Benha University
Faculty of Engineering (Shoubra)
Electrical Engineering Dept.
3rd Year Electrical Power
Student Name:

2014-2015 Mid-Term Exam
Course Title: Transmission and Distribution of Electrical Power
Time Allowed: 90 Minutes
Date: 25-11-2014

This is a closed book exam. The exam consists of two pages. Attempt all questions

Question # 1: Complete the following sentences (10 points)

1) **Overhead transmission line insulators must have the following characteristics:**
   (a) (b) (c)
   (d) (e) (f)
2) **The commonly used materials for overhead transmission line insulators are**
   (a) (b) (c)
3) **Main types of overhead transmission line insulators are**
   (a) (b) (c)
4) **The main causes of overhead transmission line insulators failure are**
   (a) (b) (c)
   (d) (e) (f)
5) **The main methods for improving voltage distribution across different units of a string insulators are**
   (a) (b) (c)
6) **The main factors affecting Corona are**
   (a) (b) (c)
   (d)
7) **The main advantages of Corona are**
   (a) (b) (c)
   (d)
8) **The undesirable effects of corona are**
   (a) (b) (c)
   (d)
9) **The Corona is minimizing by**
   (a) (b) (c)
10) **The dielectric compounds as insulates for power cables should possess the following main properties:**
   (a) (b) (c)
   (d) (e) (f)
   (g)
11) **The methods of equalizing the stress in the dielectric of the cable are:**
   (a) (b)

12) The most important advantages of plastic cables are:

(a) (b) (c)

(d) (e) (f)

(g)

13) The capacitance of a cable transmission line is very much larger than that of an overhead line of the same length due to the following reasons:

(a) (b) (c)

14) The three main causes for power loss in the dielectric of a cable are

(a) (b) (c)

15) The main factors affecting the selection of power cables are

(a) (b) (c)

(d)

16) The most important methods of installing power cables are:

(a) (b) (c)

(d)

17) The metal tape armouring is applied to protect the cable sheath from…….

18) The insulation resistance of a cable of length 5 km is 1 mega ohm its insulation resistance for 25 km length will be……..……

19) The frequency of a transmission system is changed from 50 Hz to 60 Hz the string efficiency will……..……

20) A certain cable has an insulation of ε_r =2. If the insulation is replaced by one of ε_r =6, then capacitance of cable is……..……

Question # 2: (10 points)

a) Find the potential difference across each unit of an overhead line suspension insulator consisting of four similar units. The pressure between the line conductor and earth is 60 kV and the ratio of the capacity of each unit insulator to the capacity relative to earth, of each intermediate section of the connecting network, is five to one. It is assumed that no leakage takes place. Find also the string efficiency.

b) A 3-phase, 220 kV, 50 Hz transmission line consists of 1.5 cm radius conductors spaced 2 m apart in equilateral triangle formation. If the irregularity factor is 0.8, temperature 20^0C and atmospheric pressure of 75 cm of mercury, determine the corona loss per km of line.