

**BJNP***Learning with the Speed of Mumbai and the Tradition of Kota***Max Marks: 200****Date: 08.08.2022**

JB 2 KVL BATCH
CHEMISTRY: PART TEST
Topic: States of Matter + S- Block

1. 16 g of oxygen and 3 g of hydrogen are mixed and kept at 760 mm pressure and 0°C . The total volume occupied by the mixture will be nearly
(a) 22.4 litres (b) 33.6 litres (c) 448 litres (d) 44800 ml
2. Pure hydrogen sulphide is stored in a tank of 100 litre capacity at 20°C and 2 atm pressure. The mass of the gas will be
(a) 34 g (b) 340 g (c) 282.4 g (d) 28.24 g
3. At N.T.P. the volume of a gas is found to be 273 ml. What will be the volume of this gas at 600 mm Hg and 273°C
(a) 391.8 mL (b) 380 ml (c) 691.6 ml (d) 750 ml
4. One litre of a gas weighs 2 g at 300 K and 1 atm pressure. If the pressure is made 0.75 atm, at which of the following temperatures will one litre of the same gas weigh one gram.
(a) 450 K (b) 600 K (c) 800 K (d) 900 K
5. A weather balloon filled with hydrogen at 1 atm and 27°C has volume equal to 12000 litres. On ascending it reaches a place where the temperature is -23°C and pressure is 0.5 atm. The volume of the balloon is
(a) 24000 litres (b) 20000 litres (c) 10000 litres (d) 12000 litres
6. The density of a gas at 27°C and 1 atm is d . Pressure remaining constant at which of the following temperatures will its density become $0.75d$
(a) 20°C (b) 30°C (c) 400 K (d) 300 K

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7. A sample of gas occupies 100 ml at 27 ° C and 740 mm pressure. When its volume is changed to 80 ml at 740 mm pressure, the temperature of the gas will be
(a) 21.6° C (b) 240° C (c) -33° C (d) 89.5° C
8. The total pressure exerted by a number of non-reacting gases is equal to the sum of the partial pressures of the gases under the same conditions is known as
(a) Boyle's law (b) Charle's law (c) Avogadro's law (d) Dalton's law
9. "Equal volumes of all gases at the same temperature and pressure contain equal number of particles." This statement is a direct consequence of
(a) Avogadro's law (b) Charle's law
(c) Ideal gas equation (d) Law of partial pressure
10. If three unreactive gases having partial pressures P_A , P_B and P_C and their moles are 1, 2 and 3 respectively then their total pressure will be
(a) $P = P_A + P_B + P_C$ (b) $P = \frac{P_A + P_B + P_C}{6}$ (c) $P = \frac{\sqrt{P_A + P_B + P_C}}{3}$ (d) None
11. Dalton's law of partial pressure will not apply to which of the following mixture of gases
(a) H_2 and SO_2 (b) H_2 and Cl_2 (c) H_2 and CO_2 (d) CO_2 and Cl_2
12. Which of the following mixtures of gases does not obey Dalton's law of partial pressure
(a) O_2 and CO_2 (b) N_2 and O_2 (c) Cl_2 and O_2 (d) NH_3 and HCl
13. To which of the following gaseous mixtures is Dalton's law not applicable
(a) $Ne + He + SO_2$ (b) $NH_3 + HCl + HBr$ (c) $O_2 + N_2 + CO_2$ (d) $N_2 + H_2 + O_2$

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14. The chemical nature of hydrogen peroxide is :
- (a) Oxidising and reducing agent in acidic medium, but not in basic medium.
 - (b) Oxidising and reducing agent in both acidic and basic medium
 - (c) Reducing agent in basic medium, but not in acidic medium
 - (d) Oxidising agent in acidic medium, but not in basic medium
15. The strength of 11.2 volume solution of H_2O_2 is : [Given that molar mass of $\text{H} = 1 \text{ g mol}^{-1}$ and $\text{O} = 16 \text{ g mol}^{-1}$]
- (a) 13.6% (b) 3.4% (c) 34% (d) 1.7%
16. The correct statements among (a) to (d) are :
- (i) saline hydrides produce H_2 gas when reacted with H_2O .
 - (ii) reaction of LiAlH_4 with BF_3 leads to B_2H_6 .
 - (iii) PH_3 and CH_4 are electron – rich and electron – precise hydrides, respectively.
 - (iv) HF and CH_4 are called as molecular hydrides.
- (a) (iii) and (iv) only (b) (i), (ii) and (iii) only
 - (c) (i), (ii), (iii) and (iv) (d) (i), (iii) and (iv) only
17. Hydrogen peroxide in its reaction with KIO_4 and NH_2OH respectively, is acting as a
- (a) reducing agent, oxidizing agent (b) reducing agent, reducing agent
 - (c) oxidizing agent, oxidizing agent (d) oxidizing agent, reducing agent
18. Alkali metal hydrides react with water to give
- (a) Acidic solution (b) Basic solution (c) Neutral solution (d) Hydride ion
19. When electric current is passed through an ionic hydride in the molten state
- (a) Hydrogen is liberated at the anode (b) Hydrogen is liberated at the cathode
 - (c) No reaction takes place (d) Hydride ion migrates towards cathode

