Max Marks: 200 **Date: 12.09.2022**

JB 2 MR BATCH
CHEMISTRY : PART TEST
Topic: Mole Concept (Till Reaction Mechanism)

1. The unbalanced equation for the reaction of P_4S_3 with nitrate in aqueous acidic medium is given below:

$P_4S_3 + NO_3^- \rightarrow H_3PO_4 + SO_4^{2-} + NO$

The number of moles of water required per mole of P_4S_3 is:

(a) 18 (b) $\frac{8}{3}$ (c) 8 (d) 28

2. $MnO_4^- + NO_2^- + H^+ \rightarrow Mn^{2+} + NO_3^- + H_2O$

When this equation is balanced correctly with the smallest integer coefficients, what is the coefficient for H^+?

(a) 1 (b) 6 (c) 8 (d) 16

3. $Cl_2 + OH^- \rightarrow Cl^- + ClO_3^-$

What is the coefficient for OH^- when this equation is balanced with the smallest integer coefficients?

(a) 2 (b) 3 (c) 4 (d) 6

4. When the reaction : $Cl^- + ClO_3^- \rightarrow Cl_2 + H_2O$ is balanced in acid solution what is the ratio of Cl^- to ClO_3^- ?

(a) $\frac{1}{1}$ (b) $\frac{2}{1}$ (c) $\frac{3}{1}$ (d) $\frac{5}{1}$

5. When the equation $Sn^{2+}(aq) + IO_3^-(aq) + H^+(aq) \rightarrow Sn^{4+}(aq) + I_2(aq) + H_2O(l)$ is balanced, what is the $Sn^{2+}(aq)$ / $IO_3^-(aq)$ mole ratio?

(a) $\frac{1}{1}$ (b) $\frac{2}{1}$ (c) $\frac{1}{2}$ (d) $\frac{5}{2}$

6. Ratio of stoichiometric coefficient of N_2+H_4 to Cl^- in the following reaction :

$ClO_3^- + N_2H_4 \rightarrow NO_3^- + Cl^-$

(a) $\frac{8}{15}$ (b) 1 (c) $\frac{2}{3}$ (d) $\frac{6}{14}$

Space for Rough Work

7. In the equation, $SnCl_2 + 2HgCl_2 \rightarrow Hg_2Cl_2 + SnCl_4$ The equivalent weight of stannous chloride (molecular weight= 190) will be :

(a) 190 (b) 95 (c) 47.5 (d) 154.5

8. In the following change,

$3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$

If the atomic weight of iron is 56, then its equivalent weight will be

(a) 42 (b) 21 (c) 63 (d) 84

9. Which statement is correct for equivalent weight of $KMnO_4$?

(a) Equivalent weight is $\frac{1}{3}$ of molecular mass in neutral and weak basic medium

(b) Equivalent weight is $\frac{1}{5}$ of molecular mass in basic medium.

(c) Equivalent weight is equal to molecular mass in acidic medium

(d) Equivalent weight is $\frac{1}{3}$ of molecular mass in acidic medium.

10. Equivalent weight of NH_3 in the change $N_2 \rightarrow NH_3$ is :

(a) $\frac{17}{6}$ (b) 17 (c) $\frac{17}{2}$ (d) $\frac{17}{3}$

11. What is the equivalent mass of $S_2O_3^{2-} \rightarrow S_4O_6^{2-} + S_2^{2-}$ Where the charge above species represents charge on the ion and not oxidation state ?

(a) 132 (b) 22 (c) 130.6 (d) 113.15

12. In the reaction: $Na_2S_2O_3 + 4Cl_2 + 5H_2O \rightarrow Na_2SO_4 + H_2SO_4 + HCl$ the equivalent weight of $Na_2S_2O_3$ will be :

(M = molecular weight of $Na_2S_2O_3$)

