

# UNIVERSITY OF LUCKNOW

## UNDERGRADUATE ENTRANCE TEST (UGET) - B.Sc. (MATHEMATICS) 2026

लखनऊ विश्वविद्यालय - स्नातक प्रवेश परीक्षा - बी.एस-सी. (गणित) 2026

**MODEL PAPER - SET 6 / प्रतिदर्श प्रश्नपत्र - सेट 6**

*General Instructions: All questions are compulsory. Each question carries 2 marks. Only one option is correct.*  
सामान्य निर्देश: सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न 2 अंक का है। केवल एक विकल्प सही है।

### SECTION A - MATHEMATICS / खण्ड A - गणित

1. Euler function tends to  $\infty$  in which condition follows?

Euler function tends to  $\infty$  in which condition follows?

- (1)  $n$  tends to a positive limit /  $n$  tends to a positive limit
- (2)  $n$  tends to zero /  $n$  tends to zero
- (3)  $n$  tends to  $\infty$  /  $n$  tends to  $\infty$
- (4)  $n$  tends to a negative limit /  $n$  tends to a negative limit

**Correct Answer / सही उत्तर : (3)  $n$  tends to  $\infty$  /  $n$  tends to  $\infty$**

**Solution / हल :** Correct option:  $n$  tends to  $\infty$  | सही विकल्प:  $n$  tends to  $\infty$

2.  $y =$  is the reflection of  $y = \log x$  in the line  $10$  whose equation is ?

$y =$  is the reflection of  $y = \log x$  in the line  $10$  whose equation is ?

- (1)  $y = x x$  /  $y = x x$
- (2)  $y = 10x$  /  $y = 10x$
- (3)  $y = 10 \log x$  /  $y = 10 \log x$
- (4)  $y = x + 10$  /  $y = x + 10$

**Correct Answer / सही उत्तर : (1)  $y = x x$  /  $y = x x$**

**Solution / हल :** Correct option:  $y = x x$  | सही विकल्प:  $y = x x$

3. The diagonal of a rectangular plot is 60 m more than the shorter side 'b'. If the longer side 'a' is 30 m more than the shorter side, then the size 'a' ?

The diagonal of a rectangular plot is 60 m more than the shorter side 'b'. If the longer side 'a' is 30 m more than the shorter side, then the size 'a' ?

- (1) 180 m / 180 m
- (2) 90 m / 90 मी
- (3) 60 m / 60 m
- (4) 120 m / 120 मी

**Correct Answer / सही उत्तर : (4) 120 m / 120 मी**

**Solution / हल :** Correct option: 120 m | सही विकल्प: 120 मी

4. Find the radius of convergence for the power ?

Find the radius of convergence for the power ?

- (1)  $3! / 3 : 1$
- (2)  $(2x+a) / (2x+a)$
- (3)  $3 |x+1| / 3 |x+1|$
- (4)  $7 < |3x| / 7 < |3x|$

**Correct Answer / सही उत्तर : (4)  $7 < |3x| / 7 < |3x|$**

**Solution / हल :** Correct option:  $7 < |3x|$  | सही विकल्प:  $7 < |3x|$

5. Consider the following series  $\langle + \rangle$ , and check whether the series is uniformly convergent on  $[0, 1]$ ?

Consider the following series  $\langle + \rangle$ , and check whether the series is uniformly convergent on  $[0, 1]$ ?

- (1) it is uniformly continuous on  $[0, 1]$   $n2x$  / it is uniformly continuous on  $[0, 1]$   $n2x$
- (2) it is uniformly continuous on  $(0, 1)$  / it is uniformly continuous on  $(0, 1)$

(3) none of the above options hold / none of the above options hold

(4) it is not uniformly continuous on  $[0, 1]$  / it is not uniformly continuous on  $[0, 1]$

**Correct Answer / सही उत्तर : (4) it is not uniformly continuous on  $[0, 1]$  / it is not uniformly continuous on  $[0, 1]$**

**Solution / हल :** Correct option: it is not uniformly continuous on  $[0, 1]$  | सही विकल्प: it is not uniformly continuous on  $[0, 1]$

6. Let  $f$  be a sequence of bounded function and series given by  $f$  is uniformly continuous to some function say  $g$ , then \_\_\_\_\_ ?

Let  $f$  be a sequence of bounded function and series given by  $f$  is uniformly continuous to some function say  $g$ , then \_\_\_\_\_ ?

