

2112E103

BACHELOR OF VOCATION
Mechanical Manufacturing
Subject: Basic Electrical and Electronics Engineering
Subject Code: EE-501
Semester: Third
December 2021
Theory (External): 35 Marks
Time: 03 hours

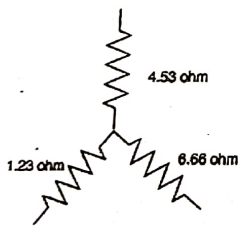
Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

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SECTION -A (OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

- A How much current is in a circuit if it takes 5 seconds for 7 coulombs to flow past a given point?
- B What effect does three batteries connected in series configuration have on current and voltage?
- C Define instantaneous value and frequency with respect to sinusoidally varying quantities.
- D What is the frequency of a sine wave with a period of 0.02 second?
- E Can DC be applied to transformers? Explain with reason
- F Find the equivalent delta circuit of given circuit



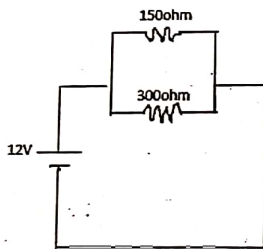
- G Industries are required to
 - a) Provide certain types of PPE at no cost to the employee
 - b) Train employees on the use of PPE
 - c) Monitor and enforce the use of required PPE
 - d) All of the above

- LS
- H The primary function of a fuse is to
- a) Open the circuit
 - b) Protect the appliance
 - c) Protect the line
 - d) Prevent excessive currents from flow through the circuit
- I A semiconductor is electrically neutral since it has (choose the correct option)
- a) no minority carriers
 - b) no majority carriers
 - c) no free carriers
 - d) equal number of positive and negative carriers
- J Impurities like boron and indium are added to intrinsic semiconductor to form
- a) P-type doped semiconductor
 - b) N-type doped semiconductor
 - c) a junction diode
 - d) none of the above

SECTION - B (ESSAY TYPE QUESTIONS)

(5×5 = 25)

- 1 a) Three resistances 560ohm, 680 ohm and 1 kilohm are connected in series in a circuit having voltage source of 12 V. Calculate the total current flow in the circuit. 2
- b) State Kirchoff's current law. Find the current and voltage drop through each component using Kirchoff's law: 3



- 2 a) Define voltage and power with their units. 2
- b) Explain conversion of current source to voltage source and vice versa. 3
- 3 Explain construction, principle of operation and basic equations of DC generator.
- 4 a) Explain working of Induction motor and its applications. 4
- b) Enlist applications of servo and stepper motor 1

- 5 a) Draw waveform of three-phase emf generated using AC Generator. 2
- b) Differentiate between three-phase and single-phase power supply. 3
- 6 Derive expression of conversion of three resistances connected in delta connection to star connection.
- 7 a) List different personal protective equipment and briefly explain their purpose. 2
- b) Briefly explain the purpose of contactors, MCBs and ELCBs 3
- 8 a) What do you mean by potential barrier for a P-N junction diode? 1
- b) Explain V-I characteristics of thyristor and its applications in industrial sector. 4

==END OF PAPER==