

1. (69 points)

Team Number

ZIPGRADE.COM

- | | | | | | |
|----|---------------------|-----|---------------------|----|---------------------|
| 1 | (A) (B) (C) (D) | 13 | (A) (B) (C) (D) (E) | 29 | (A) (B) (C) (D) (E) |
| 2 | (A) (B) (C) (D) (E) | 14 | (A) (B) (C) (D) | 30 | (A) (B) (C) (D) (E) |
| 3 | (A) (B) (C) (D) (E) | 15 | (A) (B) (C) (D) (E) | 31 | (A) (B) (C) (D) (E) |
| 4 | (A) (B) (C) (D) (E) | 16 | (A) (B) (C) (D) (E) | 32 | (A) (B) (C) (D) (E) |
| 5a | (A) (B) (C) (D) (E) | 17 | (A) (B) (C) (D) (E) | 33 | (A) (B) (C) (D) (E) |
| 5b | (A) (B) (C) (D) | 18 | (A) (B) (C) (D) (E) | 34 | (A) (B) (C) (D) (E) |
| 6a | (A) (B) (C) (D) | 19 | (A) (B) (C) (D) (E) | 35 | (A) (B) (C) (D) (E) |
| 6b | (A) (B) (C) (D) (E) | 20 | (A) (B) (C) (D) | 36 | (A) (B) (C) (D) (E) |
| 6c | (A) (B) (C) (D) | 21a | (A) (B) (C) (D) (E) | | |
| 6d | (A) (B) (C) (D) | 21b | (A) (B) (C) (D) (E) | | |
| 7a | (A) (B) (C) (D) (E) | 21c | (A) (B) (C) (D) | | |
| 7b | (A) (B) (C) (D) | 22 | (A) (B) (C) (D) (E) | | |
| 7c | (A) (B) (C) (D) (E) | 23 | (A) (B) (C) (D) (E) | | |
| 8 | (A) (B) (C) (D) (E) | 24 | (A) (B) (C) (D) (E) | | |
| 9 | (A) (B) (C) (D) (E) | 25 | (A) (B) (C) (D) | | |
| 10 | (A) (B) (C) (D) (E) | 26 | (A) (B) (C) (D) | | |
| 11 | (A) (B) (C) (D) (E) | 27 | (A) (B) (C) (D) | | |
| 12 | (A) (B) (C) (D) (E) | 28 | (A) (B) (C) (D) (E) | | |

26 Circuits (9110)

Free Response Questions

37. (a) (1 point) _____
(b) (1 point) _____
(c) (1 point) _____
(d) (1 point) _____
(e) (3 points)

- (f) (2 points)

- (g) i. (2 points) _____
ii. (2 points) _____
iii. (4 points)

- iv. (2 points) _____

38. (a) (1 point) _____
(b) (2 points)

(c) (2 points) _____

(d) (2 points) _____

39. (a) (2 points)

(b) (2 points) _____

(c) (3 points)

(d) (1 point) _____

(e) (1 point) _____

(f) (1 point) _____

(g) (1 point) _____

(h) (1 point) _____

(i) (2 points)

40. **(TB #3)**

(a) (1 point) _____

(b) (2 points) _____

(c) (1 point) _____

(d) (2 points) _____

(e) (3 points)

A large, empty rectangular box with a thin black border, intended for the student's answer to question (e).

(f) (3 points)

A large, empty rectangular box with a thin black border, intended for the student's answer to question (f).

(g) (3 points)

A large, empty rectangular box with a thin black border, intended for the student's answer to question (g).

(h) (3 points)

A large, empty rectangular box with a thin black border, intended for the student's answer to question (h).

(i) (3 points)

A large, empty rectangular box with a thin black border, intended for the student's answer to question (i).

(j) (3 points)

41. (a) (3 points)

(b) (2 points) _____

(c) (2 points) _____

(d) (2 points) _____

(e) (2 points)

(f) (2 points)

(g) (2 points)

42. (TB #1)

(a) (1 point) _____

(b) (1 point)

(c) (1 point)

(d) (1 point)

(e) (2 points)

(f) (2 points)

(g) (2 points)

(h) (2 points)

(i) Treat the 18Ω resistor as the load for the following subparts.

i. (3 points)

ii. (3 points)

iii. (4 points)

iv. (4 points)

43. (a) (1 point) _____

(b) (2 points)

(c) (1 point) _____

(d) (1 point) _____

(e) (2 points) _____

(f) (2 points) _____

(g) (2 points)