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20. In which of the following reaction hydrogen peroxide is a reducing agent?
- (a) $2\text{FeCl}_2 + 2\text{HCl} + \text{H}_2\text{O}_2 \rightarrow 2\text{FeCl}_3 + 2\text{H}_2\text{O}$
- (b) $\text{Cl}_2 + \text{H}_2\text{O}_2 \rightarrow 2\text{HCl} + \text{O}_2$
- (c) $2\text{HI} + \text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{I}_2$
- (d) $\text{H}_2\text{SO}_3 + \text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{SO}_4 + \text{H}_2\text{O}$
21. The reaction of $\text{H}_2\text{S} + \text{H}_2\text{O}_2 \rightarrow \text{S} + 2\text{H}_2\text{O}$ manifests
- (a) Acidic nature of H_2O_2 (b) Alkaline nature of H_2O_2
- (c) Oxidising nature of H_2O_2 (d) Reducing action of H_2O_2
22. Hydrogen peroxide is reduced by
- (a) Lead sulphide suspension (b) Barium peroxide
- (c) Acidic solution of KMnO_4 (d) Ozone
23. Metals like platinum and palladium can absorb large volumes of hydrogen under special conditions. Such absorbed hydrogen by the metal is known as
- (a) Adsorbed hydrogen (b) Occluded hydrogen
- (c) Reactive hydrogen (d) Atomic hydrogen
24. Ortho and para hydrogen differ in
- (a) Proton spin (b) Electron spin (c) Nuclear charge (d) Nuclear reaction
25. Hydrogen from HCl can be prepared by
- (a) Mg (b) Cu (c) P (d) Pt .

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MATHEMATICS : PART TEST

Topic: Trigonometry

26. 290 meter of wire is available for fencing off a flower-bed in the form of a circular sector of radius 5 metres, then the maximum area (in sq. m) of the flowerbed is
(a) 15 (b) 20 (c) 25 (d) 30
27. If $\operatorname{cosec} \theta + \cos \theta = \frac{5}{2}$, then the value of $\tan \theta$ is
(a) $\frac{14}{25}$ (b) $\frac{20}{21}$ (c) $\frac{21}{20}$ (d) $\frac{15}{16}$
28. If $\sin \alpha = 15/17$, $(\pi/2) < \alpha < \pi$ and $\sec \beta = 13/12$, $(3\pi/2) < \beta < 2\pi$, then : $\cos(\beta - \alpha) =$
(a) $220/221$ (b) $-171/221$ (c) $-140/171$ (d) None of these
29. $\tan 20^\circ + \tan 25^\circ + \tan 20^\circ \cdot \tan 25^\circ = \dots$
(a) $-\sqrt{2}$ (b) 1 (c) $1/\sqrt{2}$ (d) -1
30. $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots + \sin^2 90^\circ = \dots$
(a) $6\frac{1}{2}$ (b) $7\frac{1}{2}$ (c) $8\frac{1}{2}$ (d) $9\frac{1}{2}$
31. The radian measure of the angle, subtended at the centre of a circle by an arc whose length is twice the diameter of the circle, is
(a) 2 (b) $\frac{\pi}{2}$ (c) π (d) 4
32. $8 \cdot \sin \frac{x}{8} \cdot \cos \frac{x}{2} \cdot \cos \frac{x}{4} \cdot \cos \frac{x}{8} =$
(a) $8 \cos x$ (b) $\cos x$ (c) $8 \sin x$ (d) $\sin x$

