REG.NO.:

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SLOT: C1 + TC1 +TCC1

SCHOOL OF ELECTRICAL ENGINEERING
WINTER SEMESTER 2025-2026
CONTINUOUS ASSESSMENT TEST - II

Programme Name & Branch	: B.Tech. (EEE)
Course Code and Course Name	: BEEE304L & POWER SYSTEM ENGNEERING
Faculty Name(s)	: Dr. Meikandasivam S, Dr. Arun S L
Class Number(s)	: 0823, 2296
Date of Examination	: 17/03/2026
Exam Duration	: 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- Rough work should not be done on question paper. It will be treated as malpractice.
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Course Outcomes Statements:

CO. 2: Compute and analyze the transmission line parameters.
CO. 3: Design electrical equivalent models and analyze the performance of transmission & distribution systems.
CO. 4: Design and analyze the number of string insulators and line sag for overhead lines.

Q. No	Question	M	CO	BL
1	A transmission line conductor is strung between two towers, A and B, over a hillside. The span length (l) is 300 meters, the vertical height difference (h) is 5 meters (Tower B is higher than Tower A), the conductor weight (w): 0.7 kg/m and allowable Tension (T): 1,500 kg. Calculate the following: 1. The horizontal distance of the lowest point of the conductor from the lower support (Tower A). 2. The sag at the lower support (S_1). 3. The sag at the higher support (S_2).	10	4	3
2.	A 3-phase, 50 Hz, overhead transmission line is 100 km long. The line parameters are: • Resistance per km per phase: 0.1 Ω • Inductive reactance per km per phase: 0.2 Ω • Capacitive admittance per km per phase: 0.04 x 10^{-3} Siemens The line supplies a load of 30 MW at 110 kV and 0.85 power factor lagging. Using the Nominal-π method, calculate the sending end voltage (V_s), sending end current (I_s), sending end Power factor and Voltage regulation (%).	10	3	3
3.	Determine the sending end voltage and sending end current for a 80 km section of 3-phase single circuit 50 Hz line delivering 50 MVA at 110 kV and power factor 0.8 lagging. Also calculate the efficiency of the line. The resistance per line is 0.1557 ohm per km and the effect of shunt capacitance is negligible. The spacing among the conductors are 3.7 m, 6.475 m, 7.4 m transposed at equi-distance. The diameter of each cconductor is 1.956 cm.	10	3	3
4.	A 3-phase, 220 kV (line-to-line), 50 Hz overhead transmission line consists of three conductors placed in an equilateral triangle configuration with a spacing of 5 m. Each conductor has a diameter of 2 cm. The air density factor (delta) is 0.95	10	3	4

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and the surface irregularity factor (m_0) is 0.85. The breakdown strength of air (g_0) is 30 kV/cm (peak). Solve and check the above transmission system encounters the corona and visual corona effecct during normal operation of 220 kV.

5. a. Compare Load break switch and Circuit breaker with various Arc quenching medium. 5+5 3 4

b. Observe the system and answer the following question in one sentence.

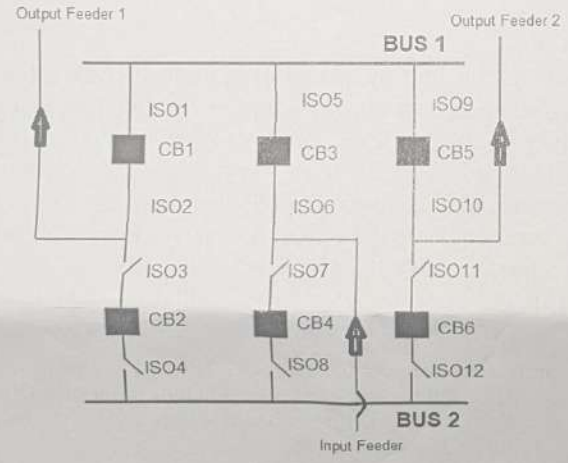

Fig. 1

1. As per Fig. 1, Which bus is energized?
2. Give the step by step procedure to energize the other bus from existing bus without any interruption of supply. Draw the repective diagram.

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