

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMESTER END THEORY EXAMINATION, B.Tech. (D.T.) Degree Course 2017-18

Semester : **II (V Dean)**

Academic Year : 2017-2018

Course No. : DE-207

Course Title : Basic Electrical Engg.

Credits : 2+1=3

Total Marks : 50

Day. & Date : Friday, 15.06.2018

Time : 11.00 to 13.00 Hrs.

Note : 1) **Section "A"** is Compulsory.

2) Solve **Any Three** questions from **Section "B"**

3) The use of scientific tables, charts and calculator is allowed in case of engineering courses.

SECTION – 'A'

Q. 1 A) Define the following. (05)

- i) Connected load
- ii) Average demand
- iii) Diversity factor
- iv) Capacity factor
- v) Utilization factor

B) State the SI units with notations of following electrical quantities. (05)

- i) Capacitance
- ii) Conductance
- iii) Charge
- iv) Current
- v) Electromotive force

Q. 2 A) State whether True or False. If false, rewrite the statement after making necessary corrections. (05)

- i) The function of brushes is to collect current from the commutator.
- ii) E_2/E_1 is known as the transformer Ratio.
- iii) Power is defined as work done per unit time.
- iv) An autotransformer is an electrical transformer with only one winding.
- v) Commutator is an essential part of an AC generator.

B) Choose the most appropriate answer from the options given below. (05)

i) The value of power factor in a pure capacitive circuit will be

- a) 0.0
- b) 0.1
- c) 0.2
- d) 0.3

ii) State the law used to find direction of statically induced emf

- a) Faraday
- b) Ohm's
- c) Lenz
- d) None of these

iii) Power factor can be improved by installing

- a) Capacitors
- b) Resistance
- c) Starter
- d) None of these

(P.T.O.)

- iv) The neutral wires carry no current in load.
- | | |
|-------------------|------------------|
| a) Balanced | b) Unbalanced |
| c) Both a) and c) | d) None of these |
- v) The phase supply system is commonly used for distribution purpose.
- | | |
|-----------|-----------------|
| a) Single | b) Two |
| c) Three | d) All of these |

SECTION –‘B’

- Q. 3 A) Write the equivalent exponential and polar forms of the vector $12 + j5$. Illustrate the vector by means of a vector diagram. (05)
B) What is alternating current? Explain with suitable sketches, how A.C. voltage is induced. (05)
- Q. 4 A) Describe briefly the salient parts of an alternator and their function. (05)
B) Calculate the speed at which an eight-poled alternator must be driven to generate an emf of frequency 50 Hz. (05)
- Q. 5 A) Explain the working principle of an induction motor. (03)
B) Explain in brief the r.m.s. value of an alternating current. (03)
C) What is dynamo? Describe with neat sketches, the different parts of D.C. generator. (04)
- Q. 6 A) State the working principle of a transformer with suitable diagram. (03)
B) Derive the general equation of alternating voltage and current. (03)
C) A 200 kVA, 6600/400 V, 50 C/S, Single phase transformer has 80 turns in its secondary winding. Neglecting losses, calculate the primary winding current and secondary winding current. (04)
- Q. 7 Obtain a tariff for the consumers of supply undertaking which generates 39×10^7 kWh/year and has maximum demand of 130 MW connected to it. The cost is distributed as follows: (10)
Fuel: Rs. 37.5 lakh, Generation : Rs. 18 lakh, Transmission : Rs. 37.5 lakh, Distribution : 25.5 lakh. Of these items, 90 %, 10%, 5% and 7% respectively are allocated to running charges, the remainder being fixed charges. The total loss between the station and the consumers is 10% of the energy generated. Find also the load factor and overall cost per unit.
