

May 2019

B.Tech IV SEMESTER

Power System -I (EE-202C)

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
  2. Answer any four questions from Part -B in detail.
  3. Different sub-parts of a question are to be attempted adjacent to each other.
  4. Any other specific instructions

**PART -A**

- Q1 (a) Explain why the thermal efficiency of a steam power station is quite low? (1.5)
- (b) Why the hydro electric plants are suited for both base load and peak load operations? (1.5)
- (c) What is a hydrograph and what information does it provide? (1.5)
- (d) What is the principle of working of fuel cell? (1.5)
- (e) Define load factor and diversity factor. (1.5)
- (f) Define string efficiency. How can it be improved? (1.5)
- (g) Why loss angle of a cable should be very small? (1.5)
- (h) On what factors does the insulation resistance of a cable depend? (1.5)
- (i) Why the transmission lines are transposed? (1.5)
- (j) What is skin effect? (1.5)

**PART -B**

- Q2 (a) Discuss the factors which influence the choice of site for hydro electric power plants. (7)
- (b) Explain with a neat sketch the working of modern thermal station. Which devices are necessary to increase the thermal efficiency. (8)
- Q3 (a) Explain the operation and control of gas turbine plant. (7)
- (b) Describe the working of a solar power plant. (8)
- Q4 (a) Explain various types of tariffs in use and mention the category of consumers for whom each one is applicable. (7)
- (b) A generating station has a connected load of 40 MW and maximum load of 20MW. The units generated being  $60 \times 10^6$  per annum. Calculate the load factor and demand factor. If the tariff is Rs 50 per KW plus Rs 0.03 per kwh consumed. Calculate the annual bill. (8)
- Q5 (a) Explain various types of insulators with their application. (7)
- (b) Explain the methods for improving the voltage distribution along the string of insulators. (8)
- Q6 (a) Explain the construction of HSL type oil filled power cable. (7)

(b) What do you mean by grading of a cable? Discuss any one method of grading. (8)

Q7 (a) Derive an expression for inductance of a transmission line per km per conductor. (7)

(b) Derive the expression for the capacitance of an unsymmetrical transposed 3-phase transmission line. (8)

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