Code: 9A02403

1

B.Tech II Year II Semester (R09) Regular & Supplementary Examinations, April/May 2013
GENERATION OF ELECTRIC POWER
(Electrical and Electronics Engineering)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1   What are the nuclear materials used in nuclear power plants?

2   Explain the different methods of solar energy storage.

3   Why pulverized fuel is preferred? What are the types of pulverized fuel burners?

4 (a)   Explain the role and potential of wind energy option.
  (b)   Why wind energy is is considered as a renewable energy source. Mention its demerits as a source of energy.

5   What are the techniques suggested for maintaining the biogas production? Explain.

6   Discuss the advantages and disadvantages of geothermal plants compared with conventional thermal plants.

7 (a)   Can the load factor of the system be 100%?
  (b)   A generating station has a maximum demand of 80 MW, a load factor of 65%, a plant capacity factor of 40% and a plant use factor of 85%. Find
        (i) Daily energy produced.
        (ii) Reserve capacity of plant.
        (iii) Maximum energy that could be produced daily if the plant was running all the time and maximum energy that could be produced daily if the plant was running as per operating schedule.

8   Explain what is meant by 'two part tariff and give the economic basis for adopting such a tariff.

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1   What are the advantages and disadvantages of the nuclear power station?

2   Explain the thermal analyses of a flat plate collector.

3   Write a short note on super heaters and reheaters.

4   What are the design considerations of horizontal axial machines?

5   With the help of neat diagrams, explain the working of biogas plants of floating type and fixed type systems. Discuss their relative merits and demerits.

6   Bio fueling is one major problem in developing OTEC plant. Discuss, explain and suggest the methods to prevent it.

7 (a) What is meant by depreciation of a power station?
  (b) A generating station has maximum demand of 10 MW. Calculate the cost per unit generated from the following data:
       Annual load factor = 30%.
       Capital cost = Rs. 12,50,000.
       Annual cost of fuel and oil = Rs. 8,00,000.
       Taxes, wages and salaries = Rs. 7,00,000.
       Interest and depreciation = 10%.

8   Explain giving examples:
     (i) Flat rate tariff
     (ii) Block rate tariff
     (iii) Two part tariff
     (iv) Power factor tariff. Give the advantages and disadvantages of each.

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1		Write short notes on the following:
	(a)	Atomic number and mass number.
	(b)	Atomic mass unit.
	(c)	Isotope.

2		How a concentrating collector differ from flat plate collector?

3		What are the functions of economizer and super heater in a thermal power plant?

4		Explain the various types of wind mills.

5		Write in brief about biomass resource development.

6		Explain with justification the potential of wave energy available in India. What factors are considered in selecting a site for wave power plant?

7		Define the load factor and maximum demand. Explain how the load factor affects the cost of energy generated.

8		A customer is offered power at Rs. 50 per annum per KVA of maximum demand plus 5 paise per unit. He proposes to install a motor to carry his estimated maximum demand of 300 b.h.p.(metric). The motor available has power factor of 0.83 at full load. How many units will be required at 30% load factor and what will be the annual bill? The motor efficiency is 90%.

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Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　　　　Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1　Write a short note on fast breeder reactor and also advantages and disadvantages.

2　Briefly explain the role and potential of solar energy generation.

3　Write a note on types of boilers and their characteristics.

4　Describe with a neat sketch the working of a wind energy system with main components.

5　What is meant by anaerobic digestion? What are the factors which affect bio digestion? Explain briefly.

6　What factors are considered in finding out the power potential of a tidal plant? Discuss with the merits of each factor.

7　(a)　Define the following terms for generating station:
　　　　(i) Load factor.　(ii) Utilization factor.　(iii) Load curves
　(b)　Load factor of a consumer is 35% and the monthly consumption is 504 KWh. If the rate of electricity is Rs.180 per KW maximum demand plus Rs 20. per KWh, find
　　　　(i) The monthly bill and the average cost per KWh.
　　　　(ii) The overall cost per KWh if the consumption is increased by 20% with the same load factor.
　　　　(iii) The overall cost per KWh if the consumption remains same her load factor is increased to 40%.

8　(a)　Can a power factor clause be included in a tariff?
　(b)　A factory has a maximum load of 300 KW at 0.72 p.f lagging with an annual consumption of 40,000 units. The tariff in force is Rs. 4.5 per KVA of maximum demand plus 2 paise per unit. Calculate the flat rate of energy consumption. What will be the annual saving if p.f. is raised to unity?

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