(1)  $g$  is infinite /  $g$  is infinite

(2)  $g$  is bounded /  $g$  is bounded

(3)  $g$  is unbounded /  $g$  is unbounded

(4)  $g$  occurs virtually to follow 1 /  $g$  occurs virtually to follow 1

**Correct Answer / सही उत्तर : (2)  $g$  is bounded /  $g$  is bounded**

**Solution / हल :** Correct option:  $g$  is bounded | सही विकल्प:  $g$  is bounded

7. For any positive integers 'a' and 3, there exist unique 'q' and 'r' such that  $a = 3q + r$ , where r must satisfy ?

For any positive integers 'a' and 3, there exist unique 'q' and 'r' such that  $a = 3q + r$ , where r must satisfy ?

(1) 0 / 0

(2)  $1 < r < 3$  /  $1 < r < 3$

(3)  $0 < r$  /  $0 < r$

(4)  $0 < r < 3$  /  $0 < r < 3$

**Correct Answer / सही उत्तर : (1) 0 / 0**

**Solution / हल :** Correct option: 0 | सही विकल्प: 0

8. The number of real solutions of the equation  $x^2 + 9 + 4 + x = 5$  is ?

The number of real solutions of the equation  $x^2 + 9 + 4 + x = 5$  is ?

(1) 0 / 0

(2) 2 / 2 : 1

(3) 1 / 1 : 1

(4) 3 / 3 : 1

**Correct Answer / सही उत्तर : (3) 1 / 1 : 1**

**Solution / हल :** Correct option: 1 | सही विकल्प: 1 : 1

9. The limit points of  $\langle 1, 0, 2, 1, 0, 2, 1, 0, 2, \dots \rangle$  is ?

The limit points of  $\langle 1, 0, 2, 1, 0, 2, 1, 0, 2, \dots \rangle$  is ?

(1) 1, 0, 2 / 1, 0, 2

(2) 2 only / 2 only

(3) 1 only / 1 only

(4) 0 only / 0 only

**Correct Answer / सही उत्तर : (1) 1, 0, 2 / 1, 0, 2**

**Solution / हल :** Correct option: 1, 0, 2 | सही विकल्प: 1, 0, 2

10. If  $f(x) = \begin{cases} 1 & x \neq 0 \\ 21 & x = 0 \end{cases}$  then at  $x = 0$  the function is:  $1 + 21$  ?

If  $f(x) = \begin{cases} 1 & x \neq 0 \\ 21 & x = 0 \end{cases}$  then at  $x = 0$  the function is:  $1 + 21$  ?

(1) Discontinuous because  $\lim_{x \rightarrow 0} f(x) \neq f(0)$  / Discontinuous because  $\lim_{x \rightarrow 0} f(x) \neq f(0)$

(2) Discontinuous because  $\lim_{x \rightarrow 0} f(x)$  does not exist / Discontinuous because  $\lim_{x \rightarrow 0} f(x)$  does not exist

(3) Discontinuous because  $\lim_{x \rightarrow 0} f(x) \neq f(0)$  / Discontinuous because  $\lim_{x \rightarrow 0} f(x) \neq f(0)$

(4) Continuous / संतत (Continuous)

**Correct Answer / सही उत्तर : (3) Discontinuous because  $\lim_{x \rightarrow 0} f(x) \neq f(0)$  / Discontinuous because  $\lim_{x \rightarrow 0} f(x) \neq f(0)$**

**Solution / हल :** Correct option: Discontinuous because  $\lim_{x \rightarrow 0} f(x)$  | **सही विकल्प:** Discontinuous because  $\lim_{x \rightarrow 0} f(x)$

**11.** For any complex number  $z$ , the minimum value of  $|z| + |z|$  ?

For any complex number  $z$ , the minimum value of  $|z| + |z|$  ?

- (1) 2 / 2 : 1
- (2) 1 / 1 : 1
- (3) 3 / 3 : 1
- (4) 0 / 0

**Correct Answer / सही उत्तर : (1) 2 / 2 : 1**

**Solution / हल :** Correct option: 2 | **सही विकल्प:** 2 : 1

**12.** Let  $P(n) : n(n + 1)(n + 2)$  is divisible by 12. Then which of the following is true?

Let  $P(n) : n(n + 1)(n + 2)$  is divisible by 12. Then which of the following is true?

- (1)  $P(1) / P(1)$
- (2)  $P(5) / P(5)$
- (3)  $P(9) / P(9)$
- (4)  $P(4) / P(4)$

**Correct Answer / सही उत्तर : (4)  $P(4) / P(4)$**

**Solution / हल :** Correct option:  $P(4)$  | **सही विकल्प:**  $P(4)$

**13.** Which rule is used to calculate limits when the function reaches to indeterminate forms?

Which rule is used to calculate limits when the function reaches to indeterminate forms?

