17329

15162

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 the following terms related to A.C. fundamental.
   i) Frequency ii) RMS value.
b) For delta connected load, state numerical relationship between,
   i) Line current and phase current
   ii) Line voltage and phase voltage.
c) State working principle of transformer.
d) Define energy and power. State its unit.
e) Draw a 3-phase star connected supply system.
f) State the working principle of A.C. motor.
g) State the functions of ELCB and MCCB.
h) List applications of autotransformer.
i) Name different types of safety tools.
j) State emf equation of single phase transformer. Write the meaning of each term.
k) Write the classification of drives.

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

a) State and explain the factors to be considered for the selection of electrical drives.
b) Explain the concept of voltage and current with their units.
c) Three resistances of 25 ohm each are connected in delta across a 3-phase 400 volt a.c. supply. Draw the circuit. Find phase current, line voltage and phase voltage.
d) Define the following terms :
   i) Transformation ratio ii) Voltage ratio
   iii) Current ratio iv) Turns ratio.
e) Explain safety precautions to be taken to avoid electrical shocks.
f) Explain construction and working principle of universal motor.

P.T.O.

Marks

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

a) Draw a speed-torque characteristics of 3-phase induction motor and explain the nature of the same characterize.

b) Draw a neat diagram of sodium vapour lamp, label the parts. Also state how it emits the light.

c) Define earthing. State the necessity of earthing of an electrical motors and appliances.

d) Explain the construction of 3-phase autotransformer with diagram.

e) With neat sketch explain Direct ON line starter for 3-phase Induction motor.

f) Explain the functions of enclosures and mountings used for electrical drives.

SECTION – II

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

a) Define insulator and semiconductor with example.

b) Draw the symbols of

i) Photodiode ii) Zener diode

iii) UJT iv) PN junction diode.

c) What is rectifier ? What are its types ?

d) Draw the labelled symbol of OP-AMP.

e) Define filter. State the function of filter.

f) Draw the symbol of PNP and NPN transistor and state one application of transistor.

g) Draw the energy band diagram for conductor and semiconductor.

h) Draw the circuit diagram of single stage CB amplifier.

i) Name the universal gates. Draw their symbol.

j) List two ideal characteristics of operational amplifier.

k) Convert $(100)_{10}$ to binary.

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

a) Explain bridge type full wave rectifier with circuit diagram and waveform nature.

b) Draw the circuit of two stage RC coupled amplifier.

c) Convert $(500.21)_{10}$ to its equivalent binary.

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

e) With the help of a neat diagram, explain the working and characteristics of LED.

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

i) AND gate ii) NOT gate.

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

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

b) Draw circuit diagram of phase shift oscillator and list its two applications.

c) Draw the symbol and truth table for following gate :

i) XOR ii) XNOR.

d) Describe the working of Hartley oscillator with circuit diagram.

e) Explain zener diode as a voltage regulator.

f) Explain OP-AMP as subtractor.