(a) $\frac{M}{4}$ (b) $\frac{M}{8}$ (c) $\frac{M}{1}$ (d) $\frac{M}{2}$

Space for Rough Work

13. The oxidation numbers of sulphur in S_8, S_2F_2 and H_2S respectively are

(a) 0, +1 and -2 (b) +2, +1 and -2 (c) 0, +1 and +2 (d) -2, +1 and -2

14. In which reaction there is a change in valency?

(a) $2NO_2 \rightarrow N_2O_4$ (b) $2NO_2 + H_2O \rightarrow HNO_2 + HNO_3$

(c) $NH_4OH \rightarrow NH_4^+ + OH^-$ (d) $CaCO_3 \rightarrow CaO + CO_2$

15. Maximum oxidation state is present in

(a) CrO_2Cl_2 and MnO_4^- (b) MnO_2

(c) $[Fe(CN)_6]^3$ and $[Co(CN)_6]^3$ (d) MnO

16. The oxidation number of phosphorus in $Ba(H_2PO_2)_2$ is

(a) +3 (b) +2 (c) +1 (d) -1

17. Oxidation state of Fe in $Fe_{0.94}O_1$ is

(a) 200 (b) $\frac{200}{94}$ (c) $\frac{94}{200}$ (d) none of these

18. Oxidation state of Pt in $[Pt(C_2H_4)Cl_3]^{-1}$ is

(a) +1 (b) +2 (c) +3 (d) +4

19. Oxidation states of oxygen in KO_3 and Na_2O_2 are

(a) 3,2 (b) 1,0 (c) 0,1 (d) -0.33, -1

20. The oxidation state of iodine in IPO_4 is

(a) +1 (b) +3 (c) +5 (d) +7

21. In the reaction $HAsO_2 + Sn^{2+} \rightarrow As + Sn^{4+} + H_2O$, oxidising agent is

(a) Sn^{2+} (b Sn^{4+} (c) As (d) $HAsO_2$

Space for Rough Work

22. A reducing agent is a substance which can

(a) Accept electron (b) Donate electrons (c) Accept protons (d) Donate protons

23. Which of the following acids possesses oxidising, reducing and complex forming properties?

(a) HNO_3 (b) H_2SO_4 (c) HCl (d) HNO_2

24. Number of moles of NH_3 formed when 0.535 g of NH_4Cl is completely decomposed by NaOH, is

$NH_4Cl + NaOH \rightarrow NH_3 + NaCl + H_2O$

(a) 0.01 mol (b) 5.35 mol (c) 1.7 g (d) 0.17 mol

25. $2KClO_3 \rightarrow 2KCl + 3O_2$.5.0 g of $KClO_3$ is

(a) 49% (b) 50% (c) 95% (d) 98%

Space for Rough Work

Date: 12.09.2022

JB 2 MR BATCH
MATHEMATICS : PART TEST
Topics: Sequence and Series

26. If $\frac{x+y}{2}$, y, $\frac{y+z}{2}$ are in H.P. then x, y, z are in

(a) A.P. (b) G.P. (c) H.P. (d) None of these

27. The value of $a^{\log_b x}$ where

$a = 0.5, b = \sqrt{2}$ and $x = 1 + \frac{1}{2} + \frac{1}{4} + ...$ upto ∞ is

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{1}{8}$ (d) 1

28. Three numbers are in G.P. If we double the middle term. We get an A.P., the common ratio of the G.P. is

(a) $3 \pm \sqrt{2}$ (b) $5 \pm \sqrt{3}$ (c) $2 \pm \sqrt{3}$ (d) $3 \pm \sqrt{5}$

29. If 5, x, y, z, 405 are in G.P. Then z is equal to

(a) 15 (b) 25 (c) 45 (d) 135

30. If m^{th} terms of two series. 63 + 65 + 67 + … and 3 + 10 + 17 + …. are equal, then the value of m is

(a) 19 (b) 13 (c) 9 (d) 7

31. The sum of 11 terms of an A.P. whose middle term is 30, is

(a) 350 (b) 340 (c) 330 (d) 320

32. Sum of three terms of an A.P. is 33 and their product is 792 the greatest of them is

(a) 18 (b) 4 (c) 11 (d) 23

Space for Rough Work

33. $\sum_{r=0}^{n} r(n-1)$ is equal to

(a) $\sum n^2$ (b) $(\sum n)^2$ (c) $\sum n$ (d) $\frac{n-1}{3}(\sum n)$

34. The sum of all numbers between 1 to 1000 which are divisible by 7 is

(a) 61071 (b) 71071 (c) 71061 (d) 61061

35. The sum of an infinite series of G.P. is 3 and sum of square of their term is $\frac{9}{2}$. Then sum of cubes of their terms is

(a) $\frac{105}{13}$ (b) $\frac{103}{13}$ (c) $\frac{108}{13}$ (d) $\frac{113}{13}$

