



# **CHEMISTRY**

**BOOKS - ARIHANT PUBLICATION**

**JHARKHAND**

**LAWS OF CHEMICAL COMBINATION  
AND GAS LAWS**

**Exam Booster For Cracking Exam**

1. Which one of the following is a correct relationship between mass and energy?

A.  $E = hc$

B.  $E = \frac{m}{c^2}$

C.  $c = \sqrt{\frac{E}{m}}$

D.  $m = Ec^2$

**Answer: C**



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2. The law of multiple proportion was proposed by

A. Lavoisier

B. Dalton

C. Proust

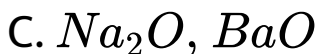
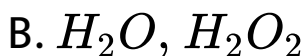
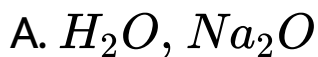
D. Gay-Lussac

**Answer: B**



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3. Which one of the following pairs of compounds illustrate the law of multiple proportion?



D. All of these

**Answer: B**



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4. Which of the following laws deals with mass of reactants and products during chemical reactions?

- A. Law of definite proportions
- B. Law of conservation of energy
- C. Law of conservation of mass
- D. Law of reciprocal proportions

**Answer: C**



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5. Hydrogen, sulphur and oxygen gives , and .

This is according to the law of

- A. constant proportions
- B. multiple proportions
- C. reciprocal proportions
- D. conservation of mass

**Answer: C**



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6. In the reaction  $N_2 + 3H_2 \rightarrow 2NH_3$  ratio by volume of  $N_2$ ,  $H_2$  and  $NH_3$  is 1:3:2 . This suggested law of

- A. definite proportions
- B. multiple proportions
- C. reciprocal proportions
- D. combining volume

**Answer: D**



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7. Law of conservation of mass is not correct for

A. radioactive change

B. oxidation

C. hydrolysis

D. None of these

**Answer: A**



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8. Radioactive change follows the law of

A. conservation of mass

B. conservation of mass-energy

C. Both (a) and (b)

D. None of the

**Answer: B**



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9. Different proportions of oxygen in the various oxides of nitrogen prove the law of

- A. equivalent proportion
- B. multiple proportions
- C. constant proportions
- D. conservation of matter

**Answer: B**



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10. Two different oxides of a metal contain 20% and % oxygen by weight. This is in accordance with the law of

- A. conservation of mass
- B. constant composition
- C. multiple proportion
- D. reciprocal proportion

**Answer: C**



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11. Two elements A and B combine to form two compounds in which a g of A combines with  $b_1$ , and  $b_2$ , g of B, respectively. According to the law of multiple proportions

A.  $b_1 = b_2$

B.  $b_1$  and  $b_2$  bear a simple whole number ratio

C.  $a_1$  and  $b_1$  bear whole number ratio

D. no relation exists between  $b_1$ , and  $b_2$

**Answer: B**



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12. Chemical equation is balanced according to the law of

- A. multiple proportions
- B. reciprocal proportion
- C. conservation of mass
- D. definite proportion

**Answer: C**



**13.** One part of element A reacts with two parts of another element B. 6 parts of element C reacts with 4 parts of element B. If A and C combine together, the ratio of their weights be governed by

- A. law of definite proportions
- B. law of multiple proportions
- C. law of reciprocal proportions
- D. law of conservation of mass

**Answer: C**



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**14.** 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 illustrate

A. law of reciprocal proportions

B. law of constant proportions

C. law of multiple proportions

D. law of equivalent proportions

**Answer: C**



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**15.** The law of constant proportion was proposed by

A. Proust

B. Einstein



C. Richter

D. Dalton

**Answer: A**



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**16.** Formation of CO and  $CO_2$  illustrates the law of

A. reciprocal proportions

B. multiple proportions

C. conservation of mass

D. constant composition

**Answer: B**



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**17.** Which of the following compounds do not conform to the law of multiple proportion?

