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Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

EX-4005 (CBGS)

B.E. IV Semester

Examination, May 2018

Choice Based Grading System (CBGS)

Power System - I

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assuming missing data suitably.

1. a) Define and explain the terms load factor and diversity factor. 7
   b) A power station has to meet the following demand: 7
   Group A: 200kW between 8 A.M. and 6 P.M.
   Group B: 100kW between 6 A.M. and 10 A.M.
   Group C: 50kW between 6 A.M. and 10 A.M.
   Group D: 100kW between 10 A.M. and 6 P.M. and then between 6 P.M. and 6 A.M.
   Plot the daily load curve and determine load factor, diversity factor and units generated per day.

2. Classify the power generation methods and compare conventional, non-conventional and distributed generations. Also explain the effect of transmission voltage on power system economy? rgpvonline.com 10+4

3. Show that the inductance per loop meter of two wire transmission line using solid round conductors is given by $L=4\times10^{-7}\log\left(\frac{D}{R}\right)$ henries where D is distance between conductors and R is the GMR of the conductors. 14

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4. a) Describe the phenomenon of corona and what are the factors which affect the corona loss. 8
   b) A 3-phase, 220kV, 50Hz line has equilateral triangular spacing of 2cm side. The conductor diameter is 3cm. The air density factor and surface irregularity factor are 0.95 and 0.83 respectively. Find critical disruptive voltage and corona loss per km. 6

5. Explain the terms surge impedance, surge impedance loading and velocity of propagation of waves with respect to the transmission lines. rgpvonline.com 14

6. Show that the sag on level supported line conductor of span L, weight for unit length W kgs and minimum tension T in the line conductors is given by $S = Wl^2/8T$, what will be the sag if level difference is of '*h*' meters. 14

7. How would you explain a substation? Discuss the different ways of classifying the substations. 4+10

8. A 3-phase ring main ABCD fed at A at 11kV supplies balanced load of 50A at 0.8 p.f. lagging at B, 120A at unity p.f. at C and 70A at 0.866 lagging at D, the load currents being referred to the supply voltage at A. The impedances of the various sections are:
   Section AB = (1+j0.6)Ω Section BC = (1.2+j0.9)Ω
   Section CD = (0.8+j0.5)Ω Section DA = (3+j2)Ω
   Calculate the currents in various sections and station bus-bar voltages at B, C, D. 14

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