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# SIMPLE HOLIDAY PACKAGE PONGAL

*Mathematics*  
*Physics*  
*Chemistry*

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**CLASS – VII – E4 & E5**

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**VII\_MPC\_E4 to E5\_SHP**  
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## MATHEMATICS

1. Number of pairs of twin primes less than 100 is  
 1) 7                                      2) 8                                      3) 9                                      4) 10
2. If  $p^q - q^r = (p + q)^r - q$ ,  $p > r > q$ , and  $p$ ,  $r$  and  $q$  are prime numbers less than 11, then  $p + q$  is equal to  
 1)  $r(r - q)$                       2)  $r(q - p)$                       3)  $r(p + q)$                       4)  $pq$
3. 'p' is a prime number and  $(p^2 + 3)$  is also a prime number. The numbers that 'p' can assume is  
 1) 3                                      2) 2                                      3) 1                                      4) can't say
4. If  $2m + 5n$  and  $3m + 4n$  are two distinct prime numbers, then the numbers, whose G.C.D. is 50, is  
 1)  $50m + 150n$  and  $150m + 20n$                       2)  $100m + 250n$  and  $150m + 200n$   
 3)  $10m + 200n$  and  $25m + 300n$                       4)  $50m + 250n$  and  $15m + 25n$
5. A perfect square less than 500 is such that when a prime number  $p_1$  is subtracted or another prime number  $p_2$  is added to it, in both cases, it becomes the perfect square when  $p_2 = 2 + p_1$ . Then the  $p_1 + p_2$  can be  
 1) 92                                      2) 82                                      3) 84                                      4) None of these
6. If  $a$  and  $b$  are twin primes and  $a > b$ , then  $a^3 - b^3 =$   
 1)  $6a^2 + 12a + 8$                       2) 8                                      3) - 8                                      4)  $6b^2 + 12b + 8$
7. The sum of all prime numbers between 1 and 100 that are simultaneously 1 greater than a multiple of 4 and 1 less than a multiple of 5  
 1) 118                                      2) 137                                      3) 158                                      4) 187
8. If  $p$  be any odd natural number, greater than 3 then which digit will never appear as the last digit in the product of  $(p^2 - 1)(p^2 + 1)$  is  
 1) 9 and 7                      2) 5 and 3                      3) 1 and 5                      4) All of these
9. If  $\frac{p}{q} \times \frac{p+3}{q+4} = x$ , where  $p$  and  $q$  are the 2<sup>nd</sup> and 3<sup>rd</sup> odd natural numbers then  $\left(\frac{p^2 + q^2}{p^3 + q^3}\right) \times x$  is  
 1)  $\frac{16}{190}$                       2)  $\frac{18}{190}$                       3)  $\frac{15}{190}$                       4)  $\frac{17}{190}$
10. If  $a, b, c, d$  are the first consecutive odd numbers, then  $(a^2 + b^2 + c^2 + d^2)$  is a multiple of  
 1) 7                                      2) 5                                      3) 9                                      4) 8
11. Which of the following is twin prime?  
 1) (13, 49)                      2) (7, 39)                      3) (73, 91)                      4) (41, 43)

12. For what value of  $n$  are  $2^n - 3$  and  $2^n + 3$  prime?  
 1) 7                                      2) 5                                      3) 6                                      4) 2
13. If  $2^{4x} = 2^{6y} = 2^{8z} = 2^{48}$  then  $(x + 4)(y + 4) + (y + 2)(z + 4) + (x + 1)(z + 3)$  is a  
 \_\_\_\_\_  
 1) Odd number                                      2) Even number  
 3) Negative number                                      4) Square number
14. The predecessor of a prime number ( $> 3$ ) is always  
 1) Even                                      2) Odd                                      3) composite                                      4) Both (1) & (3)
15. Prime number greater than 3 can be written in the form of \_\_\_\_\_  
 where  $K \in \mathbb{N}$   
 1)  $6K+1$                                       2)  $2K+1$                                       3)  $6K-1$                                       4) Both (1)&(3)
16. Which of the following are co-primes to each other?  
 1) (49,82)                                      2) (17,148)                                      3) (97,148)                                      4) All of these
17. If  $7x + 9y = 13$ ,  $kx + 27y = 25$  has no solutions then the value of  $K$  is  
 1)13                                      2)14                                      3)21                                      4)28
18. The solution of the system of inequalities  $-18 < \frac{3(x-1)}{6} \leq 0$  is  
 1)  $-35 \leq x \leq 1$                                       2)  $-23 < x \leq 2$                                       3)  $-35 < x \leq 1$                                       4)  $-23 \leq x \leq 2$
19. The solution set for  $\left| \frac{2(3-x)}{5} \right| < \frac{3}{5}$   
 1)  $\left( \frac{1}{4}, \frac{3}{4} \right)$                                       2)  $\left( \frac{3}{2}, \frac{9}{2} \right)$                                       3)  $\left( \frac{1}{2}, \frac{3}{2} \right)$                                       4)  $\left( \frac{3}{2}, \frac{5}{2} \right)$
20. For what value of  $k$ , the system of equations  $kx + 2y = 2$  and  
 $3x + y = 1$  will be coincident?  
 1) 2                                      2) 3                                      3) 5                                      4) 6
21. If  $42573k$  is divisible by 72 then the value of  $k$  is :  
 1)4                                      2)5                                      3)6                                      4)7
22. If  $\sqrt{0.04 \times 0.4 \times a} = 0.004 \times 0.4 \times \sqrt{b}$ , then  $\frac{a}{b}$  is:  
 1)  $16 \times 10^{-3}$                                       2)  $16 \times 10^{-4}$                                       3)  $16 \times 10^{-5}$                                       4) None of these
23.  $4^{61} + 4^{62} + 4^{63} + 4^{64}$  is divisible by:  
 1)3                                      2)10                                      3)11                                      4)13
24. Let  $S$  be the set of integers  $X$  such that  
 I.  $100 < X < 200$   
 II.  $X$  is odd  
 III.  $X$  is divisible by 3 but not by 7  
 How many numbers does  $S$  contain?  
 1) 16                                      2) 12                                      3) 11                                      4) 13
25. If  $x^3 - 1 = 1330$ ,  $y^3 - 8 = 1720$ , then which of the following is true with respect to  $x$  and  $y$  ?  
 1)  $(x+y)^2 + 96$  is a perfect square                                      2) One of them is a prime  
 3) Both  $x$  and  $y$  are odd                                      4) Both (1) and (2)

26.  $-57^3 + 105^3 - 48^3$  is divisible by  
1) 81 & 16      2) 57 & 35      3) 21 & 20      4) All of these
27. The sum of the digits of a 3 digit number is subtracted from the number. The resulting number is always \_\_\_\_\_  
1) Divisible by 6      2) Divisible by 9  
3) Divisible by 3      4) Both (2) and (3)
28. If  $\sqrt{1 + \sqrt{1 - \frac{2176}{2401}}} = 1 + \frac{x}{7}$  then the Value of 'x'  
1) 3      2) 1      3) 5      4) 7
29. The value of  $\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$  is  
1) 2      2) 3      3) 4      4) 5
30. Which of the following number is exactly divisible by 24?  
1) 5245648      2) 52563744      3) 7834600      4) 46897122
31. If P is prime 'n' is a +ve integer and  $n+p=2000$ , LCM of n and p is 21879 the n = \_\_\_\_\_  
1)1969      2)1979      3)1999      4)1989
32. Find the smallest 4 digit number such that when it is divided by 12, 18, 21 and 28 leaves a remainder 3 in each case.  
1)1000      2)1012      3)1011      4)1263
33. A number when divided by 18 leaves a remainder of 10, but when the same number is divided by 9, it will leave the remainder:  
1)3      2)1  
3)4      4)can't be determined
34. The number of positive integers n in the range  $12 \leq n \leq 40$  such that the product  $(n-1)(n-2)\dots 2.1$  is not divisible by n is  
1)5      2)7      3)13      4)14
35. If  $6a = 8b = 12c$  and  $a + b + c = 36\sqrt{29}$ , then  $\sqrt{a^2 + b^2 + c^2}$  is  
1) $3\sqrt{29}$       2)116      3)87      4)None of these
36. If  $x^2 + y^2 + z^2 = 8$  and  $\left(\frac{x}{y} + \frac{y}{x}\right)^2 + \left(\frac{y}{z} + \frac{z}{y}\right)^2 + \left(\frac{x}{z} + \frac{z}{x}\right)^2 = 235$ , then  
$$\frac{1}{x^2} + \frac{1}{y^2} + \frac{1}{z^2} =$$
  
