



17329

21415

3 Hours/100 Marks

Seat No.

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- Instructions :**
- (1) **All** questions are **compulsory**.
 - (2) Answer **each** Section on **separate** answer sheet.
 - (3) Answer **each** next main question on a **new** page.
 - (4) Illustrate your answers with neat sketches **wherever** necessary.
 - (5) Figures to the **right** indicate **full** marks.
 - (6) Assume suitable data, if **necessary**.
 - (7) Use of Non-programmable Electronic Pocket Calculator is **permissible**.
 - (8) Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.
 - (9) Use of Steam tables, logarithmic, Mollier's chart is **permitted**.

MARKS

SECTION – I

1. Solve **any seven** :

(7×2=14)

- a) Classify transformers on the basis of
 - i) Construction
 - ii) Voltage
- b) Define :
 - i) Voltage ratio
 - ii) Current ratio
- c) Define voltage regulation of a transformer. State its ideal value.
- d) Define synchronous speed of a three phase induction motor. State its unit.
- e) Define slip of an induction motor. Write the formula to determine percentage slip.
- f) How can the direction of rotation of 3 phase induction motor be reversed ?
- g) State the function of fuse.
- h) State two advantages of MCCB.
 - i) State two types of earthing systems.
 - j) State two types of tariffs.

P.T.O.

**MARKS**

2. a) Attempt the following : **4**
- Define :
- i) Frequency
 - ii) Phase
 - iii) Maximum value of an alternating quantity
- b) Attempt **any four** of the following : **16**
- a) Explain why a transformer is always rated in KVA.
 - b) Draw circuit diagram of direct on line starter.
 - c) State the factors governing selection of an electric drive for particular service.
 - d) State three different safety tools used in electrical circuit. Explain the function of each.
 - e) Define RMS value of an alternating quantity. Explain its practical significance.
 - f) Draw star connected circuit. State the relation between line and phase values of voltages and currents in it.
 - g) Define autotransformer. State the different types of autotransformer on the basis of voltage level.
3. Attempt **any four** of the following : **16**
- a) State applications of sodium vapour lamps.
 - b) State the first aid measures to be given to a person who has received electric shock.
 - c) Define electric power and electric energy. State their units.
 - d) Three resistances of 25 ohms each are connected in delta across a three phase, 400 V a.c. supply. Find phase current, line current and power consumed.
 - e) Briefly explain the speed control of 3 phase I.M. by variable frequency drive with the help of block diagram.
 - f) Briefly explain three different types of enclosures for electric machines.
 - g) State the necessity of earthing of electrical motors and appliances.



SECTION – II

1. Attempt **any four** : **(4×4=16)**

- a) Explain the working principle of LCD.
- b) Define : Line regulation and Load regulation.
- c) Draw the block diagram of regulated power supply and explain it.
- d) Compare : CE configuration with CB configuration (4 pts.)
- e) Explain the circuit of transistor as a switch.
- f) Draw the symbols of following gates :
 - i) AND
 - ii) OR
 - iii) NOT
 - iv) XOR

2. Attempt **any three** : **(3×6=18)**

- a) Design basic gates using NAND and NOR gate.
- b) Draw the block diagram of OP-AMP and explain each block of it.
- c) Draw and explain the ckt. of full wave rectifier with its i/p and o/p waveforms.
- d) i) Compare : BJT with FET. (3 pts.)
 - ii) Define : Intrinsic and Extrinsic semiconductors.

**MARKS**3. Attempt **any four** :**(4×4=16)**

- a) Explain the working principle of photo diode.
 - b) Draw the ckt. diagram of RC coupled amplifier and show its frequency response with proper notations.
 - c) State Barkhausen's criteria of oscillations. List different types of oscillators.
 - d) Convert the following :
 - i) $(32)_{10} = (?)_2$
 - ii) $(99)_{BCD} = (?)_2$
 - e) Draw the symbols and truth table of :
 - i) NOR gate
 - ii) NAND gate
 - f) Draw and explain the working of phase shift oscillator.
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