

01/07/2016

4E4174

Roll No. _____

Total No of Pages: **4**

4E4174

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Electrical Engineering

4EE4A Generation of Electrical Power

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. Calculator

2. Graph paper

UNIT-I

- Q.1 (a) Draw and explain an open cycle gas turbine plant with regeneration, intercooling and reheating also differentiate the open cycle & closed cycle gas turbine plant. [8]
- (b) Discuss why [8]
- (i) The overall station efficiency of a thermal plant is very low.
 - (ii) Steam Turbines have a number of stages.
 - (iii) Maximum thermal plants use pulverized coal.
 - (iv) It is necessary to heat the water before feeding it to the boiler.

OR

- Q.1 (a) Explain the various types of Reactors used in nuclear power plant also explain the basic plant layout of nuclear power plant. [8]
- (b) Discuss the economic feasibility of a pumped storage scheme of on hydro power plant also classified the different type of hydro electric plants. [8]

UNIT-II

- Q.2 (a) Discuss the Impact of nuclear and gas power plant on environment. Also explain the green house effect. [8]
- (b) Draw & explain the scheme of solar electrical energy generation also discuss the current energy scenario of India. [8]

OR

- Q.2 (a) Draw & explain the scheme of Wind Power generation. Also discuss the sustainable energy system. [8]
- (b) Differentiate the renewable and non – renewable energy sources. Also draw the layout of the tidal generation. [8]

UNIT-III

- Q.3 (a) The load curve of an electrical system is linear with the following values at different times of the day. [8]

Time	12	5Am	9	6Pm	8Pm	10	12
Load(mw)	50	50	100	100	150	80	50

Plot chronological load curve. Find the energy required by the system in one day and the system daily load factor.

- (b) Calculate the most economic power factor when
- (i) When KW Demand is Constant
- (ii) When KVA Demand is Constant [8]

OR

- Q.3 (a) A load of 500KW at 0.8 Power factor lagging is taken by industrial concern. The tariff is ₹ 400 per KVA of maximum demand per year + 100 Paise per KWh. The cost of installation of capacitor banks is ₹ 600 per year and the Interest and depreciation is 11%. Find: [8]
- (i) The most economic power factor
 - (ii) Rating of capacitor bank to improve the power factor to this value.
- (b) Explain the following: [8]
- (i) Group Diversity factor
 - (ii) Load factor
 - (iii) Utilization factor
 - (iv) Capacity factor

UNIT-IV

- Q.4 (a) Determine the generation cost per unit of energy from the following plant data
- Installed capacity = 120 MW
- Capital cost of plant = ₹ 40000 per kw
- Interest & depreciation = 15%
- Fuel consumption = 0.64kg/ kwh
- Fuel cost = ₹ 1500 per 1000kg
- Salaries, wages & other operation cost per annum = ₹ 50,000,000
- Peak load = 100MW
- Load factor = 60% [8]
- (b) What are the different Cogeneration Technologies? Explain. [8]

OR

- Q.4 (a) Explain the different method to calculate the depreciation of a plant in details. [8]
- (b) Write short note on [8]
- (i) Energy Conservation
 - (ii) Off peak energy utilization

UNIT-V

Q.5 (a) Explain the following forms of Tariff briefly [8]

- (i) Flat Demand Rate
- (ii) Straight meter Rate
- (iii) Block meter Rate
- (iv) Two Part tariff

(b) Give the comparison between thermal, hydro nuclear & gas Power Plant. [8]

OR

Q.5 (a) An Industrial consumer has single-phase 230V supply. His monthly energy consumption is 2020kwh. A maximum demand indicator installed at his premises indicates 40A which is charged at unity power factor for 2 hours daily at ₹ 3.50 per kwh. The remaining units are charged at ₹ 1.80 per kwh. Find his monthly bill (for 30 days) and average tariff per kwh. [8]

(b) What are the different factors, which governs the size and location of a Thermal Power Plant? [8]