(h) (2 points)

(i) (2 points)

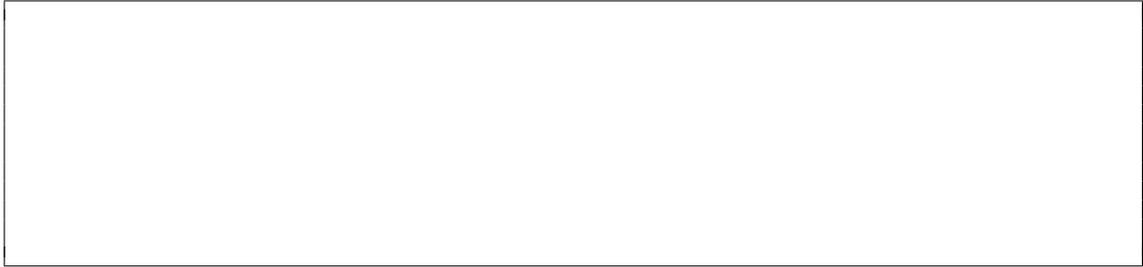
(j) (2 points)

(k) (2 points)

44. **(TB #2)**

(a) (2 points)

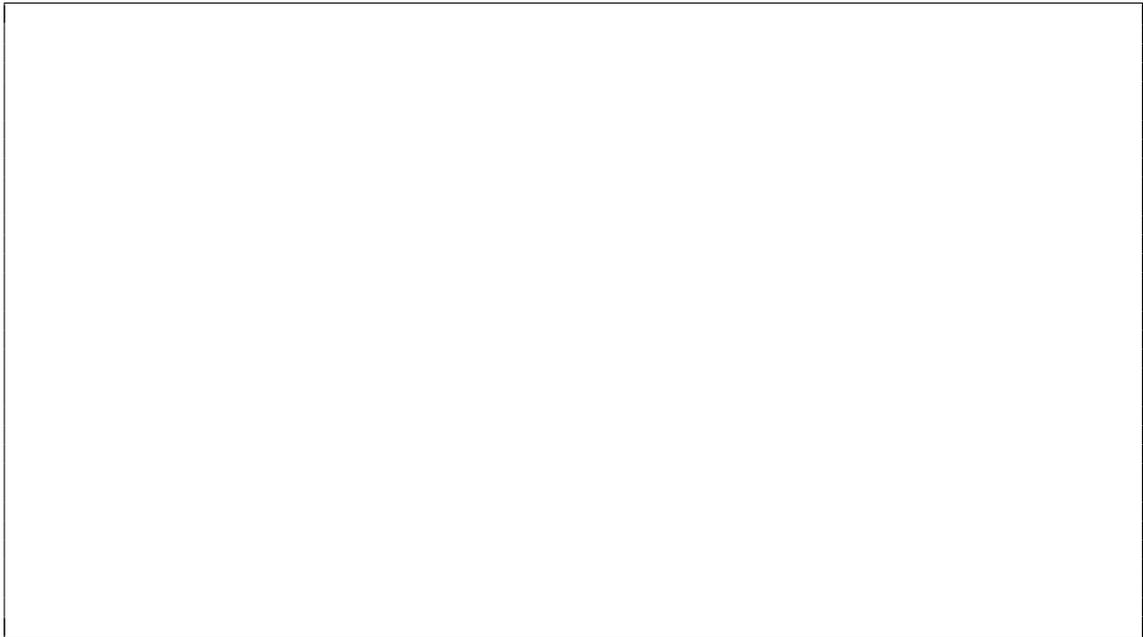
(b) (2 points)



(c) (8 points)



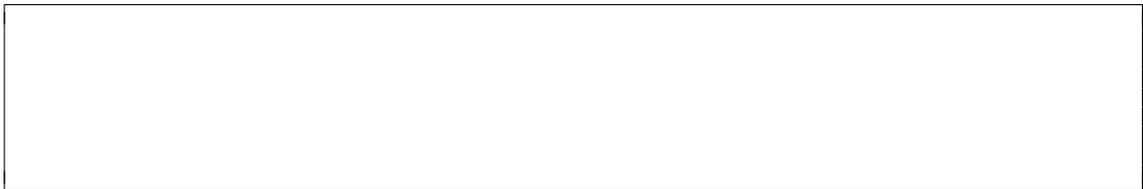
(d) (8 points)