1) $\frac{1}{2}$       2) $\frac{9}{2}$       3)27      4)29
37. If  $\frac{(12+13)!}{(11+13)!} - \frac{(11+13)!}{(12+13)!} = k + \frac{24}{25}$ , then the value of k is \_\_\_\_\_  
1)25      2)28      3)23      4)24

38. The sum of two numbers is 528 and their H.C.F is 33. Find the number of pairs of such numbers satisfying the above conditions ?
- 1)2                      2)3                      3)4                      4)1
39. The L.C.M of two numbers is 26, then which of the following can be their H.C.F
- 1)1                      2)2                      3)13                      4)All of these
40. If  $\frac{(x+45)!}{(x+44)!} - \frac{(y+25)!}{(y+24)!} = 60$ , then the value of  $x^2 - 2xy + y^2$  is \_\_\_\_\_
- 1)3600                      2)1600                      3)900                      4)None of these
41. What is the value of positive integer 'n', for which the LCM of 36 and n is 500 greater than the G.C.D of 36 and n.
- 1)42                      2)50                      3)56                      4)39
42. The value of  $(1.2.3...9)(11.12.13...19).(21.22.23..29).(31.32.33..39)(41.42.43...49)(51.52.53...59)...(91.92...99)$  is equal to \_\_\_\_\_
- 1)  $\frac{100!}{36288 \times 10^{12}}$                       2)  $\frac{99!}{388 \times 10^{11}}$                       3)  $\frac{99!}{36288 \times 10^{10}}$                       4)Both(1) and (3)
43. If  $P + P! = P^3$ , then the value of P is
- 1)4                      2)6                      3)0                      4)5
44. The number of zeroes at the end of product  $25 \times 90 \times 75 \times 80 \times 125 \times 30 \times 35 \times 40 \times 40 \times 45$ ?
- 1)11                      2)12                      3)14                      4)13
45. The appropriate value of P for the relation  $(P!+1) = (P+1)^2$  is :
- 1)3                      2)4                      3)5                      4)6
46. Find the greatest number of 4 digits such that it is exactly divisible by 12, 15, 20 and 35.
- 1)9999                      2)9240                      3)9660                      4)8820
47.  $\frac{(n-24)!}{(n+21)!} \div \frac{(n-25)!}{(n+21)!} = \frac{1}{9}$  then the value of n is
- 1)  $\frac{217}{3}$                       2)  $\frac{215}{9}$                       3)  $\frac{217}{9}$                       4)  $\frac{216}{9}$
48. Find the greatest possible quantity which can be used to measure exactly the quantities 3L 250mL, 3L 500 mL and 4L
- 1)25mL                      2)125mL                      3)250mL                      4)500mL
49. Find the greatest number which on dividing 1657 and 2037 leaves remainders 6 and 5 respectively.
- 1)125                      2)127                      3)129                      4)None of these
50. If  $\frac{n!}{2!(n-2)!}$  and  $\frac{n!}{4!(n-4)!}$  are in the ratio 2 : 1, then the value of n is
- 1)2                      2)3                      3)5                      4)4

51. Find the least square number, exactly divisible by 8, 12, 15, 20

- 1) 900                      2) 3600                      3) 1600                      4) 2000

52. For what value of  $n$  is the  $n$ th term of the two A.P's 1, 7, 13, 19, ... and 69, 68, 67, ... will be the same ?

- 1) 10                      2) 11                      3) 12                      4) None of these

53. If  $m$  and  $n$  are two distinct numbers such that  $m$  times the  $m$ th term of an A.P. is equal to  $n$  times its  $n$ th term, then the  $(m + n)$ th term of the A.P. is \_\_\_\_\_.

- 1) 0                      2) 1                      3) 2                      4) Can't be determined

54. Which term of the sequence  $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \dots$  is the first negative term?

- 1) 26<sup>th</sup>                      2) 27<sup>th</sup>                      3) 28<sup>th</sup>                      4) 29<sup>th</sup>

55.  $55^3 + 17^3 - 72^3$  is always

- 1) Even                      2) Odd  
3) Neither even nor odd                      4) Can't say

56. If  $a_1, a_2, a_3, \dots, a_n$  are in A.P., where  $a_i > 0$  for all  $i$ , then

$$\frac{1}{\sqrt{a_1} + \sqrt{a_2}} + \frac{1}{\sqrt{a_2} + \sqrt{a_3}} + \dots + \frac{1}{\sqrt{a_{n-1}} + \sqrt{a_n}} = \frac{1}{\sqrt{a_1} + \sqrt{a_n}}$$

- 1)  $\frac{n+1}{\sqrt{a_1} + \sqrt{a_n}}$                       2)  $\frac{n-1}{\sqrt{a_1} - \sqrt{a_n}}$                       3)  $\frac{n-1}{\sqrt{a_1} + \sqrt{a_n}}$                       4) None of these

57. If  $x^3 - 1 = 1330$  and  $y^3 - 8 = 1720$ . Then which of the following is true ?

- 1)  $(x+y)^2 + 96$  is a perfect square                      2) One of them is a prime  
3) Both  $x$  and  $y$  are odd                      4) Both (1) & (2)

58.  $\sqrt{1 + \sqrt{1 - \frac{2176}{2401}}} = 1 + \frac{x}{7}$  then the value of 'x' \_\_\_\_\_

- 1) 3                      2) 1                      3) 5                      4) 7

59. The value of  $\sqrt{41 + \sqrt{52 + \sqrt{129 + \sqrt{208 + \sqrt{289}}}}}$  is \_\_\_\_\_

- 1) 2                      2) 3                      3) 4                      4) 7

60. The value of  $\sqrt{42 + \sqrt{42 + \sqrt{42 + \dots}}}$  is \_\_\_\_\_

- 1) 3                      2) 4                      3) 6                      4) Greater than 6

61. The first term of an A.P. is  $a$  and the sum of the first  $p$  terms is zero, then the sum of its next  $q$  terms is.

- 1)  $\frac{-a(p+q)q}{p+1}$                       2)  $\frac{-a(p+q)}{p-1}$                       3)  $\frac{-a(p+q)q}{p-1}$                       4) None of these

62. If the 4<sup>th</sup>, 10<sup>th</sup>, 16<sup>th</sup> terms of a G.P are  $x, y, z$  respectively, then  $x, y, z$  are in

- 1) A.P                      2) G.P                      3) A.P and G.P                      4) None of these

63. If  $5a - b, 2a + b, a + 2b$  are in A.P and  $(a - 1)^2, (ab + 1), (b + 1)^2$  are in G.P,  $a \neq 0$ , then  $a$  is equal to

- 1)  $2, -\frac{1}{4}$                       2)  $-2, -\frac{1}{4}$                       3)  $-2, \frac{1}{4}$                       4)  $2, \frac{1}{4}$

64. If in an A.P.,  $S_n = qn^2$  and  $S_m = qm^2$ , where  $S_r$  denotes the sum of  $r$  terms of the AP, then  $S_q$  equals

- 1)  $\frac{q^3}{2}$                       2)  $mnq$                       3)  $q^3$                       4)  $(m+n)q^2$

65. If  $p$ th,  $q$ th and  $r$ th terms of an A.P and G.P are both  $a, b$  and  $c$ , respectively, then the value of  $a^{b-c} \cdot b^{c-a} \cdot c^{a-b} =$  \_\_\_\_\_.

