17424

14115

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.

(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 NINE of the following: **18**

a) State Ohm's Law.

b) Differentiate between core type and shell type transformer. (any two points)'

c) Two resistors of 30 ohm and 5 ohm are connected in series to a battery of 70 volt.
Calculate:

(i) total effective resistance

(ii) current supplied to the circuit.

Marks

d) A transformer does not operate on a d.c. supply. State reason.

e) List the various parts of dc machine.

f) State the necessity of the earthing.

g) Write two application of three phase induction motor.

h) State the function of fuse. Name the material used for fuse wire.

i) Write working principle of dc motor.

j) A 6 pole 3-phase induction motor operates from a supply whose frequency is 50Hz. Calculate synchronous speed of the motor.

k) Write two safety precautions to be taken while handling an electrical equipments.

l) A 200 kVA, 3300 / 240V, 50 Hz single phase transformer has 80 turns on secondary winding find maximum value of flux.

2. Attempt any <u>FOUR</u> of the following: **16**

a) Explain with a neat diagram, the construction of sodium vapour lamp.

b) Write four point of comparison between single phase supply system and three phase supply system.

c) A single phase transformer of 50 Hz has maximum flux in the core as 0.021 Wb, the no. of turns in primary being 460 and that on secondary is 52.
Calculate emf induced in primary and secondary winding of a transformer.

d) Draw different types of dc motors with circuit diagram and give one industrial application of each type.

Marks

e) Compare squirrel cage and slip ring type three phase induction motor on the basis of

(i) Starting torque.

(ii) Efficiency

(iii) Rotor construction

(iv) Application

f) Draw wiring diagram of godown wiring and explain the working.

3. Attempt any <u>FOUR</u> of the following: **16**

a) What is the importance of improvement in power factor? State any two methods for power factor improvement.

b) Draw and explain different types of wire.

c) With connection diagram, explain working principle of capacitor start capacitor run single phase induction motor.

d) Draw neat constructional sketch of auto transformer. State its two merits.

e) State the necessity of starter for dc motor. Also give two applications of dc series motor and dc shunt motor.

f) A furnace takes a current of 10 Amp from a 220 V, dc supply for 8 hours. Calculate the energy consumed in KWh.

Marks

SECTION - II

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

a) Draw the symbol of resistor and inductor.

b) State the applications of transistor. (any two)

c) What is the need of rectifier?

d) Why NAND and NOR gate are called universal gates?

e) Draw the symbol of AND gate and OR gate.

f) Draw the symbol of NPN and PNP transistor.

g) Draw the symbol of zener diode and LED.

h) Define Intrinsic and Extrinsic semiconductor.

i) Draw VI characteristics of zener diode.

j) Draw the symbol of SCR and TRIAC.

k) List any two applications of TRIAC.

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

a) Draw construction and explain working of PN junction diode in forward bias.

b) Define:

(i) Conductor

(ii) Semiconductor

(iii) Insulator

c) Draw and explain working of a NPN transistor.

d) Draw circuit diagram of single stage CE amplifier and state function of each component.

e) Draw the block diagram of regulated power supply and state function of each block in brief.

f) Describe De-morgan's theorems.

Marks

6. Attempt any <u>FOUR</u> of the following: **16**

a) Describe the working of SCR with the help of a neat sketch. Also state its two applications.

b) Describe the working of LED with the help of a neat sketch.

c) What is filter? State need of filter. List the types of filters.

d) Draw circuit diagram of half wave rectifier explain working with their input and output waveforms.

e) Draw basic gates using NAND gate.

f) Draw symbol of NOT gate and EX-OR gate with their truth table.

———