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11718

3 Hours / 100 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each Section on separate answer sheet.
 - (3) Answer each next main Question on a new page.
 - (4) Illustrate your answers with neat sketches wherever necessary.
 - (5) Figures to the right indicate full marks.
 - (6) Assume suitable data, if necessary.
 - (7) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (8) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

SECTION - I

1. Attempt any NINE of the following: 18
- a) Two resistors of 20 ohm and 10 ohm are connected in series to a battery of 50 volt. Calculate
 - (i) Current supplied to the circuit.
 - (ii) Total effective resistance.
 - b) State the principle of electromagnetic induction.
 - c) State any two application of DC motor related to chemical plant.
 - d) State the necessity of starter in DC motor.
 - e) State the working principle of AC motor.

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- f) State two application of three phase induction motor.
- g) State the types of transformer on the basis of construction.
- h) Why transformer core is laminated.
- i) State the principle of circuit breaker.
- j) State the need for earthing.
- k) State the function of fuse?
- l) Define Ohm's law.

2. Attempt any FOUR of the following:

16

- a) Differentiate between single phase and three phase supply.
(four points)
- b) Explain power factor and give its importance.
- c) Explain the working principle of D.C. shunt motor with the help of diagram.
- d) State any four parts and their materials for three phase induction motor.
- e) Describe the speed control of DC series motor with the help of diagram.
- f) Draw construction and describe the working principle of R-split Induction motor.

3. Attempt any FOUR of the following:

16

- a) (i) Two resistance of $15\ \Omega$ and $20\ \Omega$ are connected in parallel across 10 V dc supply. Find current and power supplied by DC source.
- (ii) Two resistance of $10\ \Omega$ and $5\ \Omega$ are connected in series across 10 V dc supply. Find voltage across each resistor and power supplied by DC source.
- b) List different parts and their materials for DC motor.

- c) A 50 kVA, 2200/220 V, 50 Hz single phase transformer, find:
- (i) Primary current
 - (ii) Secondary current
 - (iii) Turns ratio
 - (iv) No. of turns on primary side.
- d) Explain the concept of Autotransformer. Give two advantages, limitations and applications.
- e) Draw the wiring diagram of godown wiring and explain its working.
- f) Explain with diagram construction of mercury vapour lamp. Give its applications.

SECTION - II

4. Attempt any NINE of the following:

18

- a) Define inductor. Give its application.
- b) Draw VI characteristic of PN junction diode.
- c) Differentiate between Intrinsic and Extrinsic semiconductor.
- d) Draw the symbol of two power devices.
- e) List types of BJT and draw their symbols.
- f) State two applications of transistor.
- g) Draw the block diagram of power supply.
- h) State the need for voltage regulator.
- i) Define universal gates and draw their symbols.
- j) Describe negative and positive logic.
- k) State the working principle of LED.
- l) List types of filter.

5. Attempt any FOUR of the following: 16

- a) Draw energy level diagram of conductor and insulator. Give two example each.
- b) Describe the working of TRIAC with help of neat diagram.
- c) Explain working principle and construction of Zener diode. Draw its V-I characteristic.
- d) Explain with diagram transistor characteristic of CE configuration.
- e) Explain the working of full wave rectifier using center tapped transformer with the help of neat ckt diagram and output waveform.
- f) Explain with diagram principle of zener shunt regulator.

6. Attempt any FOUR of the following: 16

- a) Explain with diagram construction and working of PN junction diode.
 - b) Explain the construction and working principle of SCR.
 - c) Explain the concept of power amplifier and list its types.
 - d) Draw symbol and truth table for AND OR and NOT Gates.
 - e) State and prove De-Morgan's first and second theorem.
 - f) Explain types of LCD display with neat diagram.
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