



# 17524

16117

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) *All questions are compulsory.*
  - (2) *Illustrate your answers with neat sketches wherever necessary.*
  - (3) *Figures to the right indicate full marks.*
  - (4) *Assume suitable data, if necessary.*
  - (5) *Use of Non-programmable Electronic Pocket Calculator is permissible.*
  - (6) *Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.*

**Marks**

1. A) Attempt **any three** of the following : **12**
- a) Define the following terms with their units E.M.F. ; current ; resistance and potential difference.
  - b) State the various types of stepper motor. Give atleast two applications of stepper motor.
  - c) Explain the purpose of colour code in the electrical circuit of an automobile.
  - d) Define zener diode. Draw symbol and characteristics of zener diode.
- B) Attempt **any one** of the following. **6**
- a) Explain with neat sketch the generation of alternating current and voltage. Draw the graphical representation of generated A.C. EMF.
  - b) What is positive return system and negative return systems ? State the advantages of positive return system over negative return system in automotive wiring.
2. Attempt **any four** of the following : **16**
- a) Compare core type transformer and shell type transformer ? (4 points)
  - b) Explain with schematic diagram the working of resistance split phase single phase induction motor ?

**P.T.O.**



- c) Explain with wiring diagram ; the working of windshield wiper.
- d) Define the terms : Accuracy, precision resolution and reproducibility related to measurement system.
- e) Describe with circuit diagram the working of bridge type full wave rectifier. Draw the wave form of input and output.
- f) Draw the symbols of following Electronic Devices Photodiode ; LED ; PNP transistor and NPN transistor.

**3. Attempt any four of the following :**

**16**

- a) State the Faraday's Laws of electromagnetic induction. Also state the magnetic effect of electric current.
- b) i) State the various types D.C. motor .  
ii) Compare intrinsic semiconductor and extrinsic semiconductor (only two points).
- c) Define the transducers. State at least one transducer for the measurement of speed ; force and flow.
- d) Explain with suitable diagram ; the measurement of temperature with the help of thermistor.
- e) Draw the symbol and write the truth table and logic expression of NAND gate.

**4. A) Attempt any three of the following :**

**12**

- a) A single phase 50Hz transformer has 300 primary turns and 750 secondary turns. The net cross-sectional area of the core is 64 square centimeter. If the primary induced e.m.f. is 440V find
  - i) Maximum flux density in the core.
  - ii) E.M.F. induced in the secondary.
- b) Define the following terms related to A.C. supply.
  - i) R.M.S. value
  - ii) Form factor
  - iii) Active power
  - iv) Reactive power
- c) Draw the wiring diagram of :
  - i) Headlight
  - ii) Turn indicator
- d) Explain with neat diagram the working of LVDT.



B) Attempt **any one** of the following : 6

- a) Describe with neat sketches ; the symbol ; construction and working of SCR. Draw the V-I characteristics of SCR.
- b) Describe the working principle with block/logic diagram of multiplexer (4:1) and demultiplexer (1:4).

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

- a) Draw the connection diagram showing the connection of voltmeter ; Ammeter and wattmeter in A.C. circuit with load.
- b) Why the single phase induction is not self starting motor ? Draw the circuit diagram for capacitor start induction run single phase induction motor.
- c) What is wiring harness ? State its importance.
- d) What is the necessity of filter in rectifier circuit ? State the different types of filters.
- e) Define the following terms related to dynamic characteristics of measuring system.
  - i) Speed of response
  - ii) Lag
  - iii) Fidelity
  - iv) Dynamic error
- f) Describe the working principle with general block diagram of shift register.

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

- a) Describe the operation of P-N junction diode under forward and Reverse biasing condition.
  - b) Define the conductor and insulator. Compare between conductor and insulator.
  - c) Compare the electrical instruments and mechanical instruments (4 points).
  - d) Explain the working of following transducers :
    - i) Piezo electric transducer
    - ii) Potentiometer.
  - e) Describe the RS flipflop and D flipflop with its symbols and truth table.
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