- 1) 0                      2) 1                      3) -1                      4) 2

66.  $x^a = y^b = z^c = u^d$  and  $x, y, z, u$  are in G.P. then  $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$  are

- 1) In A.P.                      2) In G.P.                      3) Equal                      4) None of these

67. Suppose  $(m+n)^{th}$  term of a G.P is  $p$  and  $(m-n)^{th}$  term is  $q$ , then its  $n^{th}$  term is .....

- 1)  $\sqrt{pq}$                       2)  $p\left(\frac{q}{p}\right)^{\frac{m}{n}}$                       3)  $p\left(\frac{q}{p}\right)^{\frac{m}{2n}}$                       4)  $\sqrt{\frac{p}{q}}$

68.  $p, q, r, s, t$  are first five terms of an A.P. such that  $p + r + t = -12$  and  $p \cdot q \cdot r = 8$ . Find the first term of the above A.P.

- 1) 3                      2) 2                      3) 4                      4) None

69. The sum of positive terms of the series

$$27 + 26\frac{3}{8} + 25\frac{3}{4} + 25\frac{1}{8} + \dots \text{ is}$$

- 1)  $\frac{2387}{8}$                       2)  $\frac{4774}{4}$                       3)  $\frac{2387}{4}$                       4) None of these

70. The consecutive digits of a three digit number form a G.P. If we subtract 594 from this number, we get a number consisting of the same digits written in the reverse order and if we increase the second digit of the required number by 1, the resulting digits forms an A.P. The number is

- 1) 248                      2) 842                      3) 482                      4) None of these

71. If the  $p$ th and  $q$ th terms of a G.P. are  $q$  and  $p$  respectively, then its  $(p+q)$ th term is \_\_\_\_\_

- 1)  $\left(\frac{q}{p}\right)^{\frac{1}{p-q}}$                       2)  $q\left(\frac{p}{q}\right)^{\frac{p-1}{p-q}}$                       3)  $\left(\frac{q^p}{p^q}\right)^{\frac{1}{p-q}}$                       4) None of these

72. If  $x, 2y$  and  $3z$  are in A.P. where the distinct numbers  $x, y$  and  $z$  are in G.P., then the common ratio of the G.P. is

- 1) 3                      2)  $\frac{1}{3}$                       3) 2                      4)  $\frac{1}{2}$

73. A carpenter was hired to build 192 window frames. The first day he made five frames and each day, thereafter he made two more frames than he made the day before. How many days did it takes him to finish the job?  
1)14                      2)12                      3)15                      4)18
74. Let  $S_n$  denote the sum of the first  $n$  terms of an A.P. , if  $S_{2n} = 3S_n$ , then  $\frac{S_{3n}}{S_n}$  is equal to\_\_\_\_\_  
1)4                      2)6                      3)8                      4) 10
75. The sum of three numbers in G.P. is 56. If we subtract 1, 7, 21 from these numbers in that order, we obtain an A.P. The three numbers are  
1)8, 16, 32              2)10, 18, 26              3)9, 16, 23              4) None of these
76. The 16th common term between the series  $3 + 7 + 11 + \dots$  and  $1 + 6 + 11 + \dots$  is  
1)191                      2)211                      3)311                      4) none of these
77. If  $a^2(b+c), b^2(c+a), c^2(a+b)$  are in A.P, then  $2b - c$   
1) $a^2$                       2) $b$                       3) $b^2$                       4) $a$
78. If  $S_n$  denotes the sum of  $n$  terms of an A.P., then  $2S_{n+4} - 6S_{n+3} + 6S_{n+2} - 2S_{n+1} =$ \_\_\_\_\_  
1)2                      2)1                      3) $\frac{1}{2}$                       4)0
79. If  $\frac{1}{256}, x_1, x_2, x_3, 1$  are in GP then the value of  $x_1 + x_2 + x_3$  is  
1) $\frac{19}{64}$                       2) $\frac{23}{64}$                       3) $\frac{17}{64}$                       4) $\frac{21}{64}$
80. If  $S_n = nP + \frac{n}{2}(n-1)Q$ , where  $S_n$  denotes the sum of the first  $n$  terms of an A.P., then the common difference is  
1)  $P + Q$                       2) $2P + 3Q$                       3) $2Q$                       4) $Q$

THE NARAYANA GROUP

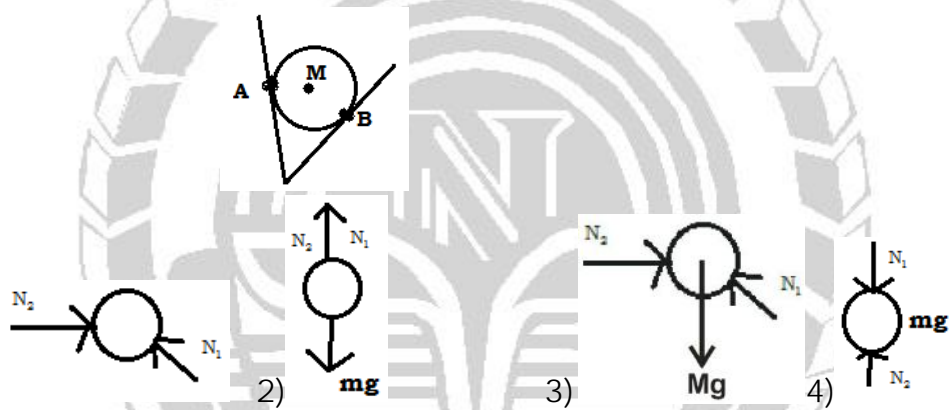


**PHYSICS**

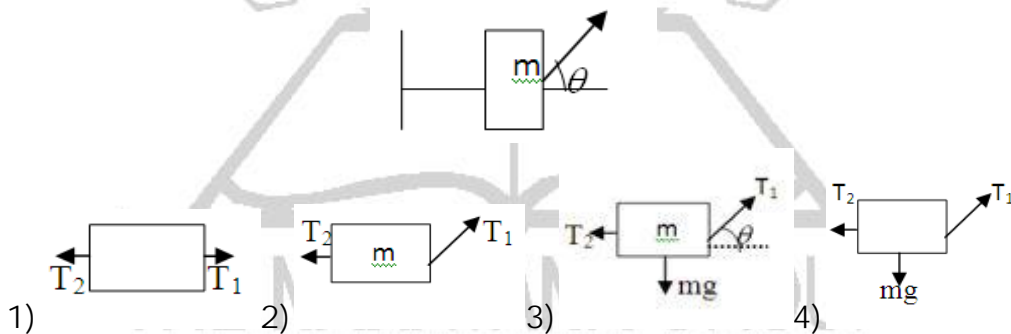
- A man and cart approach each other mass of the man is 64kg and his velocity is 5.4 kmph. Mass of the cart is 32kg and its velocity is 1.8 kmph. If the man jumps in to the cart the velocity of the cart becomes

1)3kmph            2)4.11 kmph            3)1.8kmph            4)5.4 kmph
- A body of mass "  $m_1$  " moves with a velocity of 40 m/s hits another body of mass "  $m_2$  " which is at rest. After the impact both the bodies move with common velocity of 30m/s. The ratio of their masses respectively is

1)1:3            2)2:1            3)3:1            4)9:1
- Free body diagram of sphere placed in between two planks is ( it is in contact at ( A & B )



- A block of mass 'm' is attached with two strings as shown in the figure FBD of the block is



