17404

11819

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

Instructions : *(1)* ***All*** *questions are* ***compulsory****.*
(2) Illustrate your answers with neat sketches ***wherever*** *necessary.*
(3) Figures to the ***right*** *indicate* ***full*** *marks.*
(4) Assume suitable data, if ***necessary****.*
(5) Use of Non-programmable Electronic Pocket Calculator is ***permissible****.*
(6) Mobile Phone, Pager and any other Electronic Communication devices are ***not*** *permissible in Examination Hall.*

Marks

1. Attempt **any ten** of the following : **20**

a) Define :
   i) Average value
   ii) RMS value of an AC Wave.

b) Give two differences between MI and PMMC instrument.

c) State the principle of wattmeter.

d) Draw schematic diagram of DC compound long shunt motor.

e) List the losses occurred in transformer.

f) State the working principle of transformer.

g) Write four applications of servomotor.

h) Draw the symbols of following :
   i) Fuse
   ii) Earthing.

i) State the function of any two safety tools used in electrical workshop.

j) State any four advantages of three phase induction motor.

k) Classify single phase induction motors.

l) What are the factors to be considered while selection of motors for different drives ?

P.T.O.

Marks

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

a) Draw the single line diagram of electrical power supply system and show its different stages.

b) Define the terms related to a.c. supply with waveform :

i) Instantaneous value

ii) Time period

iii) Amplitude

iv) Phase difference.

c) A capacitor having a capacitance of 20 microfarad is connected in series with a non-inductive resistance of 120 ohm across 100V, 50 Hz supply. Calculate

i) Current

ii) Impedance

iii) Phase difference

iv) Power.

d) Compare star connected load with delta connected load.

e) A balanced star connected load is supplied from 400 V, 3ϕ, 50 Hz supply, the resistance per phase is 20Ω.

Calculate :

i) line voltage

ii) phase voltage

iii) line current

iv) power consumed.

f) Draw the construction diagram of clip on meter and state its principle.

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

a) State the function of following parts of DC motor :

i) Yoke

ii) Poles

iii) Field winding

iv) Commutator.

Marks

b) Explain efficiency of transformer. What is full load and half load efficiency ?

c) Explain construction and working of auto transformer.

d) Compare AC and DC supply (four points)

e) Draw circuit diagram, waveform, phasor diagram and comment on the phase relationship between voltage and current in RL series circuit.

f) A single phase, 50 Hz, 230/115 volts draw a primary current of 4 amperes at full load. Find

i) KVA rating of transformer

ii) Secondary full load current.

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

a) Derive the emf equation of transformer.

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

c) Compare variable reluctance and permanent magnet motors.

d) With the help of neat diagram, explain the concept and principle used in electroplating.

e) Explain the construction of alternator with neat diagram.

f) A 6 pole, 3 phase induction motor operates from a supply whose frequency is 50 Hz.

Calculate :

i) Synchronous speed of the motor

ii) The speed of the rotor when the slip is 0.04.

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

a) State the starters used in case of 3 phase induction motor and explain any one of them.

b) Compare squirrel cage and slip ring rotor on the basis of

i) Rotor construction

ii) Starting torque

iii) Efficiency

iv) Applications.

c) State the meaning of electric drive. Give classification of electric drive.

d) Explain in brief the working of universal motor and state its application.

e) Enlist any four advantages of induction heating.

f) Explain dielectric heating with suitable diagram.

Marks

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

a) Enlist any four types of enclosures with their applications.

b) Write short notes on fire extinguishing methods adopted in electrical engineering.

c) Why earthing is essential in electrical installation ? Explain any one type of earthing.

d) Draw the wiring diagram of fluorescent tube. Explain the working of choke and starter.

e) Describe with a neat diagram, the process of any one type of electric welding.

f) State the function of :

i) MCCB

ii) ELCB

iii) MCB

iv) Switch.
