KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

Marks Scored:

Level : B. E.
Year : IV

Course : EPEG 413
Semester: I

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date 03 JUN 2019

SECTION "A"
[20Q. × 0.5 = 10 marks]

Encircle the most appropriate answer.

1. The concept of an electrically short, medium and long is primarily based on the:
   a. Nominal voltage of the line
   b. Physical length of the line
   c. Wavelength of the line
   d. Power transmitted over line

2. The injection of VARs is required to:
   a. Compensate for line losses
   b. Get a good voltage profile
   c. Increase the voltage at the receiving end
   d. All of above

3. The incremental fuel costs for two generating units G_1 and G_2 are given by: $IC_1 = 25 + 0.2\ PG_1$ and $IC_2 = 32 + 0.2\ PG_2$, where PG_1 and PG_2 are real powers generated by the units. The economic allocation for a total load of 250 MW, neglecting transmission loss, is given by:
   a. 142.5 MW and 107.5 MW
   b. 109.75 MW and 140.25 MW
   c. 125 MW and 125 MW
   d. 100 MW and 150 MW

4. If the effect of earth is taken into account, then the capacitance of line to ground:
   a. Decreases
   b. Increases
   c. Remains unaltered
   d. Becomes infinite

5. When the power system is not in a position to meet the load it will restore to:
   a. Power factor improvement at the generator
   b. Load shedding
   c. Efficient plant operation
   d. Penalising high load consumers by increasing the charges

6. Advantages of the improved power factor are:
   a. Increase in operating efficiency of the power system
   b. Improvement in voltage regulation
   c. Reduction in overall cost per unit
   d. Better utilization of kW capacities of prime movers, transformers, switchgear and the lines

7. The surge impedance of a 400 kV, 100 km transmission line is 300 ohms. For a 200 km length the line surge impedance will be:
   a. 300Ω
   b. 150 Ω
   c. 600 Ω
   d. 400 Ω

8. Series capacitors on transmission lines are of little use when:
   a. The load VAR requirement is small
   b. The load VAR requirement is large
   c. The load VAR requirement is fluctuating
   d. Series capacitors are never used in transmission lines

9. Conductors used in HT transmission lines are standard because of:
   a. Increased tensile strength
   b. Ease in handling
   c. Cheaper in cost
   d. Reduced resistivity

10. Which of the following results in symmetrical fault?
   a. Single phase to earth
   b. Phase to phase
   c. All the three phase to earth
   d. Two phase to earth

11. Capacitors are used in power system to?
   a. Improve supply power factor
   b. Improve voltage regulation
   c. Change the load characteristics
   d. All of the mentioned

12. For a fault at the terminals of synchronous generator, the fault current is maximum for a:
   a. 3-phase fault
   b. 3-phase to ground fault
   c. Line to line fault
   d. Line to ground fault

13. A transformer rated for 500 kVA, 11 kV/ 0.4 kV has an impedance of 10% and is connected to an infinite bus. The fault level of the transformer is:
   a. 500 kVA b. 5000 kVA c. 500 MVA d. 250 kVA

14. A single phase transmission line of impedance j0.8 ohm supplies a resistive load of 500 A at 300 V. The sending-end power factor is:
   a. Unity b. 0.8 lagging c. 0.8 leading d. 0.6 lagging

15. A 500 MVA, 50 Hz, 3-phase turbo-generator produces power at 22 kV. Generator is Y-connected and its neutral is solidly grounded. Its sequence reactances are X1 = X2 = 0.15 and X0 = 0.05 pu. It is operating at rated voltage and disconnected from the rest of the system (no load). The magnitude of the sub-transient line current for single line to ground fault at the generator terminal in PU will be:
   a. 2.851 b. 3.333 c. 6.667 d. 8.553

16. Steady state stability of a power system is improved by:
   a. Reducing fault clearing time
   b. Using double circuit line instead of single circuit line
   c. Single pole switching
   d. Decreasing generator inertia

17. The positive-sequence current for a L-L fault of a 2 kV system is 1,400 A, and corresponding current for a L-L-G fault is 2,220 A. The zero-sequence impedance of the system is:
   a. 62.75 ohm b. 4.5275 ohm c. 5.275 ohm d. 0.5275 ohm

18. Load flow study is carried out for:
   a. Load frequency control
   b. Planning of power system
   c. Fault calculation
   d. Study of system stability

19. Ferranti effect happens in transmission line when the line is:
   a. Short and loaded
   b. Long and loaded
   c. Long and unloaded
   d. None of these

20. A voltage-controlled bus is specified by:
   a. Real power and reactive power
   b. Reactive power and voltage
   c. Voltage and phase angle
   d. Real power and voltage