- Two bodies A and B of masses 100gm and 400gm respectively are moving towards each other with speeds 100cm/s respectively. They suffer a head an collision and stick together. The distance travelled by the combined mass in 10seconds after the collision is

1)600 cm            2)120 cm            3)60 cm            4)12cm
- A gun of mass 10kg fires a bullet of 10g mass with a muzzle velocity of 200m/s. Recoil velocity of the gun is

1)0.1 m/s            2)0.2 m/s            3)0.4 m/s            4)0.8 m/s

7. A bag of sand of mass 'm' suspended by a rope. A bullet of mass  $\frac{m}{40}$  is fired at it with velocity 'V' and gets embedded in to it. The final velocity of the bag

- 1)  $\frac{V}{41}$                       2)  $\frac{1}{41}$                       3)  $\frac{1}{41V}$                       4)  $\frac{V}{410}$

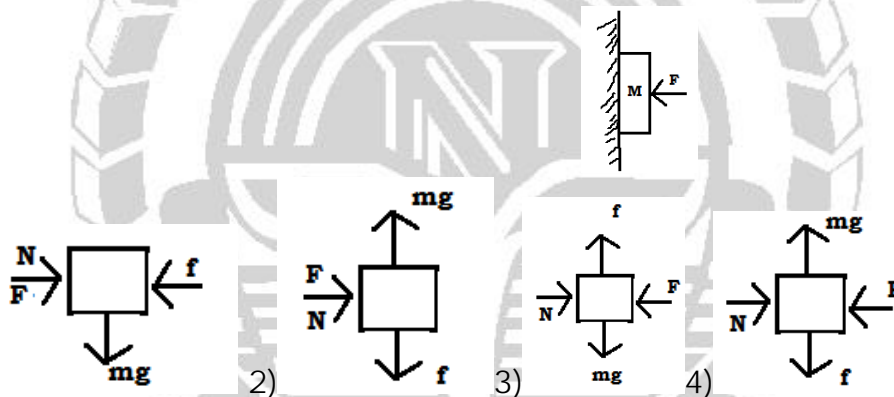
8. A hockey ball at rest is hit by a hockey stick, such that the force acts on the ball for 0.08sec. If the ball is of mass 100g and covers a distance of 80m in 1.6 sec, find the magnitude of force

- 1)62.5N                      2)56.5 N                      3)33.5N                      4)96.8N

9. A bullet of mass 30g, and moving with a velocity x hits a wooden target with a force of 187.5N.If the bullet penetrates 80cm, find the value of x?

- 1)200m/s                      2)100 m/s                      3)400 m/s                      4)300 m/s

10. Free body diagram of Hock pressing towards rough wall with a force F is



11. An object moving with a velocity of 6m/s on a surface comes to rest after travelling a distance of 16m. Then the coefficient of friction between the surface and the object is ( $g = 9.8\text{m/s}^2$ )

- 1)0.1158                      2)0.1148                      3)0.1198                      4)0.1167

12. Gymnastic and tennis shoes have rubber soles rather than leather because

- 1) Rubber sole is can be easily washed and cleaned  
2) Rubber sole is lighter than that of a leather  
3) Rubber gives a better appearance  
4) Rubber provides more friction than leather

13. A space craft of mass M is moving with velocity V in free space. When it explodes it breaks into two pieces. After explosion, a mass m is left stationary then velocity of the other part is

- 1)  $\frac{MV}{(M-m)}$                       2)  $\frac{(M+m)V}{M}$                       3)  $\frac{mV}{(M-m)}$                       4)  $\frac{mV}{(M+m)}$

14. A 6kg of mass collides with a body at rest. After collision they travel together with a velocity equal to one third of the velocity of 6kg mass. The mass of second body is

- 1)6kg                      2)3kg                      3)12kg                      4)18kg

15. A body of mass 6kg travelling with a velocity of 10m/s collides elastically with a body of mass 4kg travelling at a speed of 5m/s in opposite direction and comes to rest. Then velocity of the second body is
- 1)0                      2)6m/s                      3)8 m/s                      4)10m/s
16. A body of mass 20kg moving with a velocity of 20m/s collide with another body of mass 40kg moving in the same direction with a velocity of 10m/s. After collision, if they move together, their common velocity is,
- 1) $\frac{10}{3}$  m/s                      2) $\frac{20}{3}$  m/s                      3) $\frac{40}{3}$  m/s                      4) $\frac{50}{3}$  m/s
17. A block of mass 10 kg is on a rough horizontal surface. A horizontal force 4 N is applied on it. If coefficient of static friction between those two surface is 0.5, frictional force between the two surface in contact is
- 1)4 N                      2)49 N                      3)4.9 N                      4)20 N
18. Two masses  $M_A$  and  $M_B$  moving with velocities  $V_A$  and  $V_B$  in opposite direction collide elastically. After that the masses  $M_A$  and  $M_B$  moving with velocities  $V_B$  and  $V_A$  respectively. The ratio of  $M_A$  and  $M_B$  is
- 1)1                      2) $\frac{V_A}{V_B}$                       3) $\frac{M_A / M_B}{M_A}$                       4) $\frac{V_A - V_B}{V_A + V_B}$
19. Five bodies of masses  $m, 2m, 3m, 4m, 5m$  moving with velocities  $V, 2V, 3V, 4V, 5V$  in the same direction collide among themselves and stick together. Their common velocity is.
- 1) $\frac{11}{3}$  m/s                      2) $\frac{11V}{3}$  m/s                      3) $\frac{22V}{3}$  m/s                      4) $\frac{22}{3}$  m/s
20. A 5kg lump of clay moving with 10m/s to the left stricken a 6kg lump moving at 12m/s to the right after collision they stick together and move with a velocity
- 1)4m/s                      2)3m/s                      3)2.5 m/s                      4)2 m/s
21. A 1.0 kg ball is thrown up with a speed of 9.9 m/s. Calculate the work done by its weight in one second.
- 1)-56 J                      2)-49 J                      3)-35 J                      4)-59 J
22. Five 100-W bulbs are used for 10 hours every day for 30 days. Find the cost of electricity if the rate is Rs 4.00/- unit.
- 1)Rs 600                      2)Rs 700                      3)Rs 800                      4)Rs 900
23. A box is lifted from the floor and kept on the table. The work done on the box depends on
- 1)The path along which it is lifted                      2)Weight of the box  
3)Weight of the person lifting it                      4)Time taken to lift it

24. The average work done by a human heart while it beats once is 0.5 J. Calculate the power used by heart if it beats 72 time in a minute.
- 1)36 W                      2)70 W                      3)0.6 W                      4)None of these
25. An object of mass 2kg is raised through a height h. Its potential energy is increases by 0.5J. Height h is ( $g = 9.8 \text{ m/s}^2$ )
- 1)0.025m                      2)0.111m                      3)0.102m                      4)1.245 m
26. A person 'A' does 500J of work in 1 hour, person 'B' does 1000J of work in 80 min and another person 'C' does 700 J of work in 3600 sec. Let the power delivered by A is  $P_1$ , B is  $P_2$ , C is  $P_3$  respectively. Then
- 1) $P_1 = P_2 = P_3$                       2) $P_1 > P_2 > P_3$                       3) $P_2 > P_3 > P_1$                       4) $P_3 > P_1 > P_2$
27. Choose the correct statements from the following
- 1)Work done by a frictional force is always negative  
2)A body is at rest can have mechanical energy  
3)Mechanical energy of freely falling body decreases gradually  
4) Work done by gravitational force in moving a body is path dependent
28. Identify the correct statements from the following
- 1) A body can have energy without momentum, but It cannot have momentum without energy  
2) When a gun fires a bullet both gain momentum but in opposite direction  
3) The power developed by an electrical locomotive depends on the opposing forces acting on it  
4) All the above
29. A ball dropped from a height 6m strikes the ground and loses 40% of its energy. Then it rebounds from the ground with a velocity (nearly)
- 1)8.4 m/s                      2)3.6 m/s                      3)8.4ms<sup>-1</sup>                      4)Both(1) and (3)
30. Choose the correct statements
- 1) The body falling freely under the action of gravity has positive work done by the gravitational force  
2)When brakes are applied on a moving vehicle, work done by the braking force is negative  
3)Work done by the flying aeroplane is zero as the force and displacement are perpendicular to each other  
4)All the above
31. A shot travelling at the speed of 200ms<sup>-1</sup> is just able to pierce a plank 5 cm thick. The velocity required to pierce a small plank 20cm thick is
- 1)100ms<sup>-1</sup>                      2)300ms<sup>-1</sup>                      3)400ms<sup>-1</sup>                      4)800ms<sup>-1</sup>
32. The kinetic energy of a 500gm stones 100 J. Against a force of 50 N how long will it travel?
- 1)0.1s                      2)0.2s                      3)0.3s                      4)0.4s

