

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]  
(2064)

14611

B. Tech 2nd Semester Examination

Basic Electrical Engineering (O.S.)

EE-1001

Time : 3 Hours

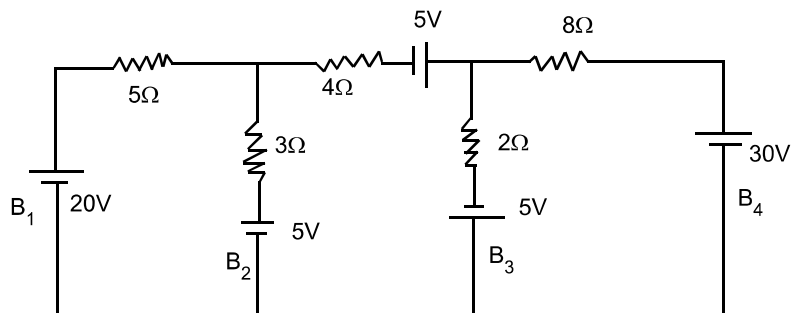
Max. Marks : 100

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Attempt five questions in all, selecting one question each from section A, B, C & D. Section-E is compulsory.

**SECTION - A**

1. (a) State Maximum power transfer theorem and also prove the condition when maximum power is transferred in a circuit. (10)
- (b) Determine the current supplied by each battery in the circuit shown in Fig. 1 by using mesh analysis. (10)

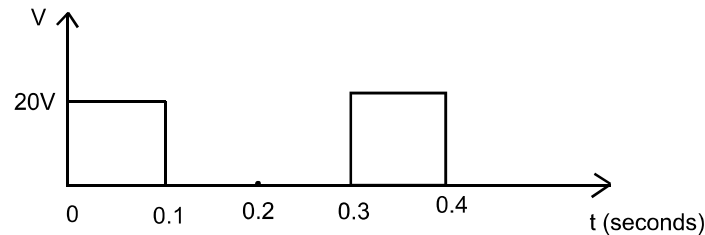


**Fig. 1**

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2. (a) Compute the average and effective values of the square voltage wave shown in figure 2. (8)



**Fig. 2**

- (b) Derive the transient response of a RLC network with step input. (12)

### SECTION - B

3. (a) Define resonance in RLC circuits, also give the graphical representation of parallel resonant RLC circuit in detail. (12)
- (b) Explain the importance of earthline in the electrical systems in detail. (8)
4. (a) Explain the measurement of power in three phase circuits. Also derive the expression for power measurement using 2- wattmeter method. (12)
- (b) A delta connected balanced 3-phase load is supplied from a 3-phase 400V supply. The line current is 20A and the power taken by the load is 10,000 W. Find (i) impedance in each branch (ii) the line current, power factor and power consumed if the same load is connected in star. (8)

### SECTION - C

5. (a) Draw the constructional features of transformer and explain its working in detail. Also derive the emf equation of transformers. (15)
- (b) Derive the torque equation of dc motor. (5)

6. (a) Draw the construction details and explain in detail the working principle of DC generators. (12)
- (b) Give the classification of generators according to the way in which their fields are excited. (8)

#### SECTION - D

7. Draw the constructional features and explain in detail the working of PMMC instruments. Also enumerate the advantages and disadvantages of this type of instruments. (20)
8. (a) Explain the working and construction of attraction type moving iron instruments. (10)
- (b) Explain the working principle and construction of energy meters. (10)

#### SECTION - E

9. (a) State Tellegen's theorem.
- (b) Define RMS value and instantaneous value of voltage and current in AC circuit.
- (c) Define resonance in RLC circuit.
- (d) What is condition of maximum efficiency of transformers?
- (e) Explain Kirchoffs laws.
- (f) Why the core of the transformers is made of thin laminations?
- (g) Differentiate between moving iron and moving coil instruments?
- (h) What is superposition theorem?
- (i) What are the values of power factor for  
(1) purely resistive circuit (2) purely capacitive circuit  
(3) purely inductive circuit
- (j) What is creeping in energy meter? (2×10=20)