

**Sample/Pre-Board Paper 26**  
**Class X Term 1 Exam Nov -Dec 2021**  
**Science (086)**

**Time: 90 Minutes**

**General Instructions:**

1. The question paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

## Section A

Section – A consists of 24 questions. Attempt any 20 questions from this section.  
The first attempted 20 questions would be evaluated.

1. Consider following two statement :  
 $S_1$  : A chemical equation can be balanced easily by altering the formula of a reactant or product.  
 $S_2$  : In a chemical equation, the products are written on the left-hand side and the reactants on the right-hand side with an arrow in between.  
Choose the correct option :  
(a)  $S_1$  and  $S_2$  both are true  
(b)  $S_1$  is true and  $S_2$  is false  
(c)  $S_1$  and  $S_2$  both are false  
(d)  $S_1$  is false and  $S_2$  is true
2. When you add a few drops of acetic acid to a test-tube containing sodium bicarbonate powder, which one of the following is your observation?  
(a) No reaction takes place.  
(b) A colourless gas with pungent smell is released with brisk effervescence.  
(c) A brown coloured gas is released with brisk effervescence.  
(d) Formation of bubbles of a colourless and odourless gas.
3. The electronic structures of six elements  $A$  to  $F$  are given in the table below :
4. Complete the following chemical reaction with correct option:  
$$\text{Pb}(\text{NO}_3)_2 + 2\text{KI} \longrightarrow \dots\dots\dots + 2\text{KNO}_3$$
  
(a)  $\text{PbI}_2$  (b)  $\text{PbNO}_3$   
(c)  $\text{Pb}(\text{NO}_3)_2$  (d)  $\text{PbIO}_3$
5. Which among the following is not a base?  
(a)  $\text{NaOH}$  (b)  $\text{KOH}$   
(c)  $\text{NH}_4\text{OH}$  (d)  $\text{C}_2\text{H}_5\text{OH}$
6. In the reaction:  
$$2\text{FeCl}_2 + \text{Cl}_2 \longrightarrow 2\text{FeCl}_3$$
  
Chlorine may be regarded as:  
(a) an oxidizing agent  
(b) a reducing agent  
(c) a catalyst  
(d) providing an inert medium
7. The mixture of carbon and sulphur is separated by using the solution of .....  
(a) carbon dioxide (b) carbon monoxide  
(c) sulphur oxide (d) carbon disulphide
8. pH of different solution are given in the table below.

	Electronic structure		Formula of compound
1.	$A : 2, 1$	$B : 2, 6$	$A_2B$
2.	$B : 2, 6$	$C : 2, 7$	$B_2C$
3.	$C : 2, 7$	$D : 2, 8, 3$	$DC_3$
4.	$E : 2, 8, 6$	$F : 2, 8, 8, 2$	$FE_2$

Which of the compounds formed are wrong?

- (a) 1 and 3 (b) 2 and 3  
(c) 3 and 4 (d) 2 and 4

Solution	pH
A	2.4
B	14.0
C	7.5
D	9.0

Arrange the above solution in the increasing order of  $\text{OH}^-$  ion concentration.

- (a)  $D < C < B < A$  (b)  $A < C < D < B$   
(c)  $C < D < B < A$  (d)  $B < D < C < A$

9. Which of following tablets are used by a person suffering from acidity?

- (a) Antacid (b) Antabuse  
(c) Antasalt (d) None of these

10. Which of the following is a feasible reaction?

- (a)  $\text{Ba(s)} + \text{K}_2\text{SO}_4(\text{aq}) \longrightarrow \text{BaSO}_4(\text{aq}) + 2\text{K(s)}$   
(b)  $\text{Zn(s)} + 2\text{AgNO}_3(\text{aq}) \rightarrow \text{Zn(NO}_3)_2(\text{aq}) + 2\text{Ag(s)}$   
(c)  $\text{Mg(s)} + \text{Na}_2\text{SO}_4(\text{aq}) \rightarrow \text{MgSO}_4(\text{aq}) + 2\text{Na(s)}$   
(d)  $\text{Cu(s)} + \text{MgSO}_4(\text{aq}) \longrightarrow \text{CuSO}_4(\text{aq}) + \text{Mg(s)}$

11. Choose the form in which most of the plants absorb nitrogen from the atmosphere?

- (a) Proteins (b) Amino acids  
(c) Atmospheric nitrogen (d) Nitrates and nitrites

