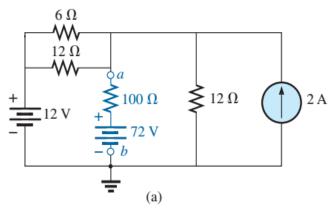


S

- This is a closed book exam.
- Read each question carefully before answering it, and list any important assumptions you make.
- Exam questions in three pages, answer all of them.
- Good Luck!
- 1. Find the Norton equivalent circuit for the portions of the networks in Figure 1 external to branch a-b. [10 marks]



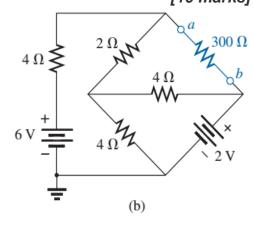


Figure 1

2. Determine the current I for the network in Figure 2.

[10 marks]

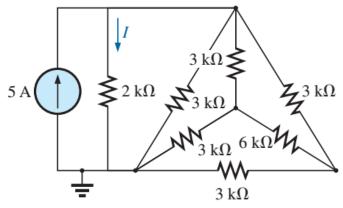


Figure 2

3. For the circuit in Figure 3, determine the value of R such that the maximum power delivered to the load is 3 mW. [10 marks]

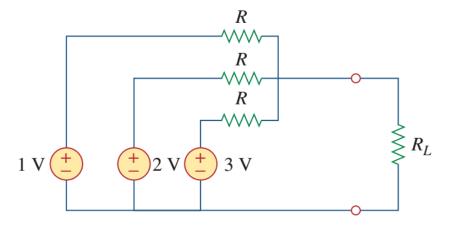


Figure 3

4. Using nodal analysis, find v_o and i_o in the circuit of Figure 4.

[10 marks]

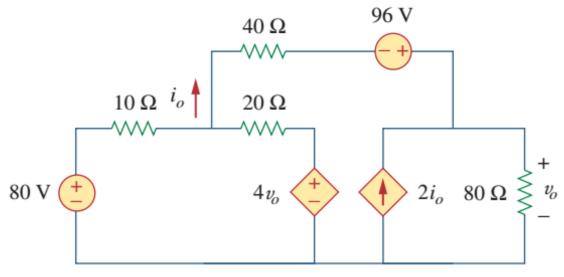


Figure 4

5. Choose the correct answers

[10 marks]

- i. The primary purpose of a resistor is to
 - (a) increase current

(b) limit current

(c) produce heat

- (d) resist current change.
- ii. While putting four 1.5 V batteries in a flashlight, you accidentally put one of them in backward. The voltage across the bulb will be
 - (a) 6 V
- (b) 3 V
- (c) 4.5 V
- (d) 0 V.
- iii. While checking out a series-resistive circuit, you find that the current is higher than it should be. You should look for
 - (a) an open circuit

- (b) a short
- (c) a low resistor value
- (d) answers (b) and (c).
- iv. In a parallel circuit, each resistor has
 - (a) the same current
- (b) the same voltage

(c) the same power

- (d) all of the above
- v. Maximum power is transferred from a source to a load when
 - (a) the load resistance is very large
 - (b) the load resistance is very small
 - (c) the load resistance is twice the source resistance
 - (d) the load resistance equals the source resistance

vi. In a parallel circuit containing set of bulbs, if one of the bulbs blew up the effective resistance offered will						
(a) Increase	(b) Remains san	ne (d	c) Decrease	(d) Fluctuate.		
series. The value	e of resultant resis	stance is				
(a) $111 \pm 0 \Omega$	(b) $111 \pm 2.77 \Omega$	(c)	111 ± 5.55 Ω	(d) $111 \pm 7.23 \Omega$.		
Active element of	of electrical circuit	is				
(a) voltage source	ce (b)current sou	ırce (c)	both of them	(d) none of above.		
ix. You have to replace 1500 Ω resistor in radio. You have no 1500 Ω resistor						
but have several 1000 Ω ones which you would connect						
(a) two in paralle	el .	(b) two in parallel and one in series				
(c) three in serie	es (d) three in parallel.					
Electrical current	t is defined as					
(a) free electrons			(b) the flow r	ate of free electrons		
(c) the energy red	quired to move ele	ectrons	(d) the charg	ge on free electrons		
	effective resistant (a) Increase $R_1 = 36 \Omega$ and $R_2 = 36 \Omega$ and $R_3 = 36 \Omega$ and $R_4 = 36 \Omega$ and $R_4 = 36 \Omega$ and $R_5 =$	effective resistance offered will (a) Increase (b) Remains san $R_1 = 36 \Omega$ and $R_2 = 75 \Omega$, each I series. The value of resultant resist (a) $111 \pm 0 \Omega$ (b) $111 \pm 2.77 \Omega$ Active element of electrical circuit (a) voltage source (b) current source (b) current source (b) thave to replace 1500Ω resist but have several 1000Ω ones while (a) two in parallel (c) three in series Electrical current is defined as (a) free electrons	effective resistance offered will (a) Increase (b) Remains same (c) $R_1 = 36 \Omega$ and $R_2 = 75 \Omega$, each having to series. The value of resultant resistance is (a) $111 \pm 0 \Omega$ (b) $111 \pm 2.77 \Omega$ (c) Active element of electrical circuit is (a) voltage source (b) current source (c) You have to replace 1500Ω resistor in rabut have several 1000Ω ones which you will (a) two in parallel (b) two (c) three in series (d) three Electrical current is defined as (a) free electrons	effective resistance offered will (a) Increase (b) Remains same (c) Decrease $R_1 = 36 \Omega$ and $R_2 = 75 \Omega$, each having tolerance of $\pm 5 \Omega$ series. The value of resultant resistance is (a) $111 \pm 0 \Omega$ (b) $111 \pm 2.77 \Omega$ (c) $111 \pm 5.55 \Omega$ Active element of electrical circuit is (a) voltage source (b)current source (c) both of them You have to replace 1500Ω resistor in radio. You have but have several 1000Ω ones which you would connect (a) two in parallel (b) two in parallel and (c) three in series (d) three in parallel. Electrical current is defined as (a) free electrons (b) the flow results of the parallel (b) the flow results of the parallel (c) the flow results of the parallel (d) the flow results of the parallel (e) the flow results of the parallel (for th		