BE - sem-VIII - Electrical - DMAES
CBSGS

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

(b) What are the typical billing components of HT billing 10

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

- Data for Illumination Design problems

Coefficient of Utilization Chart

K	Rc=0.7			Rc=0.5			Rc=0.3		
	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	0.40
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

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BE - Sem - VIII - Electrical - CBSGS - D&C

18/5/15

Q. P. Code: 13628

(3 Hours) [Total Marks: 80]

N.B.: (1) **Question No. 1** is compulsory.
(2) Answer any **THREE** questions out of the remaining **FIVE** questions.
(3) Assume suitable data if necessary and justify them.
(4) **Figure** to the **right** indicates marks.

1. (a) What is electrical drive? State the main factors which decide the choice of electrical drives. **5**
(b) Explain regenerative braking of three – phase Induction Motor with relevant speed torque characteristics. **5**
(c) Justify two quadrant operation capability of single – phase fully controlled rectifier fed dc drive with Va – α curve and relevant diagram. **5**
(d) Describe the operation of variable reluctance stepper motor. **5**

2. (a) Explain four quadrant operation of a motor driving a hoist load with suitable diagram. **10**
(b) A weight of 500 kg is being lifted up at a uniform speed of 1.5 m/s by a winch driven by a motor running at a speed of 1000 rpm. The moments of inertia of the motor and winch are 0.5 and 0.3 kg-m^2 respectively. Calculate the motor torque and the equivalent moment of inertia referred to the motor shaft. In the absence of weight, motor develops a torque of 100 N-m when running at 1000 rpm. **10**

3. (a) Explain any two classes of motor duty. **6**
(b) Derive the temperature expression for the thermal model of motor for heating and draw its characteristics with time. **7**
(c) Explain the operation of closed – loop speed control using Phase – Locked – Loop (PLL). **7**

4. (a) Explain plugging operation of dc motors (separately excited) with suitable diagram and draw its speed – torque curves. **4**
(b) Explain the operation of chopper control of separately excited dc motor in motoring mode with suitable diagram, waveforms and characteristics. **6**
(c) Give comparison between scalar control and vector control. **10**

5. (a) Explain ac dynamic braking of a wound rotor motor with equivalent circuit and speed – torque curves. **12**
(b) Draw and explain Static Scherbius drive with its four modes of operation. **8**

6. (a) Draw the block diagram of direct vector control scheme and explain it. **10**
(b) Explain brushless dc motor drive for servo applications. **10**

30/5/17

Q.P. Code :17121

(Time: 3 Hours) [Total Marks :80]

Please check whether you have got the right question paper.

N. B.
(1) Question No. **1** is **compulsory**.
(2) **Attempt** any **three** questions out of remaining questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) **Assume** suitable **data** if **necessary**.

1. Attempt any **four** :- 20
   a) Explain Load growth characteristics in detail
   b) Draw Bath Tub curve and define all three regions in it.
   c) State the objectives of system planning.
   d) Show that M.T.T.F. is reciprocal of failure rate λ
   e) A system is to be designed with overall reliability of 0.96 using components having individual reliability of 0.6. What is the minimum number of components that must be connected in parallel.

2. a) Explain PJM method in detail. 10
   b) What is Load forecasting ? Describe different techniques used for load forecasting. 10

3. a) Differentiate in Short term, Medium term and Long term planning. 10
   b) What is reactive power planning? What are the methods used for reactive power planning? 10

4. a) Consider a system containing six units of 40 MW each with a forced outage rate of 0.03. Prepare the capacity outage table for the system. Find Loss of Load Expectation (LOLE) and risk factor if the annual peak load is 170 MW and base load is 40% of peak load. 10
   b) Derive a general expression for the unreliability of model shown in figure below and hence evaluate the unreliability of the system if all component have a reliability of 0.8. 10

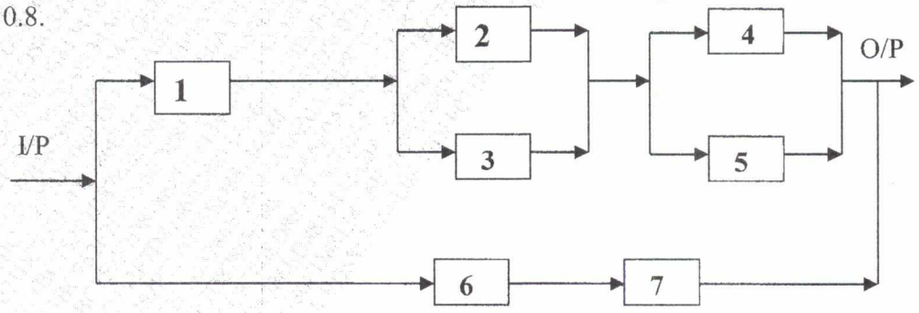

Figure for Q.4b

Please Turn Over

Q.P. Code :17121

5. a) Describe the various data requirements for composite system reliability evaluation. 10
   b) Explain frequency and duration method and hence explain the concept of rate of departure. 10

6. a) A generating system contains four 25 MW generating units each with FOR = 3% and one unit of 30MW unit with FOR=5%. Prepare capacity outage table. 10
   b) Explain two state Markov model and derive the expression of availability and unavailability. Draw the state space model for three units indicating all transition rates. 10

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BE-Sem-VIII - CBSGS - Electrical

(78)

24/5/17

T4728 / T1757 ELECTIVE II 1) FLEXIBLE AC TRANSMISSION SYSTEM

Q. P. Code: 13637

TOTAL MARKS: 80

N.B: 1) Question No 1 compulsory.

2) In all attempt 4 questions.

3) Assume suitable data if necessary.

4) Draw neat diagram, wherever necessary.

1. a) Explain objective in Load compensation.	10 MARKS
b) Explain basic types of FACTS controllers.	10 MARKS
2. a) Explain Switching convertor type VAR generator.	10 MARKS
b) Explain fixed capacitor thyristor controlled reactor (TCR).	10 MARKS
3 .a) Draw and explain reactive power characteristic.	10 MARKS
b) Explain voltage and current characteristic of TCR and TCR with fixed capacitor.	10 MARKS
4. a) Explain Midpoint voltage regulation of line segmentation.	10 MARKS
b) Explain voltage regulator TCVR.	10 MARKS
5. a) Explain basic operating principle of UPFC.	10 MARKS
b) Explain objective of series compensation.	10 MARKS
6. a) Draw and explain TSSC	10 MARKS
b) Explain Power Flow and Dynamic Stability Considerations of a Transmission Interconnection	10 MARKS

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