unacademy

NEET (Pre-Medical)

Course: Master Pro-1 | Minor Test-1

Test Date: 13 July 2025 | Answer Key & Solutions

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Ans.	1	1	3	4	3	4	4	2	1	3	2	2	4	4	2	1	1	3	2	2	1	2	4	1	1
Que.	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
Ans.	4	3	1	2	2	4	1	1	4	2	1	2	3	2	3	3	4	2	2	1	1	1	1	3	4
Que.	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**
Ans.	1	4	2	4	3	2	1	4	4	2	2	2	2	3	3	3	1	4	2	3	3	4	3	2	3
Que.	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
Ans.	3	3	3	4	3	3	1	3	3	2	1	2	1	1	1	1	1	3	2	1	3	2	2	4	4
Que.	**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**	**111**	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**	**121**	**122**	**123**	**124**	**125**
Ans.	3	1	2	3	3	4	3	4	3	4	3	2	2	2	4	2	3	3	3	4	1	3	3	4	1
Que.	**126**	**127**	**128**	**129**	**130**	**131**	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**	**141**	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**
Ans.	3	3	1	3	3	1	2	3	1	3	2	3	1	3	3	3	4	4	4	2	4	2	2	4	2
Que.	**151**	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**	**161**	**162**	**163**	**164**	**165**	**166**	**167**	**168**	**169**	**170**	**171**	**172**	**173**	**174**	**175**
Ans.	4	4	1	3	4	1	1	2	3	1	3	4	3	4	2	3	2	4	2	1	4	3	3	3	3
Que.	**176**	**177**	**178**	**179**	**180**																				
Ans.	2	3	4	4	3																				

HINTS & SOLUTION

PHYSICS

1. $y = \sin 5x$

Let $5x = \theta$

$y = \sin\theta$

$\frac{dy}{dx} = \frac{dy}{d\theta}\cdot\frac{d\theta}{dx} \quad \Rightarrow \quad \frac{dy}{d\theta} = \cos\theta \quad \frac{d\theta}{dx} = 5$

$\therefore \frac{d\theta}{dx} = 5\cos\theta \qquad \theta = 5x$

$\therefore \frac{dy}{dx} = 5\cos 5x$

3. $v = \frac{ds}{dt} = 15 - 0.8\,t$; $v = 7$;

$7 = 15 - 0.8\,t \Rightarrow t = 10$ second.

4. $y = x^2 - 2x + 1$

$\int y\,dx = \int\left(x^2 - 2x + 1\right)dx + c$

$= \int x^2dx - 2\int x\,dx + \int dx + c$

$= \frac{x^3}{3} - x^2 + x + c$

6. Dot product of two mutually perpendicular vectors is zero $\vec{A}.\vec{B} = 0$

$\therefore (4\hat{i} + n\hat{j} - 2\hat{k}).(2\hat{i} + 3\hat{j} + \hat{k}) = 0$

$\Rightarrow (4\times2) + (n\times3) + (-2\times1) = 0$

$\Rightarrow 3n = -6$

$\Rightarrow n = -2$

7. $\frac{dy}{dx} = \frac{1}{x} + e^x, \quad \frac{d^2y}{dx^2} = -\frac{1}{x^2} + e^x$

9. Here $\vec{r} = 5\hat{i} - 3\hat{j} + 0\hat{k}$ and $\vec{F} = 4\hat{i} - 10\hat{j} + 0\hat{k}$

$\therefore \vec{\tau} = \vec{r}\times\vec{F} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 5 & -3 & 0 \\ 4 & -10 & 0 \end{vmatrix}$

$= \hat{i}\,(0-0) - \hat{j}\,(0-0) + \hat{k}\,(-50 + 12) = -38\,\hat{k}$

21. Magnitude of a unit vector is unity

$\sqrt{(0.5)^2 + (2\alpha)^2 + \alpha^2} = 1$

$\Rightarrow \quad 5\alpha^2 = 0.75 \Rightarrow \alpha^2 = 0.15$

$\Rightarrow \quad \alpha = \sqrt{\frac{15}{100}} = \sqrt{\frac{3}{20}} = \sqrt{\frac{3}{\beta}}$

$\beta = 20$

22. $\cos\theta = \frac{\vec{A}\cdot\vec{B}}{AB} = \frac{2}{\sqrt{3}\sqrt{2}} = \sqrt{\frac{2}{3}}$

$\theta = \cos^{-1}\sqrt{\frac{2}{3}}$

24. $\frac{a_1}{b_1} = \frac{a_2}{b_2} = \frac{a_3}{b_3}$ condition of being parallel

$\frac{2}{5} = \frac{p}{7} = \frac{q}{3}$

$\Rightarrow p = \frac{14}{5} \text{ and } q = \frac{6}{5}$

25. $|A \times B| = |(2\hat{i} + 3\hat{j} - \hat{k}) \times (\hat{i} + 2\hat{j} + 2\hat{k})|$

$= |8\hat{i} - 5\hat{j} + \hat{k}| = \sqrt{90}$

$|A - B| = |\hat{i} + \hat{j} - 3\hat{k}| = \sqrt{11}$

A.B = 2 + 6 – 2 = 6

$|A + B| = |3\hat{i} + 5\hat{j} + \hat{k}| = \sqrt{35}$

27. As $i > i_c$

At $i = i_c$ angle of refraction

'r' = 90°

$\therefore$ sin i_c/sin 90° = μ = 1

28. $n_d \sin i_c = n_r \sin 90°$

($\because$ From Snell's law)