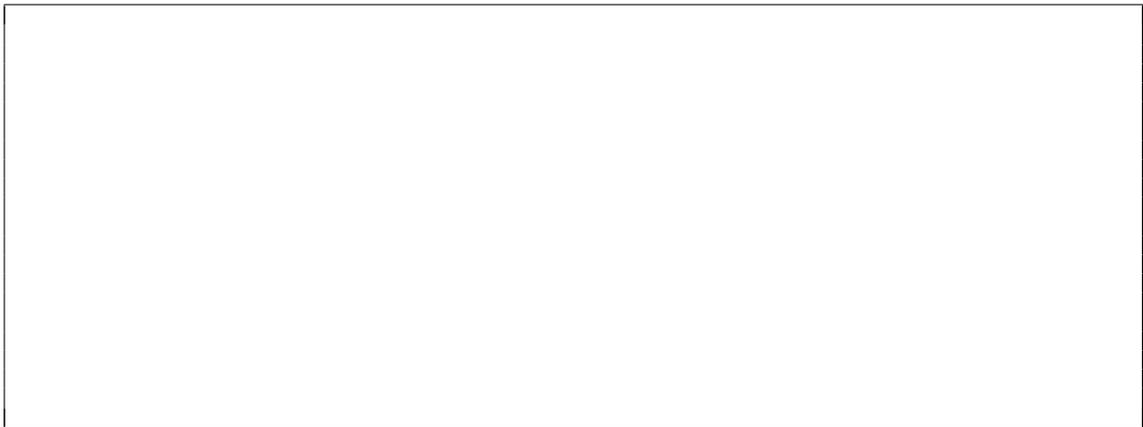
45. (a) (1 point)



(b) (1 point)



(c) (4 points)



- 46. (a) (2 points) _____
- (b) (2 points) _____
- (c) (2 points) _____
- (d) (3 points) _____
- (e) (2 points) _____

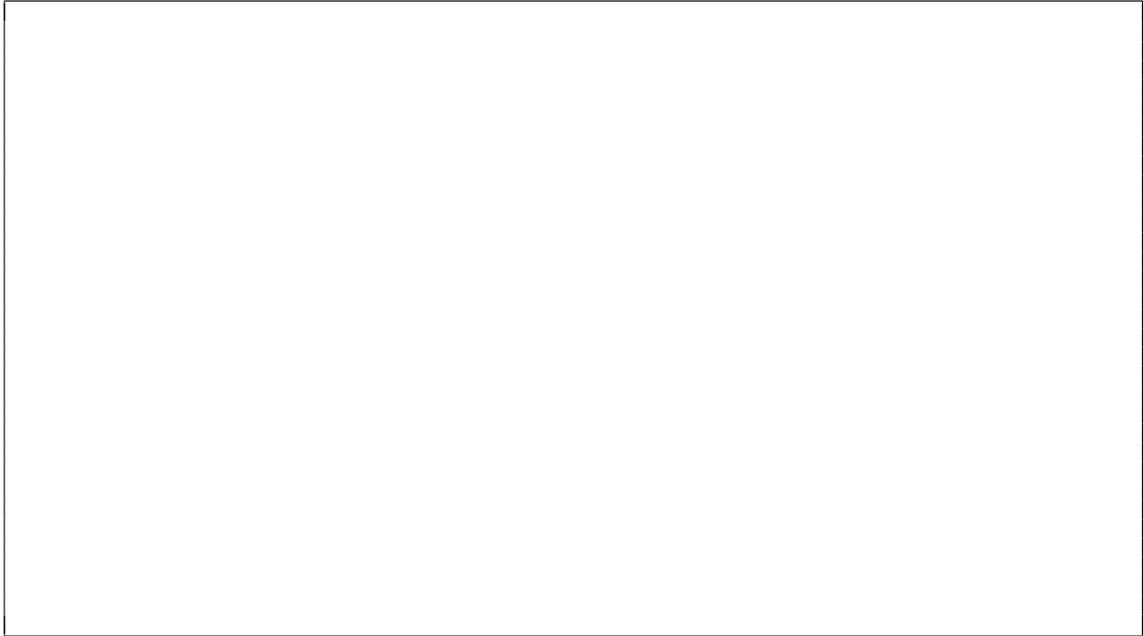
- 47. (a) (2 points)

- (b) (3 points)

- (c) (4 points)

- (d) (2 points)

(e) (5 points)



48. (a) (4 points)



(b) (2 points)



