram.

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

- (a) Draw circuit diagram of HWR and full wave bridge rectifier. Compare them.  
(any four points)
- (b) Draw diagram of LVDT and explain its working for displacement measurement.
- (c) Define Accuracy, Precision, Resolution, Repeatability and compare electrical and mechanical instruments. (any four points)

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

- (a) (i) Define and classify transducers.
- (ii) Compare thermistor and RTD. (any four points)
- (b) (i) Draw the block diagram of 4 : 1 multiplexer and explain it.
- (ii) Explain working principle of ultrasonic flow meter.
- (c) (i) Define logic gates and draw the symbol of OR gate, AND gate and NOT gate with their truth tables.
- (ii) Draw the symbol and write truth table for NAND gate and NOR gate.

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

- (a) (i) Compare analog and digital signal. (any four points)
  - (ii) Explain working of seven segment LED display.
  - (b) (i) Draw the symbols of resistor, inductor, capacitor and earthing.
  - (ii) Explain the importance of wiring harness in automotive wiring.
  - (c) (i) Compare forward biasing and reverse biasing of PN junction (diode).  
(Any four points)
  - (ii) Explain working of transistor as an amplifier with neat diagram.
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