- (1) Leibnitz rule / Leibnitz rule
- (2) Cinco rule / Cinco rule
- (3) C and D rule / C and D rule
- (4) L' Hospital's rule / L' Hospital's rule

**Correct Answer / सही उत्तर : (4) L' Hospital's rule / L' Hospital's rule**

**Solution / हल :** Correct option: L' Hospital's rule | **सही विकल्प:** L' Hospital's rule

**14.** Given set  $A = \{2, 3, 4, 5\}$  and set  $B = \{11, 12, 13, 14, 15\}$ . Two numbers randomly selected are from each set What is probability that the sum of the numbers equal 16?

Given set  $A = \{2, 3, 4, 5\}$  and set  $B = \{11, 12, 13, 14, 15\}$ . Two numbers randomly selected are from each set What is probability that the sum of the numbers equal 16?

- (1) 0.35 / 0.35
- (2) 0.3 / 0.3
- (3) 0.2 / 0.2
- (4) 0.25 / 0.25

**Correct Answer / सही उत्तर : (3) 0.2 / 0.2**

**Solution / हल :** Correct option: 0.2 | **सही विकल्प:** 0.2

**15.**  $y=5$  and if  $2^x = 5$  then  $x + 2^x$  ?

$y=5$  and if  $2^x = 5$  then  $x + 2^x$  ?

- (1) 2 / 2 : 1
- (2) 1 / 1 : 1
- (3) 4 / 4 : 1
- (4) 3 / 3 : 1

**Correct Answer / सही उत्तर : (2) 1 / 1 : 1**

**Solution / हल :** Correct option: 1 | **सही विकल्प:** 1 : 1

**16.** When 22000 is divided by 17, then the remainder is ?

When 22000 is divided by 17, then the remainder is ?

- (1) 2 / 2 : 1
- (2) 5 / 5

(3) 9 / 9%

(4) 1 / 1 : 1

**Correct Answer / सही उत्तर : (4) 1 / 1 : 1**

Solution / हल : Correct option: 1 | सही विकल्प: 1 : 1

17. For a set of circles in a plane, the relation 'concentric' is a ?

For a set of circles in a plane, the relation 'concentric' is a ?

(1) equivalence relation / equivalence relation

(2) not transitive / not transitive

(3) symmetric only / symmetric only

(4) reflexive only / reflexive only

**Correct Answer / सही उत्तर : (1) equivalence relation / equivalence relation**

Solution / हल : Correct option: equivalence relation | सही विकल्प: equivalence relation

18. Section : Discipline-3 41. How many numbers must be selected form the set {1, 2, 3, 4, 5, 6} to guarantee that at least one pair of these numbers add up to 7?

Section : Discipline-3 41. How many numbers must be selected form the set {1, 2, 3, 4, 5, 6} to guarantee that at least one pair of these numbers add up to 7?

(1) 3 / 3 : 1

(2) 2 / 2 : 1

(3) 4 / 4 : 1

(4) 5 / 5

**Correct Answer / सही उत्तर : (3) 4 / 4 : 1**

Solution / हल : Correct option: 4 | सही विकल्प: 4 : 1

19. The sum of the length, breadth and depth of a cuboid is 19cm and its diagonal is 5 5cm. Its surface area is  $\text{cm}^2$   $\text{cm}^2$  ?

The sum of the length, breadth and depth of a cuboid is 19cm and its diagonal is 5 5cm. Its surface area is  $\text{cm}^2$   $\text{cm}^2$  ?

(1) 275 / 275

(2) 250  $\text{cm}^2$   $\text{cm}^2$  / 250  $\text{cm}^2$   $\text{cm}^2$

(3) 236 / 236

(4) 361 / 361

**Correct Answer / सही उत्तर : (3) 236 / 236**

Solution / हल : Correct option: 236 | सही विकल्प: 236

20. If the point P(x, y) is equidistant from the points A (a + b, b) ?

If the point P(x, y) is equidistant from the points A (a + b, b) ?

(1)  $ax = by$  /  $ax = by$

(2)  $bx = ay$  /  $bx = ay$

(3)  $x = ay$  /  $x = ay$

(4)  $y = bx$  /  $y = bx$

**Correct Answer / सही उत्तर : (2)  $bx = ay$  /  $bx = ay$**

Solution / हल : Correct option:  $bx = ay$  | सही विकल्प:  $bx = ay$

21. How many 3-Sylow subgroup are there in the group of order 15?

How many 3-Sylow subgroup are there in the group of order 15?