33. The ratio of kinetic energies of two bodies is 2:1 and their momentum are in the ratio of 1:2. The ratio of their masses are in the ratio  
 1)1:4                      2)4:1                      3)1:8                      4)1:9
34. If the K.E of a body increases to  $x$  times. Then the linear momentum of the same body is  
 1)Momentum increases to  $2\sqrt{x}$  times  
 2)Momentum increases to  $\frac{\sqrt{x}}{2}$   
 3)Momentum increases to  $\sqrt{x}$  times  
 4)Momentum increases to  $\frac{\sqrt{x}}{4}$
35. Work energy theorem  
 1)Change in K.E                      2)Change in Linear momentum  
 3)Both 1 & 2                      4)None
36. For same momentum K.E is  
 1) $\propto \frac{l}{m}$                       2) $\propto \frac{l}{v}$                       3)1 & 2                      4)All the above
37. When we speak in front of a microphone, the \_\_\_\_\_ energy changes into electric energy  
 1)Light                      2)Sound                      3)Magnetic                      4)All the above
38. In electric dry cells or car batteries, the chemical energy changes into \_\_\_\_\_ energy.  
 1)Heat                      2)Light                      3)Electrical                      4)None
39. A stone is projected vertically up to reach a maximum height 'h'. The ratio of its kinetic energy to potential energy at a height  $\frac{4h}{5}$  will be  
 1)5:4                      2)4:5                      3)1:4                      4)4:1
40. A sphere of mass 4kg is dropped from a certain height. After 5s, its kinetic energy is ( $g = 10ms^{-2}$ )  
 1)5J                      2)50J                      3)5 KJ                      4)50 KJ
41. The P.E of a body at a height 'h' is mgh. When it falls to the ground its K.E becomes.  
 1)2 mgh                      2)Mgh/2                      3)Mgh                      4)None of these
42. Two bodies travelling with  $20ms^{-1}$  and  $40ms^{-1}$  have the same K.E. The ratio of their masses is  
 1)1:4                      2)4:1                      3)1:2                      4)2:1
43. A stone of mass 'm' is thrown vertically upwards with a velocity v. The K.E at the highest point is  
 1) $\frac{1}{2}mv^2$                       2)Zero                      3) $2\left(\frac{1}{2}mv^2\right)$                       4)2 mgh

44. A body of mass 2kg is thrown up vertically with kinetic energy of 490J. If  $g = 9.8m/s^2$ , the height at which the kinetic energy of the body becomes half of the original value, is  
 1)50m                      2)25m                      3)12.5m                      4)19.6m
45. For the same kinetic energy, the momentum shall be maximum for which of the following particle?  
 1)Electron                      2)Proton                      3)Deuteron                      4)Alpha particle
46. A bullet fired into a trunk of a tree loses 1/4 of its kinetic energy in travelling a distance of 5 cm. Before stopping it travels a further distance of  
 1)150 cm                      2)1.5 cm                      3)1.25                      4)15 cm
47. A cradle is 'h' meters above the ground at the lowest position and 'H' meters when it is at the highest point. If 'v' is the maximum speed of the swing of total mass 'm' the relation between 'h' and 'H' is  
 1) $\frac{1}{2}mv^2 + h + H$                       2) $(v^2 / 2g) + h = H$   
 3) $(v^2 / g) + 2h = H$                       4) $(v^2 / 2g) + H = h$
48. A bullet of mass 10 gm strikes a target at 400m/s velocity and loses half of its initial velocity. The loss of kinetic energy in joules is  
 1)800                      2)200                      3)400                      4)600
49. The work done to accelerate a body from  $30 ms^{-1}$  to  $60 ms^{-1}$  is three times the work done to accelerate it from  $10 ms^{-1}$  to 'v'. The value of 'v' in  $ms^{-1}$  is  
 1)30                      2) $20\sqrt{2}$                       3) $30\sqrt{2}$                       4) $10\sqrt{10}$
50. A ball of mass 'm' is thrown in air with speed  $v_1$  from a height  $h_1$  when its speed becomes  $v_2$ . Find the work done on the ball by air resistance.  
 1) $mg(h_2 - h_1) + \frac{1}{2}m(v_2^2 - v_1^2)$                       2) $mg(h_2 - h_1)$   
 3) $\frac{1}{2}m(v_2^2 - v_1^2)$                       4) $mg(h_2 - h_1) - \frac{1}{2}m(v_2^2 - v_1^2)$
51. A stone of mass  $\frac{1}{2}$  kg is whirled round the end of a piece of string in a horizontal circle of radius half a meter with a uniform speed of 1m/s. The tension in the string is  
 1) $25 \times 10^3$  dyne                      2) $10^5$  dyne                      3) $5 \times 10^3$  dyne                      4) $4 \times 10^5$  dyne
52. A belt passes over a wheel of radius 25cm. If a point on the belt has a speed of 5m/s. The belt is moving with an angular velocity of  
 1)3.2 rad/s                      2)0.32 rad/s                      3)20 rad/s                      4)30 rad/s
53. Water is lifted from a well of depth 50m. If mass of water is 20 kg and weight of the rope is 0.2kg and per metre, the amount of work done is  
 1)15250J                      2)12520J                      3)12250J                      4)125.20J

54. When a belt moves horizontally at a constant speed of 1.5 m/s, gravel is falling on it at  $5\text{kg s}^{-1}$ . Then the extra power needed to drive the belt is  
 1)  $7.5w$                       2)  $0.3w$                       3)  $37.5w$                       4)  $11.25w$
55. At a certain point the P.E and K.E of a body of mass 0.1 kg moving vertically up are 3.6 J and 6.2 J. It rises to a maximum height of  
 1) 0.1 m                      2) 1m                      3) 10m                      4) 100m
56. A body of mass 1kg dropped from a height of 20m. After 2s its P.E in joules  
 1) 3.92                      2) 392                      3) 39.2                      4) 3920
57. Dimensional formula of coefficient of friction  
 1)  $MLT^{-2}$                       2)  $MLT^{-1}$                       3)  $M^0L^0T^0$                       4)  $M^0L^1T^0$
58. Choose the correct statements.  
 1) The force of friction does not depend upon the area of the surface in contact.  
 2) Frictional force depends on nature of two surfaces in contact with each other  
 3) Static friction is a self adjusting force.  
 4) All the above
59. The K.E of a freely falling body  
 1) is directly proportional to height of its fall  
 2) is inversely proportional to height of its fall  
 3) is directly proportional to square of time of its fall  
 4) Both (1) & (3)
60. Nature of work done by gravitational force  
 1) may be negative                      2) may be positive  
 3) may be zero                      4) All of these
61. The relation between G and g  
 1)  $g = \frac{G}{R^2}$                       2)  $g = \frac{GM}{R^2}$                       3)  $g = \frac{gm}{r^2}$                       4)  $g = \frac{M^2}{R^2}$
62. According to Newton every object in this universe attracts every other object with a certain force called \_\_\_\_\_  
 1) Electrostatic force                      2) Magnetic Force  
 3) Gravitational force                      4) Nuclear force
63. The force of gravitation between the earth and the sun given that the mass of the earth =  $6 \times 10^{24}\text{kg}$  and of the sun =  $2 \times 10^{30}\text{kg}$  the distance between the two is  $14.96 \times 10^{10}$  ?  
 1)  $4.57 \times 10^{27}\text{N}$                       2)  $3.57 \times 10^{22}\text{N}$   
 3)  $2.57 \times 10^{22}\text{N}$                       4)  $3.57 \times 10^{27}\text{N}$
64. An object has mass of 50kg on earth then its mass on the moon is  
 1) 50kg                      2) 60kg                      3) 10kg                      4) 40kg
65. The value of g is \_\_\_\_\_ at the equator and \_\_\_\_\_ at the poles

