17474

16117

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) 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) Identify the symbols shown in Figure No. 1.

(i) (ii) (iii) (iv)

Fig. No. 1

b) Draw the IS symbols for the following used in layout diagram

(i) intermediate switch

(ii) plug and socket

c) State the meaning of the following single line representation.

$$\frac{3 \sim 50\ \text{Hz}, 6\ \text{KV}}{3 \times 50\ \text{mm}^2}$$

d) Why symbols are used in electrical Engg. Drawing.

e) What are various types of light sources?

P.T.O.

Marks

f) Define the term "Tender".

g) Define the term M.C.C.

h) State the expansion of following abbreviations

(i) ELCB

(ii) ICTP

i) What is wiring diagram and schematic diagram.

j) State IE Rule 29.

k) Draw wiring diagram of one lamp controlled from two places.

l) Give the name for feeder protection and transformer.

2. Attempt any FOUR of the following: 16

a) Compare residential and commercial installation. (any four points)

b) Describe C.I. Pipe earthing with a neat diagram.

c) State IE rules related to residential installation.

d) Calculate the total load no. of lighting and power subcircuits and draw circuit layout for a fraction hall having a load of power points 10 nos. each of 1000 W plug points, 20 nos. each of 100 W, light point points 30 nos. each of 40 W, fan points 30 nos. each of 60 W supplied from a 3ϕ 400V, 4 wire 50 Hz supply.

e) A 16 m × 8 m classroom having ceiling at a height of 4 m is to be provided with following filling:

(i) Fluorescent tube 40 W = 9 Nos.

(ii) Ceiling fans 60 W = 4 Nos.

(iii) Plug points 100 W = 2 Nos.

draw single line diagram shown the position of switches and fitting, find length of casing capping and length of wire required.

f) List eight examples of commercial installation.

Marks

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

a) Show the position of switch board, distribution board and main switch in the circuit diagram for commercial installation.

b) State any four rules related to lighting loads followed in an electrical installation.

c) A drawing Hall 30 m × 15 m with a ceiling height of 5 m is to be provided with a general illumination of 120 Lux. Take Cu = 0.7, M.f. = 0.8. Determine the no. of fluorescent tubes required, their spacing and total wattage.

d) Define the following terminology.

(i) Luminous intensity

(ii) illumination

e) What are various design consideration of good lighting scheme.

f) Write working principal of metal halide lamp with neat sketch.

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

a) Describe the procedure for execution of work.

b) (i) Quotation

(ii) Quotation formate

(iii) Placing of P.O.

(iv) Order formate

c) What are the different types of contract? State any two advantages and two disadvantages of item rate contract.

d) Write the detailed procedure for submission and opening of a tender document.

Marks

e) Describe how rating of cables and fuses are to be decided for three-phase squirrel cage induction motor by taking suitable rating.

f) In a workshop 10 hp (metric), 415 V, three phase, 50 Hz Motor is to be installed. Prepare the estimate required for the motor installation assuming PVC surface conduit type of wiring.

The detailed plan is show in Figure No. 2.

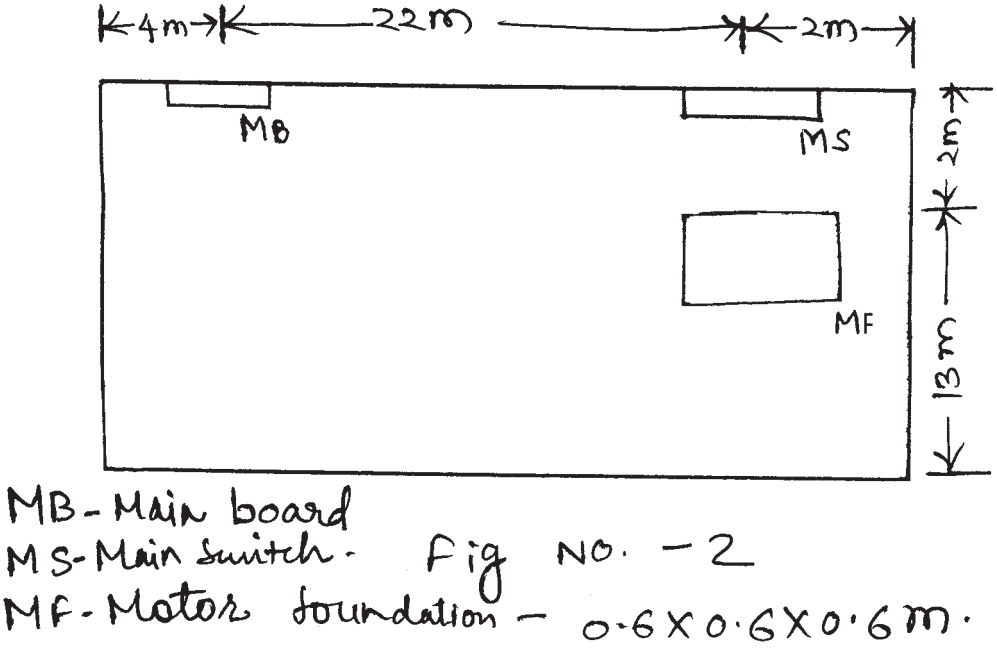

Fig. No. 2

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

a) Draw single line diagram for 15 h.p., three phase, 415 V induction motor to be operated on suitable starter.

b) A small work shop has to be equipped with the following machinery.

- 5 H.P., 400 V, 3 ph motor
- 3 H.P., 400 V, 3 ph motor
- 1 H.P., 400 V, 3 ph motor

Calculate full load current, starting current and decide the rating of individual SFV and main switch for all motors.

c) Explain how rating of cables and fuses are decided for motor installation.

Marks

d) Explain how the ratings of cables and fuses are decided for motor curing installation?

e) State the design considerations to prepare estimate for a factory installation.

f) What is meant by bus bar? Give its function?

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

a) Compare MCB and ordinary fuse. Write their specifications.

b) Predict the types of starters required for following motors.

(i) I.M. of fractional K.W. rating.

(ii) I.M. of medium rating (upto 15 kW)

(iii) I.M. with high rating.

(iv) Slipring I.M. of high rating.

c) What are the various accessories used in power control centre?

d) Write the protection scheme for PCC for over current, earth fault proction.

e) Explain motor control circuit for starter, protection system for motor in over current and earth fault.

f) Explain the power control centre for feeder - line or transformer, breaker, protection system for motor.

———