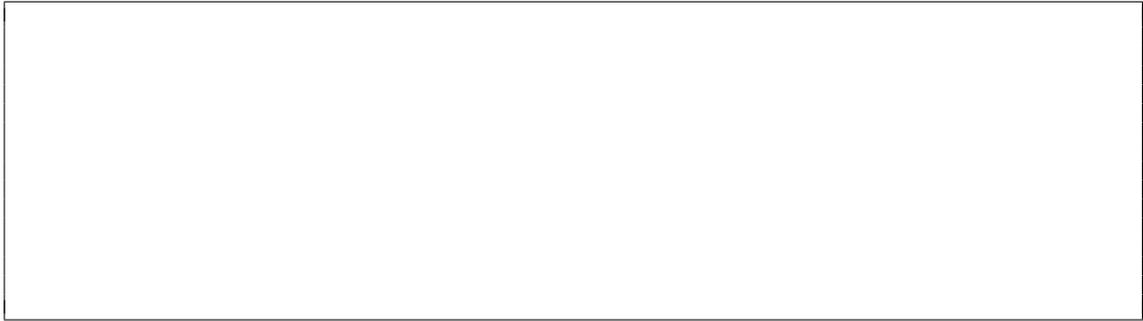
(c) (2 points)



(d) (2 points)



(e) (4 points)



(f) (2 points)



(g) (4 points)



Hands-On Tasks

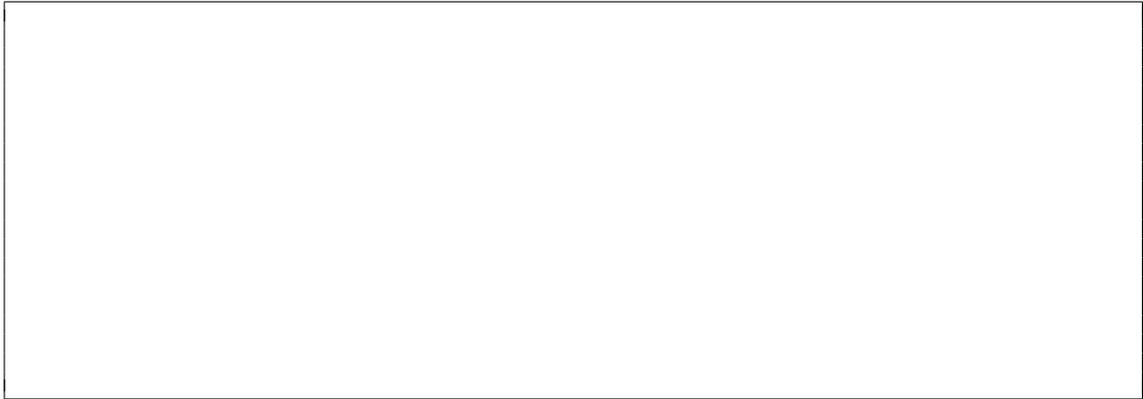
49. (a) (4 points)

(b) (4 points)

(c) (6 points)

(d) (4 points)

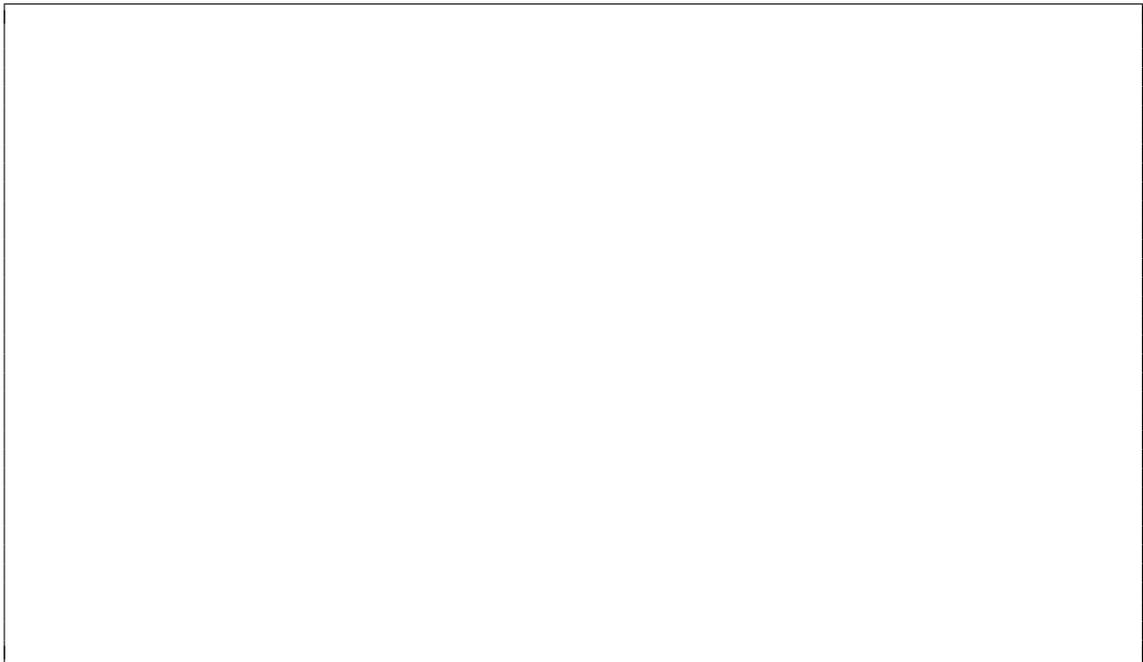
(e) (4 points)



