VRK/KS/14/6558

Faculty of Engineering & Technology
Second Semester B.E. (C.B.S.) Examination
ADVANCED ELECTRICAL ENGINEERING
Paper–V
Sections—A & B

Time—Two Hours] [Maximum Marks—40

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Due credit will be given to neatness and adequate dimensions.

(3) Assume suitable data wherever necessary.

(4) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Draw a single line diagram of a power system showing various stages of generation, transmission and distribution indicating their voltage levels. 6

(b) Write comparison between overhead and underground distribution system. 4

OR

2. (a) Explain with neat schematic diagram the working of Hydro Electric Power Station. 5

(b) Explain the necessity of equipment earthing with the help of neat diagrams. 5

3. (a) Derive an emf equation of a d.c. generator. 4

(b) A 4 pole, 1200 rpm D.C. generator has a lap wound armature having 60 slots and 12 conductors per slot. If flux per pole is 0.02 wb, determine the emf induced in the armature. Also calculate emf generated for wave wound armature. 6

OR

4. (a) Derive Torque equation of DC motor and show $T_a - I_a$ characteristics of DC series motor. 5

(b) A 220V DC shunt motor runs at 500 rpm when armature current is 50 A. Calculate the speed if armature current is doubled. Assume that $R_a = 0.2\Omega$ and flux is constant. 5

5. (a) Explain the working and construction of fluorescent Tube. 3

(b) Define :

(i) Illumination

(ii) Lumen

(iii) Lamp efficiency. 3

(c) A suitable lighting scheme having the following specifications :

(i) Area of hall = 20 m × 30 m

(ii) Required illumination on work place = 100 Lux = 100 Lumen/m^2.

Assume coefficient of utilization as 0.6 and depreciation factor as 1.4 and Lamp efficiency is 20 Lumen/W. Calculate number of lamps required and their rating. 4

OR

6. (a) What is Tariff ? What do you mean by Flat Rate Tariff ? 4

(b) The monthly electricity consumption of a residence is given as follows :

Light Load : 5 Tubelights, 60 Watts each working 7 hours daily.

Fan Load : 8 Fans, 150 Watts working 5 hours daily.

Geyser : 1 kWh daily.

Miscellaneous Load : 1 kw for one hour daily.

Find the monthly bill at the following tariff :

First 15 units : Rs 2.80 per kWh

Next 25 units : Rs. 3.00 per kWh

Remaining units : Rs. 3.25 per kWh

Constant charge : Rs. 10.00 per month. 6

7. (a) Write comparison between squirrel cage and slip ring induction motor. 4

(b) How the direction of 3 ϕ induction motor can be reversed ? 2

(c) A 440V, 50 Hz, 3 phase induction motor has 4 poles. Calculate :

(i) Synchronous speed

(ii) Slip if it runs at 1440 rpm

(iii) Motor speed if slip is 5%. 4

OR

8. (a) Write a short note on capacitor start induction run single phase induction motor. 5

(b) Why single phase induction motor is not self starting ? How to make it self starting ? 5