



B.Tech II Semester Regular Examinations, September 2021

BASIC ELECTRICAL ENGINEERING

(Common to ECE, CSE, IT, CSE(AI&ML) & CS(DS))

Maximum Marks: 70

Date: 15.09.2021 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

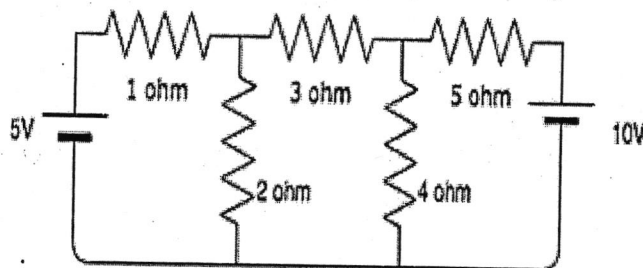
- 1 Differentiate independent and dependent sources.
- 2 State reciprocity theorem.
- 3 Define peak value.
- 4 A sinusoidal voltage is represented by $v(t) = 325.3 \sin 314t$. Determine the rms value and frequency of the voltage.
- 5 Enumerate the advantages of auto transformer over ordinary transformer.
- 6 Define efficiency of a transformer.
- 7 Give the classification of DC generators.
- 8 List out few applications of induction motors.
- 9 Write few salient points of Switch fuse unit (SFU).
- 10 List the important characteristics of batteries.

Part-B

Answer All the following questions.

(5X10M=50Marks)

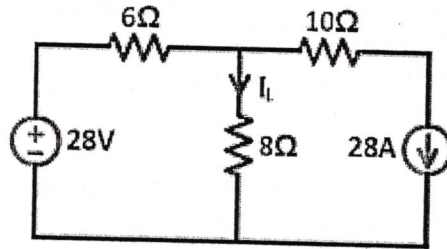
- 11 A. State and explain Kirchoff's laws with examples.
B. Determine the current in 2Ω resistor using mesh analysis for the circuit shown below.



[5+5]

OR

- 12 A. State and explain Thevenin's theorem
B. Determine the current in 8Ω resistor using superposition theorem for the circuit shown below. [5+5]



- 13 Determine the average, rms, formfactor and peak factor of a sinusoidal voltage waveform. [10]
- OR
- 14 A. Derive the relationship between phase and line quantities of voltage and current in a balanced three phase star connected system.
B. A series R-L circuit with $R=20\Omega$ and $L=100\text{mH}$ is excited by a single phase 230V, 50Hz supply. Determine the power factor and power consumed by the load. [5+5]
- 15 With a neat circuit diagram explain OC and SC tests conducted on a transformer. [10]
- OR
- 16 A. Derive EMF equation of a transformer.
B. Determine the efficiency of 2KVA transformer operating at half full load and 0.8 power factor. Consider core losses to be 400W and full load copper losses to be 2000W. [5+5]
- 17 A. Explain the working principle of three phase induction motor.
B. Give the constructional details of DC machine. [3+7]
- OR
- 18 A. Describe the operation of synchronous generator.
B. A DC shunt generator delivers 400A at 230V and the resistance of shunt field and armature are 60Ω and 0.03Ω respectively. Determine the generated EMF. [5+5]
- 19 A. With a neat diagram, explain the working of miniature circuit breaker.
B. What is earthing. Explain the concept of earthing. [5+5]
- OR
- 20 A. Discuss the classification of wires and cables
B. A domestic consumer uses 2 fans of 80W for 6 hours and 4 tube lights of 40W for 10 hours each day. Calculate the total number of units consumed in a month (30 days). [5+5]