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BIEE-036

00451

DIPLOMA - VIEP - ELECTRICAL ENGINEERING (DELVI)

Term-End Examination

June, 2013

BIEE-036 : ELECTRICAL INSTALLATION AND SYSTEM

Time : 2 hours *Maximum Marks : 70*

*NOTE : Question No. 1 is **compulsory**. Remaining **four** questions are to be attempted out of question No. 2 to 8.*

1. (a) The design of insulation for systems above 400 kV, is based upon : **2x7=14**
   (i) lightning over-voltage
   (ii) switching surges
   (iii) system voltage level
   (iv) system load level

   (b) A lightning arrester connected between the line and earth in a power system :
   (i) protects the terminal equipment against travelling waves.
   (ii) protects the transmission line against lightning stroke.
   (iii) suppresses high frequency oscillations in the line.
   (iv) reflects back the travelling wave approaching it.

(c) The presence of earth in case of overhead lines :

(i) Increases the capacitance

(ii) Increases the inductance

(iii) Decreases the capacitance

(iv) Decreases the inductance

(d) A 1000 MW power station delivers 1000 MW for 2 hours, 500 MW for 6 hours and is shut down for the rest of each day. It is also shut down for 60 days annually. The annual load factor of this station is :

(i) 25.8% (ii) 23.0%

(iii) 22.0% (iv) 20.8%

(e) Write whether the following statement is True of False :

"In a cable transmission scheme the ratios of volumes of conductor in d.c., single phase a.c. and three phase a.c. are given by

$$v_1 : v_2 : v_3 = 1 : \frac{1.5}{\cos^2\phi} : \frac{2}{\cos^2\phi}.$$

where $\cos\phi$ is the p.f. of load."

(f) Whether the following statement is *True or False*.

"For the transmission of power over a given length, the percentage regulation is inversely proportional to the square of voltage".

(g) Outdoor switch gear is used normally for voltage :

(i) 1.1 kV and above

(ii) 11 kV and above

(iii) 33 kV and above

(iv) 66 kV and above

2. A consumer has annual consumption of 70,080 kWh. The charge is 100 per kW of maximum demand plus 5 paise per kWh. **14**

(a) Find the annual bill and the overall costs per kWh if the load factor is 40%.

(b) What is the overall cost per kWh if consumption was reduced by 25% with the same load factor ?

3. (a) Distinguish between a feeder, distributor and service main in a distribution scheme. Show that with an increase in working voltage to n times the cross-sections of a feeder and a distributor would be reduced to $\frac{1}{n}$ and $\frac{1}{n^2}$ of their respective values. **9+5=14**

(b) Explain how a 2 - wire d.c. distributor with concentrated loads fed at one end can be represented by a single line diagram.

4. Explain the following sub - stations briefly : **14**

(a) Outdoor type

(b) Indoor type

(c) Underground type

(d) Pole mounting type

5. (a) Explain different types of wiring. **8+6=14**

(b) Differentiate between casing - capping and conduit wiring.

6. (a) What are the main items that comprises an overhead line ? **7+7=14**

(b) Discuss various types of line supports.

7. (a) What do you know about earnest money and security deposits ? **7+7=14**

(b) Explain the method of overhead service connection line to a multi - storey buildings.

8. Write short note on ***any four*** of the following : **3½x4=14**

(a) Meter distribution board

(b) IE Rules

(c) Electrical point method and fixed percentage method

(d) Selection of wires and cables

(e) Electrical layout

(f) Storage and Supervision charge