

17353

11819

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. Attempt any SEVEN of the following: **14****
- a) Draw the single line diagram of electrical power AC supply system from generation to distribution level.
 - b) Differentiate between AC and DC supply.
 - c) State the relation between phase voltage and line voltage in 3-phase delta connection.
 - d) What is use of clip-on meter?

P.T.O.

- e) Write working principle of PMMC instrument.
- f) Define transformation ratio and efficiency of a transformer.
- g) Define energy audit.
- h) List the classification of electric drives.
- i) State the principle of electric heating.
- j) Enlist and name the different types of welding.

2. Attempt any THREE of the following: 12

- a) Define the following terms:
 - (i) Cycle
 - (ii) Frequency
 - (iii) Amplitude
 - (iv) Time period
- b) Draw a neat labelled diagram of single phase energy meter.
- c) Derive emf equation of 1-phase transformer.
- d) What are the functions of MCB and ELCB in the protection of electrical system.
- e) Explain the working principle of capacitor start 1 phase induction motor.

3. Attempt any THREE of the following: 12

- a) With neat sketch explain the working of a MI type voltmeter.
- b) A 6600V/600V, 50Hz 1 ϕ transformer has a maximum flux density of 1.35 wb/m² in its core. If the net cross sectional area of iron in the core is 0.2m². Calculate the no of turns in the primary and secondary winding of the transformer.
- c) Explain the operating principle of Auto transformers.
- d) Draw wiring diagram for 2 switches and 2 fans used for residential purpose.
- e) Draw neat label diagram of star - delta starter.

4. Attempt any THREE of the following: 12

- a) A circuit consist of resistance $R=20\mu$, inductance of $L = 0.05H$, A source voltage of 230 volt, 50H2 frequency is connected across the series combination of R and L

Calculate the following:

- (i) Total circuit current
 - (ii) Total circuit impedance
 - (iii) Voltage across resistance
 - (iv) Voltage across inductor
- b) Explain with suitable diagram necessity of earthing.
- c) Draw constructional diagram of stator and rotor of 3-ph induction motor label different parts of it.
- d) State any four factors for selection of motor for different drives.
- e) Explain working principle of electroplating.

SECTION - II**5. Attempt any NINE of the following: 18**

- a) Define Intrinsic and Extrinsic semiconductor.
- b) Draw the symbol of light emitting diode and zenner diode.
- c) Mention any two application's of light emitting diode.
- d) Draw energy band diagram of semiconductor.
- e) Draw the symbol of PNP and NPN transistor.
- f) Write down the logic expression of AND and NOR gate.
- g) Which gates are called as universal gates?
- h) What are different types of filter in power supply? Mention
- i) Write down truth table of EX-OR gate. Draw it's symbol.
- j) What is Avalanche effect in zenner diode? Explain.
- k) Draw block diagram of regulated power supply.
- l) Define:
 - (i) Negative logic
 - (ii) Positive logic

- 6. Attempt any FOUR of the following:** **16**
- a) Draw and explain V-I characteristics of P-N junction diode.
 - b) Draw and explain single stage common emitter amplifier.
 - c) State De Morgan's theorem? Explain with truth-table.
 - d) Define:
 - (i) Conductor
 - (ii) InsulatorAlso draw energy band diagram.
 - e) Explain two transistor analogy of SCR. Also give two applications of SCR.
 - f) Explain full wave bridge rectifier with necessary waveform.
- 7. Attempt any FOUR of the following:** **16**
- a) Explain zenner diode as a shunt regulator with neat sketch.
 - b) Draw and explain center tapped full wave rectifier with necessary wave form.
 - c) Explain V-I characteristic of light emitting diode. Also draw constructional diagram.
 - d) With neat constructional sketch explain working principle of TRIAC.
 - e) With neat sketch, explain working of NPN transistor.
 - f) Draw and explain class B push-pull amplifier.
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