

Roll No																			
---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023**

Semester : Semester VI -2020

Course Code : EEE3002

Course Name : Sem VI - EEE3002 - Power System Analysis

Program : EEE

Date : 13-APR-2023

Time : 11:30AM - 1:00PM

Max Marks : 60

Weightage : 30%

Instructions:

- (i) Read all questions carefully and answer accordingly.
 - (ii) Question paper consists of 3 parts.
 - (iii) Scientific and non-programmable calculator are permitted.
 - (iv) Do not write any information on the question paper other than Roll Number.
-

PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. The per unit value of a 2 ohm resistor at 100 MVA base and 10 kV base voltage
a) 4 pu (CO1) [Knowledge]
b) 1/2 pu
c) 2 pu
d) 0.2 pu
2. Power flow studies are performed to determine voltages, active and reactive power, etc. at various network nodes for various operating conditions, subject to constraints on generator capacities, specified net interchange between operating systems, and a number of other constraints. For load flow solutions, what quantities are specified at the load bus?
a) P & |V| (CO2) [Knowledge]
b) P & Q
c) P & δ
d) Q & |V|
3. If a voltage-controlled bus is regarded as a load bus in a power system, which of the following limits would be violated?
a) Voltage (CO2) [Knowledge]
b) Active Power
c) Reactive power
d) Phase angle

4. The point where numerous components of a power system join is known as a The bus is a conductor made of copper or aluminum having negligible resistance. The buses are considered as points of constant voltage in a power system.
- a) Bus (CO2) [Knowledge]
 b) Impedance
 c) Conductor
 d) All of the above
5. The load flow study of a power system is essential to decide the best operation of existing system and for planning the future expansion of the system. Also essential for designing a new system. In power system network each bus in a system are associated with the following quantities;
- a) Magnitude of voltage and Phase angle of voltage (CO2) [Knowledge]
 b) Real power, Reactive power, Magnitude of voltage and Phase angle of voltage
 c) Impedance, Reactive power, Magnitude of voltage and Phase angle of voltage
 d) Real power, Reactive power, Magnitude of voltage and Phase angle of impedance

PART B

ANSWER ALL THE QUESTIONS

(2 X 15 = 30M)

6. Consider the electricity infrastructure depicted in Fig. 1. Each generator has a line impedance of $(0.2 + j0.2)$ pu and $(0.5 + j0.5)$ pu. Without taking into account line charging admittances, form YBus for the provided power system network using the Singular Transformation method and check the outcome using the direct inspection method.

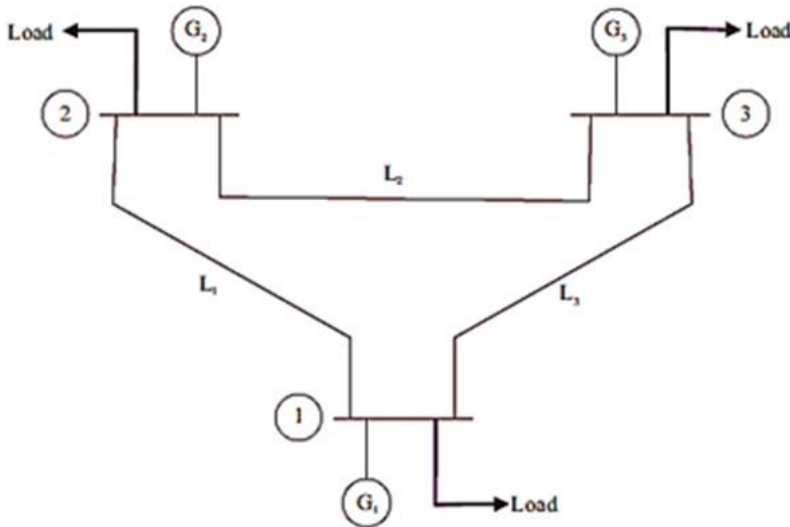


Fig. 1

(CO1) [Comprehension]

7. Power is transported from Yelhanka's 100 MW gas power station to KGF through this system. This setup includes the generator, one transmission cable, one transformer, and two loads. A steady-state study should be done on this system, mainly to find out how power flows through it under certain operating conditions. As the electrical head of the project, suggest the various types of load analysis methods that are used to carry out the study to Mr. Thanish, the NTPC manager, and briefly discuss any one of the computational procedures for computing the load flow solution by considering a simple system.

(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. For the power system shown in Fig.2, the specification of the components are the following;

G1: 25 kV, 100 MVA, X=9%.

G2: 25 kV, 100 MVA, X=9%.

T2: 25kV/220 kV, 90 MVA, X=12%.

T2: 220kV/25 kV, 90 MVA, X=12%.

Line 220 kV, X=150 ohm.

Choose 25 kV as the base voltage at the generator G1, & 200 MVA as the MVA base. Draw the impedance diagram & per unit diagram.



Fig.2

(CO1) [Application]