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NEET UG SPECIAL CHAPTER WISE TEST

NKC-01

Q. Types : Easy	Moderate	Difficult	Total
Q. Number : 20	20	10	50
Max. Marks : 80	80	40	200

ALL INDIA TEST SERIES

TOPIC-MOLE CONCEPT

Date	05 July-24
Time	50 minutes

INSTRUCTIONS-

❖ This test is purely based on pattern of NEET(UG)–2025

❖ Before attempting the question paper ensure that it contains all the pages and no question is missing.

❖ The important points to note:

- Each question carries 04 (four) marks and, for each correct answer candidate will get 04 (four) marks.

- For each incorrect answer, 01 (one) mark will be deducted from the total score.

- To answer a question, the candidate has to find, for each question, the correct answer/ best option.

- However, after the process of the challenge of key, if more than one option is found to be correct then all/any one of the multiple correct/best options marked will be given four marks (+4).

- Unanswered/Unattempted questions will be given no marks. In case, a question is dropped/ ignored, all candidates will be given four marks (+4) irrespective of the fact whether the question has been attempted or not attempted by the candidate.

OUR EXPERT AND RESPECTED TEACHERS

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1. Difference in density is the basis of
(a) Ultrafiltration
(b) Molecular sieving
(c) Molecular attraction
(d) Gravity Separation

2. Two samples of lead oxide were separately reduced to metallic lead by heating in a current of hydrogen. The weight of lead from one oxide was half the weight of lead obtained from the other oxide. The data illustrates
(a) law of reciprocal proportions
(b) law of constant proportions
(c) law of multiple proportions
(d) law of equivalent proportions

3. Match the columns

Column-I (Law of chemical combinations)	Column-II (Scientists)
A) Law of definite proportions	p) Antoine Lavoisier
B) Law of multiple Proportions	q) Gay Lussac
C) Law of conservation of mass	r) Dalton
D) Law of gaseous Volumes	s) Joseph Proust

(a) A-(s), B-(r), C-(p), D-(q)
(b) A-(p), B-(r), C-(s), D-(q)
(c) A-(r), B-(p), C-(s), D-(q)
(d) A-(q), B-(s), C-(r), D-(p)

4. In compound A, 1.00g of nitrogen unites with 0.57g of oxygen. In compound B, 2.00g of nitrogen combines with 2.24g of oxygen. In compound C, 3.00g of nitrogen combines with 5.11g of oxygen. These results obey the following law
(a) law of constant proportion
(b) law of multiple proportion
(c) law of reciprocal proportion
(d) Dalton's law of partial pressure

5. An organic compound contains carbon, hydrogen and oxygen. Its elemental analysis gave C, 38.71% and H, 9.67%. The empirical formula of the compound would be:
(a) CH_3O
(c) CHO
(b) CH_2O
(d) CH_4O

6. 20.0 kg of $N_2(g)$ and 3.0 kg of $H_2(g)$ are mixed to produce $NH_3(g)$. The amount of $NH_3(g)$ formed is:
(a) 17 kg
(b) 34 kg
(c) 20 kg
(d) 3 kg

7. The molar solution of H_2SO_4 is equal to:
(a) N/2 solution
(c) 2N solution
(b) N solution
(d) 3N solution

8. Match the mass of elements given in Column I with the number of moles given in Column II and mark the appropriate choice. Choose the correct codes from the options given below.

Column-I	Column-II
(A) 28 g of He	(p) 2 moles
(B) 46 g of Na	(q) 7 moles
(C) 60 g of Ca	(r) 1 mole
(D) 27 g of Al	(s) 1.5 mole

(a) A-(s), B-(r), C-(q), D-(p)
(b) A-(p), B-(r), C-(q), D-(s)
(c) A-(r), B-(q), C-(p), D-(s)
(d) A-(q), B-(p), C-(s), D-(r)

9. With increase of temperature, which of these changes?
(a) Molality
(b) Weight fraction of solute
(c) Molarity
(d) Mole fraction

10. Choose correct option based on following statements. Here T stands for true statement and F for false statement.
(i) Homogeneous mixture has uniform composition throughout.
(ii) All components of a heterogeneous mixture are observable to naked eyes.
(iii) All solutions are homogeneous in nature.

(iv) Air is an example of heterogeneous mixture.
(a) TTFF (b) TTFT (c) FFTT (d) TFFF

11. Assertion : Volume of a gas is inversely proportional to the number of moles of gas.
Reason : The ratio by volume of gaseous reactants and products is in agreement with their mole ratio.
(i) Both A and R are true and R is the correct explanation of A.
(ii) A is true but R is false.
(iii) A is false but R is true.
(iv) Both A and R are false.