(1) 5 / 5

(2) 0 / 0

(3) 1 / 1 : 1

(4) 3 / 3 : 1

**Correct Answer / सही उत्तर : (3) 1 / 1 : 1**

Solution / हल : Correct option: 1 | सही विकल्प: 1 : 1

22. In the equation  $f(x) = 2x^2 + 3x + 5$  the value of  $x$  changes from 2 to 2.02 then the expectation will increase and decrease respectively meceerke ?

In the equation  $f(x) = 2x^2 + 3x + 5$  the value of  $x$  changes from 2 to 2.02 then the expectation will increase and decrease respectively meceerke ?

- (1) 0.2204 and 0.22 / 0.2204 and 0.22
- (2) 0.2204 and 0.24 / 0.2204 and 0.24
- (3) 0.2208 and 0.24  $2x^2 + 3x + 5$  / 0.2208 and 0.24  $2x^2 + 3x + 5$
- (4) 0.2208 and 0.22 / 0.2208 and 0.22

**Correct Answer / सही उत्तर : (4) 0.2208 and 0.22 / 0.2208 and 0.22**

Solution / हल : Correct option: 0.2208 and 0.22 | सही विकल्प: 0.2208 and 0.22

23. The relation between mean deviation (M.D.) and standard deviation (S.D) is ?

The relation between mean deviation (M.D.) and standard deviation (S.D) is ?

- (1) 4 M.D. = 3S.D / 4 M.D. = 3S.D
- (2) 4 M.D. = 5S.D / 4 M.D. = 5S.D
- (3) 5M.D. = 4 S.D / 5M.D. = 4 S.D
- (4) 3M.D. = 4S.D / 3M.D. = 4S.D

**Correct Answer / सही उत्तर : (3) 5M.D. = 4 S.D / 5M.D. = 4 S.D**

Solution / हल : Correct option: 5M.D. = 4 S.D | सही विकल्प: 5M.D. = 4 S.D

24. Find the limit of  $\sin(y)$  ?

Find the limit of  $\sin(y)$  ?

- (1) 1 / 1 : 1
- (2) doesn't exist / doesn't exist
- (3) infinite / infinite
- (4) 0 / 0

**Correct Answer / सही उत्तर : (2) doesn't exist / doesn't exist**

Solution / हल : Correct option: doesn't exist | सही विकल्प: doesn't exist

25. If  $Z$  is a complex number then minimum value of  $|Z| + |Z|$  ?

If  $Z$  is a complex number then minimum value of  $|Z| + |Z|$  ?

- (1) 1 / 1 : 1
- (2) none of these / इनमें कोई नहीं
- (3) 0 / 0
- (4) 2 / 2 : 1

**Correct Answer / सही उत्तर : (1) 1 / 1 : 1**

Solution / हल : Correct option: 1 | सही विकल्प: 1 : 1

26. What are the names numbers  $U(p, f)$  and  $L(p, f)$ ?

What are the names numbers  $U(p, f)$  and  $L(p, f)$ ?

- (1) Upper and lower Riemann integrals / Upper and lower Riemann integrals
- (2) Upper and lower Reimann sums / Upper and lower Reimann sums
- (3) Supremum and infimum / Supremum and infimum
- (4) Upper and lower bound / Upper and lower bound

**Correct Answer / सही उत्तर : (2) Upper and lower Reimann sums / Upper and lower Reimann sums**

Solution / हल : Correct option: Upper and lower Reimann sums | सही विकल्प: Upper and lower Reimann sums

27. The rate at which the radius of a sphere 1 changes over time is . When the radius is 5 2 ?

The rate at which the radius of a sphere 1 changes over time is . When the radius is 5 2 ?

- (1)  $15 \text{ cm}^2$  /  $15 \text{ cm}^2$
- (2)  $5 \text{ dr } 1$  /  $5 \text{ dr } 1$
- (3)  $20 \text{ cm}^2$  /  $20 \text{ cm}^2$
- (4) 10 / 1, 0

**Correct Answer / सही उत्तर : (3) 20 cm<sup>2</sup> / 20 cm<sup>2</sup>**

**Solution / हल :** Correct option: 20 cm<sup>2</sup> | सही विकल्प: 20 cm<sup>2</sup>

**28.** The relevant residues are 1, 7, 11, 13, 17, 19, 23 and 29 (eight). We count 8 ?  
The relevant residues are 1, 7, 11, 13, 17, 19, 23 and 29 (eight). We count 8 ?

