



SIDDHARTH GROUP OF INSTITUTIONS (AUTONOMOUS)
(Approved by AICTE, New Delhi & Affiliated to JNTUA, Ananthapuramu)
(Accredited by NAAC with “A” Grade & ISO 9001 : 2008 Certified Institution)

QUESTION BANK

Subject with Code : GENERATION OF ELECTRICAL POWER (20EE0203)

Course & Branch : B. Tech -EEE

Year & Semester : II - B. Tech. & I - Semester

Regulation : R20

UNIT-I

THERMAL AND HYDRO POWER GENERATING SYSTEMS

1	(a)What is a steam power station? Discuss its advantages and disadvantages (b)Draw the schematic diagram of a modern steam power station and explain its operation.	[L5][CO1] 5M [L5][CO1]10M
2	(a)Explain the important components of a steam power station. (b)What are the factors taken into account while selecting the site for a thermal power station? Explain in detail.	[L1][CO1]10M [L1][CO1]5M
3	(a)Explain the function of the following in thermal power plant and explain the principle of operation of each. a) Economizer b)Electrostatic Precipitator c) Condenser (b)What is turbine? Classify different types of turbines used in the power plant	[L2][CO1]10M [L2][CO1]5M
4	(a)Explain the function of the following in thermal power plant and explain the principle of operation of each. A) Super heater b) Cooling tower c)Boilers	[L2][CO1]10M
5	(a)Discuss the merits of Thermal Power station when compared with Hydro power station. (b)Discuss the demerits of Thermal Power station when compared with Hydro power station. (c)What are the differences between thermal and hydro power plant.	[L2][CO1]5M [L2][CO1]5M [L2][CO1]5M
6	Draw a neat schematic diagram of a hydro-electric plant and explain the functions of various components.	[L1][CO1]10M
7	Classify the different types of hydropower plant.	[L2][CO1]10M
8	Discuss the merits and demerits of a hydro-electric plant when compared with Thermal power plant.	[L2][CO1]10M
9	What factors are taken into account while selecting the site of hydroelectric power plant in detail? What are the classification of hydro power plants?	[L1][CO1]10M
10	Write a short note on (i) Surge tank (ii) Penstock(iii) Forebay	[L1][CO1]10M

UNIT -II
NUCLEAR POWER GENERATING SYSTEMS

1	Write a short note on following (i) Chain reaction (ii) Nuclear fission (iii) List demerits of a nuclear power plant.	[L1][CO2]10M
2	(a)What is Chain Reaction? Explain Nuclear Fission and Fusion Process (b)Discuss the factors consider for the selection of site in nuclear power plant	[L1][CO2]10M
3	Draw the schematic diagram of a nuclear power station and discuss its operation.	[L5][CO2]10M
4	Draw the schematic diagram of a nuclear reactor and discuss its operation.	[L5][CO2]10M
5	Discuss the following components in nuclear power station briefly. Moderator (b) Control rods(c) Reflector(d) Coolant(e) Nuclear reactor	[L2][CO2]10M
6	Explain shielding and safety precautions in nuclear power plants	[L1][CO2]10M
7	a) What are the classification of nuclear reactors? b) Explain about the boiling water reactor	[L1][CO2]5M [L2][CO2]5M
8	a) Explain about the fast breeder reactor. b) What are the factors considered while selecting the site for nuclear power plant?	[L2][CO2]5M [L1][CO2]5M
9	9. Write short note on a) FBR b) PWR	[L5][CO2]5M [L5][CO2]5M

10	Compare thermal, hydro and nuclear power plants on the basis of technical, mechanical and economical aspects.	[L3][CO2]10M
----	---	--------------

UNIT-III

SOLAR & WIND POWER GENERATING SYSTEMS

1	What is the role and potential of solar energy? Explain in detail.	[L1][CO3] 5M
2	(a) Explain types of solar energy collectors with principle of concentrating type solar collector	[L2][CO3]10M
	(b) Explain the Flat plate collectors and concentrating solar energy collectors	[L1] [CO3]5M
3	What is solar energy storage? Explain their methods.	[L2][CO3]10M
4	a) What is the need for solar thermal energy storage?	[L5][CO3]5M
	b) Explain solar pond with neat diagram?	[L5][CO3]5M
5	a) Explain PV cell construction and operation.	[L1][CO3]5M
	b) What are the VI characteristics of PV cell?	[L2][CO3]5M
6	(a) What is the role and potential of wind energy? Explain in detail.	[L2][CO3]5M
	(b) Describe the different types of wind mills	[L2][CO3]5M
7	(a) Explain 1) Horizontal Axis wind mills.	[L2][CO3]5M
	2) Vertical Axis wind mills.	[L2][CO3]5M
	b) What are the merits and demerits of solar and wind power systems?	
8	Explain principle of operation and working of Wind Power Plant.	[L2][CO3]10M
9	a) Explain Power- Speed characteristics	[L2][CO3]5M
	b) Explain Torque- Speed Characteristics	[L2][CO3]5M
10	Explain Pitch and Yaw control.	[L2][CO3]10M

