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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **EE254U - Power Systems-I**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve any three sub-questions

- a) State the applications of diesel power plant. [3]
- b) Define the following terms: i) Demand Factor ii) Load Factor iii) Diversity Factor [3]
- c) What is the Resistance of a transmission line and how it varies with the temperature? [3]
- d) Why are insulators used with overhead lines? Discuss the desirable properties of insulators. [3]

2) Solve any three sub-questions

- a) Explain terms base load and peak load by giving proper definitions. List the power plants used as base load and peak load plants. [4]
- b) What are the various types of loads on Power System [4]
- c) Discuss the advantages and disadvantages of corona. [4]
- d) What is a strain insulator and where is it used? Give a sketch to show its location. [4]

3) Solve any three sub-questions

- a) What are the factors to be considered for selecting the site for steam Power Plant? [5]
- b) A generating station has daily load cycle as: [5]

Time (Hrs)	0-6	6-10	10-12	12-16	16-20	20-24
Load (kW)	40	50	60	50	70	40

Draw the load curve and load duration curve and find (i) maximum demand, (ii) units generated and (iii) load factor.

- c) Derive the capacitance of a single phase 2 wire transmission line [5]
- d) The towers of height 30 m and 90 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500 m. If the tension in the conductor is 1600 kg, find the minimum clearance of the conductor and water and clearance mid-way between the supports. Weight of the conductor is 1.5 kg/m. Bases of the towers can be considered to be at water level. [5]

4) Solve any four sub-questions

- a) What is the basic difference between a diesel engine and a steam turbine? [6]
- b) Name the different types of fuels used in nuclear reactors. [6]
- c) Give the classification of Transmission Lines based on their lengths. [6]
- d) Discuss the terms voltage regulation and transmission efficiency as applied to transmission line. [6]
- e) A 3-phase line delivers 3600 kW at a pf 0.8 lagging to a load. If the sending end voltage is 33 kV determine (i) the receiving end voltage (ii) line current (iii) transmission efficiency. The resistance and reactance of each conductor are 5.31 Ω and 5.54 Ω respectively. [6]

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