

KUNCI TEST PERSIAPAN UN

01. $s = \frac{w}{V} = \frac{MLT^{-2}}{L^3} = ML^{-2}T^{-2}$ jawab : D

02. $y = \frac{v_o^2 \sin^2 \alpha}{2g} \rightarrow 5 = \frac{v_o^2 \sin^2 30^\circ}{2 \cdot 10} \rightarrow v_o = 20 \text{ m/s}$

$x_{\max} = \frac{v_o^2 \sin 2\alpha}{g} = \frac{20^2 \sin 2 \cdot 30}{10} = 20\sqrt{3} \text{ m}$jawab : D

03. $w_B : w_P = m \cdot G \frac{M_B}{R_B^2} : m \cdot G \frac{M_P}{R_P^2} = \frac{M}{R^2} : \frac{\frac{1}{2}M}{(\frac{1}{4}R)^2} = 1 : 8 \rightarrow w_P = 8w_B$jawab : C

04. jawab : A sudah jelas.

05. Jawab : B karena massa sama dan kecepatan sama berlawanan arah maka setelah bertumbukan akan arah berbalik untuk masing-masing benda.

$\frac{1}{K_s} = \frac{1}{20} + \frac{1}{5} = \frac{1+4}{20} = \frac{1}{4} \rightarrow K_s = 4 \text{ N/m}$

06. $K_t = 4 + 4 + 2 = 10 \text{ N/m}$

$\Delta X = \frac{0,02 \cdot 10}{10} \cdot 100 \text{ cm} = 2 \text{ cm}$jawab : B

07.

$h = \frac{V}{A} = \frac{2.000}{50} = 40 \text{ cm} \rightarrow P_h = \rho \cdot g \cdot h = 800 \cdot 10 \cdot (40 - 10) \cdot 10^{-2} = 2.400 \text{ N/m}$jawab : A

08. $Q_1 = Q_2 \rightarrow \pi R_1^2 v_1 = \pi R_2^2 v_2 \rightarrow (2R)^2 \cdot 1 = R^2 \cdot v_2 \rightarrow v_B = 4 \text{ m/s}$jawab : E

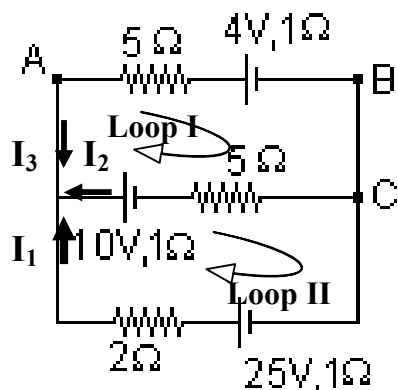
09. $F_1 : F_2 = k \frac{q_1 \cdot q_2}{r^2} : k \frac{q_1 \cdot q_2}{(2r)^2} = 4 : 1 \rightarrow F_2 = \frac{1}{4} F_1$jawab : A

10. $Q = V \cdot C \rightarrow Q = 3 \cdot 10^{-5} \cdot 120 = 3,6 \cdot 10^{-3} \text{ Coulomb}$jawab : D

11. Karena berlaku 4.3 = 2.6 berlaku jembatan wheatstone maka :

$\frac{1}{R_p} = \frac{1}{6} + \frac{1}{9} = \frac{9+6}{54} \rightarrow R_p = \frac{54}{15} = 3,6$jawab : E

12.



$i_3 = i_1 + i_2$

Loop I

$6i_2 + 6i_3 - 10 + 4 = 0 \rightarrow i_2 + i_3 = 1 \rightarrow i_2 + i_1 + i_2 = 1$

$i_1 + 2i_2 = 1$

Loop II

$3i_1 - 6i_2 - 25 + 10 = 0 \rightarrow i_1 - 2i_2 = 5$

$i_1 - (1 - i_1) = 5 \rightarrow i_1 = \frac{6}{2} = 3 \text{ A}$Jawab : C

13. jawab : C sudah jelas.