12. "Water" like fluid in our mouth is secreted by

- (a) Pancreas (b) Thyroid  
(c) Pituitary (d) Salivary gland

13. Bio catalysts are also known as:

- (a) Enzymes (b) Autotrophs  
(c) Heterotrophs (d) Excretory tissue

14. What types of nitrogenous wastes are excreted by living organisms?

- (a) Ammonia (b) Uric acid  
(c) Urea (d) All of the above

15. Which vessel carries blood to the kidneys?

- (a) Renal Arteries (b) Renal Vein  
(c) Both A and B (d) Only A

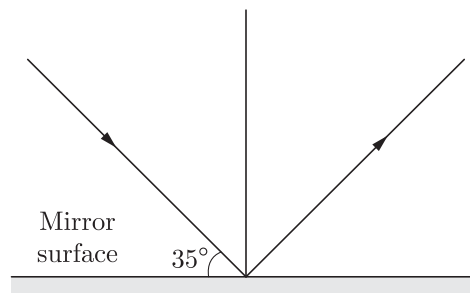
16. What happens if a person has one kidney removed?

- (a) They will accumulate excess urea  
(b) They will die  
(c) They will continue as normal  
(d) They will stop making urine

17. Which of the following lenses would you prefer to use while reading small letters found in a dictionary?

- (a) A convex lens of focal length 50 cm.  
(b) A convex lens of focal length 50 cm.  
(c) A convex lens of focal length 5 cm.  
(d) A concave lens of focal length 5 cm.

18. The angle of incidence and angle of reflection in the following diagram.



- (a)  $45^\circ, 40^\circ$  (b)  $55^\circ, 55^\circ$   
(c)  $60^\circ, 60^\circ$  (d)  $30^\circ, 30^\circ$

19. An object is kept in front of a concave mirror of focal length 20 cm. The image is three times the size of the object. The possible distances of the object from the mirror is-

- (a)  $\frac{-80}{3}$  (b)  $\frac{-40}{3}$   
(c)  $\frac{-50}{3}$  (d)  $\frac{-10}{3}$

20. In an experiment with a rectangular glass slab, a student observed that a ray of light incident at an angle of  $55^\circ$  with the normal on one face of the slab, after refraction strikes the opposite face of the slab before merging out into air making an angle of  $40^\circ$  with the normal. What value would you assign to the angle of refraction and angle of emergence?

- (a)  $40^\circ, 55^\circ$  (b)  $55^\circ, 40^\circ$   
(c)  $10^\circ, 20^\circ$  (d)  $40^\circ, 90^\circ$

21. With respect to air, the refractive index of ice is 1.31 and that of rock salt is 1.54. the refractive index of rock salt with respect to ice is-

- (a) 1.25 (b) 1.18  
(c) 1.90 (d) 1.40

22. What is the difference between concave and convex mirrors? Choose the correct statement ?

- (a) Convex mirror is curved outwards and concave mirror is curved inwards  
(b) Focal point is in front of convex mirror and for a concave mirror, it is behind  
(c) Centre of curvature is in front of convex mirror and for a concave mirror, it is behind  
(d) None of these

23. The angle between reflected ray and the ..... is called angle of reflection.

- (a) normal (b) incident ray  
(c) reflecting surface (d) none of the above

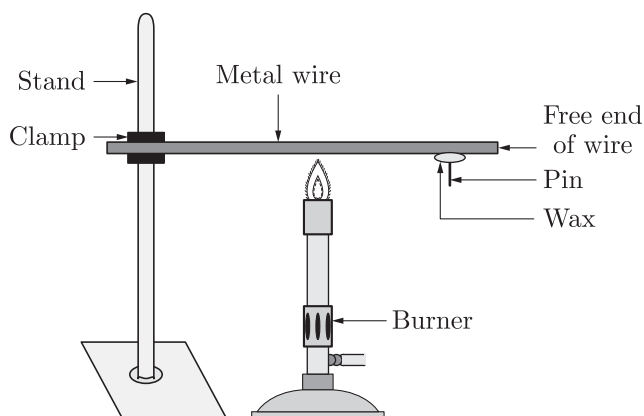
24. Which colour suffers least deviation on passing through a prism?

