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16172

3 Hours / 100 Marks Seat No. | | | | | | | | |

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) 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.

Marks

SECTION - I

1. Attempt any SEVEN of the following: **14**

a) Define:

(i) Time period

(ii) Frequency

b) List any four wiring accessories.

c) State the relation between line voltage and phase voltage in 3ϕ STAR connection.

d) Write working principle of PMMC meter.

e) Define regulation of transformer.

f) State the working principle of electric welding.

Marks

g) State any two factors which is to be considered for selecting the motor for electrical drives.

h) Give two applications of single phase induction motor.

i) List different types of enclosers.

j) Define slip in case of induction motor.

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

a) Explain the concept of energy conservation.

b) Explain working principle of transformer.

c) Explain with neat diagram the working principle of MI instrument.

d) Explain with one example the necessity of earthing.

e) Name the different methods of power factor improvement.

f) Compare between AC and DC power supply.

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

a) Explain operating principle of Auto Transformer.

b) Draw neat diagram of STAR-DELTA starter.

c) Give the advantages of AC supply over DC supply.

d) Explain working principle of Electroplating.

e) Draw labeled diagram of 1-phase energy meter.

f) Explain working of capacitor RUN induction motor.

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

a) For the R-L circuit shown in Figure No. 1 find value of impedance, current and power factor.

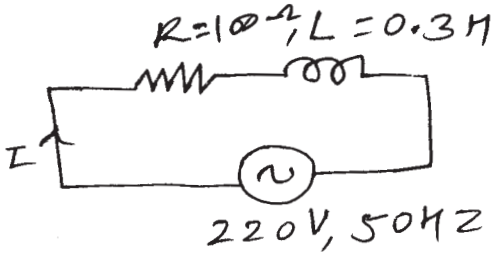

Fig. No. 1

Marks

b) In STAR connected circuit if supply voltage is 415V, 50Hz and phase resistance and inductor are of 25Ω and 0.1 Henry. Calculate line current, phase current and phase impedance.

c) Draw wiring diagram for 2 switches and 2 fans used for residential purpose.

d) Name the different types of welding techniques and given any two applications.

e) Describe emf equation for transformer.

f) State three applications of electrical machines used in agrosystem.

SECTION - II

5. Attempt any NINE of the following: **18**

a) Define inductance and resistance.

b) Define Doping.

c) Draw symbol for P-N junction diode and zener diode.

d) Define semiconductors and name two intrinsic semiconductor.

e) Write two applications of SCR.

f) Draw the symbol of NAND gate.

g) Why NAND and NOR gates known as universal gates?

h) Give the statement for Demozgan's first and second theorem.

i) List different types of display.

j) Define filter.

k) Name the different types of rectifiers.

l) Give two applications of LED.

m) State the need of voltage regulator.

Marks

6. Attempt any FOUR of the following: **16**

a) Compare between NPN and PNP transistor.

b) Draw the circuit diagram of half wave rectifier and explain its working.

c) Draw construction of SCR and explain its working principle.

d) Implement OR and AND gate using NAND gate only.

e) Draw the circuit diagram of single stage CE amplifier and explain its working.

f) Draw and explain Pi (π) filter.

7. Attempt any FOUR of the following: **16**

a) Draw energy band diagram for conductors semi conductor and insulator.

b) Draw symbol and truth table for Ex-NOR gate.

c) State any four applications of TRIAC.

d) Draw and explain zener diode characteristics.

e) Explain the operation of NPN transistor.

f) Draw the block diagram for the regulated power supply and explain the working of each block.