14. Alat optic yang bayangan akhir tegak : kacata mata, Lup, Teropong bumi, teropong bintang.

Aat optic yang bayangan ahir terbalik : Mikroskop dan teropong bintang.....jawab: E

15. $mvr = \frac{n.h}{2\pi}$ jawab:C

16. alfa $\rightarrow 198 = 186 + 4n \rightarrow 4n = 12 \rightarrow n = 3$

Beta $\rightarrow 86 = 82 + 3.2 + n \rightarrow n = 2$ jawab : C

$a = 0 \rightarrow 6 - t = 0 \rightarrow t = 6$ detik

17. $v = \int a.dt \rightarrow v = \int (6-t)dt \rightarrow v = 6t - \frac{1}{2}t^2 + c \rightarrow t = 0 \rightarrow v = 2$

$v = 6t - \frac{1}{2}t^2 + 2 \rightarrow v = 6.2 - \frac{1}{2}2^2 + 2 = 20$jawab : C

18. $v = \frac{dr}{dt} = (4t - 3t^2)\hat{i} - 6t \hat{j} = (8 - 3.2^2)\hat{i} - 6.2.\hat{j} = -4\hat{i} - 12\hat{j}$

$v = \sqrt{4^2 + 12^2} = 4\sqrt{10}$jawab : E

19. $M = \frac{1}{2} MR^2 + MR^2 = \frac{3}{2} MR^2$ jawab : E

20. $L_A : L_B = \frac{2}{5} MR_A^2 \omega_A : \frac{2}{5} MR_B^2 \omega_B = mR^2 . \frac{1}{2} \omega_B : 2m(\frac{1}{2}R)^2 . \omega_B = 1:1$jawab : E

21. jawab : D sudah jelas.

22. $y = A \sin \theta \rightarrow \frac{1}{2} A = A \sin \theta \rightarrow \theta = 30^\circ$

$E_k = \frac{1}{2} 0,2(2\pi.4)^2 (0,5)^2 \cos^2 30^\circ = 0,1.64\pi^2 .0,25.0,75 = 1,2\pi^2$ jawab : E

23.

$f_{POT} = f_D \rightarrow \frac{2n+1}{4L_{POT}} V_{POT} = \frac{n+1}{L_D} V_D \rightarrow \frac{2.2+1}{4L_{POT}} 2V = \frac{1+1}{2.32} \rightarrow L_{POT} = 80 \text{ cm}$jawab : B

24. $\lambda = \frac{v}{f} = \frac{600}{50} = 12 \text{ cm} \rightarrow \varphi = \frac{x}{\lambda} = \frac{7}{12}$jawab : C

25.

No	A	y	A.y
01	$2a^2$	$\frac{5}{3} a$	$\frac{10}{3} a^3$
02	$2a^2$	$\frac{1}{2} a$	a^3
	$4a^2$		$\frac{13}{3} a^3$

$y = \frac{13/3a^3}{4a^2} = \frac{13}{12} a$jawab : A

$$26. \frac{F_1}{\sin 90^\circ} = \frac{F_2}{\sin 120^\circ} \rightarrow 20 = \frac{F_2}{\frac{1}{2}\sqrt{3}} \rightarrow F_2 = 10\sqrt{3} \text{ N} \dots \text{jawab : A}$$

$$27. PV = nRT \rightarrow P = \frac{nRT}{V} \rightarrow P_A : P_B = \frac{5.R.300}{2} : \frac{3.R.400}{5} = 25 : 8 \dots \text{jawab : B}$$

$$28. \Delta U = 1000.4,2 - 500 = 3.700 \text{ joule} \dots \text{jawab : D}$$

$$29. B = \frac{\mu_o I N}{\ell} = \frac{4\pi \cdot 10^{-7} \cdot 10 \cdot 200}{12,56 \cdot 10^{-2}} = 2 \cdot 10^{-2} \text{ Tesla} \dots \text{jawab : C}$$

30. jawab : E (sudah jelas)

$$31. E = -L \frac{\Delta i}{\Delta t} = -0,4 \frac{10 - 2}{0,1} = 32 \text{ volt} \dots \text{jawab : C}$$

$$32. P_p = \frac{100}{90} \cdot 45 = 50 \text{ watt} \rightarrow P_p = i_p \cdot V_p \rightarrow i_p = \frac{50}{25} = 2 \text{ A} \dots \text{jawab : D}$$

33. jawab : E (sudah jelas)

$$34. Z = \sqrt{R^2 + (X_L - X_C)^2} = \sqrt{40^2 + (90 - 60)^2} = 50 \text{ ohm}$$

35. Jawab : D(sudah jelas)

$$36. \varphi = (n_u - n_m)\beta = (1,67 - 1,63)10^\circ = 0,04 \cdot 10^\circ = 0,4^\circ \dots \text{jawab : B}$$

37.