A. NaCl and  $BaCl_2$

B. CaO and  $Na_2O$

C.  $H_3PO_4$  and  $Ca_3(PO_4)_2$

D. All of these

**Answer: D**



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**18.** Equal masses of oxygen, hydrogen and methane kept under identical conditions. The ratio of the volumes of gases will be

A. 1:1:1

B. 1 : 16 : 2

C. 2 : 16 : 1

D. 1 : 4 : 1

**Answer: B**



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**19.** Law of combining volumes was proposed

by

A. Dalton

B. Tswett

C. Gay-Lussac

D. Einstein

**Answer: C**



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20. The law of multiple proportions is not illustrated by which pair of compounds

A. CO and  $CO_2$

B.  $\text{CuO}$  and  $\text{Cu}_2\text{O}$

C.  $\text{CO}_2$  and  $\text{H}_2\text{CO}_3$

D.  $\text{SO}_2$  and  $\text{SO}_3$

**Answer: C**



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21. Which of the following compounds conform the law of multiple proportion?

A.  $\text{HgCl}_2$ , and  $\text{Hg}_2\text{Cl}_2$

B.  $Na_2O$  and  $CaO$

C.  $NaCl$  and  $BaCl_2$

D.  $H_3PO_4$  and  $Ca_3(PO_4)_2$

**Answer: A**



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**22.** A balanced chemical equation is based on

A. law of conservation of mass

B. law of constant proportions

C. law of multiple proportions

D. law of combining weights

**Answer: A**



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**23.** Consider the following laws

(I) Law of conservation of mass

(II) Law of definite proportions

(III) Law of multiple proportions



Which of the above govern (s) the quantitative aspects of chemical changes?

A. Only (I)

B. (II) and (III)

C. (I) and (II)

D. All of these

**Answer: D**



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24. 8 g of oxygen combine with 1 g of hydrogen and 29 g of calcium therefore, when calcium combines with hydrogen it must combine in the ratio of 20:1. This statement conforms to the law of

- A. multiple proportions
- B. reciprocal proportions
- C. definite proportions
- D. gaseous volume

**Answer: B**



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25. If 2.0 g of the hydrogen on burning in 16.0 g of oxygen forms 18.0 g of water then which of the following laws is applicable?

- A. Law of conservation of mass
- B. Law of constant compositions
- C. Law of multiple proportions
- D. Law of reciprocal proportions

**Answer: A**



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26. The ratio in weight by which carbon and oxygen combine in a molecule of carbon monoxide is

A. 3 : 4

B. 3 : 3

C. 3 : 2

D. 3 : 1

**Answer: A**



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27. Which of the following statements are correct?

(I) When water is decomposed volume ratio of to is 2:1, but the mass ratio is 1:8.

(II) Water is a polar compound

(III) Water is good conductor of electricity.

Select the correct answer given below

A. (I) and (II)

B. (I) and (III)

C. (II) and (III)

D. All of these

**Answer: D**



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**28.** A gaseous mixture contains  $H_2$  , and  $N_2$  ,  
in the ratio of 1:4 by weight, the ratio of the  
molecules is

A. 7: 2

B. 1 : 8

C. 2 : 7

D. 1 : 4

**Answer: A**



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**29.** Real gas will approach the behaviour of ideal gas at

A. low temperature and high pressure

B. high temperature and low pressure

C. low temperature and low pressure

D. high temperature and high pressure

**Answer: B**



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**30.** Nitrogen combines, with oxygen to form five gaseous oxides  $N_2O$ ,  $NO$ ,  $N_2O_4$ ,  $NO_2$ , and  $N_2O_5$ . This illustrates



A. Gay-Lussac law

B. Law of constant composition

C. Law of multiple proportion

D. Avogadro's law

**Answer: C**



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**31.** Equal volumes of all gases under same temperature and pressure contain equal number of molecules according to

A. Avogadro's law

B. Charle's law

C. Boyle's law

D. Graham's law

**Answer: A**



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**32.** Matter can be converted into energy. It is represented by

A.  $E^2 = mc$

B.  $E = mc^2$

C.  $E = \frac{1}{2}mc^2$

D.  $E = m^2c$

**Answer: B**



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**33.** Which of the following is not a chemical reaction?