UNIT-IV

BIOGAS, GEOTHERMAL AND OCEAN POWER GENERATING SYSTEMS

1	a) How biomass conversion takes place? b) What is difference between biomass and biogas? c) What is meant by anaerobic digestion? What are the factors, which affect bio digestion? Explain briefly.	[L4][CO4]5M [L4][CO4]5M [L4][CO4]10M
2	a) How are biogas plants classified? Explain them briefly. b) Explain any one type of biogas digester with neat diagram and their advantages and disadvantages	[L4] [CO4]10M [L4] [CO4]10M
3	a) What factors are taken into account while selecting the site for a bio-gas plant? b) What are the Economic and Environmental Aspects of Bio gas generation?	[L1] [CO4]5M [L1] [CO4]5M
4	a) Explain the factors affecting bio-digestion of gas? b) Write some applications of biogas.	[L4][CO4]5M [L4][CO4]5M
5	a) How can geothermal energy be converted into electrical energy? c) Define geothermal energy	[L2][CO4]5M [L2][CO4]3M
6	Draw schematic diagram of geothermal system and explain the working principle?	[L4][CO4]10M
7	a) Classify geothermal sources b) What are the advantages and disadvantages of geothermal energy? c) Write some applications of geothermal	[L1][CO4]10M [L1][CO4]5M [L1][CO4]5M
8	a) What is ocean energy? How is it produced? b) What is basic principle of ocean thermal energy conversion	[L2][CO4]5M [L1][CO4]5M

9	a) Explain the Tidal and Wave Energy and Ocean Thermal Energy Conversion systems.	[L2][CO4]2M
	b) what are the advantages and disadvantages of ocean thermal energy?	[L2][CO4]2M
10	Explain with neat sketch about OTEC system?	[L4][CO4]10M

UNIT-V

ECONOMIC ASPECTS OF POWER GENERATION

1	Write short notes on the following	[L1][CO5]2M													
	(a) Load curve	[L2][CO5]2M													
	(b) Duration curve	[L1][CO5]2M													
	(c) Integrated load duration curve	[L1][CO5]2M													
	(d) Load demand	[L1][CO5]2M													
2	(e) Diversity factor	[L1][CO5]2M													
	A generating station has the following daily load cycle. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Time (hrs)</td> <td>0-6</td> <td>6-10</td> <td>10-12</td> <td>12-16</td> <td>16-20</td> <td>20-24</td> </tr> <tr> <td>Load (MW)</td> <td>30</td> <td>40</td> <td>20</td> <td>70</td> <td>50</td> <td>40</td> </tr> </table> <p>Draw the load curve and find i) Maximum demand ii) Units generated per day iii) Average load and load factor .</p>	Time (hrs)	0-6	6-10	10-12	12-16	16-20	20-24	Load (MW)	30	40	20	70	50	40
Time (hrs)	0-6	6-10	10-12	12-16	16-20	20-24									
Load (MW)	30	40	20	70	50	40									
3	a) Explain about load curve and load duration curve.	[L3] [CO5]5M													
	b) Briefly discuss the type of loads.	[L3] [CO5]5M													
	c) The maximum demand of a generating station is 200MW. The annual load factor being 60% calculate the total electrical energy generated per year.	[L3] [CO5]5M													

4	The load on a power plant on a typical day is as under 12 Midnight to 5am = 20 MW, 5 AM to 9 AM = 40 MW, 9AM to 6 PM = 80 MW, 6 PM to 10 PM = 100MW, 10 PM to 12 Midnight = 20 MW. Draw load curve and load duration curve. Find energy supplied by the plant per day in 24 hours and load factor of the plant.	[L3][CO5]10M
5	What do you understand by 'Economics of power generation'? Discuss the different classifications of costs of electrical energy	[L2][CO5]10M
6	Explain how a load duration curve is plotted. What is its use?	[L4][CO5]10M
7	An industrial consumer having a maximum demand of 100kw, maintains a load factor of 60%. The tariff rates are Rs.900 per KVA of maximum demand per annum plus Rs.1.80 Per Kwh of energy consumed. If the average power factor is 0.8 lagging, calculate: i) Total energy consumed per annum ii) The annual electricity bill and iii) The overall cost per Kwh consumed.	[L1][CO6]10M
8	a). Difference between two-part tariff and Three –part tariff	[L2][CO6]5M
	b) Define block rate tariff and power factor tariff.	[L2][CO6]5M
9	a) Describe the desirable characteristics of a tariff	[L2][CO6]5M
	b) Describe three types of tariff.	[L2][CO6]5M
10	A generating station has a maximum demand of 500MW. The annual load factor is 50% and capacity factor is 40%. Find the reserve capacity of the plant.	[L4][CO6]10M