International Islamic University Chittagong

Department of Electrical and Electronic Engineering

B. Sc. Engineering in EEE

Midterm Examination, Autumn-2022

Course Code: **EEE-2415** Course Title: **Transmission and Distribution of Electrical Power System**

Time: 1 hour 30 minutes Full Marks: 30

(i) Answer all the questions. The figures in the right-hand margin indicate full marks.

(ii) Course Outcomes (COs) and Bloom's Levels are mentioned in additional Columns.

Course Outcomes (COs) of the Questions	
CO1	Develop the idea to deliver quality power to the end users using Transmission and Distribution System.
CO2	Ability to apply various voltage control techniques to maintain proper voltage at the level of end users.
CO3	Modelling of the transmission and Distribution line to analysis the effect of line parameters on the power flow.

Bloom's Levels of the Questions						
Letter Symbols	R	U	Ap	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

1) a) i) How does frequency of AC affect its distribution throughout cross-section of a conductor?

ii) Suppose your house is electrified from Raozan Steam power station, Now, design the single line diagram for this typical A.C power supply scheme showing all stages. CO1 An ,C 3+2

1) b) Fig.1 shows the spacing's of a double circuit 3-phase overhead line. The phase sequence is *ABC* and the line is completely transposed. The conductor radius in 1.3 cm. Find the inductance per phase per kilometer. CO3 E 5

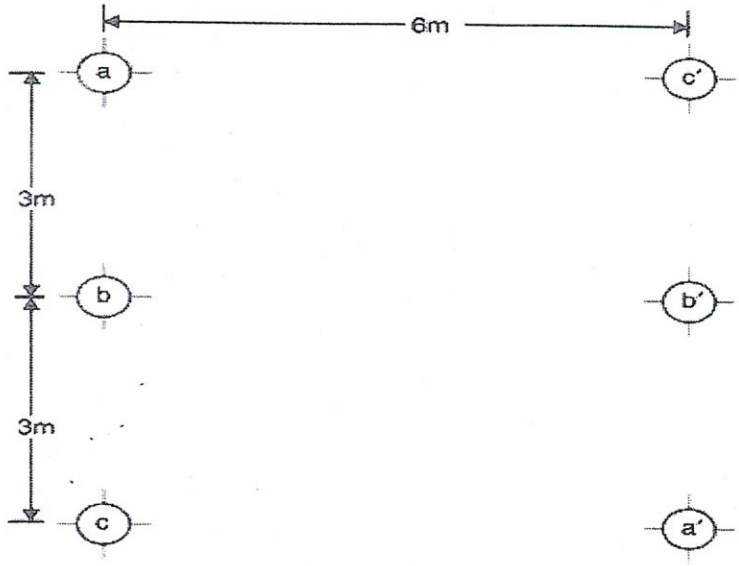

Fig. 1

2)	a)	i) Describe the bundled conductor with proper sketch. ii) Write down the types of Aluminum conductors with full meaning. Which types of conductor do you prefer most for overhead transmission line and why?	CO1	R, U, C	3+2
2)	b)	Deduce the equation of capacitance of a three phase line with equilateral spacing.	CO1	An	5
3)	a)	What is voltage regulation? Find the transmission line parameter A,B,C,D in case of nominal **π model** and prove that AD-BC=1.	CO1/ CO3	E	1+4
3)	b)	An overhead 3-phase transmission line delivers 5000 kw at 22 KV at 0.8 p.f. lagging. The resistance and reactance of the each conductor is 4Ω and 6Ω respectively. Determine I) Sending end voltage, II) Percentage regulation III) Transmission efficiency.	CO3	E	5
		OR			
3)	a)	What is long transmission line? Explain the hyperbolic form for long transmission line	CO1/ CO3	R, An	1+4
3)	b)	A single-phase overhead transmission line delivers 1100 kw at 33 KV at 0.8 p.f. lagging. The total resistance and inductive reactance of the line are 10Ω and 15Ω respectively. Determine I) Sending end voltage, II) Sending end power factor, III) Transmission efficiency.	CO3	E	5