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(REVISION — 2015)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019

ELECTRICAL ESTIMATING AND COSTING

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Write a complete typical specification of the following electrical items.

   (a) Conduit pipe (b) Socket outlet

2. Define the term luminous intensity. State its unit.

3. List any four systems of wiring.

4. List the four types of earthing used for electrical installations.

5. List the main classification of outdoor substations. (5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. State the laws of illumination.

2. An incandescent lamp is suspended 3m above a level workbench and is fitted with a reflector so that the luminous intensity is 400cd. Calculate the illuminance.

   (a) at point A which is vertically below the light source

   (b) at point B which is horizontally displaced 4m from point A.

3. List any six general rules for internal wiring.

Marks

4. Calculate according to Indian electricity rules the number of light and power sub circuits in a wiring installation for the loads given below :

Item	*Lamp*	*Fan*	*5A plug socket*	*16 A socket*
Wattage	100	80	100	1000
Quantity	7 Nos	5 Nos	5 Nos	2 Nos

5. Explain the purpose of earthing.

6. A 3 phase 415 V, 50 Hz, 10 hp induction motor is to be installed in a workshop. Determine the current rating of the copper conductor to be used and then select a suitable copper conductor for this motor from the table given below. Take the efficiency of the motor as 85% and pf as 0.8 lag.

Normal cross sectional area (sq.mm)	1	1.5	2.5	4
Ampere rating	5	10	20	25

7. List any six materials used in Overhead distribution line. (5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III A small assembly shop 15 m long, 9 m wide, and 3 m up to trusses is to be illuminated to a level of 200 lux. The coefficient of utilisation is 0.75 and maintenance factor is 0.8.

(a) Calculate the number of 40 W Fluorescent lamps required to illuminate the whole area, if the lumen output of the lamp selected is 3000 lumens. 3

(b) Calculate the No. of lamps fitted along length wise and breadth wise and draw the layout of light fittings. Take a space height ratio as 1.5 and lamp mounting height as 2m. 9

(c) Determine the number of sub circuits required for electrification. 3

OR

IV (a) Distinguish between following four lighting schemes.

(i) Direct (ii) Indirect

(iii) Semi direct (iv) Semi indirect 8

(b) With the help of a neat sketch explain the working of a sodium vapour lamp. 7

Marks

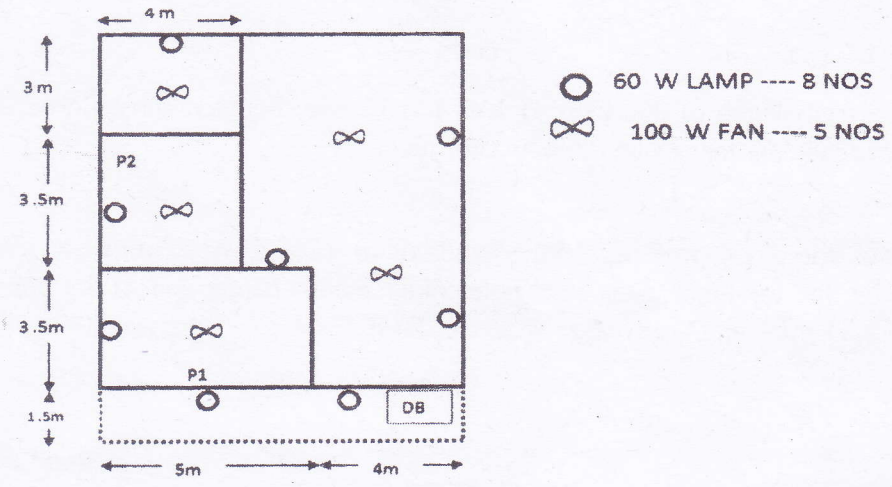
UNIT — II

V Fig. shows the plan of a newly constructed building. This building has to be wired in concealed system with the positions of the electric points are marked in the plan.

(a) Determine the number of sub circuit as per IE Rules (Take P1 and P2 as power plug) and draw the distribution of various outlets. 6

(b) Determine the size of wire required for each sub circuit and main circuit. 6

(c) Determine the rating of main switch and distribution board. 3



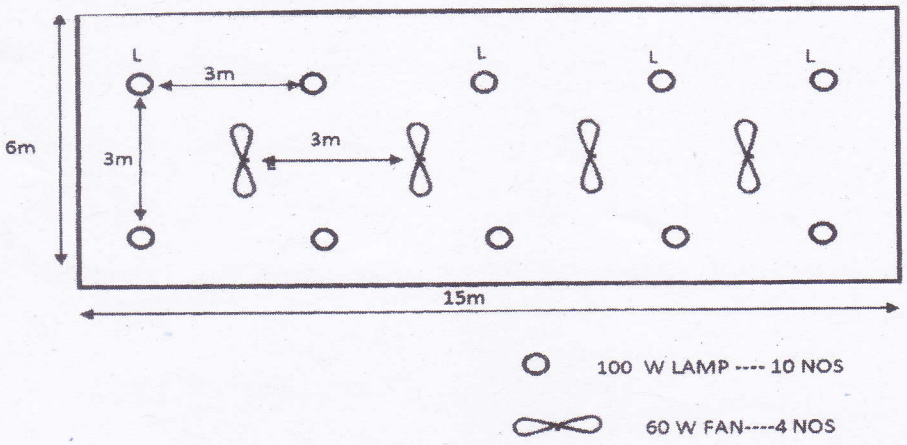
OR

VI Fig. shows the plan of a newly constructed building. This building has to be wired in PVC open conduit system with 10 numbers of 100 w lamps and 4 numbers of 60 w fans. The positions of the electric points are marked in the plan.

(a) Determine the number of sub circuit as per IE Rules. 2

(b) Determine the size of wire required for each sub circuit and main circuit. 3

(c) Prepare an estimate (excluding labour cost) of the wiring.



10

Marks

UNIT — III

VII (a) Draw a neat sketch of standard pipe earthing. 7

(b) Prepare an estimate for the earthing work for pipe earthing. 8

OR

VIII (a) Prepare an estimate of materials required for giving single phase overhead service connection from an existing line. Assume that the nearby LT pole is 10 m away from the building. 8

(b) Draw a neat sketch of plate earthing. 7

UNIT — IV

IX Draw a neat sketch of 200 kVA 11 kV/ 400 V pole mounted substation and prepare a list of materials for erecting this transformer. 15

OR

X Estimate the quantity of material required to extend an existing 11 kV 50 Hz overhead line for 1 km using steel poles of 11 meters height and ACSR conductor of 6/1 × 2.59 mm with an average span of 120 m. 15