- (1) 20 cm / 20 cm
- (2) 17 cm / 17 cm
- (3) 15 cm / 15 cm
- (4) 14 cm / 14 cm

**Correct Answer / सही उत्तर : (3) 15 cm / 15 cm**

**Solution / हल :** Correct option: 15 cm | सही विकल्प: 15 cm

**29.** For what values of m the equations  $(m+2)x+(2m+1)y=2(m ?$   
For what values of m the equations  $(m+2)x+(2m+1)y=2(m ?$

- (1) 2 / 2 : 1
- (2) 3 / 3 : 1
- (3) 5 / 5
- (4) 4 / 4 : 1

**Correct Answer / सही उत्तर : (4) 4 / 4 : 1**

**Solution / हल :** Correct option: 4 | सही विकल्प: 4 : 1

**30.** Taylor's theorem is mainly used in expressing the function as a sum with \_\_\_\_\_ terms?  
Taylor's theorem is mainly used in expressing the function as a sum with \_\_\_\_\_ terms?

- (1) complete / complete
- (2) finite / finite
- (3) infinite / infinite
- (4) partial / partial

**Correct Answer / सही उत्तर : (3) infinite / infinite**

**Solution / हल :** Correct option: infinite | सही विकल्प: infinite

**31.** Which of the following is not included in general method to draw a algebraic curve for tracing?  
Which of the following is not included in general method to draw a algebraic curve for tracing?

- (1) orthogonality / orthogonality
- (2) symmetry / symmetry
- (3) region / region
- (4) tangent to the curve / tangent to the curve

**Correct Answer / सही उत्तर : (1) orthogonality / orthogonality**

**Solution / हल :** Correct option: orthogonality | सही विकल्प: orthogonality

**32.** There are 10 lamps in a hall. Each of them can be switched on independently. The number of ways in which the hall can be illuminated is ?  
There are 10 lamps in a hall. Each of them can be switched on independently. The number of ways in which the hall can be illuminated is ?

- (1) 210 / 210
- (2) 102 / 102
- (3) none of these / इनमें कोई नहीं
- (4) 1023 / 1023

**Correct Answer / सही उत्तर : (4) 1023 / 1023**

**Solution / हल :** Correct option: 1023 | सही विकल्प: 1023

**33.** An automorphism is defined if it is ?  
An automorphism is defined if it is ?

- (1) isomorphism but not one one and onto / isomorphism but not one one and onto
- (2) isomorphism, one one, onto / isomorphism, one one, onto
- (3) isomorphism only / isomorphism only
- (4) one one , onto / one one , onto

**Correct Answer / सही उत्तर : (2) isomorphism, one one, onto / isomorphism, one one, onto**

**Solution / हल :** Correct option: isomorphism, one one, onto | सही विकल्प: isomorphism, one one, onto

**34.** A stone is dropped in quiet take and waves move in circles at the speed of 5 cms-1 At the instant when the radius of the circular wave is 8cm, how fast is the enclosed area increasing?

A stone is dropped in quiet take and waves move in circles at the speed of 5 cms-1 At the instant when the radius of the circular wave is 8cm, how fast is the enclosed area increasing?

- (1) ke / ke
- (2) 80 / 80
- (3) None of these / इनमें कोई नहीं
- (4) 60 / 60

**Correct Answer / सही उत्तर : (4) 60 / 60**

**Solution / हल :** Correct option: 60 | सही विकल्प: 60

**35.** If the roots of quadratic equation  $x^2+px+q=0$  are  $\tan 30^\circ$  ?

If the roots of quadratic equation  $x^2+px+q=0$  are  $\tan 30^\circ$  ?

- (1) 0 / 0
- (2) 1 / 1 : 1
- (3) 3 / 3 : 1
- (4) 2 / 2 : 1

**Correct Answer / सही उत्तर : (3) 3 / 3 : 1**

**Solution / हल :** Correct option: 3 | सही विकल्प: 3 : 1

**36.** The arm length of a cube is 10 cm. If the error in measuring the length of arm is 0.08 cm, the approximate value of the error in the volume of the cube will be:

The arm length of a cube is 10 cm. If the error in measuring the length of arm is 0.08 cm, the approximate value of the error in the volume of the cube will be:

- (1) 24 cm<sup>3</sup> / 24 cm<sup>3</sup>
- (2) 12 cm<sup>3</sup> / 12 cm<sup>3</sup>
- (3) 8 cm<sup>3</sup> / 8 cm<sup>3</sup>
- (4) 15 cm<sup>3</sup> / 15 cm<sup>3</sup>

**Correct Answer / सही उत्तर : (1) 24 cm<sup>3</sup> / 24 cm<sup>3</sup>**

**Solution / हल :** Correct option: 24 cm<sup>3</sup> | सही विकल्प: 24 cm<sup>3</sup>

**37.** If  $nC =$  then the sum + is  $r r-1 r$  (n ?

If  $nC =$  then the sum + is  $r r-1 r$  (n ?