- 1) Maximum, Minimum                      2) Maximum, Maximum  
3) Minimum, Minimum                      4) Minimum, Maximum
- 66. The value of acceleration due to gravity 'g' goes on \_\_\_\_\_ as we go above the surface of earth**  
1) Decreasing                                      2) Increasing  
3) Both 1 & 2                                      4) Neither 1 nor 2
- 67. Weight of 2kg mass on earth ( $g = 9.8\text{m/sec}^2$ )**  
1) 20 N                                      2) 9.8 N                                      3) 196 N                                      4) 19.6 N
- 68. Pressure exerted by liquid at depth h =**  
1)  $p = \frac{hg}{d}$                                       2)  $p = \frac{hd}{g}$                                       3)  $p = hdg$                                       4)  $p = hg$
- 69. In the relation  $F = \frac{GMm}{d^2}$ , the quantity G is**  
1) If of the same value irrespective of the place of observation  
2) Is used only when the earth is one of the two masses.  
3) Is the greatest on the surface of the earth  
4) Depends on the value of 'g' at the place of observation
- 70. An apple of mass 100g falls from a tree because of gravitational attraction between the earth and apple. If the magnitude of force exerted by the earth on the apple be  $F_1$  and the magnitude of earth exerted by the apple on the earth be  $F_2$  then**  
1)  $F_1 = F_2$                                       2)  $F_1 > F_2$                                       3)  $F_1 \neq F_2$                                       4) None of these
- 71. The instrument used to measure the atmospheric pressure is called**  
1) Thermometer                                      2) Barometer  
3) Manometer                                      4) None of these
- 72. Hydraulic press based on**  
1) Archemiedie's principle                      2) Byonce force  
3) Pascal's law                                      4) Newton's law
- 73. Mechanical advantage of Hydraulic press is given by**  
1)  $\frac{\text{(Radius of large piston)}}{\text{(Radius of smaller piston)}^2}$                       2)  $\frac{\text{Radius of smaller piston}}{\text{Radius of large piston}}$   
3)  $\frac{\text{(Radius of large piston)}^2}{\text{(Radius of smaller piston)}^2}$                       4)  $\frac{\text{(Radius of smaller piston)}^2}{\text{(Radius of larger piston)}}$
- 74. A metal cube is placed in an empty vessel. When water is filled in the vessel so that the cube is completely immersed in the water, the force on the bottom of the vessel in contact with the cube.**  
1) Will remain the same                      2) Will decrease  
3) Will increase                                      4) Will be zero
- 75. A force of 20N is applied on the area of cross section of cylinder  $5 \times 10^{-4}\text{m}^2$  then the pressure produced in the cylinder is**  
1) 40,000 N/m<sup>2</sup>    2) 20,000 N/m<sup>2</sup>    3) 10,000 N/m<sup>2</sup>    4) 50,000 N/m<sup>2</sup>



76. The Column of mercury in a barometer is 76cm Hg. Calculate the atmospheric pressure if the density of mercury =  $13600 \text{ kgm}^{-3}$   
(Take  $g = 10 \text{ ms}^{-2}$ )  
1)  $10.4 \times 10^7 \text{ Pa}$     2)  $1.03 \times 10^5 \text{ Pa}$     3)  $1.02 \times 10^{-7} \text{ Pa}$     4)  $2.45 \times 10^{-1} \text{ Pa}$
77. The pressure of a liquid of density  $1 \text{ g/cm}^3$  at a depth 2cm from the surface of liquid is (atmospheric pressure =  $1 \times 10^5 \text{ Pa}$  and  $g = 10 \text{ m/s}^2$ )  
1)  $1.002 \times 10^5 \text{ Pa}$     2)  $1.004 \times 10^5 \text{ Pa}$     3)  $1.002 \times 10^4 \text{ Pa}$     4)  $1.02 \times 10^5 \text{ Pa}$
78. What force will produce a pressure of 50,000pa on an area of  $0.20 \text{ m}^2$ ?  
1) 20,000 N    2) 10,000 N    3) 40,000 N    4) 30,000 N
79. If the atmospheric pressure ( $P_0$ ) acting on the free surface of liquid is also taken into account the total pressure in a liquid at a depth 'h' is  
1) Atmospheric pressure  $\times$  Pressure due to liquid column  
2) Atmospheric pressure + Pressure due to liquid column  
3) Atmospheric pressure  $\div$  Pressure due to liquid column  
4) Atmospheric pressure - Pressure due to liquid column
80. What will be the pressure in Pascal, due to a mercury column of - 76cm. density of mercury is  $13.6 \text{ g/cm}^3$ ,  $g = 980 \text{ cm/s}^2$ ?  
1)  $0.0129 \times 10^4 \text{ Pa}$     2)  $1.0129 \times 10^2 \text{ Pa}$   
3)  $1.0129 \times 10^5 \text{ Pa}$     4)  $1.0129 \times 10^3 \text{ Pa}$



THE NARAYANA GROUP

### CHEMISTRY

1. Which of the following salts does not contain water of crystallisation?

- 1) Blue vitriol      2) Baking soda      3) Washing soda      4) Gypsum
2. **Sodium carbonate is a basic salt because it is a salt of**
- 1) strong acid and strong base      2) weak acid and weak base  
3) strong acid and weak base      4) weak acid and strong base
3. **Which of the following phenomena occur, when a small amount of base is added to water?**
- (i) Ionisation      (ii) Neutralisation  
(iii) Dilution      (iv) Salt formation
- 1)(i) and (ii)      2)(i) and (iii)      3)(ii) and (iii)      4)(ii) and (iv)
4. **Which of the following is a correct statement?**
- 1) A substance formed by the neutralisation of an acid with a base is called salt  
2) A salt formed by the complete replacement of the hydrogen ions of an acid with metal ions is called normal salt.  
3) A salt formed by the partial replacement of ions of an acid from its molecule, with metal ions is called acid salt  
4) All of these
5. **Acid + Base → Salt + Water**  
 $A + 2NaOH \rightarrow Na_2SO_4 + B$
- 1)  $A \rightarrow NaCl, B \rightarrow H_2O$       2)  $A \rightarrow H_2SO_4, B \rightarrow 2H_2O$   
3)  $A \rightarrow HCl, B \rightarrow H_2O$       4)  $A \rightarrow 2H_2SO_4, B \rightarrow H_2O$
6. **The formula of Magnesium hydrogen sulphate is**
- 1)  $[Mg(HSO_4)_3]$       2)  $[Mg(HSO_2)_3]$       3)  $[Mg(HSO_4)_2]$       4)  $[Mg(HSO_3)_2]$
7. **Which of the following is normal salt?**
- 1)  $NaHSO_4$       2)  $NaHCO_3$       3)  $Na_2SO_4$       4)  $Na_2HSO_3$
8. **In potassium hydrogen sulphate and potassium hydrogen carbonate what is the common metal atom?**
- 1) potassium      2) hydrogen      3) sulphur      4) oxygen
9. **The chemical name of  $NaHSO_3$**
- 1) Sodium hydrogen sulphate      2) Sodium hydrogen sulphite  
3) Sodium bi sulphate      4) Sodium bi hydrogen sulphate
10. **Total no. of atoms present in lead sulphate.**
- 1) 4      2) 5      3) 6      4) 3
11.  $NaHSO_4 \xrightarrow{H_2O} Na^+ + X + SO_4^-$  **what is X**
- 1)  $OH^-$       2)  $H^+$       3)  $SO_4^{-3}$       4)  $SO_4^{-4}$
12. **Sodium hydrogen carbonate when added to acetic acid evolves a gas.**  
**Which of the following statements are true about the gas evolved?**