$\sin i_c = n_r/n_d = v_d/v_r$

$\sin i_c = \frac{1.5 \times 10^8}{2 \times 10^8} = 1.5/2$

$\sin i_c = \frac{3}{4} \tan i_c = \frac{3}{\sqrt{4^2 - 3^2}} \quad \Rightarrow \quad \frac{3}{\sqrt{7}}$

The critical angle between them,

$i_c = \tan^{-1}\left(\frac{3}{\sqrt{7}}\right)$

29. We know that frequency of electromagnetic radiation remains the same when it changes the medium. Further

$\mu = \frac{\text{wavelength of light in vacuum}}{\text{wavelength of light in medium}} = \frac{\lambda_v}{\lambda_m}$

$\lambda_m = \frac{\lambda_v}{\mu} = \frac{\lambda}{\mu}$

Similarly, $\mu = \frac{\text{velocity of light in vacuum}}{\text{velocity of light in medium}}$

$\lambda_m = v/\mu$

30. For critical angle $\theta_c, \sin i\theta_c = 1/\mu$

For greater wavelength or lesser frequency μ is less.

So, critical angle would be more. So, they will not suffer reflection and come out at angles less then 90°.

31. $\sin C = \frac{1}{\mu} = \frac{1}{\sqrt{2}}$

$\therefore \quad c = \sin^{-1}\left(\frac{1}{\sqrt{2}}\right) = 45^\circ$

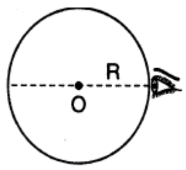
Now sinC/sin r = 1/ν or $\frac{\sin 45^\circ}{\sin r} = \frac{1}{\sqrt{2}}$

sin r = 1 or r = 90°

32. If a lens is cut into two half along principal axis, its focal length remains unchanged only the intensity of image gets reduced.

So, power of L_1 will remain unaffected as p = 1/f.

33. $1/f = (\mu - 1)(1/R_1 - 1/R_2)$



1/16 = (1.5) (1/R – 1/∞)

$\Rightarrow$ 1/16 = 0.5 × 1/R

$\Rightarrow$ R = 8 cm

34. $p = 1/f = (\mu_1 - \mu_2)(1/R_1 - 1/R_2)$

(μ_1 is refractive index of lens and μ_2 is of surrounding medium)

$\Rightarrow \quad 1.25 = (1.5 - \mu_2)(1/0.2 + 1/0.4)$

$\Rightarrow \quad \frac{1.25 \times 0.08}{0.6} = (1.5 - \mu_2)$

$\Rightarrow \mu_2 = 4/3$

36. Let the distance between the lenses be d. Then, equivalent power is

$P = P_1 + P_2 - dPP_1P_2$

Given $P_1 = P_2 = +5$ D

$\therefore$ P = (10 – 25 d)D

For P to be –ve, 10 – 25d < 0

$\Rightarrow \quad d > \frac{2}{5}m$

or, d > 0.4 m or d > 40 cm

37. Cutting a lens in transverse direction doubles their focal length i.e., 2 f.
Using the formula of equivalent focal length.

$$\frac{1}{f}=\frac{1}{f_1}+\frac{1}{f_2}+\frac{1}{f_3}+\frac{1}{f_4}$$

We get equivalent focal length as f/2.

38. Since $\lambda_R > \lambda_v$ $\mu_R < \mu_v$

$$\left(\therefore \mu \propto \frac{1}{\lambda}\right)$$

$$\Rightarrow f_v < f_R \left(\because \frac{1}{f} \propto (\mu - 1)\right)$$

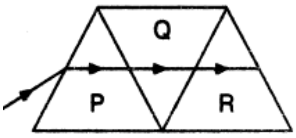
39. $$\frac{P_a}{P_1}=\frac{\left(\frac{\mu_g}{\mu_g}-1\right)}{\left(\frac{\mu_g}{\mu_1}-1\right)}=\frac{+5}{-100/100}=-5$$

$$-5\left(\frac{\mu_g}{\mu_1}-1\right)=\frac{\mu_g}{\mu_a}-1$$

$$\frac{1.5}{\mu_1}-1=\frac{-1}{5}(1.5-1)=-0.1;\ \mu_1=\frac{1.5}{0.9}=\frac{5}{3}$$

40. In the position of minimum deviation

$$i=e=\frac{A+\delta m}{2}=\frac{60+30}{2}=45^\circ$$

41. 

There will be no refraction from P to Q and then from Q to R (all being identical). Hence the ray will now have the same deviation.

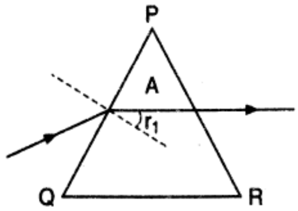
42. $i_1=i_2=2/4A$

As $A+\delta=i_1+i_2$

$$\therefore \quad \delta=i_1+i_2-A=\frac{3}{4}A+\frac{3}{4}A-A$$

$$=\frac{A}{2}=\frac{60^\circ}{2}=30^\circ$$

44. Light ray emerges normally from another surface, hence, e (angle of emergence) =0



$\therefore r_2 = 0$

$r_1 + r_2 = A$

$\Rightarrow \quad \mu_1 \cdot \sin i = \mu_2 \cdot \sin r$

Applying Snell's law on first surface PQ

$\Rightarrow 1\cdot \sin i = \mu \cdot \sin r_1 \quad \Rightarrow \quad \sin i = \mu \sin A$

For small angles ($\sin \theta \approx \theta$)

$\therefore i = \mu A$

45. $$h_{app}=\frac{h_1}{\mu_1}+\frac{h_2}{\mu_2}=\frac{6}{3/2}+\frac{6}{8/5}$$

$$=4+\frac{15}{4}=\frac{31}{4}\text{cm}$$