12. Match the columns

Column –I	Column-II
(Physical quantity)	(Unit)
A) Molarity	p) mol
B) Mole fraction	q) Unitless
C) Mole	r) $mol\ L^{-1}$
D) Molality	s) $mol\ Kg^{-1}$

(a) A-(r), B-(q), C-(s), D-(p)
(b) A-(r), B-(p), C-(q), D-(s)
(c) A-(r), B-(q), C-(p), D-(s)
(d) A-(q), B-(r), C-(p), D-(s)

13. Assertion : One atomic mass unit is defined as one twelfth of the mass of one carbon - 12 atom.
Reason : Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.
(i) Both A and R are true and R is the correct explanation of A.
(ii) A is true but R is false.
(iii) A is false but R is true.
(iv) Both A and R are false.

14. What is the mass percent of carbon in carbon dioxide?
(i) 0.034%
(ii) 27.27%
(iii) $0.2\ mol\ L^{-1}$
(iv) $2\ mol\ L^{-1}$

15. Which of the following statements about a compound is incorrect?

(i) A molecule of a compound has atoms of different elements.
(ii) A compound cannot be separated into its constituent elements by physical methods of separation.
(iii) A compound retains the physical properties of its constituent elements.
(iv) The ratio of atoms of different elements in a compound is fixed.

16. Assertion (A): The empirical mass of ethene is half of its molecular mass.
Reason (R): The empirical formula represents the simplest whole number ratio of various atoms present in a compound.
(i) Both A and R are true and R is the correct explanation of A.
(ii) A is true but R is false.
(iii) A is false but R is true.
(iv) Both A and R are false.

17. The number of significant figures for the three numbers 161 cm, 0.161 cm, 0.0161 cm are
(a) 3,4 and 5 respectively
(b) 3,4 and 4 respectively
(c) 3,3 and 4 respectively
(d) 3,3 and 3 respectively

18. The number of protons, neutrons and electrons in 175/71 Lu, respectively, are
(a) 104, 71 and 71
(b) 71, 71 and 104
(c) 175, 104 and 71
(d) 71, 104 and 71

19. An element, X has the following isotopic composition:
200 X : 90%, 199 X : 8.0%, 202 X : 2.0%
The weighted average atomic mass of the naturally occurring element X is closest to
(a) 201 u
(b) 202 u
(c) 199 u
(d) 200 u

20. Match the items of Column I, II and III appropriately and choose the correct option from the codes given below.

Column I (Multiple)	Column II (Prefix)	Column III (Symbol)
(A)10^{-15}	(p) Kilo	(i) m
(B)$10-3$	(q) yotta	(ii) f
(C)10^3	(r) milli	(iii) k
(D)10^{24}	(s)femto	(iv) Y

(a) A-(s), (ii); B-(r), (i); C-(p), (iii); D-(q), (iv)
(b) A-(p), (ii); B-(q), (iii); C-(r), (i); D-(s), (iv)
(c) A-(q),(iv); B-(p), (ii); C-(p),(i);D-(r), (iii)
(d) A-(r), (iii); B-(p), (ii); C-(s), (i); D-(q), (iv)

21. Consider the following statements.
(i) Atoms of H, O, N and C have identical properties but different mass.
(ii) Matter is divisible into atoms which are further indivisible.
(iii) The ratio of N: H in NH_3 is 1: 3 and N: O in nitric oxide is 2: 1.
(iv) Dalton's atomic theory support law of conservation of mass.

Which of the following pairs of statements is true according to Dalton's atomic theory?
(a) (i) and (ii)
(b) (ii) and (iii)
(c) (ii) and (iv)
(d) (i) and (iv)

22. Which one of the following sets of compounds correctly illustrate the law of reciprocal proportions?
(a) P_2O_5, PH_3, H_2O
(b) P_2O_5, PH_3, H_2O
(c) N_2O_5, NH_3, H_2O
(d) N_2O, NH_3, H_2O

23. Which one of the following is the lightest?
(a) 0.2 mole of hydrogen gas
(b) 6.023×10^{22} molecules of nitrogen
(c) 0.1 g of silver
(d) 0.1 mole of oxygen gas

24. How many moles of lead (II) chloride will be formed from a reaction between 6.5 g of PbO and 3.2 g of HCl?
(a) 0.044
(b) 0.333
(c) 0.011
(d) 0.029

25. 10 mL of 2(M) NaOH solution is added to 200 mL of 0.5 (M) of NaOH solution. What is the final concentration?
(a) 0.57 (M)   (c) 11.4 (M)
(b) 5.7 (M)   (d) 1.14 (M)

