

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMESTER END THEORY EXAMINATION, B.Tech. (D. T.)

Semester	: II(V Dean)	Academic Year	: 2023-2024
Course No.	: DE-207	Course Title	: Basic Electrical Engineering
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Monday; 12/08/2024	Time	: 2.00 hrs.

- Note : 1) All questions from **Section 'A'** are compulsory.
2) Solve **Any Three** questions from **Section 'B'**.
3) Draw neat and well labelled diagram wherever necessary.

SECTION - 'A'

Q. 1 A) Choose the most appropriate answer from the options given below. (05)

- i) What is the current discharge through a resistor of 100 Ohms under 30V?
a) 30 A b) 0.03 A
c) 0.3 A d) 3.0 A
- ii) The rotating part in a D.C. machine is generally called
a) armature b) rotor
c) pole d) stator
- iii) An electric motor is used for converting energy to energy.
a) electrical, mechanical b) mechanical, electrical
c) magnetic, mechanical d) mechanical, magnetic
- iv) The ability of a material to resist the flow of magnetic flux through it is called
a) resistance b) inductance
c) capacitance d) reluctance
- v) The condition for maximum efficiency of the transformer is that
a) copper losses are zero b) copper losses are half of the iron losses
c) copper losses are equal to the iron losses d) copper losses are square of the iron losses

B) Define the following. (05)

- i) Amplitude
- ii) Frequency
- iii) Power factor
- iv) Efficiency of a transformer
- v) RMS value of current

Q. 2 A) Match the following. (05)

Column - A

- i) Voltage
- ii) Energy
- iii) Resistance
- iv) Open circuit test
- v) Short circuit test

Column - B

- a) Higher iron losses
- b) Voltmeter
- c) Higher copper losses
- d) Ohm
- e) Wattmeter

(P.T.O.)

- B) State whether True or False. If false, rewrite the statement after making necessary corrections in the underlined word. (05)
- i) Inductance is absent in DC circuit.
 - ii) In case of A.C. motor moving part is known as rotor.
 - iii) For step up transformer, the transformation ratio is more than unity.
 - iv) The frequency adopted for generation of a.c. current in India is 60 Hz.
 - v) The batteries can store A.C. as well as D.C. power.

SECTION –‘B’

- Q. 3 A) Write the construction details of stator. (05)
- B) Power to an induction motor is supplied by a 12 pole, 3-phase, 500 r.p.m. alternator. The full load speed of the motor is 1440 r.p.m. Find the percentage slip. (05)
- Q. 4 A) Explain the generation of alternating current and their equation. (05)
- B) Write the characteristics of pure inductive a.c. circuit. (05)
- Q. 5 A) Write down the relationship between line voltage and line current with phase voltage and phase current in star-connected circuit. (03)
- B) State the Ohms law. (03)
- C) Calculate the impedance in a circuit having resistance of 2 Ohms, inductance of 7 Henry and capacitance of 9 Faraday (04)
- Q. 6 A) State the Faraday's law of electromagnetic induction. (03)
- B) A single-phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of the core is 60 cm^2 . If the primary winding be connected to 50 Hz supply at 520 V, Calculate (i) induced voltage in secondary winding and (ii) the peak value of flux density in the core. (03)
- C) Find the condition for obtaining maximum efficiency in a transformer. (04)
- Q. 7 Discuss the construction and working principle of a transformer with its advantages and disadvantages. (10)
