

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 10Ω , 20Ω and 30Ω 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

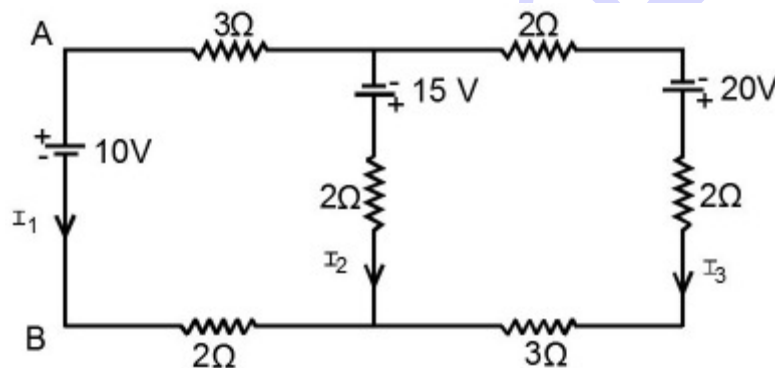
5x10=50M

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.

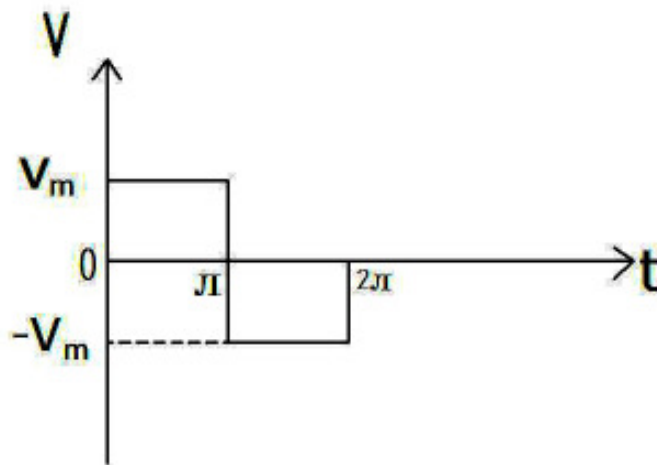
12) Find the branch currents I_1 , I_2 and I_3 in the following network by using Kirchoff's Laws.



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 50Ω and capacitance of $30\ \mu\text{F}$, is connected across a 230V , 50Hz 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 230V , 50Hz 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, 230V , 50Hz a.c. supply. Find
(a) Line current (b) Power factor (c) Active power (d) Reactive power (e) Apparent power.

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