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

CLASS: BE **SEMESTER: V**
BRANCH: EEE **SESSION : MO/2019**

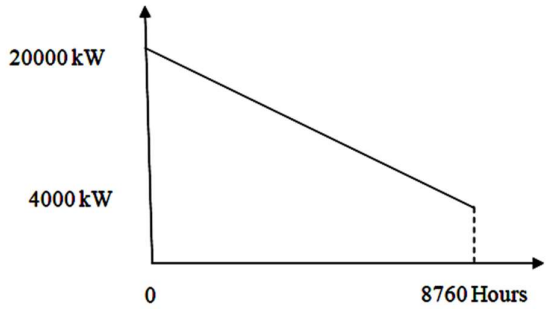
SUBJECT : EE5207 POWER SYSTEMS - I

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.

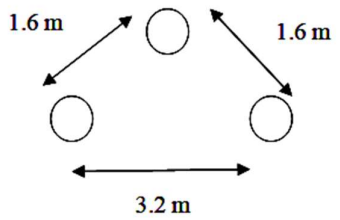
Q1 (a) Differentiate between Load Curve and Load Duration Curve with diagrams? [2]
(b) With example in each case, define block rate tariff, power factor tariff and three part tariff. [3]

Q2 (a) Why Diversity factor should be high and what can be done to improve diversity factor? [2]
(b) The annual load duration curve of a certain power station can be considered as a straight line from 20 MW to 4 MW as shown in the figure. To meet the load three turbine generator units, two rated at 10 MW each and one rated at 5 MW are installed. Determine a) Plant capacity factor b) Load factor c) number of units generated per annum [3]



Q3 (a) What are the different types of conductor used in over head lines and which conductor is widely used and why? [2]
(b) Derive the equations of inductance of 3 phase transmission line having unsymmetrical spacing. Comment on the equations and what can be done to overcome drawbacks? [3]

Q4 (a) Determine the inductance of a 100 km 3 phase line operating at 50 Hz for the conductor arrangement shown below. The conductor diameter is 0.8 cm? [2]



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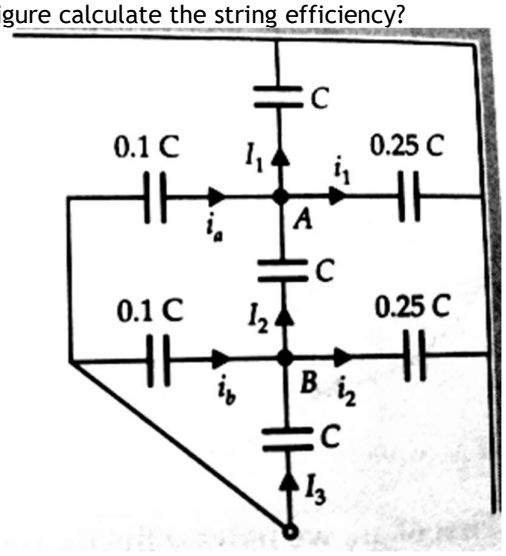
(b) Explain the concept of skin effect with diagrams and what are factors effecting skin effect? [3]

Q5 (a) Explain the method of grading ring to equalise potential across string of three insulators and derivethe equation? [2]

(b) For the following figure calculate the string efficiency? [3]



Q6 (a) Write any five insulating materials used in cables? [2]

(b) A single core cable has a conductor diameter of 2.5 cm and sheath of inside diameter 6 cm operating at 3 phase 66 kV. It is desired to reduce the maximum stress by using two intersheaths. Determine their best position and voltage on each intersheath? [3]

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