

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

CLASS: BE
BRANCH: EEE

SEMESTER: V
SESSION : MO/2018

SUBJECT : EE5207 POWER SYSTEM-I

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

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- Q1 (a) Differentiate between Load curve and Load duration curve with diagrams? [2]
(b) A generating station has a maximum demand of 25 MW, a load factor of 60%, a plant capacity factor of 50%, and a plant use factor of 72%. Find (a) the daily energy produced, (b) the reserve capacity of the plant and (c) the maximum energy that could be produced daily if the plant, while running as per schedule, were fully loaded. [3]
- Q2 (a) What is skin effect? Explain with proper diagram. Why it is absent in the dc system? [2]
(b) A 3-phase double circuit line has flat vertical configuration. The diameter of each conductor is 2 cm, the vertical distance between phases a, b, and b, c is 2 m and the horizontal distance between a, c' or b, b' or c, a' is 6m. The line may be assumed to be fully transposed. Find the capacitance per phase to neutral of the line. [3]
- Q3 (a) Write a short note on Availability Based Tariff. [2]
(b) Derive the necessary equations for inductance of three phase unsymmetrically spaced transmission line and comment on the equations? [3]
- Q4 (a) Explain why the voltage does not divide equally across the units of a string insulator. Listing the various methods by which the voltages across the units can be equalized and which of these methods is actually used in practice? [2]
(b) Each conductor of a 33kV, 3 - phase system is suspended by a string of three similar insulators; the capacitance of each disc is nine times the capacitance to ground. Calculate the voltage across each insulator. [3]
- Q5 (a) With a neat diagram, show the various parts of a high voltage single core cable. [2]
(b) Determine the diameter of core of a cable operating at 85 kV for the longer life of the insulating material whose breakdown strength is 65 kV/cm? [3]
- Q6 Complete the following sentences. [5]
(i) Capacitance of a cable is higher than overhead conductor because
(ii) The benefit of transposing a transmission line is
(iii) Steel core is used in ACSR conductor because
(iv) Bundle conductor is used because
(v) The disadvantage of simple tariff is
(vi) Distribution transformer is delta -star because
(vii) The benefit of keeping high load factor is
(viii) One method of ensuring high diversity factor is
(ix) Gauss's law relates
(x) The reason of developing line capacitance is