- (a) Green (b) Violet  
(c) Red (d) Yellow

## Section B

Section - B consists of 24 questions (Sl. No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

25. When 2 mL of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in test tube. When the contents are warmed, a gas evolves which is bubbled through a soap solution before testing. The name of the gas is:  
 (a) Hydrogen (b) Oxygen  
 (c) Nitrogen (d) Helium
26. When NaOH and HCl are mixed in equal molar quantities, the result is  
 (a) the formation of salt +  $\text{H}_2\text{O}$   
 (b) the formation of salt +  $\text{H}_2(\text{g})$   
 (c) the formation of salt +  $\text{O}_2(\text{g})$   
 (d) All above are correct
27. A student arrange the following practical setup-



Which of the following metals can be suitable for the experiment?

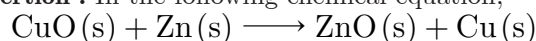
1. Iron
  2. Gallium
  3. Caesium
  4. Copper
- (a) 1 and 4 (b) 1 and 3  
 (c) 2 and 3 (d) 2 and 4
28. In an ionic compound, cations and anions are held together by:  
 (a) electrostatic forces (b) gravitational forces  
 (c) magnetic forces (d) frictional forces
29. The hydroxyl ion concentration of a solution is 0.001 M. The pH of the solution is:  
 (a) 11 (b) 12  
 (c) 13 (d) 14
30. Which of the following is amphoteric oxides?  
 (a)  $\text{Al}_2\text{O}_3$  (b)  $\text{SO}_2$   
 (c)  $\text{ZnO}_2$  (d)  $\text{AlO}_2$

31. **Assertion** : Plaster of Paris is obtained on heating gypsum at 373K.

**Reason** : On heating gypsum at 373K, it loses water molecules.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of the Assertion.  
 (b) Both Assertion and Reason are true but Reason is not the correct explanation of the Assertion.  
 (c) Assertion is true but the Reason is false.  
 (d) Both Assertion and Reason are false.

32. **Assertion** : In the following chemical equation,



Zinc is getting oxidised and copper oxide is getting reduced.

**Reason** : The process in which oxygen is added to a substance is called oxidation whereas the process in which oxygen is removed from a substance is called reduction.

- (a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.  
 (b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.  
 (c) Assertion is True but the Reason is False.  
 (d) Both Assertion and Reason are False.

33. **Assertion** : Plants excrete various waste products during their life processes.

**Reason** : They produce urea just like humans.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.  
 (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.  
 (c) Assertion is true but Reason is false.  
 (d) Assertion is false but Reason is true.

34. **Assertion** : A prism deviates a ray of light towards its base.

**Reason** : Both refracting sides scatter the light.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.  
 (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.  
 (c) Assertion is true but Reason is false.  
 (d) Both Assertion and Reason are false.

35. The chemical formula of plaster of paris is

- (a)  $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$  (b)  $\text{CaSO}_3 \cdot \frac{1}{2}\text{H}_2\text{O}$   
 (c)  $\text{Ca} \cdot \text{SO}_4 \frac{1}{2}\text{O}_2$  (d)  $\text{SO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$

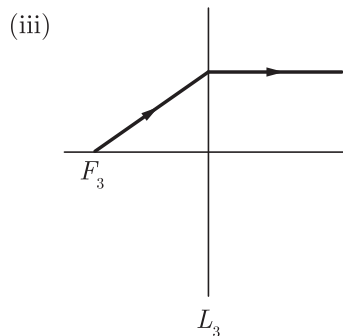
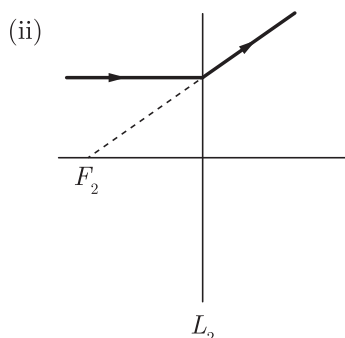
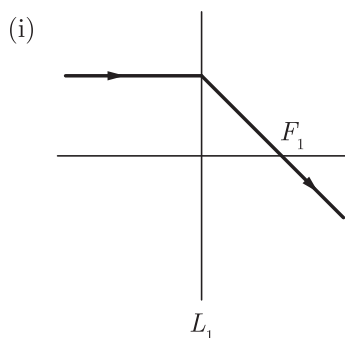
36. Magnesium ribbon burns in air with a dazzling white flame. This is due to the formation of a white solid. This white solid dissolves in water and gives a solution which turns red litmus blue. Which type of reaction is performed in above process?
- Combination reaction
  - Decomposition reaction
  - Redox reaction
  - Oxidation reaction

