

17318

11920

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) Give any two difference between AC and D.C. quantity.
 - b) Define time period and frequency.
 - c) Define crest factor and form factor, state its value.
 - d) State the meaning of impedance and impedance triangle.
 - e) Define the phase sequence in 3 phase A.C. supply.
 - f) State what is meant by 3-phase balanced load.
 - g) State any two advantages of 3ϕ system over a 1ϕ system.
 - h) State Faraday's laws of electromagnetic induction.
 - i) State principle of transformer.
 - j) Why thin stamping are used in the core of transformer.
 - k) Define slip of Induction motor.

P.T.O.

- l) How direction of rotation of 3ϕ induction motor can be reversed?
- m) State types of single phase induction motor.
- n) State the types of earthing.

2. Attempt any FOUR of the following: 16

- a) Write four advantages of 'AC' over 'DC' supply.
- b) Explain the process of generation of A.C. by elementary alternator.
- c) For R–C circuit Draw circuit diagram, write voltage and current equations, vector diagram. Draw impedance triangle
- d) With suitable example state equation and sketch vector diagram of R–L–C series, circuit for $X_L > X_C$.
- e) Compare star and delta connected system.
- f) State relation between line current and phase current of star and delta connected system.

3. Attempt any FOUR of the following: 16

- a) What are different ways of interconnection of phases in 3ϕ system? Why it is required?
- b) An alternating current is given by $i = 70.7 \sin 320 t$, calculate its frequency, RMS value of current, average value of current.
- c) Explain R–L series circuit in detail.
- d) What are different types of power? Explain.
- e) State and explain Fleming's right hand rule.
- f) Compare core type and shell type transformer.

- 4. Attempt any FOUR of the following:** **16**
- a) What is KVA rating of transformer? Why transformer rating is in KVA?
 - b) What are different types of losses in a single phase transformer? Explain.
 - c) Explain in detail autotransformer.
 - d) Explain in detail pure capacitive circuit.
 - e) A 100 KVA, 1ϕ transformer has a full load cu loss of 3 kW and iron loss of 2 kW. Find efficiency of transformer at half and full load with unity power factor.
 - f) Explain the phenomenon of resonance in R–L–C series circuit.
- 5. Attempt any FOUR of the following:** **16**
- a) Explain working principle of 3ϕ induction motor.
 - b) Draw and explain torque speed characteristics of 3-phase induction motor.
 - c) Explain V/F speed control method of 3ϕ induction motor.
 - d) Explain in detail A.C. servomotors.
 - e) Explain working of universal motor.
 - f) Explain working of split phase single phase induction motor.
- 6. Attempt any FOUR of the following:** **16**
- a) Write safety precautions while working with electrical system.
 - b) Draw neat sketch and explain working principle of shaded pole 1ϕ induction motor.
 - c) Explain necessity of starter in 3ϕ induction motor.
 - d) Compare 3ϕ squirrel cage induction motor with slip ring induction motor.
 - e) Draw and explain capacitor start and run induction motor.
 - f) Explain in detail any one plate or pipe earthing.
-