I D NO.	

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 40 % Max Marks: 40 Max Time: 2 hrs. 14 May 2018, Monday

ENDTERM FINAL EXAMINATION MAY 2018

Even Semester 2017-18 Course: **EEE 215 Power System Analysis** VI Sem. Electrical

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Instructions:

(i) Read the question properly and answer accordingly.

(ii) Question paper consists of 3 parts.

(iii) Scientific and Non-programmable calculators are permitted

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Part A

(3 Q x 4 M = 12 Marks)

1. Define stability pertaining to a power system and classify the different types of stability.
2. Establish the interconnection of sequence networks for two line open conductors fault.
3. Write short notes on Equal area criterion for transient stability

Part B

(3 Q x 6 M = 18 Marks)

4. Derive the Power angle equation of a synchronous machine connected to an infinite bus (SMIB).
5. A 3 phase generator with an open circuit voltage of 400 V is subjected to an LG fault through a fault impedance of j2 Ω. Determine the fault current if Z_1= j4 Ω, Z_2= j2 Ω, and Z_0= j1 Ω. Repeat the problem for LL fault.

6. A turbo generator, 6 pole, 50 Hz, of capacity 80 MW working at 0.8 pf has an inertia of 10 MJ/MVA.
   (a) Calculate the energy stored in the rotor at synchronous speed
   (b) Find rotor acceleration if the mechanical input is suddenly raised to 75 MW for an electrical load of 60 MW.

Part C

(1 Q x 10 M = 10 Marks)

7. Derive an expression for fault current, when line to line fault through impedance occurs on power systems. Show the interconnection of sequence networks.

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PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20% Max Marks: 20 Max Time: 1 hr. 2 April Monday 2018

TEST – 2 **SET A**

Even Semester 2017-18 Course: **EEE 215 Power System Analysis** VI Sem. Electrical

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Instruction:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted

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Part A

(2Q x 3 M = 6 Marks)

1. Prove that a balanced set of three phase voltages will have only positive sequence components of voltages only.
2. Derive an expression for complex power in terms of symmetrical components

Part B

(1 Q x 7 M = 7 Marks)

3. Draw the positive, negative and zero sequence networks for the power system shown in Fig. 1.

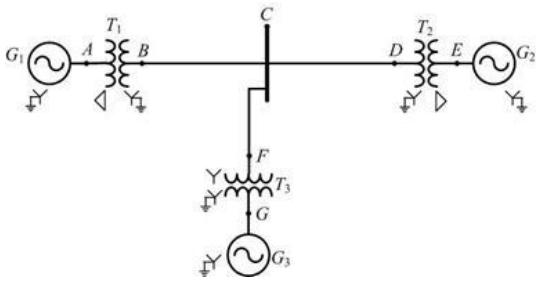

Fig. 1

Part C

(1Q x 7 M = 7 Marks)

4. With the help of relevant vector diagrams for voltages and currents, establish the phase shift of the symmetrical components in star delta transformers. Assume the HT side to be star connected and LT side to be delta connected.

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SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 20 Max Time: 1 hr. 23 Feb Friday 2018

TEST – 1

Even Semester 2017-18 Course: **EEE 215 Power System Analysis** VI Sem. **Electrical**

Instruction:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted

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Part A

(2 Q x 3 M = 6 Marks)

1. Define the per unit (p.u) quantity. Mention the advantages of the per unit system.
2. The three phase power and line-line ratings of the electric power system shown in Fig. 1. are given below:

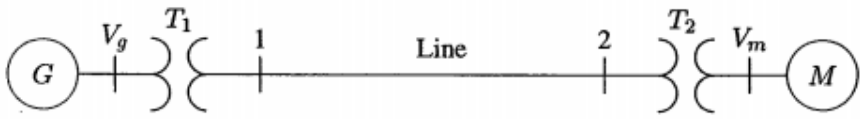

Fig. 1

G1: 60 MVA, 20 kV, X=9%

T1: 50 MVA, 20/200 kV, X=10%

T2: 50 MVA, 200/20 kV, X=10%

M: 43.2 MVA, 18 kV, X=8%

Line: 200 kV, X=j200 Ω

Draw a reactance diagram showing all reactances in per-unit on a 100 MVA base. Choose 20 kV as the voltage base for generator.

P.T.O.

Part B

(1 Q x 7 M = 7 Marks)

3. Explain clearly the short circuit currents and reactances with reference to unloaded synchronous generator on the occurrence of 3 phase fault.

Part C

(1Q x 7 M = 7 Marks)

4. A synchronous generator and motor are rated for 30 MVA, 13.2 kV and both have subtransient reactance of 20%. The line connecting them has a reactance of 10% on the base of machine ratings. The motor is drawing 20 MW at 0.8 p.f leading. The terminal voltage of the motor is 12.8 kV. When a symmetrical three-phase fault occurs at motor terminals, find the subtransient current in generator, motor and at the fault point.