

4245

BOARD DIPLOMA EXAMINATION,(C-14)

JUNE-2019

DEEE- THIRD SEMESTER EXAMINATION

ELECTRICAL CIRCUITS

Time: 3 Hours ]

[Max.Marks: 80

## PART-A

10x3=30M

**Instructions:** 1) Answer **all** the questions. Each question carries **three** marks.  
2) Answers should be brief and straight to the point and shall not exceed five simple sentences.

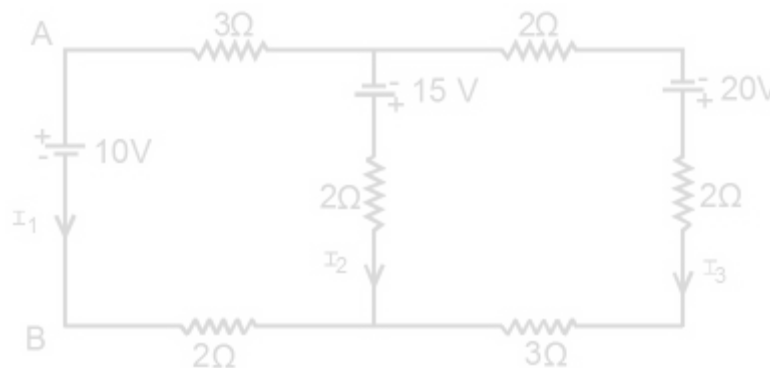
- 1) Define (a) Active circuit (b) Passive circuit.
- 2) Three resistances  $10\Omega$ ,  $20\Omega$  and  $30\Omega$  are connected in delta. Find their equivalent values in star.
- 3) State the relation between poles, speed and frequency.
- 4) Define the terms (a) Phase (b) Phase difference.
- 5) Convert the following vector quantities into its equivalent rectangular form  
(i)  $25 \angle 30^\circ$  (ii)  $15 \angle -45^\circ$
- 6) Define (a) Inductance (b) Capacitance.
- 7) Derive the relation between voltage and current in pure resistive circuit when a.c. supply is applied across it.
- 8) State the condition for resonance in parallel a.c circuits.
- 9) List any three advantages of 3phase system over single phase system.
- 10) Give the expressions for line and phase values of current and voltage in 3 phase Delta connection.

**PART-B**

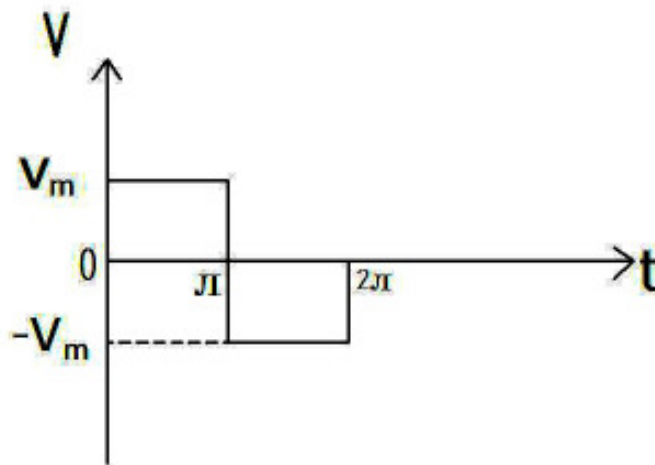
**5x10=50M**

- Instructions:** 1) Answer any **five** questions. Each question carries **ten** marks.  
2) Answers should be comprehensive and the criterion for valuation is the content but not the length of answer.

- 11) Develop the transformation formula for Star to Delta transformation.  
12) Find the branch currents  $I_1$ ,  $I_2$  and  $I_3$  in the following network by using Kirchoff's Laws.



- 13) (a) State Thevenin's Theorem. 4M  
(b) Explain Ideal voltage source and Ideal current source. 6M
- 14) Calculate the RMS value, average value and form factor for the following square wave form.



- 15) A series R-C\* circuit, whose resistance is  $50\Omega$  and capacitance of  $30\ \mu\text{F}$ , is connected across a  $230\text{V}$ ,  $50\text{Hz}$  supply. Find the (a) Capacitive reactance (b) Impedance (c) Current (d) Power Factor (e) Active power of the circuit.
- 16) Calculate the impedance, current, phase angle, power and power factor in R-L Series circuit.
- 17) Two impedances  $Z_1=(10+j15)$  and  $Z_2=(5-j10)$  are connected in parallel across the  $230\text{V}$ ,  $50\text{Hz}$  a.c supply. Find the current passing through each branch, power factor of the whole network and power dissipated in each branch.
- 18) A balanced Star connected load of  $(15+j25)\ \Omega$  per phase is connected to a 3-phase,  $230\text{V}$ ,  $50\text{Hz}$  a.c. supply. Find (a) Line current (b) Power factor (c) Active power (d) Reactive power (e) Apparent power.

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