(f) (4 points)

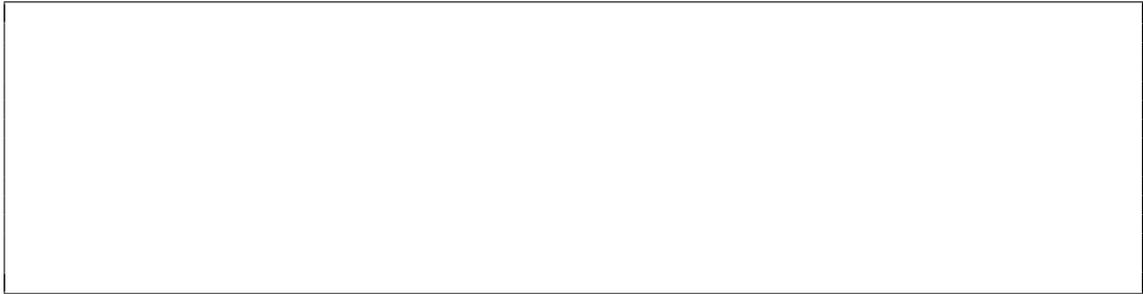


(g) (6 points)

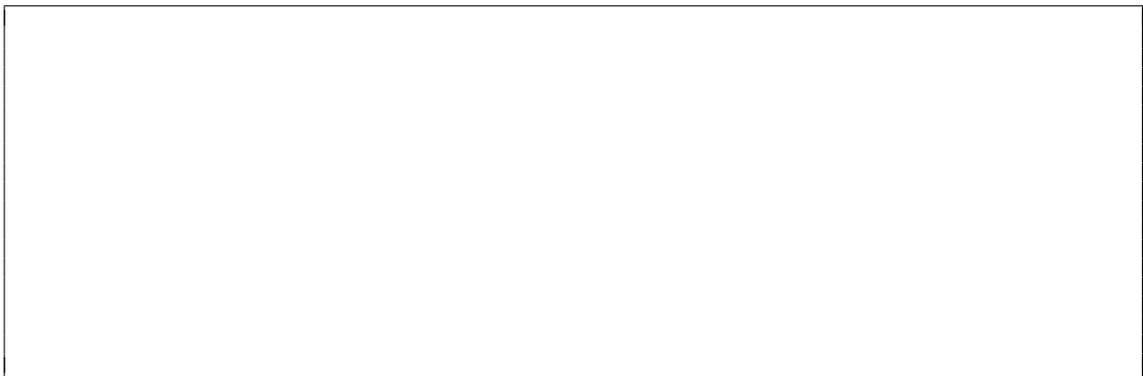


50. (a) (1 point) _____

(b) (3 points)



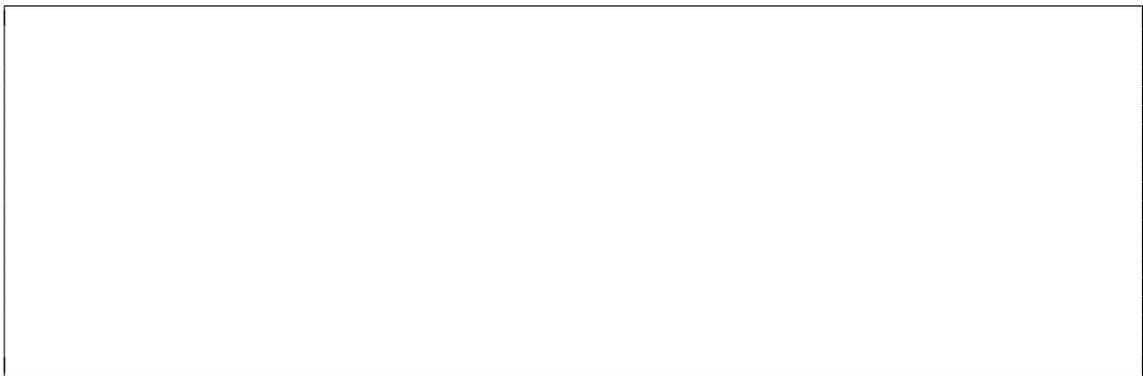
(c) (2 points)