- (i) It turns lime water milky  
 (ii) It extinguishes a burning splinter  
 (iii) It dissolves in a solution of water  
 (iv) It has a pungent odour  
 1)(i) and (ii)      2)(i), (ii) and (iii)      3)(ii), (iii) and (iv) 4)(i) and (iv)
13. A farmer was unhappy because of his low crop yield. He discussed the problem with an agricultural scientist and realised that the soil of his field was either too acidic or too basic. What remedy would you suggest the farmer to neutralize the soil?  
 1) If the soil is too acidic, it is treated with bases such as quick lime (calcium oxide) or (calcium hydroxide).  
 2) If the soil is too basic, organic matter is added to it.  
 3) Organic matter releases acids  
 4) All of these
14.  $2X + CuO \rightarrow CuCl_2 + H_2O$ : Here 'X' is:  
 1)  $HNO_3$       2)  $HCl$       3)  $H_2SO_4$       4)  $H_3PO_4$
15. "The fixed number of water molecules which are in loose combination with one molecule of salt is called"  
 1) Basic salt      2) Hydrated salt  
 3) Water of crystallization      4) Anhydrous salt
16. Identify the correct name of the compound with the formula?  
 1) Sodium carbonate=  $Na_2SO_4$       2) Sodium sulphate=  $Na_2CO_3$   
 3) Sodium hydroxide=  $Na_2SO_4$       4) Sodium sulphate=  $Na_2SO_4$
17. Which of the following is not a basic Salt?  
 1)  $Zn(OH)Cl$       2)  $Cu(OH)Cl$       3)  $CuSO_4 \cdot 7H_2O$       4) Both 1 and 2
18. A salt formed by the partial neutralisation of hydroxyl ions ( $OH^-$ ) of a base by an acid is called:  
 By using above statement identify the example:  
 1)  $NaHSO_4$       2)  $Mg(HCO_3)_2$       3)  $Cu(OH)Cl$       4)  $[Mg(HSO_3)_2]$
19. Green coloured hydrated salt is  
 1)  $MgSO_4 \cdot 7H_2O$       2)  $ZnSO_4 \cdot 7H_2O$       3)  $CuSO_4 \cdot 5H_2O$       4)  $FeSO_4 \cdot 7H_2O$
20. Which of the following statement is true for sodium hydroxide react with sulphuric acid :  
 1) To form sodium sulphate with Hydrogen gas  
 2) To form sodium sulphate with water  
 3) To form Copper chloride with water  
 4) To form Copper carbonate with hydrogen
21. Formula of potash alum is  
 1)  $K_2SO_4 \cdot Al_2(SO_4)_2 \cdot 26H_2O$       2)  $K_2SO_3 \cdot Al_2(SO_4)_3 \cdot 24H_2O$   
 3)  $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 23H_2O$       4)  $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$

22. **The chemical formula of smelling salt is**  
 1)  $(\text{NH}_4)_2\text{SO}_4$       2)  $(\text{NH}_4)_2\text{CO}_3$       3)  $\text{NH}_4\text{OH}$       4)  $\text{NH}_4\text{Cl}$
23. **Maharshi Kanad views about the matter is\_\_\_\_\_**  
 1) Matter is made up of tiny particles paramanus  
 2) Matter is not continuous  
 3) Atoms of same elements are not alike is all aspects  
 4) Both 1 and 2
24. **Which of the following is correct regarding atom**  
 1) Atoms are indivisible cannot be further broken down  
 2) The atoms of an elements are alike is all respects  
 3) Atoms can be neither be created nor be destroyed in a chemical reaction  
 4) All of these
25. **Trivial name of calcium carbonate is**  
 1) Lime stone      2) Chalk      3) Baking soda      4) Both(1) and (2)
26. **Plaster of paris is \_\_\_\_\_**  
 1) Hydrated calcium sulphate      2)  $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$   
 3) used for making statues      4) All the above
27. **According to Dalton, atoms combine in small whole number to form**  
 1) Compound atoms      2) Molecules  
 3) Isotopes      4) None
28. **Hydrated ferrous sulphate is \_\_\_\_\_**  
 1)  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$       2) Used in curing leathers  
 3) Green vitriol      4) All of these
29. **Chile salt peter is used in the preparation of**  
 1) Nitric acid      2) Gunpowder      3) Dyes      4) Both 1 and 2
30. **The first atomic theory was proposed by \_\_\_\_\_ electrons**  
 1) Democritus      2) John Dalton  
 3) William crookes      4) J.J.Thomson
31. **If ' $S_1$ ' be the specific charge of cathode rays and ' $S_2$ ' be that of positive rays then which is true?**  
 1)  $S_1 = S_2$       2)  $S_1 < S_2$       3)  $S_1 > S_2$       4) either of these
32. **The first atomic model was given by**  
 1) Neils Bohr      2) John Dalton      3) Rutherford      4) J.J.Thomson
33. **The increasing order of specific charge of an electron (e), proton(p), alpha particle ( $\alpha$ ) and neutron (n) is**  
 1) e, p, n,  $\alpha$       2) n, p, e,  $\alpha$       3) n,  $\alpha$ , p, e      4) n, p,  $\alpha$ , e
34. **The massive particle among the following is**  
 1)  $\alpha$  – particle      2) deuteron      3) proton      4)  $\beta$  – particle
35. **Mass of proton in amu:**  
 1)  $1.67 \times 10^{-24}$       2) 0.0005      3) 1.007      4) All



51. When aluminium chloride react with sulphuric acid to form  
1)  $Al_2(SO_3)_3$       2)  $Al_2(SO_2)_3$       3)  $Al_3(SO_4)_2$       4)  $Al_2(SO_4)_3$
52. In Rutherford's  $\alpha$ -ray scattering experiment, which of the following does happen?  
1) A few  $\alpha$ -Particles are deflected back  
2) Most of the  $\alpha$ -rays passed through without deflection  
3)  $\alpha$ -Particles going near the nucleus are slightly deflected  
4) All of these
53. Calamine Solution is applied on the skin when an ant bites why?  
1) The sting of an ant contains formic acid  
2) To remedy to the which causes irritation on the skin  
3) Calamine solution contain zinc Carbonate which is a base and this solution neutralizes effect of acid  
4) All of the above
54. The formulae of potash alum \_\_\_\_\_  
1)  $NaAl(SO_4)_2$       2)  $Mg Al(SO_4)_2$       3)  $KAl(SO_4)_2 \cdot 12H_2O$       4)  $Alk(SO_4)_2$
55. When  $\alpha$ -Particle are sent through a thin metal foil, most of them so straight through the foil because  
1)  $\alpha$ -Particles are much heavier than electrons  
2)  $\alpha$ -Particles are positively charged  
3) Most part of the atom is empty space  
4)  $\alpha$ -Particle move with high velocity
56. The salts with certain fixed number of water molecule are called  
1) Water of Crystallization      2) Hydrated salt  
3) An hydrated salt      4) Both 1 and 2
57. The chemical formula of sodium carbonate  
1)  $NaCl$       2)  $NaHCO_3 \cdot 10H_2O$       3)  $Na_2CO_3 \cdot 10H_2O$       4)  $NaCO_3 \cdot 10H_2O$
58. Which statement(s) about cathode rays is/are correct  
1) They can effect photographic plate  
2) They produce fluorescent discharge through the walls of the tube  
3) They produce heating effect  
4) All of these
59. Which of the following statement(s) is/are correct ?  
1) A photon is a particle of light energy  
2) A photon is a quantum of light  
3) A photon is a bundle of energy of definite magnitude but necessarily light energy  
4) Both (1) and (2)
60. Which of the following points are related to modern atomic theory?  
1) Atoms is the smallest unit of matter which takes part in a unit of matter.  
2) All atoms have isotopes

