Solutions of MOCK –cet paper –II (2) 2012

PHYSICS

1.Answer **: (2) 1:4**

$A_1 = 3$, $f_1 = 100\ \pi/2\pi = 50$ Hz & $A_2 = 4$, $f_2 = 150\ \pi/2\ \pi = 75$ Hz

$$\frac{I_1}{I_2} = \frac{(3X50)^2}{(4X75)^2} = \frac{1}{4}$$

2. Answer: **(3)** mass used to produce the energy to bind the nucleons

3. Answer : **(2)** 1.5 m A $I_E = I_B + I_c = 1.3 + 0.2 = 1.5$

4. Answer **: (4)**

5. Answer: (4)

Depletion region does not contain either electrons or holes

6. Answer: (2)

7. Answer : (3) green

$E_4 – E_2 = -0.85 – (-3.4) = 2.55$ eV

$E_5 – E_2 = -0.54 – (-3.4) = 2.86$ eV

$2.86 = hc/\lambda$ therefore $\lambda = \frac{6.625X10^{-34}X\ 3\ X10^{8}}{2.86\ X\ 1.6\ X\ 10^{-19}} = 505$ nm

It corresponds to green colour

8. Answer :(1) maximum velocity of photo electrons

9. Answer: (4)

Let ‘a’ be the acceleration of the system. $F = ma$ $a = F/m = 4/8 = 0.5$

Therefore force on 3 Kg = 3 X 0.5 =1.5 N

10. Answer: (1) 2.5 N

Static friction is $\mu mg = 0.5\ X\ 2\ X\ 10 = 10\ N$

Hence the body is not in motion. Therefore friction = applied force

11. Answer (2)

$F = \sqrt{3^2 + -4^2 + 5^2} = \sqrt{9 + 16 + 25} = \sqrt{50} = 2\sqrt{5}$

$M = F/a = 2\sqrt{5}/2 = \sqrt{5}$

12. Answer (2)

Reverse biased mode

13. Answer: (2) same mass, same spin, and opposite charge

14. Answer : (4) 0.6 min^{-1}

$A = A_0 e^{-\lambda t}$ $e^{-\lambda t}$ =A/A_0 = 100 / 5 = 20

$-\lambda t = 2.303 \log_{10}(20) = 2.303 \times 1.3010$

$\lambda = 2.303 \times 1.3010 / 5 = 0.59 = 0.6$

15. Answer (1) $nh/2\pi$

16. Answer : (3) $M^0 L^1 T^0$

17. Answer : (4) 10Ω

16.2 -13.1 = 3.1 therefore 13.1 -.3.1 = 10

18. Answer (2) 20 mA

$$I = \frac{V_{rms}}{X_c} = \frac{200\sqrt{2}/\sqrt{2}}{1/\omega c}$$ where ω=100 I= 20 X 10^{-3}

19. Answer (1) $V_p I_p = V_s I_s$ 100 X 2 = 1000 X I I = 0.2 A

20. Answer (3) 30^0

$tan\theta = \frac{B_V}{B_H} = \frac{1}{\sqrt{3}} = \tan 30$ therefore 30^0

21. Answer (1) $\lambda = \frac{h}{mv} = \frac{6.625X10^{-34}}{9.1\ X\ 10^{-31}X10^{7}}$=0.7 X 10^{-9}

22. Answer (1)

$B_E = \sqrt{B_H^2 + B_v^2} = \sqrt{16X10^{-10} + 9X10^{-10}} = 5X10^{-5}$s

23. Answer (2) 0.4 H

We know that $\varphi = M\ I$ $d\varphi = M\ dI$ $M = \frac{d\varphi}{dI} = \frac{1.2}{3} = 0.4$

24. Answer (4) Maxwell's law

25. Answer (1) zero

We know that $X_L = \omega L$ ω = 0 for dc

26. Answer (4) zero F = I X B = IB sin□

27. Answer (2) 16 : 1

$$I = nA\, e\, v_d$$

28. Answer (2) 0.32 J

Energy stored in the capacitor appears as heat in the capacitor

$E = \frac{1}{2} C V^2 = 1/2 \times 4 \times 10^{-6} \times 4 \times 4 \times 10^4 = 32 \times 10^{-2}$