- (1)  $r+1 n+1C$  /  $r+1 n+1C$
- (2) None of these / इनमें कोई नहीं
- (3)  $r+1$  /  $r+1$
- (4)  $r nC$  /  $r nC$

**Correct Answer / सही उत्तर : (4)  $r nC$  /  $r nC$**

**Solution / हल :** Correct option:  $r nC$  | सही विकल्प:  $r nC$

**38.** The number of words that can be formed by using the letters of the word "MATHEMATICS" that start as well as end with T is ?

The number of words that can be formed by using the letters of the word "MATHEMATICS" that start as well as end with T is ?

- (1) 90,720 / 90,720
- (2) 20,860 9! / 20,860 9!

(3) 80,720 / 80,720

(4) 37,528 / 37,528

**Correct Answer / सही उत्तर : (1) 90,720 / 90,720**

Solution / हल : Correct option: 90,720 | सही विकल्प: 90,720

39. Which operator is used in theorem ?

Which operator is used in theorem ?

(1) open / ओपन

(2) logical / logical

(3) set / set

(4) Curl / Curl

**Correct Answer / सही उत्तर : (4) Curl / Curl**

Solution / हल : Correct option: Curl | सही विकल्प: Curl

40. A non-terminating but recurring decimal is ?

A non-terminating but recurring decimal is ?

(1) An integer / An integer

(2) A natural number / A natural number

(3) A rational number / A rational number

(4) A whole number / A whole number

**Correct Answer / सही उत्तर : (3) A rational number / A rational number**

Solution / हल : Correct option: A rational number | सही विकल्प: A rational number

## SECTION B - PHYSICS / खण्ड B - भौतिक विज्ञान

41. If a point charge is placed at the origin, then the 30V equipotential surface will have radius ?

If a point charge is placed at the origin, then the 30V equipotential surface will have radius ?

(1) 270m / 270m

(2) 900m / 900m

(3) 450m / 450m

(4) 135m / 135m

**Correct Answer / सही उत्तर : (3) 450m / 450m**

Solution / हल : Correct option: 450m | सही विकल्प: 450m

42. Frequency of a photon of energy  $1.32 \times 10^{-17}$  joule will be :  $\times 10^{14}$  ?

Frequency of a photon of energy  $1.32 \times 10^{-17}$  joule will be :  $\times 10^{14}$  ?

(1) 5 hertz  $\times 10^{15}$   $\times 10^{14}$  / 5 hertz  $\times 10^{15}$   $\times 10^{14}$

(2) 2 hertz / 2 hertz

(3) 5.5 hertz / 5.5 hertz

(4) 2.5 hertz / 2.5 hertz

**Correct Answer / सही उत्तर : (2) 2 hertz / 2 hertz**

Solution / हल : Correct option: 2 hertz | सही विकल्प: 2 hertz

43. The Clausius Mossotti relation holds best for ?

The Clausius Mossotti relation holds best for ?

(1) Gases and dilute solutions / Gases and dilute solutions

(2) Concentrate solutions / Concentrate solutions

(3) Polar molecules / Polar molecules

(4) Solids / Solids

**Correct Answer / सही उत्तर : (3) Polar molecules / Polar molecules**

Solution / हल : Correct option: Polar molecules | सही विकल्प: Polar molecules

44. Red light is used as a danger signal because it ?

Red light is used as a danger signal because it ?

- (1) is comfortable for eyes / is comfortable for eyes
- (2) is scattered least / is scattered least
- (3) None of the above / इनमें कोई नहीं
- (4) produces least photo-chemical effect / produces least photo-chemical effect

**Correct Answer / सही उत्तर : (2) is scattered least / is scattered least**

**Solution / हल :** Correct option: is scattered least | सही विकल्प: is scattered least

**45. Planck's constant has the dimension of ?**  
Planck's constant has the dimension of ?

- (1) Momentum / Momentum
- (2) Angular momentum / Angular momentum
- (3) Frequency / Frequency
- (4) Energy / Energy

**Correct Answer / सही उत्तर : (2) Angular momentum / Angular momentum**

**Solution / हल :** Correct option: Angular momentum | सही विकल्प: Angular momentum

**46. The ratio of the largest and the shortest wavelengths of Lyman series for H-atoms is approximately ?**  
The ratio of the largest and the shortest wavelengths of Lyman series for H-atoms is approximately ?