(d) (2 points)



(e) (2 points)



(f) (1 point)

(g) (1 point)

(h) (4 points)

(i) (4 points)

(j) (2 points) _____

(k) (2 points)

(l) (2 points)

An empty rectangular box with a thin black border, intended for the student's answer to question (l).

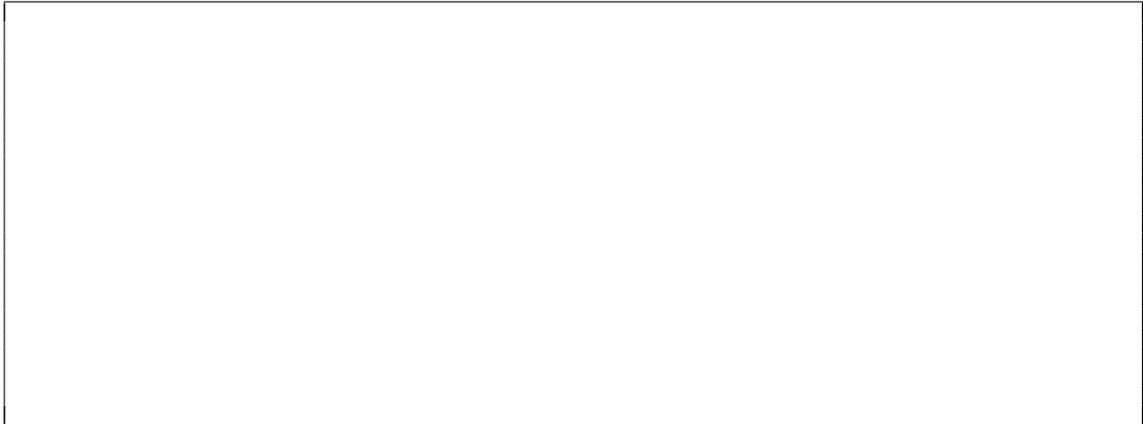
(m) (4 points)

An empty rectangular box with a thin black border, intended for the student's answer to question (m).

(n) (4 points)

An empty rectangular box with a thin black border, intended for the student's answer to question (n).

51. (a) (5 points)



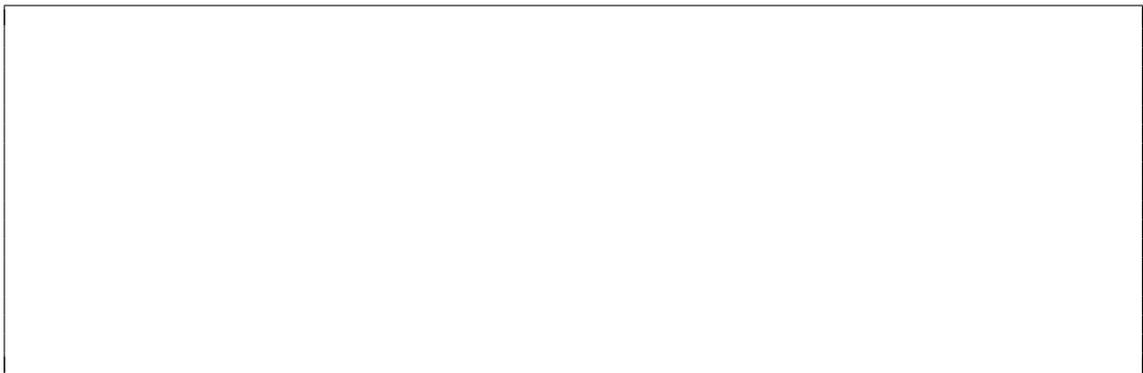
(b) (5 points)



(c) (4 points)



(d) (6 points)



(e) (4 points)

(f) (4 points)

(g) (2 points)

(h) (4 points)

(i) (5 points)

(j) (6 points)