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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.

Marks

1. Attempt any FIVE of the following : 10

(a) Define contracts and state its type.

(b) Draw the symbol for

(i) Two way switch

(ii) Fuse

(c) Name the starter used for following motor :

(i) 15 HP-3 phase squirrel cage I.M.

(ii) DC shunt motor

(d) State objective of outdoor (exterior) lighting.

(e) State the standard voltage in India for transmission line and distribution line.

(f) Define :

(i) Annual Maintenance Estimate

(ii) Rough Estimate

(g) Draw a single line diagram of AC power supply system.

2. Attempt any THREE of the following : 12

(a) State the qualities of good contractor.

(b) Explain the principle of circuit design in lighting power circuit.

(c) Draw and label single line, wiring diagram of three induction motor connected to supply with star-delta starter.

(d) Describe the process of planning before starting a work.

(e) Describe design consideration for street light estimation, prepare their list of material required.

3. Attempt any FOUR of the following : 16

(a) State methods of opening of tender and explain any one method.

(b) Two lamp point, one ceiling fan and one 5A socket to be controlled by individual switches.

Draw : (i) Wiring diagram (ii) Schematic diagram.

(c) Describe how rating of main switch, motor switch, DB and cable is decided in industrial installation.

(d) Explain the On-Off control used for street light installation.

(e) Explain the following term regarding street lighting :

(i) Glare

(ii) Uniformity Ratio

(iii) Contrast

(iv) Visual Comfort

(f) Draw a typical AC distribution system showing primary distribution system, distribution transformer and secondary distribution system.

4. Attempt any TWO of the following : 16

(a) A hall of 10 M × 6 M is to be fitted with 8 fan and 15 tubes. Prepare schedule of material for complete installation.

(b) Follow the design consideration as given below lumens required, type of luminaries, layout of roads standard for public-street light electrical installation and describe the same.

(c) Calculate total load, no. of lighting and power sub-circuit and draw circuit layout for a function hall having a load of power points 10 nos. each of 1000 watt, plug points 20 nos. each of 100 watt, light point 30 nos. each of 40 watt, fan point 30 nos. each 60 watt supplied from a 3-phase 400 V, 4 wire 50 Hz supply.

5. Attempt any TWO of the following : 16

(a) Draw a wiring diagram and calculate rating of cable, main switch, motor switch and conduit for following motor used in industry :

(i) Motor 1 – 10 HP, 3 ph, 400 V;

(ii) Motor 2 – 3 HP, 3 ph, 400 V;

(iii) Motor 3 – $\frac{1}{2}$ HP, 1 ph, 230 V;

(b) (i) Compare underground and overhead lines.

(ii) Estimate of material required for 1 km. long LT (440 V/220 V) 3 phase distribution line. Take span length = 50 m.

(c) Describe the design consideration of electrical installation in small industry.