Hall Ticket Number:

Code No.: 22701 M

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. (EEE: CBCS) II-Semester Make Up Examinations, September-2017
(Power Systems & Power Electronics)
Distribution System Planning and Automation

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. The annual peak load of a primary feeder is 2000 kW at which the power loss is 80 kW per three-phase. Assume an annual loss factor of 0.2 determine
   a) Average annual power
   b) Total annual energy loss.

2. Draw the flow chart for distribution system planning process.

3. Illustrate the use and interpretation of parameters A_n and n in the equation of percent – voltage drop where A_n is area served by one feeder, n is number of primary feeders

4. Draw the diagram of loop type primary feeder.

5. List the components in a distribution substation.

6. What is an express feeder and mention its applications.

7. Explain the concept of secondary banking.

8. A 2.4kV 1-ϕ circuit feeds a load of 360kW at a lagging power factor and the load current is 200A .If it is desired to improve the power factor determine the following
   a) the uncorrected power factor and reactive load.
   b) the new corrected power factor after installing a shunt capacitor with a rating of 300kVAr.

9. Discuss the basic functions of SCADA.

10. Illustrate the role of GIS in distribution automation.

Part-B (5 × 10 = 50 Marks)

11. a) Briefly discuss the factors effecting the future nature of distribution planning.　　[5]

　　b) Explain the role of computer in distribution system planning.　　[5]

12. a) Explain with neat diagrams the advantages and disadvantages of any three bus schemes which include the most efficient and economical bus scheme.　　[5]

　　b) Derive the equation for rating of a substation with n feeders.　　[5]

13. a) Discuss the radial method of service area development for high load density with 3 transformers and 12 feeders.　　[7]

　　b) Determine the ABCD parameters of the feeder shown in figure.　　[3]
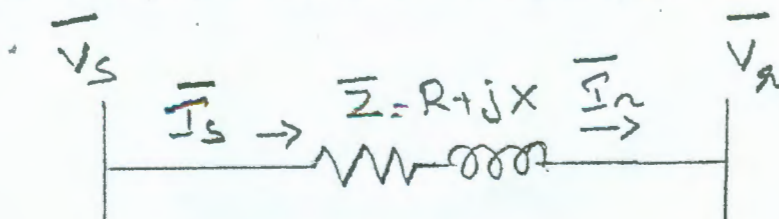
14. a) Discuss the benefits of application of capacitors in distribution system. [6]

    b) A three-phase 500 HP, 50 Hz, 4 pole, 16 kV star connected induction motor has a full [4]
Load efficiency of 88% at lagging pf of 0.75 and is connected to feeder. It is desired to
correct the power factor of the load to a lagging pf of 0.9 by connecting capacitors at
the load, determine
       i) Rating of capacitor bank
      ii) Capacitance of each unit when connected in star – delta.

15. a) Discuss the objectives of distribution system Automation. [5]

    b) Write a short notes on   i) AMR   ii) CIS [5]

16. a) Explain the ladder iterative technique for distribution feeder analysis. [6]

    b) Enumerate the advantages and disadvantage of interconnecting the transformers in [4]
secondary system.

17. Write short notes on any *two* of the following:
    a) Load characteristics [5]
    b) Substation Application Curves [5]
    c) Communication Systems Used in Distribution Automation. [5]

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