(7)

B.E- sem-VIII - Electrical - eBSGS - DMAES 23/11/17

Q.P. Code: 25416

Duration:- Three Hours **Total Marks:- 80**

NOTE
1. Question No 1 is Compulsory.
2. Solve any three out of the remaining.
3. Figure to the right side indicates marks.
4. Assume the suitable data and mention the same if required

Q 1 Answer the following questions

a. What are the different types of electrical projects? **[5]**

b. State the various criterions for selection of a battery for back up power supply **[5]**

c. What do you under stating by the term "Optimizing input energy requirement"? **[5]**

d. What are the various energy analysis techniques? **[5]**

Q 2a Explain the role of following in system design **[10]**

(i) Coordination (ii) Discrimination (iii) Temporary power supply

Q 2b Following loads are connected to a distribution transformer. **[10]**

Calculate (i). KVA rating of transformer
(ii) State and justify the various assumption related to the selection of transformer and other ratings
(iii) Draw a single line diagram showing various metering instruments, protections and load connections

Sr No	Load	Rating	Efficiency	Power Factor	Load Factor	Diversity Factor
1	Machine Shop	300	0.8	0.8	0.8	0.7
2	Paint Shop	500	0.9	0.75	0.7	0.4
3	Auxiliary Plant	700	0.9	0.8	0.9	0.6
4	Misc Load	100	0.6	0.8	0.85	0.5

Q 3a What are the different types of distribution systems? State the selection and design criterion for each. **[10]**

Q 3b Discuss the various steps to be followed while selecting a cable and its size for a given rating of load **[10]**

Q 4a Discuss the various assumptions in the design of an illumination system for a given room with specific purpose. Also state the procedure for calculation of number of lamps required. **[10]**

Q 4b Discuss the various elements of Monitoring and Targeting in energy management. **[10]**

Q 5a What is the need of energy audit? Discuss the role of various energy auditing instruments. [10]

Q 5b Discuss the steps followed for energy performance assessment of lighting system [10]

Q 6a Discuss the role of following energy efficient technologies and corresponding saving potential

(i) Automatic power factor controller (ii) Energy Efficient Transformer [10]

Q 6b State the various features of Energy Conservation Act 2003 [10]

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BE- Sem-VIII – CBSGS – Electrical – DC 29/11/17

QP CODE :25669

(3 Hours) [Total Marks-80]

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 the following 20
   a) State and explain advantages of electrical drives over drives employing other forms of energy.
   b) Explain fully controlled converter fed DC motor
   c) Enlist classes of motor duty. State its importance in selection of motor.
   d) Write a brief note on "switched reluctance motor drives".

2. a) Explain synchronous motor drive with the help of block diagram. 10
   b) Write a short note on "Choice of motor for a drive." Explain with example 10

3. a) A delta connected three phase, 50Hz, 6pole, 400V, 925rpm squirrel cage induction motor has following parameters Rs= 0.2 Ω, Xs=0.5 Ω, Rr'=0.3 Ω, Xr'=1 Ω. The motor is fed from a voltage source inverter with constant V/f ratio from 0 to 50Hz and constant voltage of 400V above 50Hz frequency. Determine 10
      i) breakdown torque for frequency of 100Hz as a ratio of its value at 50Hz
      ii) Calculate the motor torque at 30Hz and slip speed of 60 rpm.
   b) Write a note on 'stepper motor drive' 10

4. a) Explain closed loop speed control of drives. Why inner current loop is needed? 10
   b) Explain star-delta starting with characteristics. 10

5. a) Show how the time and energy lost in a transient operation are calculated. 10
   b) A 400 V, star connected 3ph, 6 pole, 50 Hz Induction motor has following parameters referred to stator 10
      $R_s=R_r'=1\ \Omega$, $X_s=X_r'=2\ \Omega$
      for plugging from its initial full load speed of 950 rpm, Stator to rotor turns ratio is 2.3. determine-
      1. Initial braking current and torque as a ratio of their full load values.
      2. Resistance to be incerted in the rotor circuit to reduce the maximum braking current to 1.5 times the fullload current. What will be the initial braking torque, now?

