



5464A

C16S-EE-302

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BOARD DIPLOMA EXAMINATION, (C-16S)  
NOVEMBER-2019  
DEEE - THIRD SEMESTER EXAMINATION

ELECTRICAL CIRCUITS

Time : 3 Hours ]

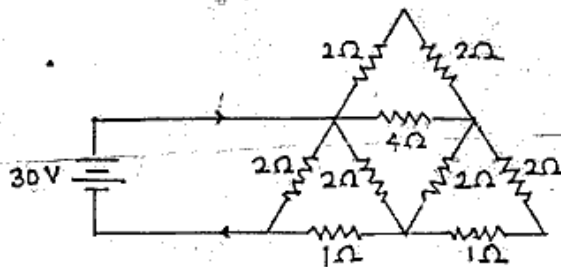
[ Total Marks: 80

PART-A

3X10=30

- Instructions :
1. Answer All questions.
  2. Each question carries THREE marks.
  3. Answer should be brief and straight to the point

1. Find the current supplied by the battery shown in the circuit.



2. Differentiate between active element and passive element.
3. An alternating voltage is represented by  $V=141.4 \sin 377t$ .

Find i) the maximum value  
ii) the frequency  
iii) the instantaneous value

Of voltage when  $t$  is 3 millise.

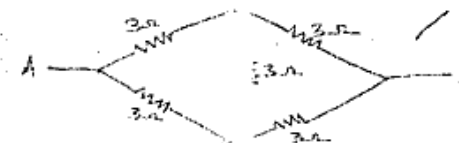
4. Define the following terms for an alternating quantity.
  - i) Maximum value
  - ii) Average value
  - iii) R.M.S value
5. Find the sum of the following two emfs and express the answer in the similar form.  
 $e_1 = 100 \sin \omega t$ ,  $e_2 = 110 \cos \omega t$ .
6. Draw the impedance triangle for the following circuits:
  - i. R-L series circuit
  - ii. R-C series circuit
  - iii. R-L-C series circuit

7. A coil of resistance  $8\Omega$  and inductance  $0.03H$  is connected to an a.c. supply at  $240V$ ,  $50HZ$ . Calculate the value of current and power taken from the supply.
8. Define the Q-factor of a parallel resonant circuit and express the Q-factor in terms of R, L and C.
9. Define maximum transfer theorem.
10. Write down the relations between line voltage and phase voltage, line current and phase current w.r.t. star-connected and Delta connected systems.

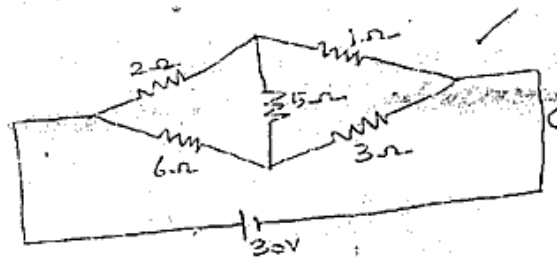
PART-B

10X5=50

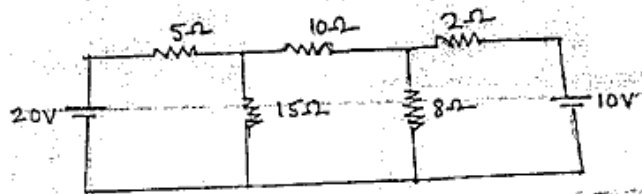
- Instructions :
1. Answer any five questions.
  2. Each question carries ten marks.
  3. Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.
11. (a) Derive transformation formulae for delta star transformation.  
(b) Determine equivalent resistance between AB.



12. Find the current through  $5\Omega$  resistor shown in the circuit.



13. Find the current in the  $10\Omega$  resistor in the network shown using the venin's theorem.



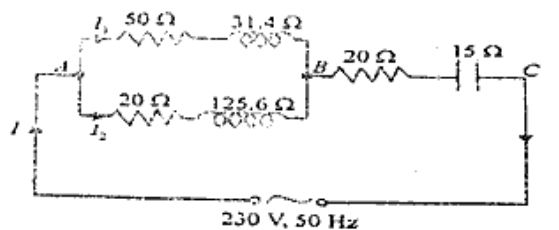
14. Find the resultant voltage of the following a.c. voltages and represent in the same form

- i.  $v_1 = 100\sin 314t$
- ii.  $v_2 = 100\sin(314t - 30^\circ)$
- iii.  $v_3 = 75\cos 314t$
- iv.  $v_4 = 60\sin(314t + 120^\circ)$

15. A two element series circuit consumes  $700W$  and has a power factor  $0.707$  leading. If applied voltage is  $v = 141.1 \sin(314t + 30^\circ)$  volts. Find the circuit constants.

16. Compare series and parallel resonant circuits. <http://www.sbtetonline.com>

17. For the series - parallel circuit shown in figure find (i) Total impedance (ii) Supply current and (iii) circuit P.F



18. (a) Give the advantages of polyphase circuits over single phase circuits.

(b) Three similar resistors are connected in star across  $400V, 3$  phase supply. The line current is  $5A$ . Calculate the value of each resistance. What value should the line voltage be changed to obtain the same line current with resistors connected in delta.

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