Seat No.

Set **P**

B.E. (Electrical) (Part – I) (New) Examination, 2016
EXTRA HIGH VOLTAGE AC TRANSMISSION (Elective – I)

Day and Date : Thursday, 28-4-2016   Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Q. No. **1** is **compulsory**. It should be solved in **first 30 minutes** in Answer Book Page No. **3. Each** question carries **one** mark.
2) **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

1. Choose the correct answer :   **20**

1) The radio interference level is governed by
   a) Amplitude of single phase
   b) Wave shape of single pulse
   c) Repetitive nature of pulse
   d) All of these

2) For reducing tower footing resistance it is better to use
   a) Chemical and ground only
   b) Chemical and counterpoise only
   c) Ground rod and counter poise only
   d) Chemical ground rod and counter poise only

3) The impulse ratio of rod gap is
   a) Unity
   b) Between 1.2 and 1.5
   c) Between 2.0 and 2.2
   d) Between 1.6 and 1.8

4) The type of EHV cable is
   a) High pressure oil filled
   b) Cross linked polythelene
   c) Gas insulated lines
   d) All of these

5) The main drawback of overhead system over underground system is
   a) Underground system is more flexible than overhead system
   b) Higher charging current
   c) Surge problem
   d) High initial cost

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

7) Television and frequency modulation broadcast and reception covers frequencies in the range of
   a) 25 – 100 MHz   b) 40 – 60 MHz   c) 50 – 80 MHz   d) None of the above

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8) The conductivity of moist is of magnitude
   a) 10^{-1} mho/metre   b) 10^{0} mho/metre   c) 10^{-2} mho/metre   d) 10^{-3} mho/metre

9) Which element has flat frequency response up to 1000 MHz ?
   a) Bifiller shunt   b) Co-axial shunt
   c) Squirrel cage shunt   d) Rogowski coil

10) Draining of trapped charge of line is done by
    a) Main breaker   b) Auxiliary breaker
    c) Air circuit breaker   d) Shunt reactors

11) First mode of propagation is called as
    a) Line to ground   b) Line to line   c) Homopolar   d) Both a) and c)

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

13) 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

14) For Aeolian vibration the frequency of vibration is usually limited to _____ Hz and the amplitudes less than _____ cm.
    a) 50 Hz, 2.5 cm   b) 25 Hz, 2.5 cm   c) 20 Hz, 2.5 cm   d) 50 Hz, 3.5 cm

15) The effect of high voltage gradient on bundled conductors are evaluated all over the world by
    a) Drums   b) Solid Cylinders
    c) Cages   d) None of the above

16) The cause of reflected and refracted wave is
    a) Discontinuity at the junction   b) Lighting effect
    c) Switching surge   d) None of these

17) In lossless transmission line theoretically have
    a) $r = 1 = 0$ b) $1 = g = 0$ c) $g = c = 0$ d) $r = g = 0$

18) 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

19) 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

20) The mechanism responsible for dielectric loss in a dielectric are
    a) Conduction   b) Polarization   c) Ionisation   d) Both b) and c)

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SECTION – I

2. Write short notes on **any four** :   **(4×5=20)**

   a) Explain in detail the advantages and disadvantages of high voltages.

   b) Effect of bundle conductor on its inductance.

   c) Brief the charge potential relations of the multi conductor lines.

   d) Explain reflection and refraction of travelling waves.

   e) Explain lightning stroke mechanism.

   f) Explain attenuation of travelling wave on transmission line.

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

   a) Describe the line parameters of modes of propagation.

   b) Explain Open ended line "Double exponential response".

   c) A tower has 40 ohms footing resistance and two ground wires with $Z_g = 500$ ohms. The lightening 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.

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SECTION – II

4. Write short notes on **any four** : **(4×5=20)**

   a) Expression for generalized constants.

   b) Reduction of switch surge over voltages.

   c) What are the factors under steady state in design of EHV-AC lines ?

   d) Describe the insulation co-ordination and over voltage protection based on lightning.

   e) Explain static reactive compensating system.

   f) Sources of overvoltage's.

5. Solve **any two** : **(2×10=20)**

   a) Explain in brief the sinusoidal excitation-lumped parameter circuits.

   b) Power circle diagram and its use.

   c) 100 MVA 230 KV 50 Hz transformer has X_f = 12% and is connected to a line 200 Km long which has an inductance of 1 mH/Km. The filter connected to the L.V. side 33 KV of the transformer, is required to suppress the 5th harmonic generated by the TCR to 1% of I_n. Calculate the value of filter capacitor if the filter inductance used in 2 mH.

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