- (1) 4:3 / 43%
- (2) 9:4 / 9:4
- (3) 9:5 / 9:5
- (4) 16:7 / 16:7

**Correct Answer / सही उत्तर : (1) 4:3 / 43%**

**Solution / हल :** Correct option: 4:3 | सही विकल्प: 43%

**47. According to Wien's law, a star which appears blue will be ?**  
According to Wien's law, a star which appears blue will be ?

- (1) colder than the sun / colder than the sun
- (2) as hot as sun / as hot as sun
- (3) hotter than the sun / hotter than the sun
- (4) very cold / very cold

**Correct Answer / सही उत्तर : (3) hotter than the sun / hotter than the sun**

**Solution / हल :** Correct option: hotter than the sun | सही विकल्प: hotter than the sun

**48. In the diffraction of a plane wave due to a circular obstacle (disc) the axial point is always ?**  
In the diffraction of a plane wave due to a circular obstacle (disc) the axial point is always ?

- (1) dark / dark
- (2) None of the above / इनमें कोई नहीं
- (3) bright / bright
- (4) may be bright of dark / may be bright of dark

**Correct Answer / सही उत्तर : (3) bright / bright**

**Solution / हल :** Correct option: bright | सही विकल्प: bright

**49. The sun appears red at sunrise or sunset. This can be explained on the basis of ?**  
The sun appears red at sunrise or sunset. This can be explained on the basis of ?

- (1) Phonon scattering / Phonon scattering
- (2) Compton effect / Compton effect
- (3) Rayleigh scattering / Rayleigh scattering
- (4) Raman effect / Raman effect

**Correct Answer / सही उत्तर : (3) Rayleigh scattering / Rayleigh scattering**

**Solution / हल :** Correct option: Rayleigh scattering | सही विकल्प: Rayleigh scattering

50. The wavelength of the radiations for which the energy is maximum in the spectrum is 490 nm. The effective temperature of the sun is ?

The wavelength of the radiations for which the energy is maximum in the spectrum is 490 nm. The effective temperature of the sun is ?

- (1) 5820 K / 5820 K
- (2) 6000 K / 6000 K
- (3) 6920 K / 6920 K
- (4) 5914 K / 5914 K

**Correct Answer / सही उत्तर : (4) 5914 K / 5914 K**

Solution / हल : Correct option: 5914 K | सही विकल्प: 5914 K

51. The value of in the (r, , ) state of a 100 r hydrogen atom is (a is Bohr radius). 0 ?

The value of in the (r, , ) state of a 100 r hydrogen atom is (a is Bohr radius). 0 ?

- (1) 0 / 0
- (2) a / a
- (3) 0 a 0 / 0 a 0
- (4) 2a / 2a

**Correct Answer / सही उत्तर : (3) 0 a 0 / 0 a 0**

Solution / हल : Correct option: 0 a 0 | सही विकल्प: 0 a 0

52. Newton's Law of cooling is an approximate form of ?

Newton's Law of cooling is an approximate form of ?

- (1) Jeans's law / Jeans's law
- (2) Stefan's law / Stefan's law
- (3) Wien displacement law / Wien displacement law
- (4) Kirchoff's law / Kirchoff's law

**Correct Answer / सही उत्तर : (2) Stefan's law / Stefan's law**

Solution / हल : Correct option: Stefan's law | सही विकल्प: Stefan's law

53. If a current is allowed to pass through a circuit consisting of two dissimilar metals, there is either an evolution or absorption of heat at the junctions depending upon the direction of the current. The effect is known as ?

If a current is allowed to pass through a circuit consisting of two dissimilar metals, there is either an evolution or absorption of heat at the junctions depending upon the direction of the current. The effect is known as ?

- (1) Peltier effect / Peltier effect
- (2) Seebeck effect / Seebeck effect
- (3) Thomson effect / Thomson effect
- (4) Joule's effect / Joule's effect

**Correct Answer / सही उत्तर : (1) Peltier effect / Peltier effect**

Solution / हल : Correct option: Peltier effect | सही विकल्प: Peltier effect

54. A straight tunnel is bored through to centre of the earth. A body of mass 5 gm is dropped into it. Its motion will be ?

