

**B.Tech. – VIEP – ELECTRICAL ENGINEERING
(BTELVI)**

Term-End Examination

June, 2017

00244

BIEE-003 : POWER SYSTEM – I

Time : 3 hours

Maximum Marks : 70

Note : Attempt **seven** questions in all. All questions carry equal marks. Use of scientific calculator is allowed.

1. (a) Derive an expression for inductance of a single-phase two-wire line. 5
- (b) Explain the influence of voltage on cost and efficiency of a transmission line. 5
2. (a) An overhead line has a span of 200 m. The line conductor weighs 0.7 kg per metre. Calculate the maximum sag if the allowable tension in line is 1400 kg. 8
- (b) What is the Ferranti effect ? 2
3. (a) Define efficiency and voltage regulation of a transmission line. 5
- (b) Derive an expression for voltage regulation of a short transmission line. 5

4. (a) With the help of neat sketches, explain the various types of insulators used in transmission lines. 5
- (b) Define string efficiency. How can string efficiency be improved? 5
5. Give classification of cables. Draw a cross-sectional view of a typical cable and explain the labelled sections. 10
6. Explain charging current, sheath effect, dielectric loss and thermal resistance in case of a cable. 10
7. Define and explain corona and radio interference phenomena. How can these be minimized? 10
8. What are ABCD constants? Give their units. Find ABCD constants of a short transmission line. 10
9. Write short notes on any *two* of the following: $2 \times 5 = 10$
- (a) Proximity Effect
- (b) Losses in a Transmission Line
- (c) Stringing Chart
- (d) Modified Kelvin's Law