Sample Paper 6

ANSWER KEYS																			
1	(c)	**7**	(c)	**13**	(a)	**19**	(a)	**25**	(c)	**31**	(a)	**37**	(a)	**43**	(c)	**49**	(a)	**55**	(d)
2	(c)	**8**	(a)	**14**	(c)	**20**	(c)	**26**	(d)	**32**	(a)	**38**	(a)	**44**	(c)	**50**	(d)	**56**	(c)
3	(c)	**9**	(b)	**15**	(b)	**21**	(c)	**27**	(c)	**33**	(c)	**39**	(c)	**45**	(c)	**51**	(d)	**57**	(b)
4	(d)	**10**	(b)	**16**	(c)	**22**	(a)	**28**	(c)	**34**	(b)	**40**	(a)	**46**	(c)	**52**	(c)	**58**	(b)
5	(c)	**11**	(c)	**17**	(c)	**23**	(c)	**29**	(b)	**35**	(d)	**41**	(c)	**47**	(c)	**53**	(b)	**59**	(d)
6	(c)	**12**	(a)	**18**	(c)	**24**	(c)	**30**	(d)	**36**	(c)	**42**	(b)	**48**	(c)	**54**	(b)	**60**	(a)

SOLUTIONS

1. **(c)** P(15): 2, 8, 5
Phosphorous is a non-metal.

2. **(c)**

3. **(c)** Sodium bicarbonate does not react with very weak acid such as phenol.

4. **(d)**

5. **(c)** Generally $BaCl_2$ reacts with Na_2SO_4 to form $BaSO_4$ (ppt) and NaCl. Reverse of this reaction has not be observed as $BaCl_2$ and Na_2SO_4 both are soluble in water but reacts together to form ppt of $BaCl_2$.

$$BaCl_2 + Na_2SO_4 \rightarrow \underset{\text{white (ppt)}}{BaSO_4} + 2\,NaCl$$

6. **(c)** A is NaOH. Electrolysis of salt solution or brine results in the formation of H_2 at cathode (C), Cl_2 at anode (B). Since Na^+ and H^+ both moves towards the cathode. H^+ takes up the electron to form H_2 gas. While sodium from NaOH near cathode. The whole process is termed as chloralkali process.

7. **(c)** Eelement with atomic number 16 is sulphur.
S(16): K(2) L(8) M(6)
Since electrons present in M shell are outermost electrons and take participate in bond formatlion. Hence, electrons present in L shell will have no contribution in bond formation.

8. **(a)** $Sn^{2+} \xrightarrow{-2e^-} Sn^{4+}$
In this reaction Sn^{2+} changes to Sn^{4+} and this represents oxidation reaction.

9. **(b)** A (pH = 1) is a strong acid and B (pH = 14) is a strong base. When strong acid reacts with strong base, a salt solution is obtained which gives neutral pH i.e. pH = 7.

10. **(b)** Sodium ions and chloride ions form.

11. **(c)** **12.** **(a)** **13.** **(a)** **14.** **(c)** **15.** **(b)** **16.** **(c)**

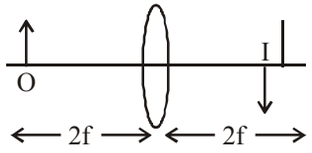
17. **(c)** Power of lens P = 1/focal length (f) of lens in metres
Given, f = 20 cm = (20/100) metres = (1/5) metres
$\therefore$ Power of lens = 1/(1/5) = +5D (+ve as convex lens)

18. **(c)** The minimum distance between a real object and its real image formed by convex lens is 4f i.e. four times of focal length.

19. **(a)** $\dfrac{\sin i}{\sin r} = \dfrac{\sin 30^o}{\sin 60^o} = \dfrac{V}{V'} \Rightarrow V' = \sqrt{3}V$

20. **(c)**

21. **(c)**



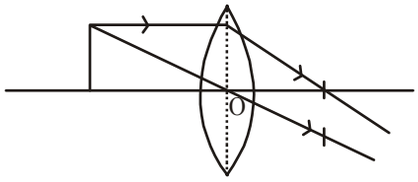
i.e. distance between object and image = $2f + 2f = 4f$

22. **(a)** f = –15 cm V = –10 cm
As we know,

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}\ \frac{1}{u} = \frac{1}{v} - \frac{1}{f} = -\frac{1}{10} - \left(-\frac{1}{15}\right)$$

$$= -\frac{1}{10} + \frac{1}{15} = -\frac{3+2}{30} = -\frac{1}{30}\ \ u = -30\ \text{cm}$$

23. **(c)**



Ray which passes through optical centre remains undeviated.

24. **(c)** $-m = \dfrac{f}{-u_1 + f};\ m = \dfrac{f}{-u_2 + f}$

$$\therefore \quad \frac{-f}{f - u_1} = \frac{f}{f - u_2}$$

$$\Rightarrow \quad f = \frac{u_1 + u_2}{2}$$

25. **(c)** $2\,Cu + O_2 \longrightarrow \underset{(X)}{2\,CuO}$

$$CuO + H_2 \xrightarrow{\Delta} \underset{(x)}{Cu} + H_2O$$

26. **(d)** Phenolphalalein remains colurless in acitic medium and turns pink in alkaline medium.

