17353

15116
3 Hours / 100 Marks

Seat No.

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) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

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

Marks

SECTION - I

1. **Attempt any SEVEN of the following :** 14

a) Give difference between AC and DC supply. (Any two pts.)

b) List various components of electrical power supply system.

c) Define the terms –

(i) Regulation factor

(ii) Transformer efficiency

d) State the working principle of transformer.

e) Draw the symbols for the following

(i) Two way switch

(ii) Fuse

   f) State the functions of ELCB.

   g) Define slip and write formula to determine percentage slip.

   h) Give the classification of electric drives.

   i) State the principle of electric heating.

   j) What is electroplating ? Write any two applications.

2.   **Attempt any FOUR of the following :**   **12**

   a) Define the following terms.

      (i) Cycle

      (ii) Frequency

      (iii) Time period

   b) Draw a neat labelled diagram of single phase energy meter showing all it's important parts.

   c) Obtain an emf equation of single phase transformer.

   d) What are the different types of tariff ? Suggest suitable fire extinguishing methods adopted in electrical engineering.

   e) State and explain the working principle of three phase induction motor.

   f) State the factors on which the selection of electrical drives depends.

3.   **Attempt any FOUR of the following :**   **12**

   a) For v = 282.8 sin 314t AC supply in the laboratory.

   Determine

      (i) Peak value of voltage

      (ii) Frequency

      (iii) Time period

   b) Draw neat sketch of electrodynamic wattmeters. State its working principle.

   c) Explain working of autotransformer with sketch.

   d) List various methods of energy conservation and audit. Explain any one.

e) Draw neat labelled diagram of star-delta starter for starting 3-phase induction motor.

f) Explain, working principle of electric welding. State different types of welding.

4. **Attempt any FOUR of the following :** **12**

a) Compare star and delta connection of a 3 phase AC supply system.

b) What are the important requirements of an indicating instruments?

c) A 2000/400 V, 20 KVA transformer has 66 turns in the secondary. Calculate -

   (i) primary no. of turns

   (ii) secondary full load current

d) Compare autotransformer with two winding transformer by three pts.

e) Draw simple electrical wiring diagram to control one lamp by two switches.

f) Explain the working of a single phase capacitor start induction run motor.

SECTION - II

5. **Attempt any NINE of the following :** **18**

a) State the function of resistor. Also draw symbol for resistor, inductor and capacitor.

b) Draw energy band diagram for conductors, insulators and semiconductors.

c) Draw symbol for SCR and TRIAC.

d) Write two examples for intrinsic semiconductors.

e) Draw symbol for NPN and PNP transistors.

f) State any two applications of transistors.

g) Define - Rectifier. List different types of rectifier.

Marks

h) State the need of power supply. List different types of regulated power supply.

i) What is meant by filter ? State different types of filter.

j) Write any four boolean algebra laws.

k) Describe the term - positive and negative logic.

l) Draw symbol and write truth table for Ex-OR gate.

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

a) With neat construction, explain working principle of SCR.

b) Draw and explain forward and reverse V-I characteristic of PN-junction diode.

c) Draw circuit diagram of single stage CE amplifier. Explain, the function of each component.

d) Draw labelled block diagram of power supply. Show the waveform at the each stage.

e) With neat diagram and waveform, explain working of LC-filter.

f) State and prove Demorgan's theorem.

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

a) With neat construction, explain working principle of zener diode.

b) What impurities are added in P and N-type semiconductors ? Draw representation for P-type and N-type semiconductors.

c) State any four applications of TRIAC.

d) Explain, working of a NPN transistor with diagram.

e) Explain, how zener diode can be used as shunt regulator.

f) Using NAND gates only, obtain AND, OR, NOR and Ex-OR gates.

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