- 3) The molecules of proteins are highly complex because atoms in organic compounds do not combine in small whole number ratio  
4) All of these
- 61. Which of the following are not isotones?**  
1)  ${}^9F^{19}, {}^{11}Na^{23}$       2)  ${}^8O^{18}, {}^7N^{17}$       3)  ${}^7N^{17}, {}^9F^{19}$       4)  ${}^8O^{18}, {}^9F^{19}$
- 62. Which of the following are isodiaphers?**  
1)  ${}^9F^{19}, {}^{11}Na^{23}$       2)  ${}^6C^{14}, {}^8O^{18}$       3)  ${}^7N^{14}, {}^8O^{16}$       4) All of these
- 63. Which of the following are true?**  
1) Atoms of different elements which contain same no. of  $A-Z$  are isodiaphers.  
2) Electronic Configuration of Carbon is 2, 2  
3)  ${}^8O^{16}, {}^8O^{17}, {}^8O^{18}$  are isotones  
4) both 2 & 3
- 64. The ratio of energy of a photon of  $2000 \text{ \AA}$  wave length radiation to that of  $4000 \text{ \AA}$  radiation are**  
1)  $1/4$       2)  $1/2$       3) 2      4) 4
- 65. The ratio of specific charge (e/m) of a proton to that of  $\alpha$  - particle is \_\_\_\_\_**  
1) 1: 4      2) 1: 2      3) 1:  $1/4$       4) 1:  $1/2$
- 66. Nuclides have**  
1) Same number of protons  
2) have specific atomic number  
3) have specific atomic number and mass number  
4) are isotopes
- 67. An element contains**  
1) Only one type of nuclide      2) Two types of nuclides  
3) Different types of nuclides      4) None
- 68. Which of the following is /are isotones of  ${}^{30}_{14}Si$  ?**  
1)  ${}^{31}_{15}P$       2)  ${}^{32}_{16}S$       3)  ${}^{35}_{15}Cl$       4) both 1 & 2
- 69. Rutherford Observed that:**  
1) 50% of  $\alpha$  - particles got deflected  
2) 99% of  $\alpha$  - particles got deflected  
3) 99% of  $\alpha$  - particles went straight without suffering any deflection  
4) Nucleus is negatively charged
- 70. What is the number of protons and neutrons of  $N^{3-}$**   
1) 7, 7      2) 6, 7      3) 8, 7      4) 6, 6
- 71. The pair isotopes among the following**  
a)  ${}^{232}_{90}Th$       b)  ${}^{238}_{92}U$       c)  ${}^{235}_{92}U$       d)  ${}^{234}_{92}U$   
1) b, c, d      2) d, c, a      3) a, d, b      4) a, b, c

72. Oxygen has three isotopes  ${}_8O^{16}$ ,  ${}_8O^{17}$ ,  ${}_8O^{18}$  and carbon has two isotopes  ${}_6C^{12}$ ,  ${}_6C^{13}$ . Then how many  $CO_2$  molecules are possible from these isotopes?  
1) 10                      2) 11                      3) 12                      4) 13
73. What is the relation between energy and wave length?  
1)  $E \propto \lambda$               2)  $E = 2\lambda$               3)  $E = \lambda$               4)  $E \propto \frac{1}{\lambda}$
74. The ratio of specific charge (e/m) of an electron to that of a hydrogen ion is  
1) 1:1                      2) 1840 : 1              3) 1: 1840              4) 2 : 1
75. Deflection back of a few particles on hitting thin foil of gold shows that;  
1) Nucleus is heavy and small  
2) Electrons create hindrance in movement of particles.  
3) Nucleus is large  
4) Revolving nature of electrons around nucleus.
76. Mass of an electron in a.m.u is \_\_\_\_\_  
1)  $5.4 \times 10^{-8}$               2)  $5.4 \times 10^{-4}$               3)  $5.4 \times 10^{-3}$               4)  $9.1 \times 10^{-31}$  kg
77.  $Li^{2+}$ ,  $Be^{3+}$  are  
1) isotopes              2) isomers              3) isobars              4) isoelectronic
78. The triad of nuclei that represents isotones;  
1)  ${}_6C^{12}$ ,  ${}_7N^{14}$ ,  ${}_9F^{19}$     2)  ${}_6C^{14}$ ,  ${}_7N^{15}$ ,  ${}_9F^{17}$     3)  ${}_6C^{14}$ ,  ${}_7N^{14}$ ,  ${}_9F^{17}$     4)  ${}_6C^{14}$ ,  ${}_7N^{14}$ ,  ${}_9F^{19}$
79. In an atom with atomic number 29, mass number 59; the number of electrons is \_\_\_\_  
1) 29                      2) 30                      3) 40                      5) 59
80. The nucleus of tritium consists of;  
1) 1 proton + 1 neutron              2) 1 proton + 3 neutrons  
3) 1 proton + no neutrons              4) 1 proton + 2 neutrons



VII_SHP_Maths_E-4 & E5_KEY										
Q.NO.	1	2	3	4	5	6	7	8	9	10
KEY	2	1	2	2	3	4	1	4	4	1
Q.NO.	11	12	13	14	15	16	17	18	19	20
KEY	4	3	1	4	4	4	3	3	2	4
Q.NO.	21	22	23	24	25	26	27	28	29	30
KEY	3	3	2	4	4	4	4	2	3	2
Q.NO.	31	32	33	34	35	36	37	38	39	40
KEY	4	3	2	2	2	4	4	3	4	2
Q.NO.	41	42	43	44	45	46	47	48	49	50
KEY	3	4	4	2	2	3	3	3	2	3
Q.NO.	51	52	53	54	55	56	57	58	59	60
KEY	2	4	1	3	1	3	4	2	4	4
Q.NO.	61	62	63	64	65	66	67	68	69	70
KEY	3	2	3	3	2	1	3	2	3	2
Q.NO.	71	72	73	74	75	76	77	78	79	80
KEY	3	2	2	2	1	3	4	4	4	4

VII_SHP_PHYSICS_E-4 & E5_KEY										
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Q.NO.	21	22	23	24	25	26	27	28	29	30
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Q.NO.	31	32	33	34	35	36	37	38	39	40
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Q.NO.	41	42	43	44	45	46	47	48	49	50
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Q.NO.	51	52	53	54	55	56	57	58	59	60
KEY	2	3	3	4	3	1	3	4	4	4
Q.NO.	61	62	63	64	65	66	67	68	69	70
KEY	2	3	2	1	4	1	4	3	1	1
Q.NO.	71	72	73	74	75	76	77	78	79	80
KEY	2	3	3	1	1	2	1	2	2	3

VII_SHP_CHEMISTRY_E-4 to E5_KEY										
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Q.NO.	31	32	33	34	35	36	37	38	39	40
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Q.NO.	41	42	43	44	45	46	47	48	49	50
KEY	2	2	4	3	3	4	1	4	1	1
Q.NO.	51	52	53	54	55	56	57	58	59	60
KEY	4	4	4	3	3	2	3	4	4	4
Q.NO.	61	62	63	64	65	66	67	68	69	70
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Q.NO.	71	72	73	74	75	76	77	78	79	80
KEY	1	3	4	2	1	2	4	2	1	4

