



SLR-VB – 335

Seat No.	
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Set **P**

B.E. (Electrical) (Part – I) Examination, 2017
Elective – I : EXTRA HIGH VOLTAGE AC TRANSMISSION

Day and Date : Monday, 8-5-2017
Time : 3.00 p.m. to 6.00 p.m.

Max. Marks : 100

- Instructions:** 1) **All questions compulsory.**
2) **Assume** suitable data if necessary and mention it clearly.
3) Figures to the **right** indicate **full** marks.
4) Q. No. **1** is **compulsory**. It should be solved in **first 30 minutes** in Answer Book Page No. **3**. **Each** question carries **one** mark.
5) **Answer MCQ/Objective type questions on Page No. 3 only. Don't forget to mention, Q.P. Set (P/Q/R/S) on Top of Page.**

MCQ/Objective Type Questions

Duration : 30 Minutes

Marks : 20

I. Choose the correct answers :

(20×1=20)

- 1) Third mode of propagation is called as
 - a) Line to ground
 - b) Phase to phase
 - c) Homopolar
 - d) Inter-phase
- 2) Operating 750 KV line gives AN at a level of
 - a) 50 dB
 - b) 55.4 dB
 - c) 52 dB
 - d) 58.5 dB
- 3) In general method of Laplace transform the series and shunt impedance operator per unit length of line is
 - a) $z(s) = r + l(s)$
 - b) $y(s) = g + c(s)$
 - c) both a) and b)
 - d) none of the above
- 4) Find out the wrong relationship
 - a) $[Q] = 2 \pi \epsilon [M] [V]$
 - b) $[V] = [P] \left[\frac{Q}{2 \pi \epsilon} \right]$
 - c) $\left[\frac{Q}{2 \pi \epsilon} \right] = [P] [V]$
 - d) All equations are correct
- 5) Refraction coefficient of current (J_T) is given by
 - a) $\frac{2z_0}{z_0 + z_t}$
 - b) $\frac{z_0 - z_t}{z_0 + z_t}$
 - c) $\frac{2z_t}{z_0 + z_t}$
 - d) $\frac{z_t - z_0}{z_0 + z_t}$
- 6) In lossless transmission line theoretically have
 - a) $r = l = 0$
 - b) $l = g = 0$
 - c) $g = c = 0$
 - d) $r = g = 0$

P.T.O.



- 7) Which type of corona discharge gives interference to radio broadcast ?
a) Pulse type b) Pulse less type
c) Glow corona d) None of the above
- 8) The velocity of travelling wave through a cable of relative permittivity is
a) 9×10^8 m/sec. b) 3×10^8 m/sec. c) 10^8 m/sec. d) None of these
- 9) Draining of trapped charge of line is done by
a) Main breaker b) Auxiliary breaker
c) Air circuit breaker d) Shunt reactors
- 10) The crest time of pulse properties for positive cycle is
a) 20 ns b) 30 ns c) 40 ns d) 50 ns
- 11) For Aeolian vibration the frequency of vibration is usually limited to _____ Hz and the amplitudes less than _____ cm.
a) 20 Hz, 2.5 cm b) 25 Hz, 2.5 cm
c) 50 Hz, 2.5 cm d) 50 Hz, 3.5 cm
- 12) The function of steel wire in an ACSR conductor is to
a) compensate for skin effect b) take care of surges
c) provide additional mechanical strength d) reduce inductance
- 13) The high voltage recognised in India are as per
a) IS 2022 b) IS 2024 c) IS 2026 d) IS 2028
- 14) The positive sequence reactance per phase in ohms 1 km in 750 transmission line is
a) 0.272 b) 0.227 c) 0.722 d) none of these
- 15) The measurement of electrostatic field of an e.h.v. line is done by
a) Dipole b) Spherical Dipole
c) Parallel plate d) All of the above
- 16) Which of the following is protective device against lightning over voltages ?
a) Rod gap b) Surge absorber c) Horn gap d) All above
- 17) The dimensions of constants B and C are respectively _____ and _____.
a) Ohm, Siemen b) Mho, Siemen
c) Both are dimensionless d) Siemen, Ohm
- 18) For 100% series compensation, resonance occur at
a) Power frequency b) 50% of power frequency
c) 40% of power frequency d) None of the above
- 19) Refraction coefficient of voltage (K_T) for open ended line
a) + 2 b) 1 c) - 1 d) 0
- 20) The percentage power loss in 750 kV transmission line is nearly equal to
a) 3.27 b) 4.76 c) 0.78 d) 2.5



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B.E. (Electrical) (Part – I) Examination, 2017
Elective – I : EXTRA HIGH VOLTAGE AC TRANSMISSION

Day and Date : Monday, 8-5-2017

Marks : 80

Time : 3.00 p.m. to 6.00 p.m.

- Instructions:** 1) **All questions compulsory.**
2) **Assume** suitable data if necessary and mention it clearly.
3) Figures to the **right** indicate **full** marks.

SECTION – I

II. Solve **any four** : **(4×5=20)**

- a) Explain in detail the advantages and disadvantages of high voltages.
- b) What are the different mechanical considerations in EHV line performance ?
- c) What are the properties of Bundled conductors in EHV-AC lines ?
- d) Explain Reflection and refraction of travelling waves.
- e) Lightning stroke mechanism.
- f) Brief the charge potential relations of the multi conductor lines.

III. Solve **any two** : **(2×10=20)**

- a) A tower has 40 ohms footing resistance and two ground wires with $Z_g = 500$ ohms. The lightning stroke surge impedance $Z_s = 400$ ohms. For $I_s = 50$ KA crest, calculate the tower top potential :
 - i) Considering all impedances
 - ii) Neglecting the ground wire and stroke surge impedances.
 - iii) Considering only one ground wire and stroke surge impedance.
- b) Explain in detail the sequence inductance and capacitance.
- c) Explain the relation between the temperature rise and current carrying capacity of EHV-AC line.

Set P



SECTION – II

IV. Solve **any four** : **(4×5=20)**

- a) Power circle diagram and its use.
- b) Enlist sources of over voltage and explain Ferro resonance voltages.
- c) Reduction of switching surge over voltages.
- d) Construction and characteristics of ZnO gapless arrester.
- e) Explain static reactive compensating system.
- f) Expression for generalized constants.

V. Solve **any two** : **(2×10=20)**

- a) Explain in brief the sinusoidal excitation-lumped parameter circuits.
 - b) What are the factors under steady state in design of EHV lines ?
 - c) Explain sub-synchronous resonance in series capacitors compensated lines.
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