22239

11819

3 Hours / 70 Marks Seat No. | | | | | | | | |

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(8) Preferably, write answers sequentially

Marks

SECTION - I

1. Attempt any FIVE of the following: **10**

a) State the term:

(i) Power

(ii) Energy

with it's unit

b) State KCL with diagram.

c) Write working principle of transformer.

d) State two applications of servomotor.

Marks

e) State two applications of solar energy in textile industry.

f) State two energy saving methods adopted in textile industry.

g) State the analog meter to measure:

(i) DC current

(ii) AC voltage

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

a) Draw circuit diagram and phasor diagram for:

(i) Pure capacitive circuit

(ii) R-C series circuit with AC supply.

b) Explain construction of servo motor.

c) Explain construction of slip - ring induction motor with necessity of slip rings.

d) Draw single line diagram for connection of following load:

(i) 3ϕ, 1 H.P., 440 V, 50 Hz induction motor

(ii) 3ϕ, 7 H.P., 440 V, 50 Hz induction motor

(iii) 1 H.P., 220 V DC shunt motor.

e) State and explain Kirchoff's current and voltage law with neat diagram.

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

a) Calculate energy bill for domestic load with tariff rate 05 Rs/unit considering following load with 1ϕ AC supply 230 V, 50 Hz for a month (30 days).

Equipment	Wattage	No. of equipment	Time
Tube light	40 W / each	2 Nos.	8 hr / day
Fan	60 W / each	2 Nos.	12 hr / day
T.V.	250 W / each	1 No.	6 hr / day

Marks

b) A 1 KVA single phase transformer has primary winding of 100 turns and secondary winding of 25 turns. The input side of transformer is supplied with voltage of 200 volts, 50 Hz. supply. Calculate secondary voltage, primary and secondary current, value of flux.

c) Classify electrical machines. State selection criteria for electrical machine used in textile industry.

d) Compare CFL and LED lamps with any four points.

SECTION - II

4. Attempt any SIX of the following: **12**

a) State active and passive components.

b) Calculate value / colour code of following resistors.

(i) Black, Red, Orange, Gold

(ii) 53 KΩ $\pm$ 10%

c) State the sensors used for:

(i) Yarn evenness testing

(ii) Automatic weft straightening

d) Draw V.I. characteristics of P.N Junction diode.

e) Draw diagram of :

(i) Bourdon tube

(ii) Bellows

f) List different types of optical sensor.

g) Define operating principle of LVDT.

h) State the basic difference between conductor and insulator.

Marks

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

a) Compare half wave, full wave and bridge rectifier on the basis of :

(i) No. of diodes used

(ii) Ripple factor

(iii) Efficiency

(iv) Peak inverse voltage

b) Draw and explain construction of NPN transistor.

c) Explain any pressure sensor used in textile industry with neat sketch.

d) Make use of yarn evenness tester with suitable block diagram.

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

a) Explain operation of center tap full wave rectifier with neat circuit diagram with input and output voltage waveform.

b) Explain the working and construction of LVDT, which type of supply is required as a input for LVDT.

c) Explain :

(i) Electromechanical relay.

(ii) Solenoid with neat sketch.

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