36. The ratio between the sum of n terms of two A.P's is (3n + 8) : (7n + 15) then the ratio between their 12th terms is

(a) 5 : 7 (b) 12 : 11 (c) 11 : 12 (d) 7 : 16

37. $\sum_{r=1}^{\infty} \frac{1}{(2r-1)^2} = \frac{\pi^2}{8}$, then $\sum_{r=1}^{\infty} \frac{1}{r^2}$ is equal to

(a) $\frac{\pi^2}{6}$ (b) $\frac{\pi^2}{3}$ (c) $\frac{\pi^2}{8}$ (d) $\frac{\pi^2}{24}$

38. Between 1 and 31 are inserted m arithmetic means so that the ratio of the 7th and $(m-1)^{th}$ means is 5 : 9. Then the value of m is

(a) 15 (b) 13 (c) 12 (d) 14

39. If x, y, z are in G.P. and x + 3, y + 3, z + 3 are in H.P. Then y is equal to

(a) 2 (b) 1 (c) 3 (d) 0

40. Sum of the series $1 + \frac{1}{2}(1+2) + \frac{1}{3}(1+2+3) + \frac{1}{4}(1+2+3+4) + \ldots$ upto 20 terms is

(a) 110 (b) 111 (c) 115 (d) 116

Space for Rough Work

41. Let $P = 3^{\frac{1}{3}} . 3^{\frac{2}{9}} . 3^{\frac{3}{27}} ... \infty$ then $P^{\frac{1}{3}}$ is equal to

(a) $\sqrt{3}$ (b) $3^{\frac{1}{3}}$ (c) $3^{\frac{3}{4}}$ (d) $3^{\frac{2}{3}}$

42. The sum of 0.2 + 0.004 + 0.0006 + 0.0000008 + … upto ∞ is

(a) $\frac{2000}{9801}$ (b) $\frac{1000}{9801}$ (c) $\frac{200}{891}$ (d) $\frac{500}{891}$

43. The value of x equals where

$x = 1 + 3y + 5y^2 + 7y^3 + 9y^4 + ... + \infty$

(a) $\frac{1+y}{1-y}$ (b) $\frac{1+y}{(1-y)^2}$ (c) $\frac{1}{(1+y)^2}$ (d) None of these

44. 8 + 88 + 888 + …. upto n term is equal to

(a) $\frac{80}{9}(10^n - 1) - \frac{8n}{9}$ (b) $\frac{80}{81}(10^n - 1) - \frac{8n}{9}$

(c) $\frac{80}{81}(10^n - 1) + \frac{8n}{9}$ (d) $\frac{80}{9}(10^n - 1) - \frac{8n}{9}$

45. If $0.\overline{523}$ is equal to

(a) $\frac{259}{990}$ (b) $\frac{259}{495}$ (c) $\frac{523}{990}$ (d) $\frac{523}{495}$

46. $1 + \frac{2}{2} + \frac{3}{4} + \frac{4}{8} + \frac{5}{16} + ... + \infty$ is equal to

(a) 2 (b) 3 (c) 4 (d) 6

Space for Rough Work

47. $\sum_{r=1}^{n} \log\left(\frac{a^r}{b^{r-1}}\right)$ is equal to

(a) $\frac{n}{2}\log\left(\frac{a^{n+1}}{b^{n-1}}\right)$ (b) $\frac{n}{2}\log\left(\frac{a^{n+1}}{b^{n+1}}\right)$ (c) $\frac{n}{2}\log\left(\frac{a^{n}}{b^{n}}\right)$ (d) $\frac{n}{2}\log\left(\frac{b^{n}}{a^{n}}\right)$

48. The sum of the series

$\frac{1}{3.5} + \frac{1}{5.7} + \frac{1}{7.9} + \ldots$ upto ∞ is equal to

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

49. In the nth row of the triangle

1

2 3

4 5 6

7 8 9 10

. . . . . .

. . . . . .

(a) First term = $\frac{1}{2}(n^2 - n + 2)$ (b) First term = $\frac{1}{3}(n^2 + n - 2)$

(c) First term = $\frac{1}{2}(n^2 + n + 2)$ (d) None of these

50. The sum of 50 terms of

1 + (2) (3) + 4 + (5) (6) + 7 + (8) (9) + ….

(a) 49765 (b) 49675 (c) 49650 (d) None of these

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Max Marks: 200 **Date: 12.09.2022**

JB 2 MR BATCH
CHEMISTRY: PART TEST ANSWER KEY
Topic: Mole Concept (Till reaction Mechanism)

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

MATHEMATICS PART TEST
Topics: Sequence and Series

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