Space for Rough Work



33. If the angles of a triangle are in the ratio 1 : 2 : 3, then the smallest angle in radian is
 (a) $\frac{\pi}{3}$ (b) $\frac{\pi}{6}$ (c) $\frac{\pi}{2}$ (d) $\frac{\pi}{9}$
34. $1 - \frac{\sin^2 \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} - \frac{\sin \theta}{1 - \cos \theta}$ equals
 (a) 0 (b) 1 (c) $\sin \theta$ (d) $\cos \theta$
35. If $\tan \alpha = 3/4$, α in third quadrant, and $\cos \beta = 9/41$, β in first quadrant, then : $\cos (\alpha + \beta) =$
 (a) $-187/84$ (b) $133/205$ (c) $124/205$ (d) None of these
36. $\tan 40^\circ + 2 \tan 10^\circ =$
 (a) $\tan 20^\circ$ (b) $\tan 80^\circ$ (c) $\tan 50^\circ$ (d) $\tan 30^\circ$
37. $\tan 20^\circ + \tan 40^\circ + \sqrt{3} \cdot \tan 20^\circ \cdot \tan 40^\circ =$
 (a) 1 (b) $\sqrt{2}$ (c) $\sqrt{3}$ (d) None of these
38. If the perimeter of a sector of a circle is twice the diameter of the circle, then the radian measure of the angle of the sector is
 (a) 2 (b) $\frac{\pi}{2}$ (c) π (d) 4
39. If $\tan \theta + \sec \theta = \sqrt{3}$, then : $\theta =$
 (a) $\frac{5\pi}{6}$ (b) $\frac{2\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
40. A semicircle is divided into two sectors whose angles are in the ratio 4 : 5. Find the ratio of their areas?
 (a) 5 : 1 (b) 4 : 5 (c) 5 : 4 (d) 3 : 4
41. If $\operatorname{cosec} \theta - \cot \theta = q$, then the value of $\cot \theta$ is
 (a) $\frac{2q}{1 + q^2}$ (b) $\frac{2q}{1 - q^2}$ (c) $\frac{1 - q^2}{2q}$ (d) $\frac{1 + q^2}{2q}$

Space for Rough Work



42. In $\sin \theta = 1/2$, $\cos \phi = 12/13$, where θ lies the second quadrant and ϕ in the fourth, then : $\tan (\theta - \phi) =$
- (a) $\frac{12 + 5\sqrt{3}}{26}$ (b) $-\frac{(12\sqrt{3} + 5)}{26}$ (c) $\frac{5\sqrt{3} - 12}{12\sqrt{3} + 5}$ (d) None of these
43. $\tan (45^\circ + A) \cdot \tan (45^\circ - A) =$
- (a) -1 (b) 0 (c) 1 (d) $\tan 2A$
44. $\tan 56^\circ - \tan 11^\circ - \tan 56^\circ \cdot \tan 11^\circ = \dots$
- (a) -1 (b) 0 (c) 1 (d) $\sqrt{3}$
45. A wire in the form of a rectangle of sides 4 cm and 6 cm is reshaped into a sector of a circle of radius 8 cm. Then the angle of the sector in degrees is
- (a) $\frac{\pi^\circ}{45}$ (b) $\frac{180^\circ}{\pi}$ (c) $\frac{360^\circ}{\pi}$ (d) $\frac{90^\circ}{\pi}$
46. If $A + B = 45^\circ$, then : $(1 + \tan A) (1 + \tan B) = \dots$
- (a) 1 (b) 2 (c) $\tan A \cdot \tan B$ (d) None of these
47. Find the measure of the angle between hour-hand and the minute hand of a clock at twenty minute past two.
- (a) 50° (b) 60° (c) 54° (d) 65°
48. The cotangent of the angles $\frac{\pi}{3}$, $\frac{\pi}{4}$ and $\frac{\pi}{6}$ are in
- (a) A.P. (b) G.P. (c) H.P. (d) Not in progression
49. For any angles A and B, $\sin (A + B) \cdot \sin (A - B) =$
- (a) $\sin (A^2 - B^2)$ (b) $\sin^2 A - \sin^2 B$ (c) $\cos^2 A - \cos^2 B$ (d) None of these
50. $\tan 75^\circ + \tan 15^\circ = \dots$
- (a) $1 + \sqrt{3}$ (b) $\sqrt{3} - 1$ (c) $\sqrt{3}$ (d) 4

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1.	(d)	2.	(c)	3.	(c)	4.	(a)	5.	(b)
6.	(c)	7.	(c)	8.	(d)	9.	(a)	10.	(c)
11.	(a)	12.	(b)	13.	(b)	14.	(b)	15.	(b)
16.	(c)	17.	(a)	18.	(b)	19.	(a)	20.	(b)
21.	(c)	22.	(a)	23.	(a)	24.	(a)	25.	(a)

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26.	(c)	27.	(b)	28.	(b)	29.	(b)	30.	(d)
31.	(d)	32.	(d)	33.	(b)	34.	(d)	35.	(b)
36.	(c)	37.	(c)	38.	(a)	39.	(c)	40.	(b)
41.	(c)	42.	(c)	43.	(c)	44.	(c)	45.	(d)
46.	(b)	47.	(a)	48.	(b)	49.	(b)	50.	(d)