37. The yellow colour of urine is due to the presence of which of the following?
- Salt
  - Glucose
  - Urochrome
  - Protein

38. Which vessel carries blood to the kidneys?
- Renal Arteries
  - Renal Vein
  - Both A and B
  - Only A

39. Consider the following statements about refraction of light :
- The incident ray, refracted ray and the normal ray lie in the same plane.
  - The angle of incidence is equal to the angle of refraction.
- Choose the correct option from the codes given below:
- Only 1
  - Only 2
  - Both 1 and 2
  - Neither 1 nor 2

40. The following figures show the path of light rays through three lenses marked  $L_1$ ,  $L_2$  and  $L_3$  and their focal points  $F_1$ ,  $F_2$  and  $F_3$  respectively.



Which of the following diagram shows the concave lens properties?

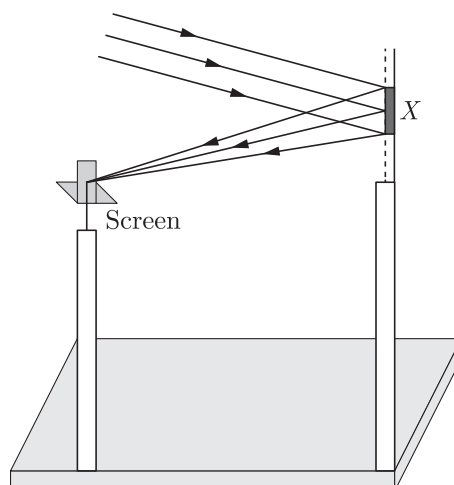
- (i)
- (ii)
- (iii)
- (i), (ii)

41. Chlorophyll-containing organs of plant are-
- Stem
  - Roots
  - Leaves
  - Flowers

42. Just as  $\text{CO}_2$  is removed from the blood in the lungs, nitrogenous waste such as urea or uric acid are removed from blood in the -
- Kidney
  - Urinary bladder
  - Urethra
  - Ureters

43. You are given water, mustard oil, glycerine and kerosene. In which of these media, a ray of light incident obliquely at same angle would bend the most?
- Kerosene
  - Water
  - Mustard oil
  - Glycerine

44. A student determines the focal length of a device  $X$ , by focusing the image of a far off object on the screen positioned as shown in figure. The device  $X$  is a



- Convex lens
- Concave lens
- Convex mirror
- Concave mirror

45. The angle between incident ray and reflected ray is  $60^\circ$ . What is the angle of incidence?
- $30^\circ$
  - $40^\circ$
  - $60^\circ$
  - $50^\circ$

46. An object of height 6 cm is placed perpendicular to the principal axis of a concave lens of focal length 5 cm. If the distance of the object from the lens is 10 cm. The position of image is:

- (a)  $\frac{10}{3}$  cm (b)  $-\frac{10}{3}$  cm  
(c)  $\frac{20}{3}$  cm (d)  $-\frac{20}{3}$  cm

47. SI unit of radius of curvature of a concave mirror is

- (a)  $-m$  (b)  $m^{-1}$   
(c)  $m$  (d) None of these

48. Ionic compounds are more likely to be soluble in:

- (a) kerosene (b) Water  
(c) oil (d) petrol

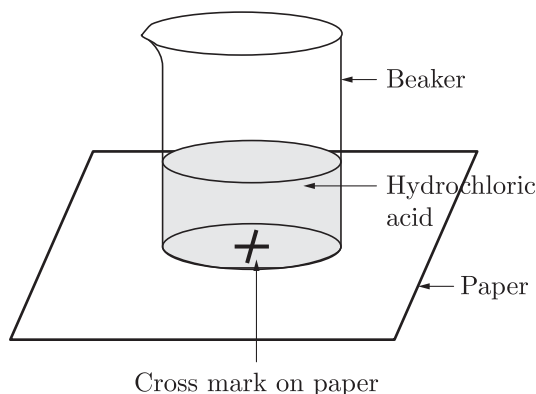
## Section C

Section- C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section.

The first attempted 10 questions would be evaluated.

### Case Based Questions: (49-52)

In chemistry lab, a student took HCl in a beaker and was placed on a white paper with cross mark. When seen through the beaker the mark as shown in the figure was visible. On adding some sodium thiosulphate in the beaker the cross marked disappeared. When seen through the beaker. The student observed some reaction as the products formed were different than the reactants. Both the reactants were transparent.