29. Answer (2) zero

according to Gauss' theorem the total electric flux through any closed surface is $1/\varepsilon$ times the total charge enclosed by that sphere. Here q = 0

30. Answer (4)

The charge at the centre causes non-zero electric field everywhere

31. Answer (2)

$$\beta = \frac{2\lambda D}{d}$$

32. Answer (4)

$$\beta \propto \frac{1}{d}$$

33. Answer (3)

34. Answer (1)

35. Answer (1)

$\delta = 8.5\lambda = 17/2\lambda$ which is odd multiple, hence dark (destructive interference)

36. Answer (2)

$$\frac{R_1}{R_2} = \frac{l_1 A_2}{l_2 A_1} = \frac{1}{8} = \frac{10}{R_2}$$

37. Answer (3)

38. Answer (2)

39. Answer (3)

$v=f\lambda$ $f_1=v/\lambda_1=v/50$, $f_2=v/50.4$, $f_b=f_1-f_2$, $6= (v/50) – (v/50.4)$

Therefore, v=378

40. Answer (3) acceleration

newton = force = mass X acceleration /mass

41. Answer (1) $500\sqrt{2}$ W = F S cos □ =25 X 40 X cos 45^0

42. Answer (2) 180^0

43. Answer (3) 2.5 ms^{-1} from the law of conservation of momentum

Since they are thrown off in perpendicular directions

$(2 X 3)^2 + (2 X 4)^2 = (4 X v)^2$ $100 = 16 v^2$ $v= 2.5$

44. Answer (4) 2 mg

$mv^2/r + mg – (mv^2/r –mg) =2 mg$

45. Answer (3) capillarity

46. Answer (4) using Lami's theorem 17.3/sin(180-□) =10/sin(90+□)

17.3/10 = tan□

47. Answer (4) zero % since it is an isothermal process

48. Answer (2) melting point falls with pressure

49. Answer (4) $\boldsymbol{F = \frac{\mu_0}{4\pi}\frac{2I_1I_2}{r}L}$ $\boldsymbol{F = \frac{\mu_0}{4\pi}\frac{2\,X\,5\,X2X5}{0.1}}$

50. Answer (2)

it indicates at melting point and boiling point, only potential

Energy of intermolecular force field increases

51. Answer (3) magnetosphere

52. Answer (2) frequency

53. Answer (4) when the chamber is evacuated the refractive index of vacume slightly less which inturn increases wavelength

54. Answer (4) at polarising angle of incidence

n = tan $\square_p$ = sin $\square_p$/sin r=tan 60^0 = $\sqrt{3}$

55. Answer (3)

1/F =1/f_1 +1/f_2 = 1/0.4 -1/0.25 = -0.15/0.100 =-1.5/1 =-0.66

56. Answer (2)

Given A = D $n = \frac{sin\left(\frac{A+D}{2}\right)}{sin\frac{A}{2}} = \frac{sinA}{sin\frac{A}{2}} = \frac{2sin\frac{A}{2}cos\frac{A}{2}}{sin\frac{A}{2}}$ =$\sqrt{3}$

Cos A/2 ==$\sqrt{3}/2$ A/2 = 30^0 A = 60^0

57. Answer (3)

58. Answer (1)

Here we have all the four arms have the same resistance that is the given network is a balanced wheatstone's bridge. So no current flows through galvanometer. Therefore the effective resistance across the battery is given by 50/2=25

59. Answer (4)

We know that $E \propto T^4$

$$\therefore \frac{E_2}{E_1} = \left(\frac{T_2}{T_1}\right)^4 = \left(\frac{600}{300}\right)^4 = 16$$

60. Answer (2)

$$V = \sqrt{\frac{\gamma P}{\rho}}$$

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KEA PUE