26. The maximum number of molecules are present in
(a) 15 L of H_2 gas at STP
(b) 5 L of N_2 gas at STP
(c) 0.5 g of H_2 gas
(d) 10 g of O_2 gas

27. 2.76 g of silver carbonate (at. mass of Ag 108) on being heated strongly yield a residue weighing
(a) 2.16 g
(b) 2.48 g
(c) 2.32 g
(d) 2.64 g

28. If 500 mL of a 5M solution is diluted to 1500 mL, what will be the molarity of the solution obtained?
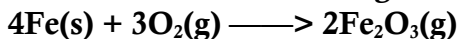(i) 1.5 M
(ii) 1.66 M
(iii) 0.017 M
(iv) 1.59 M

29. The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms?
(i) 4g He
(ii) 46g Na
(iii) 0.40g Ca
(iv) 12g He

30. One mole of any substance contains 6.022×10^{23} atoms/molecules. Number of molecules of H_2SO_4 present in 100 mL of 0.02M H_2SO_4 solution is _____.

(i) 12.044×10^{20} molecules
(ii) 6.022×10^{23} molecules
(iii) 1×10^{23} molecules
(iv) 12.044×10^{23} molecules

31. Which of the following statements is correct about the reaction given below:
$$4Fe(s) + 3O_2(g) \longrightarrow 2Fe_2O_3(g)$$
(i) Total mass of iron and oxygen in reactants = total mass of iron and oxygen in product therefore it follows law of conservation of mass.
(ii) Total mass of reactants = total mass of product; therefore, law of multiple proportions is followed.
(iii) Amount of Fe_2O_3 can be increased by taking any one of the reactants (iron or oxygen) in excess.
(iv) Amount of Fe_2O_3 produced will decrease if the amount of any one of the reactants (iron or oxygen) is taken in excess.

32. Which of the following statements indicates that law of multiple proportion is being followed.
(i) Sample of carbon dioxide taken from any source will always have carbon and oxygen in the ratio 1:2.
(ii) Carbon forms two oxides namely CO_2 and CO, where masses of oxygen which combine with fixed mass of carbon are in the simple ratio 2:1.
(iii) When magnesium burns in oxygen, the amount of magnesium taken for the reaction is equal to the amount of magnesium in magnesium oxide formed.
(iv) At constant temperature and pressure 200 mL of hydrogen will combine with 100 mL oxygen to produce 200 mL of water vapour.

33. Match the following:
(A) 88 g of CO_2 (p) 0.25 mol
(B) 6.022×10^{23} molecules of H_2O (q) 2 mol
(C) 5.6 litres of O_2 at STP (r) 1 mol
(D) 96 g of O_2 (s) 3 mol

(a) A-(r), B-(q), C-(s), D-(p)
(b) A-(r), B-(p), C-(q), D-(s)
(c) A-(r), B-(q), C-(p), D-(s)
(d) A-(q), B-(r), C-(p), D-(s)

34. 0.24 g of a volatile gas, upon vaporization, gives 45 mL vapour at NTP. What will be the vapour density of the substance?
(Density of H_2 = 0.089)
(a) 95.93
(b) 59.93
(c) 95.39
(d) 5.993

35. Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2. When 0.1 mole of XY_2 weighs 10 g and 0.05 mole of X_3Y_2 weighs 9 g, the atomic weights of X and Y are
(a) 40, 30
(b) 60, 40
(c) 20, 30
(d) 30, 20

36. If Avogadro number NA, is changed from 6.022×10^{23} mol^−1 to 6.022×10^{20} mol^−1 this would change
(a) the definition of mass in units of grams
(b) the mass of one mole of carbon
(c) the ratio of chemical species to each other in a balanced equation
(d) the ratio of elements to each other in a compound

37. Percentage of Se in peroxidase anhydrase enzyme is 0.5% by weight (at. weight = 78.4), then minimum molecular weight of peroxidase anhydrase enzyme is
(a) 1.568×10^3 (b) 15.68
(c) 2.168×10^4 (d) 1.568×10^4

38. 20.0 g of a magnesium carbonate sample decomposes on heating to give carbon dioxide and 8.0 g magnesium oxide. What will be the percentage purity of magnesium carbonate in the sample? (Atomic weight of Mg=24)
(a) 75
(b) 96
(c) 60

39. **10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be**
(a) 2 moles
(b) 3 moles
(c) 4 moles
(d) 1 mole

