

**University of Mumbai**  
**Examinations Summer 2022**

Time: 2 hour 30 minutes

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	What is a load factor?
Option A:	The ratio of average load to maximum demand.
Option B:	The ratio of maximum demand to average load.
Option C:	The product of maximum demand and average load
Option D:	The ratio of average load to the plant capacity.
2.	Power plan doesn't show
Option A:	Physical location of the loads
Option B:	Cable sizes
Option C:	Conduit sizes
Option D:	Fault levels
3.	In CUSUM chart, line moving up indicates
Option A:	Improved performance
Option B:	Declined performance
Option C:	Independent of performance
Option D:	Constant performance
4.	What is the use of Gang operated disconnector in substation
Option A:	To disconnect Transformer from HT line.
Option B:	To provide fuse on HT side
Option C:	To isolate Lightning Arrester from HT line
Option D:	To isolate CT and PT from HT line for maintenance.
5.	Which one is the example of energy substitution
Option A:	Replacement of coke by coal
Option B:	Replacement of coal by LPG
Option C:	Replacement of coal by CNG
Option D:	Replacement of electrical heater by solar heater
6.	Energy savings potential of variable torque applications compared to constant torque application is:
Option A:	Higher
Option B:	Equal
Option C:	Lower
Option D:	Does not depend on Torque
7.	With reference to existing HT tariff, energy consumption is billed
Option A:	Per KVAH
Option B:	Per KWH
Option C:	Per KVARH
Option D:	Per VAH
8.	In radial distribution system, voltage at the far end of a loaded feeder is
Option A:	Equal to rated voltage of distribution transformer

Option B:	Less than rated voltage of distribution transformer
Option C:	Greater than rated voltage of distribution transformer
Option D:	It is constant irrespective of load.
9.	What is specific energy consumption
Option A:	Total annual energy consumption
Option B:	Monthly energy consumption
Option C:	Energy consumption per unit production
Option D:	Energy consumption per unit Electricity.
10.	Which is the voltage for primary distribution
Option A:	415V
Option B:	230V
Option C:	33KV
Option D:	430V

<b>Q2</b>	<b>(20 Marks Each)</b>					
<b>A</b>	<b>Solve any Two</b>				<b>5 marks each</b>	
i.	<i>Explain with a neat diagram elementary drawing.</i>					
ii.	<i>Explain soft starters.</i>					
iii.	<i>Define Installed Load Efficacy Ratio (ILER). Illustrate its significance towards analyzing the energy performance of lighting system.</i>					
<b>B</b>	<b>Solve any One</b>				<b>10 marks each</b>	
i.	<i>Explain main features of energy conservation act 2001.</i>					
ii.	<i>The details of the load which are connected to a distribution transformer in a plant are as follows.</i>					
	<i>Type of load</i>	<i>Load in KW</i>	<i>Efficiency</i>	<i>Power factor</i>	<i>Load factor</i>	<i>Diversity Factor</i>
	<i>Washing Plant</i>	<i>500</i>	<i>0.8</i>	<i>0.75</i>	<i>0.8</i>	<i>0.7</i>
	<i>Cutting shop</i>	<i>250</i>	<i>0.85</i>	<i>0.7</i>	<i>0.6</i>	<i>0.5</i>
	<i>Misc load</i>	<i>200</i>	<i>0.85</i>	<i>0.85</i>	<i>0.5</i>	<i>0.5</i>
	<i>Machine shop</i>	<i>300</i>	<i>0.8</i>	<i>0.75</i>	<i>0.75</i>	<i>0.7</i>
	<i>Calculate the capacity of a distribution transformer feeding a plant and draw SLD showing relevant metering and protections and find compensating KVAR required for the Plant.</i>					

<b>Q3</b>	<b>(20 Marks Each)</b>				
<b>A</b>	<b>Solve any Two</b>				<b>5 marks each</b>
i.	<i>What is Benchmarking. Explain its types.</i>				
ii.	<i>Explain maximum demand controller.</i>				
iii.	<i>List and explain in brief elements of monitoring and targeting.</i>				
<b>B</b>	<b>Solve any One</b>				<b>10 marks each</b>
i.	<i>Explain tendering process in detail.</i>				
ii.	<i>Explain 10 step methodology for energy audit.</i>				

<b>Q4</b>	<b>(20 Marks Each)</b>				
<b>A</b>	<b>Solve any Two</b>				<b>5 marks each</b>
i.	<i>Explain the process of Energy Performance Assessment in motors.</i>				
ii.	<i>Explain improvements made in Energy Efficient motor over standard motors</i>				
iii.	<i>Explain features of BMS in brief.</i>				

B	Solve any One	10 marks each
i.	<i>Explain different types of distribution systems</i>	
ii.	<p><i>Design a lighting system for a reading room which measures 20m*10m*4m in dimensions. Assume and justify suitable assumptions. Find number of fixtures required to maintain average lux level of 200lux in the room.</i></p> <p><i>T5 tubelight of 28W gives 2850 lumen output.</i></p> <p><i>CFL of 18W gives 1200 lumen.</i></p> <p><i>For Rc=0.7 and Rw=0.5, COU for different Room Index are 1-0.51, 1.25-0.55, 1.5-0.57, 2-0.61, 2.5-0.63, 3-0.65</i></p>	