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Question Paper Code: 35303

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fifth Semester

Electrical and Electronics Engineering

01UEE503 – POWER SYSTEM ANALYSIS

(Regulation 2013)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. What will be the per unit impedance of a synchronous motor having a rating of 100 kVA, 13.2 kV and having a reactance of $75 \Omega / \text{ph}$?
(a) 0.043 pu (b) 0.057 pu (c) 0.036 pu (d) 0.298 pu
2. The value of diversity factor is
(a) 0 (b) 1 (c) less than 1 (d) greater than 1
3. What is the value of acceleration factor used in the GS method?
(a) 2.3 – 2.7 (b) 1.6 – 2.0 (c) 1.2 – 1.5 (d) 2.4 – 2.9
4. Gauss Seidal iterative method can be used to solve a set of
(a) linear differential equation only
(b) linear and non linear algebraic equations
(c) linear and non linear differential equations
(d) linear algebraic equation only
5. If the P.U value of synchronous impedance is 2, what is short circuit ratio?
(a) 0.05 (b) 0.5 (c) 2 (d) 0.02
6. What is the value of negative sequence impedance?
(a) 1 (b) Z
(c) Same as positive sequence (d) ∞

7. On which among the following factors does the magnitude of the fault current depend?
- (a) Total impedance upto the fault (b) Voltage at the fault point
(c) Both (a) and (b) (d) None of these
8. Which among these is the most severe fault?
- (a) Single line to ground fault (b) Double line to ground fault
(c) Line to line fault (d) Symmetrical fault
9. Kinetic energy of 800 MJ stored in the rotor at synchronous speed. What is the inertia constant for a 50 Hz four pole turbo generator rated at 100MVA, 11 kV
- (a) 2 MJ/MVA (b) 8 MJ/MVA
(c) 88 MJ/MVA (d) 6 MJ/MVA
10. Critical clearing time of fault in a power system is related to
- (a) transient stability (b) reactive power
(c) S.C. current (d) voltage limit

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Two generators rated at 10MVA, 13.2KV and 20MVA, 13.2KV are connected in parallel to a bus bar. Two motors of input 8MVA, 12.5KV and 12MVA, 12.5KV are drawn supply from bus bar. Take $x_g'' = 15\%$ and $x_m'' = 20\%$. Draw the single line diagram and calculate the new P.U. impedance for the power system components. Assume generator1 rating as base quantities. (8)
12. Construct the equations to determine the jacobian matrices for Newton Raphson method to solve load flow for an n bus system with a slack bus and load buses. (8)
13. Write the steps for the fault calculation of an n bus system using bus impedance matrix. (8)
14. Derive the equation of fault current for an L-L fault in power system. (8)
15. Derive the equation for critical cleaning angle determination. (8)