

VKR/KS/13/6447

Faculty of Engineering & Technology

Second Semester B.E. (Electrical Engg.) Examination

ADVANCE ELECTRICAL ENGINEERING

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) Explain with neat block diagram the operation of Steam power plant. 5
 - (b) Draw a neat single line diagram for generation, transmission and distribution through different voltage levels at each point. 5

OR

2. (a) What are the requirements of earthings ? Explain plate type earthing with the help of diagram. 6
- (b) Explain ON line and OFF line UPS. 4

3. (a) Derive EMF equation of DC generator. 4
- (b) An 8-pole armature has 96 slots with 8 conductor per slot. It is driven at 600 rpm. The useful flux per pole is 10 mwb. Calculate the induced EMF in armature winding when it is :
- (i) lap connected, 26.8
- (ii) wave connected. 307.2 6

OR

4. (a) Explain the following characteristics of DC series motor :
- (i) T_a Vs I_a
- (ii) N Vs I_a . 4
- (b) A 250 V dc shunt motor has armature resistance of 0.25Ω , on load it takes armature current of 50 A and runs at 750 rpm. If the flux of the motor is reduced by 10% without changing the load torque. Find the new speed of the motor. 6
5. (a) State and explain one part tariff. 3
- (b) The monthly electricity consumption of a residence can be approximated as under :
- Light load : 5 Tube lights 40 watts each working for 3 hours daily.
- Fan load : 3 Fans 100 watt each working for 5 hours daily.

Refrigerator load : 1 kWh daily.

Miscellaneous load : 1 kW for one hour daily.

Find the monthly bill at the following tariff :

First 15 units : Rs. 2.74 per kWh

Next 25 units : Rs. 2.70 per kWh

Remaining units : Rs. 2.36 per kWh

Constant charge : Rs. 7.00 per month.

7

OR

6. (a) Define the following terms (any **FOUR**) :

(i) Luminous flux

(ii) Luminous intensity

(iii) Luminous efficiency

(iv) Candle power

(v) Illumination.

4

(b) Explain the construction and working of Mercury vapour lamp.

6

7. (a) "Three Phase Induction Motor can not run at synchronous speed." Justify.

4

(b) A three phase induction motor is wound for 4-pole and is supplied from 50 Hz supply system. Calculate :

(i) The Synchronous speed.

1500

- (ii) The rotor speed when slip is 4%. $\frac{96}{100}$
- (iii) Rotor frequency when rotor runs at 600 rpm. 30
- 6

OR

8. (a) "Single Phase Induction Motor is not self starting."
Justify. 4
- (b) Explain the working of capacitor start capacitor run single phase Induction motor. 6