- A. Burning of coal
- B. Purification of milk
- C. Vaporisation
- D. Formation of water

**Answer: C**



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**34.** The law regarding the conversion of mass into energy was given by

A. Rutherford

B. Einstein

C. Currie

D. Bohr

**Answer: B**



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**35.** The law of multiple proportions is illustrated by the two compounds

A. NaCl and NaBr

B. ordinary and heavy water

C. caustic soda and caustic potash

D.  $SO_2$  , and  $SO_3$

**Answer: D**



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**36.** If the pressure of a gas is reduced to half and temperature is doubled, its volume becomes

A.  $\frac{V}{4}$

B.  $2V^3$

C.  $6V$

D.  $4V$

**Answer: D**



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**37.** Sparking is produced in a mixture 20 mL  $O_2$ , and 20 mL CO, the volume of the gaseous mixture obtained will be

A. 15 ml

B. 30 mL

C. 40 mL

D. 45 mL

**Answer: B**



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**38.** A 500 mL flask contains 400 mL  $H_2$ , at 700 mm, 200 mL  $N_2$ , at 350 mm and 100 mL He at 250 mm. The total pressure of the mixture is



A. 750 mm

B. 700 mm

C. 1300 mm

D. None of these

**Answer: A**



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**39.** Hydrogen diffuses 6 times faster than the gas X, the molecular weight of X is

A. 6

B. 36

C. 24

D. 72

**Answer: D**



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**40.** Which is correct relation between rate of diffusion and their densities

A.  $\frac{r_1}{r_2} = \sqrt{\frac{d_1}{d_2}}$

B.  $\frac{r_1}{r_2} = \sqrt{\frac{d_2}{d_1}}$

C.  $\frac{r_1}{r_2} = \frac{d_1}{d_2}$

D.  $\frac{r_1}{r_2} = \frac{d_2}{d_1}$

**Answer: B**



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**41.** At constant pressure the volume of a gas is  
Vat  $0^\circ$  C. At which temperature it will be 3V?

A.  $300^{\circ}$

B.  $273^{\circ}$

C.  $573^{\circ}$

D.  $546^{\circ}$

**Answer: D**



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**42.** A sample of nitrogen gas occupies a volume of 320 mL at STP calculate its volume at  $66^{\circ}$  C and 0.825 atm pressure

A. 526 ml

B. 570.8 ml

C. 481.6 mL

D. 446.7 mL

**Answer: C**



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**43.** Equal weights of methane and oxygen are mixed in a vessel. The partial pressure of oxygen is

A.  $\frac{1}{3}$

B.  $\frac{2}{3}$

C.  $\frac{1}{2}$

D.  $\frac{1}{2} \times \frac{273}{298}$

**Answer: A**



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**44.** Two gases A and B have molecular weight 60 and 45. 0.6 g of A and 0.9 g of B are mixed

in a closed vessel. Total pressure is 720 mm.

The partial pressure of A is

A. 240 mm

B. 480 mm

C. 600 mm

D. None of these

**Answer: A**



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45. A gas have volume 400 cc at 1 atm and  $7^{\circ}$

C the volume at  $77^{\circ}$  C and 1.875 atm will be

A. 2346 "CC "

B. 8250 "CC "

C. 266 "CC "

D. None of these

**Answer: C**



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46. 24 mL  $H_2$  , diffuses in 100 s. How much volume of  $SO_2$  , will diffuse during the same time?

A. 11.312 mL

B. 5.656 mL

C. 8 mL

D. none of these

**Answer: D**



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47. 32 mL  $H_2$  , diffuses in 100 s. How much  $SO_2$  , will in the same time?

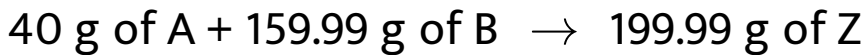
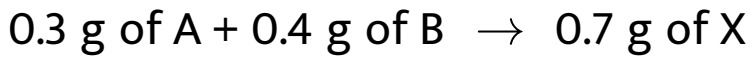
- A. 11.312 ml
- B. 5.656 ml
- C. 8 ml
- D. None of these

**Answer: B**



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**48.** Elements A and B combines to form three compounds



Above data shows an example of

- A. law of multiple proportion
- B. law of constant proportion
- C. law of reciprocal proportion
- D. None of the above

**Answer: A**



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