27. **(c)** $2Al(s) + 3H_2O(g) \longrightarrow Al_2O_3(s) + 3H_2(g)$

$$3Fe(s) + 4H_2O(g) \longrightarrow Fe_3O_4(s) + 4H_2(g)$$

28. **(c)** $Fe + H_2SO_4 \longrightarrow FeSO_4 + H_2$

$$Zn + NaOH \longrightarrow Na_2ZnO_2 + H_2$$

$$Zn + 2HCl \longrightarrow ZnCl_2 + H_2$$

$$FeS + H_2SO_4 \longrightarrow FeSO_4 + H_2O$$

29. **(b)** When dil. HCl is added in copper oxide, blue green solution is obtained due to formation of copper (ii) chloride. Copper oxide is soluble in dil. HCl.

30. **(d)**

31. **(a)** Both assertion and reason are true and reason is the correct explanation of assertion

$$\overset{\text{Oxidation loss of } 2e^-}{\overbrace{\phantom{Zn(s) + Cu^{2+}(aq)}}} \quad \overset{\text{Reduction gain of } 2e^-}{\underbrace{\phantom{Zn^{2+}(aq) + Cu(s)}}}$$
$$Zn(s) + Cu^{2+}(aq) \longrightarrow Zn^{2+}(aq) + Cu(s)$$

32. **(a)**

33. **(c)** Dark reaction occurs in the stroma region of the chloroplast and mitochondria is involved in the synthesis of ATP.

34. **(b)** When a light ray passes through denser medium from a rarer it undergoes refraction.

35. **(d)** Mg^{2+} and O^{2-} ions have greater number of charges, so they form very strong ionic bond. Hence,
MgO is very stable at high temperature and has low electrical conductivity. Thus it is used for high temperature electrical insulation.

36. **(c)** The annelid excretory system is made up of long tubular organs called nephridia. Many species have a pair of nephridia in each segment.

37. **(a)**

38. **(a)** Due to tensile strength of water, a column of water within xylem vessels of tall trees does not break under its weight.

39. **(c)** From magnification, $m = \frac{v}{u} = \frac{h_1}{h_0}$

$$\Rightarrow \frac{v}{-12} = \frac{-5}{2} \Rightarrow v = \frac{-12 \times -5}{2} = +30 \text{ cm}$$

Now from, $\frac{1}{v} - \frac{1}{u} = \frac{1}{f} \Rightarrow \frac{1}{30} - \frac{1}{(-12)} = \frac{1}{f}$

$$\Rightarrow \frac{1}{f} = \frac{1}{30} + \frac{1}{12} = \frac{2+5}{60}$$

$$\therefore f = \frac{60}{7} = +8.6\,\text{cm}$$

40. **(a)** Given,
Object distance, $u = 30$cm
When a lens is cut along the principle axis into two equal parts focal length remains same for each part.
$\therefore$ Focal length, $f = 20$cm
Using lens formula

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$\Rightarrow \frac{1}{v} = \frac{1}{20} - \frac{1}{30} = \frac{1}{60}$$

$\Rightarrow v = 60$ cm

41. **(c)** Nervous control occurs only in animals.

42. **(b)** RBC are enucleated so it contains more hemoglobin and more space is available for oxygen transport. It does not show any metabolic activity and multiplication.

43. **(c)** Given that, incident angle of light = 60°
According to Bhewster's law, $\mu = \tan i_p$
$\mu = \tan 60°$

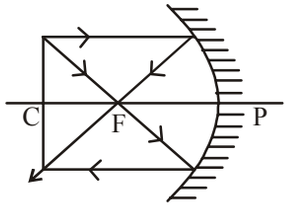
$$\mu = \sqrt{3}$$

44. **(c)**

45. **(c)** Metal dishes used for receiving TV signals from distant communication satellites are concave reflectors.

46. **(c)** When a convex lens is cut into two parts along principal axis, focal length of each part does not change.

47. **(c)**



48. **(c)** Zn and Al are more reactive than iron, therefore they will displace iron from its salt solution giving black residue, while Cu being less reactive than iron will not able to displace iron from its salt solution.
$FeSO_4 + 2Al \longrightarrow Al_2(SO_4)_3 + 3Fe$
$FeSO_4 + Zn \longrightarrow ZnSO_4 + Fe$
$FeSO_4 + Cu \longrightarrow$ No reaction
$FeSO_4 + Fe \longrightarrow$ No reaction

49. **(a)** **50.** **(d)**

51. **(d)**

52. **(c)** Tooth paste should be alkaline

53. **(b)** **54.** **(b)** **55.** **(d)** **56.** **(c)**

57. **(b)** Power, $P = \frac{1}{f} = \frac{1}{0.50} = +2D$

58. **(b)** $f = \frac{1}{\text{power}} = \frac{1}{0.4} = 2.5$ m

59. **(d)** Concave lens, $\text{Power} = \frac{100}{\text{f (in cm)}} = \frac{-100}{25} = -4D$

60. **(a)** Convex lens