

KUNCI JAWABAN  
PENILAIAN AKHIR SEMESTER 1  
TAHUN PELAJARAN 2021/2022

MATA PELAJARAN : FISIKA  
KELAS / PROGRAM : XII / MIPA  
HARI DAN TANGGAL : JUMAT, 26 November 2021

A. PILIHAN GANDA

| NO  | KUNCI |
|-----|-------|
| 1.  | E     |
| 2.  | D     |
| 3.  | A     |
| 4.  | A     |
| 5.  | C     |
| 6.  | B     |
| 7.  | E     |
| 8.  | D     |
| 9.  | B     |
| 10. | D     |
| 11. | A     |
| 12. | A     |
| 13. | C     |
| 14. | C     |
| 15. | B     |

| NO  | KUNCI |
|-----|-------|
| 16. | D     |
| 17. | D     |
| 18. | A     |
| 19. | C     |
| 20. | E     |
| 21. | E     |
| 22. | A     |
| 23. | C     |
| 24. | A     |
| 25. | D     |
| 26. | C     |
| 27. | B     |
| 28. | D     |
| 29. | A     |
| 30. | B     |

| NO  | KUNCI |
|-----|-------|
| 31. | E     |
| 32. | E     |
| 33. | C     |
| 34. | E     |
| 35. | B     |
| 36. |       |
| 37. |       |
| 38. |       |
| 39. |       |
| 40. |       |
| 41. |       |
| 42. |       |
| 43. |       |
| 44. |       |
| 45. |       |

| NO  | KUNCI |
|-----|-------|
| 46. |       |
| 47. |       |
| 48. |       |
| 49. |       |
| 50. |       |
|     |       |
|     |       |
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|     |       |
|     |       |
|     |       |

B. URAIAN : di lembar ke 2

C. NORMA PENILAIAN

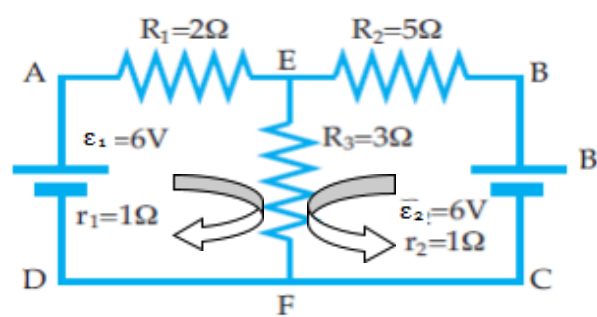
Skor Pilihan Ganda : 35 PG x 2 = 70  
Skor Uraian : 30  
No 1 skor maksimal 6  
No 2 skor maksimal 5  
No 3 skor maksimal 5  
No 4 skor maksimal 5  
No 5 skor maksimal 9  
Nilai :  $\sum$  skor PG +  $\sum$  skor UO

Purworejo, 1 November 2021  
Penyusun Naskah Soal

Dra. WURYANINGSIH. N.E  
NIP. 19660114 199512 2 001

JAWABAN URAIAN

1.



Diketahui : seperti gambar  
Ditanyakan :  $V_{EF}$  ?  
Dijawab :

Hk II Kichhoff :  $\sum \varepsilon + \sum I R = 0$

Loop 1 :

$$3 i_1 + 3 i_3 = 6$$

$$i_1 + i_3 = 2 \dots \dots \dots (1)$$

Loop 2 :

$$6 i_2 + 3 i_3 = 6$$

$$2 i_2 + i_3 = 3 \dots \dots \dots (2)$$

Hk I Kichhoff :  $\sum I \text{ masuk} = \sum I \text{ keluar}$

$$i_1 + i_2 = i_3$$

$$i_1 = i_3 - i_2 \dots \dots \dots (3)$$

Subtitusi pers (3) dan pers (1)

$$i_1 + i_3 = 2$$

$$i_3 - i_2 + i_3 = 2$$

$$- i_2 + 2 i_3 = 2 \dots \dots \dots (4)$$

Eleminasi pers (2) dan pers (4)

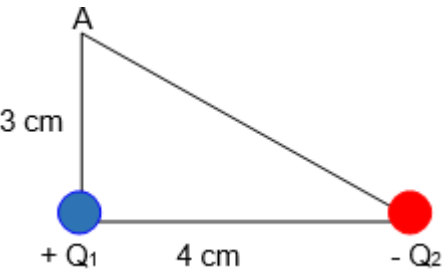
$$\begin{array}{rcl} 2 i_2 + i_3 = 3 & (\times 1) & 2 i_2 + i_3 = 3 \\ - i_2 + 2 i_3 = 2 & (\times 2) & -2 i_2 + 4 i_3 = 4 + \end{array}$$

$$5 i_3 = 7$$

$$i_3 = 1,4 \text{ A}$$

Beda potensial antara titik EF =  $1,4 \times 3 = 4,2 \text{ volt}$

2.