6. a) Explain dynamic braking of dc shunt motor. 10
   b) Compare scalar and vector control of induction motor. 10

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(2) BE - Sem-VIII - Electrical - PSPR - CBSGS 13/12

Q.P. Code : 17119

(Time: 3 Hours)

Please check whether you have got the right question paper.

Total Marks – 80

N.B.:- (1) Question No.**1** is compulsory.
(2) **Attempt** any **three** questions out of remaining **five** questions.
(3) Assume necessary data wherever necessary.

Q 1.	Answer the following questions.	**20**
a)	Write short note on different types of outages that occur in power system.	**5**
b)	Prove that instantaneous hazard rate $\lambda(t) = \frac{f(t)}{R(t)}$	**5**
c)	Draw a two state model of equipment. Define failure rate and repair rate	**5**
d)	What do you understand by spinning reserve and operating reserve.	**5**
Q 2 a)	Categorize loads in power system. Explain Load growth characteristics for various loads.	**10**
Q 2 b)	What do you understand by system planning. Explain main aims of Long Term and Short term planning.	**10**
Q 3 a)	Explain different mathematical approaches to load forecasting.	**10**
Q 3 b)	Explain in detail reactive power planning.	**10**
Q 4 a)	Find reliability of system shown in figure-1 using minimum cut set method if reliability of each component is 0.9	**10**

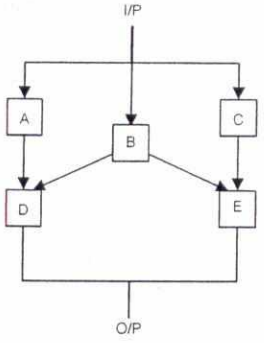

Figure-1

Q 4 b) A generating system contains three 25 MW generating units each with FOR = 4% and one unit of 30MW unit with FOR=5%. Prepare capacity outage table. **10**

Q 5 a) What is the importance of Markov Process in reliability of power system. Derive the expression of availability and unavailability **10**

Q 5 b) Explain Modified PJM method in detail. **10**

Q 6 a) A generating system consists of 2 units of 30MW and 1 unit of 60MW with λ=0.01f/day and repair μ= 0.49 r/day. Construct generation model. Also, find rate of departure and frequency of occurrence of each capacity outage state. **10**

Q 6 b) A power system is having 5 units of 100MW units each with FOR= 0.03. Find loss of Energy Expectation (LOEE) and EIR. The peak load is considered to be 400 MW and base load is 150MW. **10**

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02 BE: Sem -VIII CBSGS FACTS 7/12/1

Electrical

Q.P. Code: 27060

Time: 3 Hours **MAX. MARKS: 80**

Note:

1) Question no 1 is compulsory.
2) Attempt any THREE from the remaining questions.
3) Assume suitable data wherever necessary and mention the same.
4) Figures to right indicate full marks.

Q.1) Attempt any four **20 Marks**

A) Explain the objectives of load compensations

B) What limits loading capability of transmission systems?

C) Write a short note on objectives of voltage and phase angle regulators.

D) Explain the properties of ideal compensator.

E) Write a short note on objectives of series and shunt compensators.

Q.2) A) Prove that the purely reactive compensator cannot maintain both constant voltage profile and unity power factor at the same time. **20 Marks**

B) Explain power flow through mesh transmission lines.

Q.3) A) Show that for symmetrical line the mid-point voltage is higher than terminal voltage if it is loaded less than natural load i.e. P < Po. **20 Marks**

B) Explain the voltage / current characteristics of TCR and TCR with shunt capacitor.

Q.4) A) Show that voltage sensitivity for load reactive power is **20 Marks**

$$dV/dQl = \frac{-E/Ssc}{1+Kr * E/Ssc}$$

B) Explain basic operating principle of switching converter based type VAR generators.

Q.5) A) Explain principle of operation of TSSC used as variable impedance type series compensator. **20 Marks**

B) Explain with circuit diagram and waveform of SSSC used as switching converter type series compensator.

Q.6) A) Explain power flow control by using Phase angle regulator (PAR). **20 Marks**

B) Explain with phasor diagram, functioning of UPFC as voltage regulator, line impedance compensator, phase shifter and simultaneous control of voltage, impedance and phase angle.