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Code No. : 22203

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. II Year (E.E.E.) II-Semester (Main) Examinations, May-2016**

**Power Systems-I**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2 = 20 Marks)**

1. Explain the function of Electrostatic precipitator in thermal power plant.
2. Differentiate between Fission and fusion.
3. Differentiate between beam and diffuse radiation.
4. What is meant by pitch control?
5. What is the use of stringing chart?
6. Mention different methods of cable grading.
7. On what factors, does the skin effect depend?
8. What is the significance of equivalent spacing of a 3-phase line?
9. Write the significance of load factor.
10. What is three part tariff?

**Part-B (5 × 10 = 50 Marks)**

*(All bits carry equal marks)*

11. a) Explain about super heater in thermal plants.  
b) What are the functions of moderator and control rods in a nuclear power plants?
12. a) Derive an expression for power Coefficient of Wind energy conversion system.  
b) Discuss the problems associated with the generation of power from ocean waves.
13. a) Explain the various methods for equalizing the potential across the various units in an insulator string and discuss the methods for improving the string efficiency in a string of insulators.  
b) A transmission line conductor having a diameter of 19.5mm weighs 0.85kg/m. The span is 275 meters. The wind pressure is 40kg/m<sup>2</sup> of projected area with ice coating of 13mm. The ultimate strength of the conductor is 8000Kg. Calculate the maximum sag, if the factor of safety is 2 and ice weighs 910kg/m<sup>3</sup>.
14. a) Derive from first principles an expression for inductance per phase per km for a 3-phase transmission line with conductors of diameter 'd' arranged in the same horizontal plane at successive distance 'D' apart. The conductors are regularly transposed.  
b) Calculate the capacitance of a conductor to neutral in a single-phase transmission line having two parallel conductors spaced 3 m apart. The diameter of each conductor is 1.2 cm.
15. a) Prove that the voltage drop diagram for a uniformly loaded distributor fed at one end is parabola.  
b) A generating station is to supply four regions of load whose peak loads are 10 MW, 5 MW, 8 MW and 7 MW. The diversity factor at the station is 1.5 and the average annual load factor is 60%. Calculate:
  - i) The maximum demand on the station.
  - ii) Annual energy supplied by the station. Suggest the installed capacity and the number of units.

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16. a) Explain briefly about combined gas turbine and steam power plants.  
b) With neat sketch, explain about the method of measuring solar radiation using Angstrom compensation pyrhelimeter.

17. Answer any two of the following:

- a) How does dielectric loss vary with the change in voltage, frequency of supply and capacitance of cable?  
b) Explain briefly about the skin effect in a transmission line. How it will affect the resistance of the line?  
c) A factory has a maximum load of 240 kW at 0.8 pf lagging with an annual consumption of 50 000 units. The tariff is Rs. 350 per kVA maximum demand plus Rs. 2 per unit. Calculate the flat rate of energy consumption. What will be the annual saving if power factor is raised to unity?

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