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FACULTY OF ENGINEERING & TECHNOLOGY

M.E (EPS) Year Examination - June – 2015

Computer Aided Power System

(Revised)

[Time: Three *Hours*] **[Max. Marks: 80]**

"Please check whether you have got the right question paper."

i) Answer any two questions from section A and two from section B.

ii) Assume suitable data if required.

SECTION-A

Q.1 a) What are symmetrical components? How are they useful in power system studies? Prove that neutral current can flow only if zero sequence currents are present. 10

b) A 10 MVA, 11 KV generators is directly connected to a transmission line, a short circuit occurs between two phases of the line involving phase b and c. the positive, negative and zero sequence reactance's in ohms are respectively as follows. 10

Generator line up to fault	X_1	X_2	X_0
	27	9	4.5
	9	9	0

Write a short note on faults on a known system.

Q.2 a) Derive the expression for three phase power in terms of symmetrical components. 10

b) In a three phase system the phase voltages are given by 10

Van = $200<0^0$ V

Vbn = $600 < 100^0$ V

Vcn 400 $<270^0$ V

Find the symmetrical components of the voltage.

Q.3 a) Two generators are connected in parallel to the same bus and have sub transient reactance of x"=10 % generator / is rated 2,500KVA, 2.4KV and generator 2 is rated 5000 KVA, 2.4KV find the per unit reatance of each generator on a 15MVA, 2.4KV base. what is the per unit reactance of a single generator equivalent to the two generators in parallel on a 15MVA 2.4KV base. 10

b) What are the aims and objectives of power system anlysis? State the advantages of per unit system. 10

SECTION-B

Q.4 a) Draw the zero sequence diagrams of generators and transformers. 12

b) Explain in detail the sequence impedance of synchronous machine. 08

Q.5 a) Solve the following equations by the Newton Raphson method. 10

$x_1{}^2 - 4x_2 - 4 = 0$

$2x_1 - x_2 - 2 = 0$

b) A power system has been shown in figure1. Determine V2 by Gauss Siedal method after first relation. 10

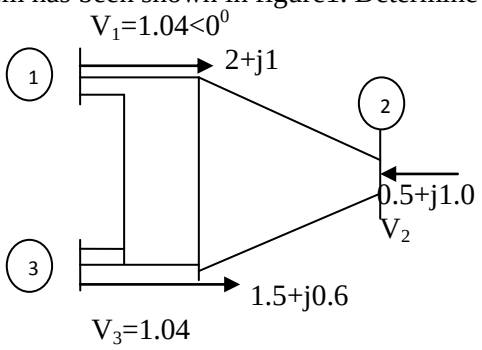

Figure 1

Q.6 a) Write the comparison of admittance and impedance matrix techniques. 08

b) Write the algorithm for obtaining y bus from a two bus networks. 12