B.E VIII Electrical CBGS

DMAES

12.5.17

Q. P. Code: 13167

(3 Hours) Total Marks - 80

N.B.: (1) Question No.1 is compulsory

(2) Solve any three questions out of remaining

(3)Assume suitable data if required and specify the same

1. (a) Write a short note on on line UPS 5

(b) What are the cost benefits of power factor improvement? 5

(c) What are the energy saving opportunities in DG set? 5

(d) Write a short note on variable speed drives. 5

2. (a) Discuss the different types of distribution and their selection criterion. 10

(b) The details of electrical load connected to a plant is given below 10

Sr no	Load in KW	Load Factor	Diversity Factor	Efficiency	PF
1	300	0.8	0.7	0.8	0.8
2	500	0.7	0.4	0.9	0.75
3	700	0.9	0.6	0.9	0.8
4	100	0.85	0.5	0.8	0.6

Based on the above data:-

[1] Calculate KVA rating of transformer required for the load. Give details of transformer connection.

[2] Draw the single line diagram showing protection and metering devices.

3. (a) Explain Energy Management System in details. 10

(b) Discuss the various energy analysis techniques for energy optimization. 10

4. (a) A classroom measuring [20m(l) × 25m(b) × 5m(h)] is to be illuminated. 10

i] State the design considerations for the lighting of above classroom.

ii] Calculate the no of lamps required.

iii] Draw the lighting layout.

Turn Over

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(b) What are the typical billing components of HT billing

5. (a) Discuss various features of Energy conservation Act 2001. 10

(b) What is the need of an Energy Audit and the different ways to perform it? 10

6. (a) Explain the ways by which efficiency of Energy Efficient Motors are increased. 10

(b) Discuss the impact of renewable energy sources in electrical system design. 10

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12-5-17 (77)

- Data for Illumination Design problems

Coefficient of Utilization Chart									
	Rc=0.7			Rc=0.5			Rc=0.3		
K	Rw=0.5	Rw=0.3	Rw=0.1	Rw=0.5	Rw=0.3	Rw=0.1	Rw=0.5	Rw=0.3	Rw=0.1
0	0	0	0	0	0	0	0	0	0
0.6	0.43	0.39	0.36	0.42	0.38	0.36	0.41	0.38	0.36
0.8	0.45	0.41	0.38	0.44	0.40	0.38	0.43	0.40	0.38
1.00	0.51	0.47	0.44	0.55	0.47	0.44	0.49	0.46	0.49
1.25	0.55	0.51	0.49	0.53	0.50	0.48	0.52	0.50	0.48
1.50	0.57	0.54	0.52	0.56	0.53	0.51	0.54	0.52	0.50
2.00	0.61	0.58	0.56	0.59	0.57	0.55	0.57	0.56	0.54
2.50	0.63	0.61	0.59	0.61	0.59	0.57	0.59	0.58	0.56
3.00	0.65	0.63	0.61	0.63	0.61	0.59	0.61	0.59	0.58
4.00	0.67	0.65	0.63	0.64	0.63	0.62	0.62	0.61	0.59
5.00	0.68	0.67	0.65	0.65	0.64	0.63	0.63	0.62	0.61

Lamp Data			
Sr.No	Type of Lamp	Wattage	Lumen output
1	GLS	25	230
		40	415
		60	710
		100	1340
		200	3000
2	Tungsten Halogen	50 (Miniature Dichroic)	900
		300	5100
		500	9000
		1000	22000
3	Fluorescent (T8/ T5)	18 (Halo phosphate)	1015
		36(Halo phosphate)	2450
		18 (82/84/86)	1300
		36(82/84/86)	3250
		28(T5)	2800
4	CFL	9	600
		11	760
		13	920
		18	1200
