# 17474

**21415**

**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) Draw symbols for

(i) choke of fluroscent tube

(ii) siren

b) Explain key diagram.

c) State any two I. E. rules related to residential installation.

d) Explain Inverse square law.

e) State the criteria for deciding the size of wire.

f) State the method of reducing earth resistance.

g) State any two types of cable.

**Marks**

h) Differentiate between residential and industrial installation. (any two point).

i) State any four accessories for industrial installation.

j) State the name of starter used for flour mill.

k) State the advantages of Busbar.

l) Define the term Tender.

m) Explain the meaning of supplementary estimate.

n) List the types of engineering contracts.

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

a) Draw wiring diagram and schematic diagram for control of one light and two fan by their individual switches.

b) Draw and label wiring diagram for 3 - phase induction motor to supply with D.O.L. starter.

c) State the importance of plan and layouts in electrical installation.

d) Explain the term

(i) Luminous flux

(ii) Intensity of illumination

(iii) Space to height ratio

(iv) Depreciation factor

e) Explain any four design consideration of good lighting scheme.

f) Explain the construction and working of sodium vapour lamp.

**Marks**

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

a) Draw a neat circuit diagram of fluorescent tube and explain the role of starter and choke in the working of tube.

b) Compare cleat wiring with casing - caping wiring system on any four points.

c) Explain any four points in selection of wiring system.

d) According to BIS rule, state the maximum load in designing sub-circuits of

(i) residential wiring and

(ii) industrial wiring. How will you decide current rating of main switch?

e) Why switch or fuse should not be installed in the earth continuity conductor?

f) Explain the methods of calculation of labour cost of wiring.

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

a) State any four methods of improving the earth resistance.

b) Draw and lable multiline diagram and single line diagram for 2 lamp, 2 fan and one 5 Amp socket connected to single phasor, 230 Volt, 50 Hz Ac supply.

c) What is the sequence to be followed to prepare estimate in factor unit?

d) Explain the purpose of PCC and it's applications.

e) Draw a protection system for motor against over current and earth fault.

f) State any four essential requirement of a valid contract.

**Marks**

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

a) (i) State four rules of industrial wiring.

(ii) State points considered in deciding size type, path and mounting of cable used for connecting power machines.

b) Prepare a complete estimate to install a 3 ph, 400 V, 50 Hz 3 HP induction motor have to be used for grinding purpose in a small scale type workshop having room size 3m × 3m. Assume necessary data required for this estimation and draw installation plan and wiring diagram.

c) Following motors are to be connected to 3 ph supply

(i) 3 ph - 415 V, 1 HP

(ii) 3 ph - 415 V, 5 HP

(iii) 1 ph - 230 V, $\frac{1}{2}$ HP

Calculate:

(i) Full load current

(ii) Starting current

(iii) Rating of main switch and

(iv) Rating of cable.

**Marks**

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

a) A three - phase 3 - wire connection is to be given to a premises in which an electric motor of 50 HP is to be installed. 40 meters of wire run from the main switch is required for this purpose. Determine the size of wire to be used if the supply voltage is 400 volt. Assume p.f. = 0.8.

b) Explain the purpose of power control centre (PCC) and it's application. State the different accessories of PCC and it's functions.

c) Prepare a tender notice with details for supply of 3 - phase, 200 KVA, 11 KV / 400 V transformer to your polytechnic.

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