17329

11819

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : *(1)* ***All*** *questions are* ***compulsory****.*

(2) Answer ***each*** *Section on* ***separate*** *answer sheet.*

(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) Define power and energy with their units.

b) Draw a 3-phase delta connected supply system.

c) State the relationship between

i) Line current and phase current

ii) Line voltage and phase voltage for 3-phase star connection.

d) Write the working principle of transformer.

e) Define the following terms for 3-phase I.M.

i) Slip

ii) Synchronous speed.

f) Write classification of drives with example.

g) What is the function of MCCB and fuse ?

P.T.O.

Marks

h) State applications of any four safety tools used in electrical workshop.

i) Write specification and rating of 3-phase autotransformer.

j) Define the following terms related to AC fundamentals.

i) Phase

ii) RMS value.

k) Write down the equation to find out the active power in 3-phase system. State the meaning of each term.

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

a) Explain the concept of voltage and current. Write its unit.

b) Three resistors of 50 ohm are connected in delta across a 400 volt, 3-phase, 50 Hz A.C. supply. Calculate the line current, phase current, line voltage and phase voltage.

c) Derive the EMF equation of a single phase transformer.

d) Draw the torque-speed characteristics of 3-phase I.M. and explain the nature.

e) Draw neat constructional sketch of single phase autotransformer. State its two applications.

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

a) Why earthing is essential in electrical installation ? State types of earthing.

b) Explain star-delta starter for 3-phase induction motor with diagram.

c) Define the terms :

i) Transformation ratio

ii) Current ratio

iii) Voltage ratio

iv) Turns ratio.

d) List the enclosures and mountings used for electrical drives.

e) State any four safety precautions to be taken while handling an electrical equipments.

f) Explain construction and working principle of sodium vapour lamp.

Marks

SECTION – II

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

a) Define insulator and conductor with two examples of each.

b) Draw the symbol of zener diode and state its two applications.

c) Define filter and rectifier.

d) List four applications of amplifier.

e) State the universal gates with its symbol.

f) Convert $(0.8)_{10}$ to equivalent binary.

g) Draw symbols of NPN and PNP transistors.

h) State two ideal characteristics of operational amplifier.

i) State the working principle of photo diode.

j) Draw the labelled symbol of OP-AMP.

k) Convert $(11100)_2$ to equivalent decimal.

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

a) Explain construction and working of PN junction diode. Also draw symbol of PN junction diode.

b) Draw and explain zener diode as a voltage regulator.

c) With the help of a neat diagram explain the working and characteristics of photo transistor.

d) Draw and explain non-inverting configuration of an OP-AMP.

e) Draw circuit diagram of two stage RC coupled amplifier.

f) Draw the logic symbol and construct the truth table for each of the following :

i) Two input OR gate

ii) Three input AND gate.

Marks

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

a) Draw and explain block diagram of regulated power supply.

b) Explain Hartley oscillator with diagram.

c) Explain OP-AMP as subtractor.

d) Draw and explain circuit diagram of single stage CE amplifier.

e) Explain bridge fullwave rectifier with circuit diagram and waveform.

f) Draw logic symbol and truth table of following gate :

i) NAND

ii) XNOR.