

Captains Test:
Circuit Lab
2018
Answer key

Part 1:

1. D
2. B
3. C
4. D
5. C
6. B
7. C
8. A
9. A
10. B
11. C
12. D
13. C
14. A
15. E
16. D
17. B
18. B
19. D
20. C

Part 2

21.

1. Length
2. Cross sections area (thickness)
3. Temperature
4. Material

22.

2 new magnets result.

23.

DC flows in one direction, while AC current changes direction

24. $1.257 \times 10^{-6} \text{ H/m}$ (T·m/a also acceptable) ($4\uparrow \times 10^{-7}$ with units is also correct)

25. 10 V

26.

- a. 529.4 ohms
- b. 302.5 ohms

27. 3.12 A

28.

R1= 4.5 ohms
R2= 6.0 ohms
R3= 1.5 ohms

29. one

30. $3.08 \times 10^{-48} \text{ N}$

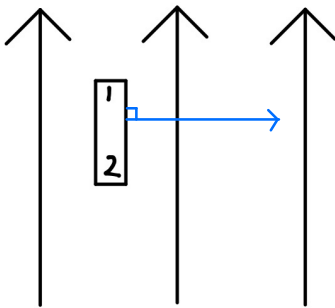
31.

Minimum= -452.5V
Maximum= 452.5V

32. Amps(A) and C/s

33. 16.3 ohms

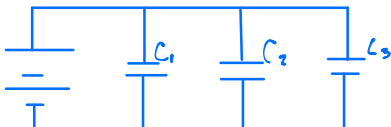
34. (Can point to left as well as long as it appears perpendicular)



35.

C1= 5.5 V
C2= 2.75 V
C3= 2.75 V

b. (Capacitors must be in parallel)

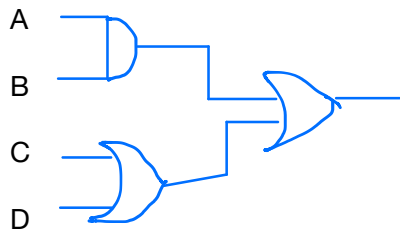


36. $5.9 \times 10^{-9} \text{ m}$

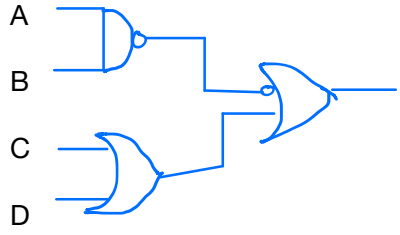
37. $4.2 \times 10^{-10} \text{ C}$

38. To the north

39.



Part B (circles could be in corresponding places on D and C



40. An area of no conductivity

41. 215.4 V