49. Which of the following reaction is of similar type as observed in the given set up.

- (a)  $\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2\text{(aq)}$   
(b)  $2\text{FeSO}_4\text{(s)} \xrightarrow{\Delta} \text{Fe}_2\text{O}_3\text{(s)} + \text{SO}_2\text{(g)} + \text{SO}_3\text{(g)}$   
(c)  $\text{Fe(s)} + \text{CuSO}_4\text{(aq)} \rightarrow \text{FeSO}_4\text{(aq)} + \text{Cu(s)}$   
(d)  $\text{Na}_2\text{SO}_4\text{(aq)} + \text{BaCl}_2\text{(aq)} \rightarrow \text{BaSO}_4\text{(s)} + 2\text{NaCl(aq)}$

50. Name the resultant insoluble substance formed in the flask.

- (a) Sulphur (b) Sodium sulphide  
(c) Sodium sulphate (d) Sodium carbonate

51. Which of the following reaction is done in the above arrangement?

- (a) Double displacement reaction  
(b) Displacement reaction

(c) Precipitation reaction

(d) Redox reaction

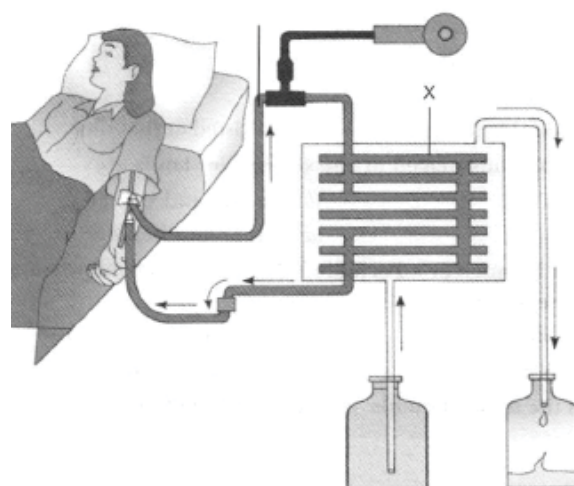
52. Why did the cross mark disappear?

- (a) The solution so formed has ability to absorb black colour hence black coloured cross is not seen.  
(b) The resultant solution has high viscosity due to which it refracts the light to other angle.  
(c) The resultant solution is dark coloured which does not allow the light to pass through it.  
(d) The insoluble precipitate that is formed in the flask does not allow the light to pass through it to see the cross mark.

### Case Based Questions: (53-56)

Nitrogenous materials formed due to metabolic activities are need to be removed. The biological process involved in the removal of these harmful metabolic wastes from the body is called excretion. Different organisms use varied strategies to do this. Many unicellular organisms remove these wastes by simple diffusion from the body surface into the surrounding water while complex multi-cellular organisms use specialised organs to perform the same function.

53.



Study the picture given above and choose the correct combination of plots provided in the following table.

	<i>X</i>	Process used	Function
(a)	Dialysing pump	Filtration	To draw blood from the body and send it to dialyser
(b)	Dialysate	Osmosis	To add fluid to the blood
(c)	B l o o d thinner	Clotting	To remove the clots from the blood
(d)	Dialyser	Diffusion	To remove the excess wastes and fluid from the blood

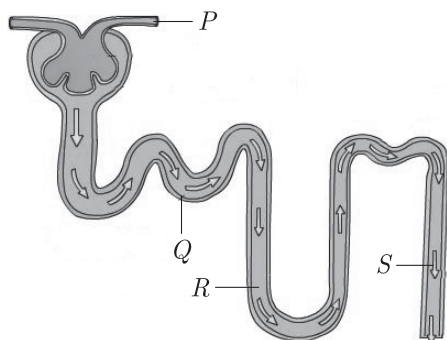
54. Which of the following statement(s) is (are) true about excretion in human beings?

- I. Urine is stored in the urethra until the urge of passing it out.
  - II. Each kidney has large numbers of filtration units called nephrons.
  - III. The bladder is muscular, so it is under nervous control.
  - IV. Kidneys are the primary excretory organs.
- (a) I and II only                      (b) I and III only  
(c) II, III and IV only              (d) I and IV only

55. Study the table below and select the row that has the incorrect information.

	Excretory Organ	Substances Excreted
(a)	Oil glands	Sebum
(b)	Skin	Sweat
(c)	Lungs	Urea
(d)	Kidneys	Nitrogenous wastes

56. The given figure represents the structure of a nephron.



Which section of the nephron is responsible for concentrating the solute in the filtrate?

