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3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any TEN of the following:

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- a) State I.E Rule No. 90.
- b) Draw the symbols for following:
 - (i) Bracket fan
 - (ii) Intermediate switch
 - (iii) Neutral link
 - (iv) Bell
- c) Draw wiring diagram for one lamp and two fan.
- d) List the name of various components of service connection for underground connection.
- e) State the purpose of following in conduit wiring:
 - (i) Nipple
 - (ii) Bushing

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- f) List the types of internal wiring in residential installations.
- g) State any two factors on which the size of bus bar chamber depends.
- h) Give any four examples of commercial electrical installations.
- i) State the function of following in motor wiring circuit:
 - (i) Motor switch
 - (ii) Main switch
- j) List the types of engineering contracts.
- k) Define the following:
 - (i) Earnest money deposit
 - (ii) Security deposit
- l) Name the starters used for following motors:
 - (i) 7 H.P. 3-Ph squirrel cage I.M
 - (ii) D.C. shunt motor

2. Attempt any FOUR of the following:

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- a) List any eight rules related to electrification of residential installation.
- b) Draw a neat labelled diagram for over head service connection to a double storey building.
- c) Compare overhead service connection and underground service connection on the basis of initial cost, identification of fault, appearance and safety.
- d) One light point, one ceiling fan, two 6 Amp socket outlet are to be wired switches are to be provided on a single switch board. Draw the wiring diagram and single line diagram.
- e) With reference to execution of work explain the meaning of:
 - (i) Administrative approval
 - (ii) Technical sanctions
- f) State the sequence to be followed to prepare estimate of factory unit.

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

- a) A college canteen hall has $6\text{ m} \times 4\text{ m}$ size. It provided with the following electric load:
- (i) 12 nos. of tube lights 40 watt each.
 - (ii) 6 nos. of fan points of 60 watt each.
 - (iii) 4 nos. of plug points of 240 watt each.
- Estimate quantity of material and their cost required for casing capping wiring system.
- b) (i) State the procedure for the selection of rating of main switch and distribution board in residential building installation.
- (ii) State the principles of circuit design in lighting and power circuits.
- c) Prepare a complete estimate to install a 3-phase, 400 volt, 50 Hz, 3 H.P. induction motor have to be used for grinding purpose in a small workshop having room size of $3\text{ m} \times 3\text{ m}$. Assume necessary data required for the estimation. Draw installation plan and wiring diagram.

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

- a) Draw the following wiring diagrams:
- (i) One lamp controlled by one switch.
 - (ii) One lamp controlled by two switches.
- b) Write necessity of earthing. Draw a neat labelled diagram of pipe type earthing.
- c) Write procedure of submission and opening of a tender.
- d) State the rating of lamps, fan and socket outlet points used in residential installation.
- e) Write the procedure to prepare a design for commercial electrical installation.
- f) A motor is to operated with star delta starter. Draw wiring diagram showing connection of motor, starter and motor switch.

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

- a) A bungalow has a lighting load of 2 kW and power load of 4 kW. It is located 10 m away from electric supply pole. Calculate the rating and quantity of service wire required. List the material required to provide O.H. connection.
- b) The main circuit wire in a house is required to carry a current 45 Amp when connected to single phase a.c. supply. Determine the size of the wire if the length of the circuit is 40 meters.
- c) State sequence to be followed for preparing estimate of residential building electrification.
- d) Define busbar. Draw and label the diagram showing its arrangement.
- e) State commercial rate of any ISI mark company each of following for per unit:
 - (i) Flexible wire bundle (90 mtr)
 - (ii) Three pin power plug (5 A)
 - (iii) Single phase, 15 Amp ICDP
 - (iv) Single phase, 15 Amp MCB
- f) State any four rules and regulations for industrial wiring.

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

- a) In a factory of area 30 m × 12 m one lathe machine of 1 H.P., 3-phase, 420 volt is to be erected. Estimate the cost for the power wiring.
 - b) State any four rules for motor wiring.
 - c) State the criteria for selection of contractor / supplier (any four).
 - d) Write any four difference between electrification of residential and industrial installation.
 - e) State the factors governing number of lighting sub-circuits and power sub-circuits in commercial installation.
 - f) Give the procedure to calculate motor current in any industrial installation.
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