Diketahui :  $Q_1 = 3 \mu C$ ,  $Q_2 = -8 \mu C$  dan  $k = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$   
Ditanyakan :  $V_A$  ?  
Dijawab :

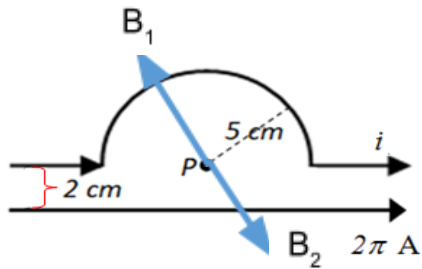
$$V_A = k \left( \frac{Q_1}{r_1} + \frac{Q_2}{r_2} \right)$$

$$V_A = 9 \times 10^9 \left( \frac{3}{3} - \frac{8}{5} \right) \times 10^{-4}$$

$$V_A = 9 \times 10^5 (1 - 1,6)$$

$$V_A = - 5,4 \times 10^5 \text{ volt}$$

3.



Diketahui:  $i = 2 \text{ A}$ ,  $\mu_0 = 4 \pi \times 10^{-7} \text{ Wb/Am}$

Ditanyakan :  $B_P$  dan arah induksi magnetik di P

Dijawab :

$$B_P = \mu_0 \left( \frac{i_2}{2\pi a_2} - \frac{i_1}{2a_1} \right)$$

$$B_P = 4 \pi \times 10^{-7} \left( \frac{2\pi}{2\pi \times 2} - \frac{2}{2 \times 5} \right) \times 10^2$$

$$B_P = 4 \pi \times 10^{-5} (0,5 - 0,2)$$

$$B_P = 1,2 \pi \times 10^{-5} \text{ Wb arah induksi magnetik menuju pengamat (searah dengan } B_2)$$

4. Diketahui :  $A = 0,6 \text{ m}^2$ ,  $\frac{dB}{dt} = 3,5 \text{ T/s}$  dan  $R = 0,5 \Omega$ ,

Ditanyakan :  $I$  induksi

Dijawab :

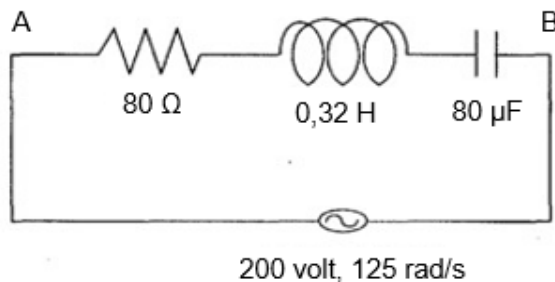
$$\varepsilon = \frac{d\phi}{dt}$$

$$\varepsilon = \frac{d(BA \cos \theta)}{dt}$$

$$\varepsilon = 3,5 \times 0,6 = 2,1 \text{ volt}$$

$$i = \frac{\varepsilon}{R} = \frac{2,1}{0,5} = 4,2 \text{ ampere}$$

5.



Diketahui :  $R = 80 \Omega$ ,  $L = 0,32 \text{ H}$ ,  $C = 80 \mu\text{F}$ ,  $V_{maks} = 200 \text{ volt}$ ,  $\omega = 125 \text{ rad/s}$

Ditanyakan :

a. Impedansi rangkaian

b. Kuat arus maksimum

c. Tegangan  $V_{AB}$

Dijawab :

$$X_L = \omega L = 125 \times 0,32 = 40 \Omega$$

$$X_C = \frac{1}{\omega C} = \frac{10^6}{125 \times 80} = 100 \Omega$$

$$a. Z = \sqrt{(X_C - X_L)^2 + R^2}$$

$$Z = \sqrt{(100 - 40)^2 + 80^2}$$

$$Z = 100 \, \Omega$$

$$b. \quad I_{max} = \frac{V_{maks}}{Z}$$

$$I_{max} = \frac{200}{100}$$

$$I_{max} = 2 \, A$$

$$c. \quad V_C = I_{max} X_C = 2 \times 40 = 80 \, \text{volt}$$

$$V_L = I_{max} X_L = 2 \times 100 = 200 \, \text{volt}$$

$$V_R = I_{max} R = 2 \times 100 = 80 \, \text{volt}$$

$$V_{AB} = \sqrt{(V_L - V_C)^2 + V_R^2}$$

$$V_{AB} = \sqrt{(200 - 80)^2 + 80^2}$$

$$V_{AB} = \sqrt{(160)^2 + 80^2}$$

$$V_{AB} = \sqrt{25600 + 6400}$$

$$V_{AB} = \sqrt{32000}$$

$$V_{AB} = 80\sqrt{5} \, \text{volt}$$