Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018
Course Code: EE301
Course Name: POWER GENERATION, TRANSMISSION AND PROTECTION
Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 5 marks.   Marks

1	With the help of a block diagram explain wind power generation	(5)
2	What is transposition of lines? Comment on its necessity in the system.	(5)
3	Comment on the effect of wind and ice loading on transmission line with respect to change in sag calculation.	(5)
4	List the advantages and disadvantages of HVDC transmission.	(5)
5	Clarify the term duality in terms of amplitude and phase comparators.	(5)
6	Discuss the problems associated with capacitive current chopping.	(5)
7	State the main types of distribution systems and compare their applications.	(5)
8	What is meant by earth fault protection of an alternator? How is it implemented?	(5)

PART B
Answer any two full questions, each carries 10 marks.

9   a)   A proposed station has the following load cycle: (5)

Time in hours: 6-8   8-11   11-16   16-19   19-22   22-24   24-6

Load in MW: 20   40   50   35   70   40   20

Draw the load curve and select suitable generator units from 10,000, 20,000, 25,000, 30,000 kVA. Prepare the operation schedule for the selected machines and determine the load factor from the curve.

  b)   State Skin Effect and Ferranti Effect and elucidate them with necessary diagrams   (5)

10 a)   Enlighten upon the various components and their operation in a hydroelectric power plant for energy production.   (5)

  b)   Derive the expression for capacitance in a single phase overhead line under the influence of earth effect.   (5)

11 a)   Mention the merits and demerits of solar power generation in bulk and explain with respect to live examples.   (5)

  b)   Classify transmission lines according to their length and enlist the line models. Derive the ABCD constants for medium lines using nominal π method.   (5)

PART C
Answer any two full questions, each carries 10 marks.

12 a) Illustrate the methods used for improving string efficiency of overhead line insulators. (5)

     b) Derive the expressions for capacitance and insulation resistance of a single core cable. (5)

13 a) Explain the advantages and disadvantages of corona. (5)

     b) With the aid of single line diagrams, differentiate between mono polar and bipolar types of HVDC links. Comment on their use in the system. (5)

14 a) Discuss the various conductor materials used for overhead lines. What are their relative merits and demerits? (5)

     b) Draw the configuration of FC+TCR. Explain its operation. (5)

PART D
Answer any two full questions, each carries 10 marks.

15 a) Derive the expression for Rate of Rise of Restriking Voltage. (5)

     b) What factors cause difficulty in applying circulating current principle to a power transformer? (5)

16 a) With a neat diagram, explain the arc extinction in VCB. (5)

     b) Explain the working of a surge diverter. (5)

17 a) Explain the operation of a microprocessor based over-current relay with the aid of a block diagram. (5)

     b) A single phase distributor AB has a total impedance of $(0.1 + J0.2)\Omega$. At the far end B, a current of 80A at 0.8 p.f. lagging and at mid-point C a current of 100A at 0.6 p.f. lagging are tapped. If the voltage of the far end is maintained at 200V, determine: (i) Supply end voltage V_A and (ii) Phase angle between V_A and V_B. The load power factors are with respect to the voltage at the far end. (5)

****