22208

21718

3 Hours / 70 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****.*

Marks

SECTION – I

1. Attempt **any six** of the following : **12**

a) Define reluctance and flux density.

b) Define form factor and peak factor.

c) The frequency of an a.c. supply is 60 Hz. Calculate the angular frequency of it.

d) Define transformation ratio of a transformer.

e) Write the voltage and current equations when a.c. suply is connected across a resistor.

f) State the working principle of single phase transformer.

g) State different types of single phase induction motors.

h) Convert the following into polar form

i) $4 + j5$ ii) $3 - j6$

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

a) State and explain Faradays laws of electro magnetic induction.

b) Draw a 3 phase balanced star connected load and indicate V_L, V_{ph}, I_L and I_{ph} on it. Write the relation between

i) line voltage and phase voltage

ii) line current and phase current.

c) Compare auto transformer and two winding transformer on the basis of

i) no. of windings ii) efficiency

iii) electrical isolation iv) applications

d) Explain the operation of split phase induction motor with neat diagram.

P.T.O.

Marks

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

a) A resistance of 100 Ω and inductance of 0.5 H are connected in series across a 230 V, 50 Hz ac supply. Calculate

i) Angular frequency
ii) Inductive reactance
iii) Impedance
iv) Current
v) Power factor
vi) Power consumed

b) Explain statically induced EMF and dynamically induced EMF with neat diagram and examples.

c) Define transformer and derive EMF equation of transformer.

SECTION – II

4. Attempt **any five** of the following : **10**

a) State the difference between active and passive components.

b) Define efficiency and PIV.

c) List different types of resistors and capacitors.

d) Draw the symbols of PNP and NPN transistor.

e) Draw the symbol of ideal voltage source and practical current source.

f) Write the applications of BJT.

5. Attempt **any three** of the following : **12**

a) Find the value of resistor from the given color code.

i) Blue, red, orange, silver
ii) Orange, Orange, Brown, Gold.

b) Explain zener diode as voltage regulator.

c) Compare CE, CB and CC configurations.

d) Draw the circuit, input and O/P waveforms of full wave rectifier (centre tap) with π filter.

e) Draw sinusoidal signal with its time and freq.domain representation.

6. Attempt **any two** of the following : **12**

a) Explain transistor as a switch and amplifier.

b) i) Differentiate between analog and digital ICs.
ii) Draw the output characteristics of CE configuration and label various regions on it.

c) Explain the operation of a full wave bridge rectifier with capacitor filter. Draw input and output waveforms.