17474

15162

3 Hours / 100 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.

Marks

1. Attempt any TEN of the following: **20**

a) State the importance of electrical drawing. Also state the types of electrical drawings.

b) What is schematic diagram?

c) Draw wiring diagram for one lamp controlled from one place.

d) Define luminous intensity. What is its unit?

e) State the laws of illumination.

f) State any two applications of sodium vapour lamp.

g) Give any two differences between wire and cable.

h) Write down the points to considered while selecting wiring method for a particular installation.

Marks

i) Predict the types of starters required for:

(i) IM of fractional KW rating

(ii) Slip ring IM of high rating

j) State the concept of PCC.

k) What is estimate?

l) State the meaning of tender and quotation in brief.

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

a) Draw the symbols for the following:

(i) Socket outlet 15 amperes

(ii) Two way switch

(iii) Buzzer

(iv) Ceiling fan

b) Draw the wiring diagram for two lamps, one fan and one 5A socket of a room connected to single phase supply.

c) What are the factors affecting the level of illumination to be provided in a situations? Explain each point in detail.

d) Explain the working of fluorescent lamp with diagram.

e) Compare types of wiring methods on the basis of safety, maintenance, labour cost and initial cost.

f) What is the necessity of earthing? Also give any two methods to reduce earth resistance.

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

a) What is series parallel connection of lamps? Explain with the help of diagrams.

b) An office 30 m × 15 m is to be illuminated by lamps of lumens output 6000 lumens. The lamp being mounted at a height of 3 m from work place, the average illumination required is 280 lwc. Calculate the no. of lamps required, assuming coefficient of utilization to be 0.6 and depreciation factor to be 0.8.

Marks

c) Draw a neat labelled diagram of pipe earthing.

d) Describe the design procedure for residential installation.

e) Compare residential electrical installation to industrial installations on the basis of any four points.

f) State any four important points of motor circuit wiring.

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

a) Draw and label single line diagram and wiring diagram for three phase induction motor connected to supply with star delta starter.

b) How the switch fuse rating, cable rating and type of starter to be used are decided for motor loads in a factory. Explain in detail.

c) What is contract? State the criteria for selecting supplier or contractor.

d) With reference to execution of work explain the meaning of:

(i) Administrative approval

(ii) Technical sanction

e) What is the purpose of PCC? Also state any two applications of PCC.

f) What are the components of PCC? State the function of each component.

5. Attempt any TWO of the following: **16**

a) Calculate the total load, no. of lighting and power subcircuits and draw single line diagram for a big function hall having a load of power points 10 nos. each of 1000 watts, plug points 20 nos. each of 100 watts, light points 30 nos. each of 40 watts and fan points 30 nos. each of 60 watts supplied form a 3-phase, 400 V, four wire 50 Hz supply.

b) What are the design considerations of electrical installation in an industrial unit casting of light load, power load and motor load. Give step by step procedure for the same.

Marks

c) It is proposed to install a power connection for 3-phase 5 HP induction motor for an agriculture tube-well in the room of size 3 m × 3 m × 3 m high. The motor is one metre away from two nearest walls.

(i) Draw the installation plan showing location of main switch board, motor etc.

(ii) Decide the rating of MS and rating of wire.

(iii) Also calculate the length of wire and conduit.

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

a) A single room of size 5 m × 4 m is required to be provided with one lamp, one fan, one fluorescent lamp and one 5A socket-outlet. Each of the points is controlled by its individual switch:

(i) Mark the location of the electrical points suitably and draw the installation plan.

(ii) Draw the wiring diagram

(iii) Prepare complete list of material required.

(No main switch is to be provided as the entry of the subcircuit is from the adjoining room.)

b) A small workshop of size 10 m × 6 m × 4 m high is under construction.. It is required to be provided with electrical power supply for the following loads:

(i) One 5 HP three phase motor

(ii) One 3 HP three phase motor

(iii) One 2 HP three phase induction motor

(iv) One single phase one HP motor

(v) One single phase 0.5 HP motor.

Design and draw the installation plan single line diagram and wiring diagram.

c) What is MCC? Where is it used? Describe MCC in detail by explaining the type of starter used and various protection systems given for motor.