- (a) *P*                                      (b) *Q*  
(c) *R*                                      (d) *S*

#### Case Based Questions: (57-60)

Many optical instrument (like compound microscope) having number of lenses which are arranged in same specific manner and it increases the magnification and sharpness of image which is formed by optical instrument. The net power (*P*) of the lenses placed in contact is given by the algebraic sum of the individual powers *P*<sub>1</sub>, *P*<sub>2</sub>, *P*<sub>3</sub>, ..... as

$$P = P_1 + P_2 + P_3 + \dots$$

The use of powers, instead of focal lengths, for lenses is quite convenient for opticians. During eye-testing, an optician puts several different combinations of corrective lenses of known power, in contact, inside the testing spectacles frame. The optician calculates the power of the lens required by simple algebraic addition. For example, a combination of two lenses of power +2.0 D and +0.25 D is equivalent to a single lens of power +2.25 D. The simple additive property of the powers of lenses can be used to design lens systems to minimise certain defects in images produced by a single lens. Such a lens system, consisting of several lenses, in contact, is commonly used in the design of camera lenses and the objectives of microscopes and telescopes.

57. The power of a convex lens is 4.0 D. The focal length of this lens will be:

- (a) 0.5 m                                      (b) 0.25 m  
(c) 2.5 m                                      (d) 5 m

58. Two lenses of power  $\frac{1}{2}$  D and -0.3 D are in contact to each other. Their combined power will be:

- (a) + 0.2 D                                      (b) -0.2 D  
(c) + 0.5 D                                      (d) + 0.8 D

59. Which of the following instrument consists of a lens system consisting of two or more lenses in contact?

- (a) Microscope                                      (b) Telescope  
(c) Camera                                      (d) All of the above

60. The focal lengths of two lenses in contact to each other are 20 cm and 50 cm respectively. Their combined power is:

- (a) + 7.0 D                                      (b) + 70 D  
(c) + 3.0 D                                      (d) + 30 D

## SAMPLE PAPER - 21 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(b)	Ch-1	3
2	(d)	Ch-2	106
3	(d)	Ch-3	136
4	(a)	Ch-1	41
5	(d)	Ch-2	27
6	(a)	Ch-1	123
7	(d)	Ch-1	23
8	(b)	Ch-2	75
9	(a)	Ch-2	118
10	(b)	Ch-1	84
11	(d)	Ch-4	221
12	(d)	Ch-4	53
13	(a)	Ch-4	20
14	(d)	Ch-4	122
15	(a)	Ch-4	123
16	(c)	Ch-4	124
17	(c)	Ch-5	14
18	(b)	Ch-5	174
19	(a)	Ch-5	26
20	(a)	Ch-5	29
21	(b)	Ch-5	30
22	(a)	Ch-5	New
23	(a)	Ch-5	New
24	(c)	Ch-6	12
25	(a)	Ch-2	119
26	(a)	Ch-2	142
27	(a)	Ch-3	167
28	(a)	Ch-3	36
29	(a)	Ch-2	137
30	(a)	Ch-3	93
31	(a)	Ch-2	159

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
32	(a)	Ch-1	167
33	(c)	Ch-4	242
34	(c)	Ch-6	59
35	(a)	Ch-2	43
36	(a)	Ch-1	174
37	(c)	Ch-4	108
38	(a)	Ch-4	123
39	(a)	Ch-5	46
40	(b)	Ch-5	45
41	(c)	Ch-4	138
42	(a)	Ch-4	154
43	(d)	Ch-5	53
44	(d)	Ch-5	104
45	(a)	Ch-5	21
46	(b)	Ch-5	40
47	(c)	Ch-5	85
48	(b)	Ch-3	56
49	(a)	Ch-3	184
50	(a)	Ch-3	185
51	(c)	Ch-3	186
52	(d)	Ch-3	187
53	(d)	Ch-4	268
54	(c)	Ch-4	269
55	(c)	Ch-4	270
56	(c)	Ch-4	271
57	(b)	Ch-5	232
58	(a)	Ch-5	233
59	(d)	Ch-5	234
60	(a)	Ch-5	235