



17404

16172

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) *All questions are compulsory.*
 - (2) *Answer each next main question on a new page.*
 - (3) *Illustrate your answers with neat sketches wherever necessary.*
 - (4) *Figures to the right indicate full marks.*
 - (5) *Assume suitable data, if necessary.*
 - (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 the difference between AC and DC supply (any two).
- b) Define:
 - i) Frequency
 - ii) Form factor.
- c) Draw connection diagram for ammeter and voltmeter.
- d) Give different ratings of energy meter.
- e) State any two parts of D.C. motor along with function.
- f) Define KVA rating of transformer.
- g) State any two important applications of autotransformer.
- h) List the applications of universal motor (any four).
 - i) How the direction of rotation of 3 phase induction motor is reversed ?
- j) State two limitations of individual drive.
- k) Name any two electrical machines used in electro-agro system.
- l) Compare MCB and kit kat fuse on basis of (1) operation (2) cost.

P.T.O.



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

16

- a) Compare two winding transformer with autotransformer.
- b) Describe the construction of rotating field type alternator with neat sketch.
- c) A 50 Hz, 4 pole, 3-phase induction motor runs at 1450 rpm at full load. Calculate :
 - i) Synchronous speed
 - ii) Full load slip of motor.
- d) Explain the factors for the selection of motor for different drives.
- e) State the principle of dielectric heating. State its any four applications.
- f) Why earthing is essential in electric installation ? State its different types.

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

16

- a) Current flowing through the circuit is $I = 141.4 \sin\left(314t - \frac{\pi}{2}\right)$ Amp.

Calculate :

- i) Frequency
 - ii) Rms value
 - iii) Phase difference
 - iv) Amplitude.
- b) Derive EMF equation of transformer.
 - c) With diagram, explain the speed control of induction motor by VFD method.
 - d) Draw and explain capacitor start and run single phase induction motor.
 - e) List four types of electric motor enclosures and state advantage of each.
 - f) Explain in short different fire extinguishing methods.

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

16

- a) Draw delta connected load. State the relationship between line and phase values for the same.
- b) Explain construction and working of transformer.



- c) Explain shaded pole induction motor with sketch.
- d) Describe working of AC servo motor with sketch. State its two applications.
- e) What is electroplating ? Give its two applications.
- f) Explain how energy conservation is done in homes and industry.

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

16

- a) Calculate voltage across individual element for the circuit shown in Figure 5 (a).

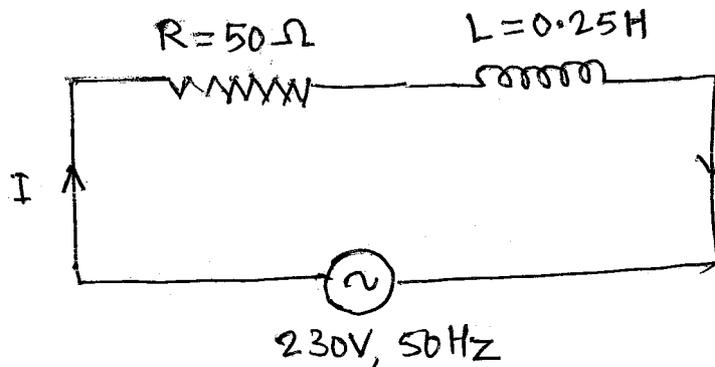


Figure 5 (a)

- b) Draw single line diagram of electrical power system and show different stages.
- c) Explain direct loading test on single phase transformer with neat circuit diagram.
- d) Why starters are required ? Draw neat sketch of DOL starter.
- e) Explain with sketch, direct resistance heating.
- f) Draw neat wiring diagram of control 2 lamps, 2 fans and 1 socket.

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

16

- a) Explain for series R.C. circuit.
 - i) Circuit diagram
 - ii) Voltage equation
 - iii) Current equation
 - iv) Power

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[4]



Marks

- b) State the advantages of polyphase (3-phase) system over single phase system (any four).
 - c) Explain with neat diagram working of dynamometer type wattmeter.
 - d) Draw speed-torque characteristics of DC shunt and series motors and explain in brief.
 - e) Give any two applications of
 - i) Stepper motor and
 - ii) Servo motor.
 - f) Explain carbon arc welding with neat diagram.
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