$$\frac{d \cdot p}{\ell} = (2k - 1)\lambda \rightarrow p = \frac{(2k - 1)\lambda \cdot \ell}{d}$$

$$10^{-3} = \frac{(2k - 1)\frac{1}{2}\lambda \cdot \ell}{d} - \frac{(2k - 1)\frac{1}{2}\lambda \cdot \ell}{d}$$

$$10^{-3} = \frac{(2 \cdot 3 - 1)\frac{1}{2}\lambda \cdot 0,5}{3 \cdot 10^{-4}} - \frac{(2 \cdot 2 - 1)\frac{1}{2}\lambda \cdot 0,5}{3 \cdot 10^{-4}} \rightarrow 3 \cdot 10^{-7} = 2 \cdot \frac{1}{2}\lambda \cdot 0,5 \rightarrow \lambda = 6 \cdot 10^{-7} \cdot 10^9 = 600 \dots \text{jawab : D}$$

$$0,4c = \frac{v_1 - v_2}{1 - \frac{v_1 \cdot v_2}{c^2}} \rightarrow 0,4c = \frac{v_1 - 0,5c}{1 - \frac{v_1 \cdot 0,5c}{c^2}} \rightarrow 0,4c - 0,2v_1 = v_1 - 0,5c$$

$$38. 0,9c = 1,2v_1 \rightarrow v_1 = \frac{0,9}{1,2} = 0,75 \dots \text{jawab : A}$$

$$39. m' = \frac{m_o}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{3000}{\sqrt{1 - \frac{(0,6c)^2}{c^2}}} = \frac{3000}{0,6} = 5000 \text{ Kg} \dots \text{jawab : E}$$

40. Jawab : C (sudah jelas)

$$Q_{\text{lepas air}} = 750 \cdot 10^{-3} \cdot 4200 \cdot 30^\circ = 94.500 \text{ joule}$$

Memanaskan es dari $-10^\circ \rightarrow 0^\circ$

$$41. Q = 1.2100 \cdot 10 = 21000 \text{ joule}$$

$$Q_{\text{melebur}} = 94.500 - 21000 = 73.500 \text{ joule}$$

$$\text{es melebut} = \frac{73.500}{334.000} = 0,22 \text{ Kg} \rightarrow \frac{0,22}{1} \cdot 100\% = 22 \%$$

$$\frac{1}{f} = \left(\frac{n'}{n} - 1\right) \left(\frac{1}{R_1} - \frac{1}{R_2}\right) \rightarrow \frac{1}{20} = (1,6 - 1) \left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$42. \left(\frac{1}{R_1} - \frac{1}{R_2}\right) = \frac{1}{20} \cdot \frac{10}{6} = \frac{1}{12}$$

$$\frac{1}{f} = \left(\frac{1,6}{4/3} - 1\right) \left(\frac{1}{12}\right) \rightarrow \frac{1}{f} = \left(\frac{4,8}{4} - 1\right) \frac{1}{12} \rightarrow \frac{1}{f} = (1,2 - 1) \frac{1}{12} \rightarrow f = 60 \text{ cm}$$

$$r_2 = (2 \cdot 2^3 - 4 \cdot 2 + 8)\hat{i} + (2^2 - 4)\hat{j} = (16 - 8 + 8)\hat{i} + 0\hat{j} = 16\hat{i}$$

$$43a. r_o = 8\hat{i} - 4\hat{j}$$

$$\bar{v} = \frac{\Delta \bar{r}}{\Delta t} = \frac{16\hat{i} - (8\hat{i} - 4\hat{j})}{2 - 0} = \frac{8\hat{i} + 4\hat{j}}{2} = 4\hat{i} + 2\hat{j}$$

$$43b. \bar{v} = \frac{d\bar{r}}{dt} = (6t^2 - 4)\hat{i} + (2t)\hat{j} = (6 \cdot 2^2 - 4)\hat{i} + (2 \cdot 2)\hat{j} = 8\hat{i} + 4\hat{j}$$

$$v = \sqrt{8^2 + 4^2} = 4\sqrt{5}$$

$$44. \eta = \frac{w}{Q} \cdot 100\% = \frac{2 \cdot 10^7}{8 \cdot 10^7} \cdot 100\% = 25 \%$$

$$45. L = \frac{\mu_r \cdot \mu_o \cdot A \cdot N^2}{2\pi \cdot R} = \frac{500 \cdot 4\pi \cdot 10^{-7} \cdot 30 \cdot 10^{-4} (10^3)^2}{2\pi \cdot 75 \cdot 10^{-2}} = 0,4 \text{ H}$$

$$W = \frac{1}{2} Li^2 = \frac{1}{2} \cdot 0,4 (20)^2 = 0,4 \cdot 200 = 80 \text{ joule}$$

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