DE. Ashwani kunos Chardel 10/5723 Roll No .:.. Name.....

National Institute of Technology, Hamirpur (HP)

Name of the Examination: B.Tech.

Branch **Course Name** 

: Electrical : Power System

Semester :4<sup>th</sup> Course Code : EE-224

## End Semester Examination: May 2023

Time: 3 Hours

Maximum Marks: 50

204

Note : Attempt all questions. Assume any missing data. Each question carries equal

Q1. (a) What are the factors to be considered for the selection of the site for a thermal power

(b) Define the following terms with example in connection to power supply system.

(i) Connected load (ii) Maximum demand (iii) Demand factor (iv) Load Factor (v) Diversity

Q2. (a) A 3 phase 132kV, 50Hz overhead line has ACSR conductors of equivalent copper area 1.5cm<sup>2</sup> and effective diameter 41.8 mm, spaced equilaterally 8 m apart (a) Find line parameters i.e. resistance, inductance and capacitance. (b) Find charging current and charging MVA. Taking resistivity as 1.73\*10<sup>-6</sup> ohm-cm.

(b) A 400kV 3 phase bundled conductor line with two sub conductors per phase has a horizontal configuration as shown in Fig. The radius of each sub-conductor is 1.6cm (a) Find the inductance per phase per km of the line. (b) Compute the inductance of the line with only one conductor per phase having the same cross-sectional area of the conductor of each phase.

Q3. (a)What is per unit system? What are the advantages of per unit system? How are the base quantities selected?

(b) What is a nominal circuit of a transmission line? Find ABCD constants for nominal pi circuit of a transmission line?

Q4 (a) A suspension string has 3 units. Each unit can withstand a maximum voltage of 11 kV. The capacitance of each joint and metal work is 10 percent of the capacitance of each disc. Find

- (i) Maximum line voltage for which the string can be used.
- (ii) String efficiency

(b) Assuming that the shape of an overhead line can be approximated by a parabola, deduce the expression for calculating sag and conductor length. What will be the effect of ice on the sag and conductor length?

Q5 (a) A single core cable for 66kV 3 phase system has a conductor of 2 cm diameter and sheath of inside diameter 5.3cm. It is required to have two intersheaths so that stress varies between the same maximum and minimum values in the three layers of dielectric. Find the positions of intersheaths, maximum and minimum stress and voltages on the intersheaths. Also find the maximum and minimum stress if the intersheaths are not used.

(b) A dc 2 wire distributor AB is 450 meters long is fed at both ends at 240V. The distributor is loaded as shown in Figure. The resistance of each conductor is 0.05 ohm per km. Find the point of minimum potential and its potential?