40. **In Haber process 30L of dihydrogen and 30L of dinitrogen were taken for reaction which yielded only 50% of the expected product. What will be the composition of gaseous mixture under the aforesaid condition in the end?**
(a) 20 L ammonia, 10 L nitrogen, 30 L hydrogen
(b) 20 L ammonia, 25 L nitrogen, 15 L hydrogen
(c) 20 L ammonia, 20 L nitrogen, 20 L hydrogen
(d) 10 L ammonia, 25 L nitrogen, 15 L hydrogen

41. **An ideal gaseous mixture of ethane (C_2H_6) and ethene (C_2H_4) occupies 28 litre at 1 atm and 273 K. The mixture reacts completely with 128 g O_2 to produce CO_2 and H_2O. Mole fraction at C_2H_6 in the mixture is:**
(a) 0.6
(b) 0.4
(c) 0.5
(d) 0.8

42. **1 mole of mixture of CO and CO_2 requires exactly 28 g KOH in solution for complete conversion of all the CO_2 into K_2CO_3. How much amount more of KOH will be required for conversion into K_2CO_3. If one mole of mixture is completely oxidized to CO_2**
(a) 112 g
(b) 84 g
(c) 56 g
(d) 28 g

43. **100 cm³ of 0.1 N HCl is mixed with 100 cm³ of 0.2 N NaOH solution. The resulting solution is**
(a) 0.1 N and the solution is basic
(b) 0.1 N and the solution is acidic
(c) 0.05 N and the solution is basic
(d) 0.05 N and the solution is acidic

44. **Arrange the following in the order of increasing mass (atomic mass: O = 16, Cu = 63, N = 14)**
I. one atom of oxygen
II. one atom of nitrogen
III. 1×10^{-10} mole of oxygen
IV. 1×10^{-10} mole of copper
(a) I < II < III < IV
(b) I < II < III < IV
(c) III < II < IV < I
(d) IV < II < III < I

45. **Give the correct order of initials T or F for following statements. Use T if statement is true and F if it is false.**
(i) Gay-Lussac's law of gaseous volumes is actually the law of definite proportion by volume.
(ii) Law of conservation of mass is true for physical change, but not for chemical change.
(iii) The percentage of oxygen in H_2O_2 is different from that in H_2O. Hence, it violates law of definite proportions.
(iv) Fixed mass of A reacts with two different masses of B (say x and y), then the ratio of x/y can be any positive integer.
(v) At STP, 5 mL of N_2 and H_2 have different no. of molecules.
(a) TTTFF
(b) FTTFT
(c) TTFFF
(d) TFTTF

46. **Which of the following is the correct empirical and molecular formulae of a compound, if the molecular mass of a compound is 80 and compound contains 60% of C, 5% of H and 35% of N?**
(a) C_2H_2N; $C_4H_4N_2$
(b) $C_3H_4N_2$; $C_6H_8N_4$
(c) $C_2H_4N_2$; $C_4H_8N_4$
(d) C_2H_2N; C_2H_2N

47. **Liquid benzene (C_6H_6) burns in oxygen according to the equation $2C_6H_6(l) + 15O_2(g)$**

$\rightarrow 12CO_2(g) + 6H_2O(g)$. How many litres of O_2 at STP are needed to complete the combustion of 39 g of liquid benzene? (Mol. wt. of O_2 = 32, C_6H_6 = 78)

(a) 74L
(b) 11.2L
(c) 22.4L
(d) 84L

48. Which of the following option represents correct limiting reagents in reactions (i), (ii) and (iii) respectively.
(i) $C + O_2 \rightarrow CO_2$
(26g) (20g)
(ii) $N_2 + 3H_2 \rightarrow 2NH_3$
(60g) (80g)
(iii) $P_4 + 3O_2 \rightarrow P_4O_6$
(100g) (200g)
(a) C, N_2, O_2
(b) C, N_2, P_4
(c) O_2, H_2, P_4
(d) O_2, N_2, P_4

49. The increasing order of molarity with 25 gm each of NaOH, LiOH, Al(OH)₃, KOH, B(OH)₃ in same volume of water?
(a) $Al(OH)_3 < B(OH)_3 < KOH < NaOH < LiOH$
(b) $LiOH < NaOH < KOH < B(OH)_3 < Al(OH)_3$
(c) $LiOH < NaOH < B(OH)_3 < KOH < Al(OH)_3$
(d) $NaOH < LiOH < B(OH)_3 < Al(OH)_3 < KOH$

50. What is the mass of precipitate formed when 50 mL of 16.9% solution of AgNO₃ is mixed with 50 mL of 5.8% NaCl solution? (Ag = 107.8, N = 14, O = 16, Na = 23, Cl = 35.5)
(a) 28 g
(b) 3.5 g
(c) 7 g
(d) 14 g

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