

4E4174

Roll No.

Total No. of Pages : 4

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B. Tech. IV Sem. (Main / Back) Exam; April-May 2017

Electrical Engg.

4EE4A Generation of Electrical Power

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 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 materials is permitted during examination. (Mentioned in form No. 205)

UNIT - I

1 (a) Discuss why ?

(i) The overall station efficiency of a thermal plant is very low.

(ii) It is necessary to heat the water (in a feed water heater) before feeding it to the boiler.

8

(b) Discuss the principle of operation of an open cycle gas turbine plant. Why is its efficiency low ?

8

OR

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[P.T.O.

1 (a) What is hydrograph ? What information does it provide ? How can a flow duration curve be obtained from a hydrograph ? 8

(b) Discuss why ?

- (i) Nuclear power plants are used only as base load plants.
 - (ii) Moderator is necessary in a reactor.
- 8

UNIT - II

2 (a) How can tidal power be utilized for benefit of mankind ? What are problems associated in construction of barrages for tidal schemes ? 8

(b) How can wind energy be converted into electrical energy ? What prohibits large scale utilization of wind power for electricity generation. 8

OR

2 (a) Discuss the role of new energy sources in the context of present day energy crisis. 8

(b) Discuss the future prospects of solar energy use. 8

UNIT - III

3 (a) The daily load curve data for a system is as under :
Week days :

Time	12-5 am	-8 am	-12 noon	-1 pm	-5 pm	-9 pm	-12 pm
Load (MW)	100	150	250	100	250	350	150

Saturday and Sunday :

Time	12-5 am	-5 pm	-9 pm	-12
Load (MW)	100	150	200	150

Draw a load duration curve for the system for one week. Find the weekly load factor.

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(b) What is the effect of load factor on unit generation cost.

6

OR

3 (a) Discuss why ?

- (i) Some power companies put a penalty for low power factors.
- (ii) It is not economical for consumers to raise power factor to unity.

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(b) Discuss the advantages of improving power factor.

6

UNIT - IV

4 (a) What is depreciation curve ? Why is it necessary to maintain it ? Discuss the methods to calculate the depreciation charges.

8

(b) How the power factor affects when kW demand is constant and in another case when kVA demand is constant.

8

OR

4 (a) What do you understand by the term co-generation ?

8

(b) Why should the total generation cost per unit of thermal energy depend on the station load factor ? Draw a typical curve showing this variation and justify its shape.

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UNIT - V

5 (a) How does the plant location affect the reliability of electric supply ?

6

(b) Distinguish between operating reserve and spinning reserve.

5

(c) What is the difference between 'present worth' and 'capitalized cost'.

5

OR

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

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(b) What is tariff ? What are its objectives ?

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