Seat No.	

B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electrical Engineering
EXTRA HIGH VOLTAGE AC TRANSMISSION SYSTEM

Day & Date: Saturday, 14-12-2019   Max. Marks: 70
Time: 02:30 PM To 05:30 PM

Instructions: 1) Q. No. 1 is compulsory and should be solved in first 30 minutes in answer book.
2) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes   Marks: 14

Q.1   Choose the correct alternatives from the options.   14

1)   Reflection coefficient of voltage (K_r) for open circuit is _____.
a)   0   b)   +2
c)   +1   d)   -1

2)   The most accurate and versatile method of achieving reactive power compensation is by using _____.
a)   Switched capacitors
b)   Fixed capacitor with controlled reactor
c)   Saturable reactor with capacitor bank
d)   Switched capacitor with controlled reactor

3)   Switching over-voltages are more hazardous than lightning surges in case of _____.
a)   Low voltage systems   b)   11 kV systems
c)   Unbalanced systems   d)   EHV and UHV systems

4)   Which of the following method may be used to inject reactive power in the transmission line?
a)   Series capacitor   b)   Synchronous capacitors
c)   Both a and b   d)   None of these

5)   For 100% series compensation, resonance occur at _____.
a)   Power frequency   b)   50% of Power frequency
c)   40% of Power frequency   d)   None of these

6)   The conductors of an EHV line is selected on the basis of _____.
a)   Current carrying capacity   b)   Corona and RI performance
c)   Line voltage   d)   None of these

7)   The power loss is important for the design of _____.
a)   Generator   b)   Motor
c)   Feeder   d)   Transmission line

8)   Third mode of propagation is called as _____.
a)   Line to ground   b)   Phase to phase
c)   Homopolar   d)   Inter-phase

9) 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

10) The positive sequence reactance per phase in ohms/km in 750 kV transmission line is _____.
   a) 0.272
   b) 0.227
   c) 0.722
   d) None of these

11) Operating 750 KV line gives AN at a level of _____.
   a) 50 dB
   b) 55.4 dB
   c) 52 dB
   d) 58.5 dB

12) The allowable noise level at one MHz is _____.
   a) 22 dB
   b) 26 dB
   c) 30 dB
   d) 32 dB

13) Voltage gradient on a transmission line conductor is highest _____.
   a) at the surface of the conductor
   b) at the centre of the conductor
   c) at the distance of one radius from the surface
   d) none of these

14) Refraction coefficient of current (J_T) is given by
   a) $\dfrac{2Z_0}{Z_0 + Z_t}$
   b) $\dfrac{Z_0 - Z_t}{Z_0 + Z_t}$
   c) $\dfrac{2Z_t}{Z_0 + Z_t}$
   d) $\dfrac{Z_t - Z_0}{Z_0 + Z_t}$

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B.E. (Part – I) (New) (CBCS) Examination Nov/Dec-2019
Electrical Engineering
EXTRA HIGH VOLTAGE AC TRANSMISSION SYSTEM

Day & Date: Saturday, 14-12-2019   Max. Marks: 56
Time: 02:30 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
               2) Figures to the right indicate full marks.
               3) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four.   **16**
    a) How the audible noise is generated and what are the characteristics?
    b) Derive equation for line energization with trapped charge voltage.
    c) Derive differential equations and solutions for general case in travelling waves.
    d) Explain in detail advantages and disadvantages of high voltage.
    e) Explain the relation between temperature rise and current carrying capacity of EHVAC line.
    f) Write short notes on limits for radio interference.

Q.3 Attempt any two.   **12**
    a) A power of 12000 MW is required to be transmitted over a distance of 1000 km. At voltage levels of 400 kV determine.
       1) Possible no. of circuits required with equal magnitudes for sending and receiving end voltages with 30° phase difference.
       2) The currents transmitted;
       3) The total line losses
       Assume the value of x = 0.327 for 400 kV.
    b) Explain the charge potential relations of multi-conductor lines.
    c) Explain reflection and refraction of travelling waves.

Section – II

Q.4 Attempt any four.   **16**
    a) Explain the term power circle diagram and its use.
    b) Explain the conductor-tower, conductor-ground and conductor-conductor clearances for the design of EHV lines.
    c) State the factors under steady state in design of EHV lines?
    d) Explain the term ferro-resonance over voltages.
    e) State & explain the sources of over voltages.
    f) Explain in detail static reactive compensating system.

Q.5 Attempt any two.   **12**
    a) Explain line insulation design based upon transient overvoltages in detail.
    b) Derive the expressions for generalized constants of transmission line.
    c) Explain in detail sinusoidal excitation lumped parameter circuit.