A straight tunnel is bored through to centre of the earth. A body of mass 5 gm is dropped into it. Its motion will be ?

- (1) Simple harmonic motion / Simple harmonic motion
- (2) Forced motion / Forced motion
- (3) Free motion / Free motion
- (4) Damped motion / Damped motion

**Correct Answer / सही उत्तर : (1) Simple harmonic motion / Simple harmonic motion**

Solution / हल : Correct option: Simple harmonic motion | सही विकल्प: Simple harmonic motion

55. Physical quantities which have same units are ?

Physical quantities which have same units are ?

- (1) Force and work / Force and work
- (2) Pressure and strain / Pressure and strain
- (3) Pressure and stress / Pressure and stress
- (4) Pressure and volume / Pressure and volume

**Correct Answer / सही उत्तर : (3) Pressure and stress / Pressure and stress**

**Solution / हल :** Correct option: Pressure and stress | सही विकल्प: Pressure and stress

56. In the circuit show in figure, power developed across 1 , 2 and 3 resistance are in the ratio of ?

In the circuit show in figure, power developed across 1 , 2 and 3 resistance are in the ratio of ?

- (1) 2 : 1 / 21
- (2) 1 : 2 / 12%
- (3) 6 : 4 / 6 : 4
- (4) 4 : 2 / 4 : 2

**Correct Answer / सही उत्तर : (4) 4 : 2 / 4 : 2**

**Solution / हल :** Correct option: 4 : 2 | सही विकल्प: 4 : 2

57. At curie point, a ferromagnetic material becomes?

At curie point, a ferromagnetic material becomes?

- (1) Diamagnetic / प्रतिचुंबकीय
- (2) Paramagnetic / अनुचुंबकीय
- (3) Strongly ferromagnetic / Strongly ferromagnetic
- (4) Non-magnetic / Non-magnetic

**Correct Answer / सही उत्तर : (2) Paramagnetic / अनुचुंबकीय**

**Solution / हल :** Correct option: Paramagnetic | सही विकल्प: अनुचुंबकीय

58. A particle moves in a circular path with uniform speed. The direction of acceleration of the particle will be ?

A particle moves in a circular path with uniform speed. The direction of acceleration of the particle will be ?

- (1) Acceleration is zero / Acceleration is zero
- (2) Along the tangent to the path / Along the tangent to the path
- (3) Normal to the plane of the path / Normal to the plane of the path
- (4) Along the radius / Along the radius

**Correct Answer / सही उत्तर : (4) Along the radius / Along the radius**

**Solution / हल :** Correct option: Along the radius | सही विकल्प: Along the radius

59. The temperature of cold junction of thermocouple is  $15^{\circ}\text{C}$ . The neutral temperature of the couple is  $285^{\circ}\text{C}$  the temperature of inversion will be ?

The temperature of cold junction of thermocouple is  $15^{\circ}\text{C}$ . The neutral temperature of the couple is  $285^{\circ}\text{C}$  the temperature of inversion will be ?

- (1)  $385^{\circ}\text{C}$  /  $385^{\circ}\text{C}$
- (2)  $585^{\circ}\text{C}$  /  $585^{\circ}\text{C}$
- (3)  $355^{\circ}\text{C}$  /  $355^{\circ}\text{C}$
- (4)  $365^{\circ}\text{C}$  /  $365^{\circ}\text{C}$

**Correct Answer / सही उत्तर : (2)  $585^{\circ}\text{C}$  /  $585^{\circ}\text{C}$**

**Solution / हल :** Correct option:  $585^{\circ}\text{C}$  | सही विकल्प:  $585^{\circ}\text{C}$

60. The effective resistance of the network between the points A and B will be ?

The effective resistance of the network between the points A and B will be ?

- (1) 6 / 6

- (2) 1 / 1 : 1  
 (3) 9 / 9%  
 (4) Zero / शून्य

**Correct Answer / सही उत्तर : (2) 1 / 1 : 1**

**Solution / हल :** Correct option: 1 | सही विकल्प: 1 : 1

## SECTION C - CHEMISTRY / खण्ड C - रसायन विज्ञान

**61.** Intense violet colour of potassium permanganate is due to ?  
 पोटैशियम परमैंगनेट का गहरा बैंगनी रंग किसके कारण है ?

- (1) Charge transfer transition / आवेश स्थानांतरण संक्रमण  
 (2) f-f transition / f-f संक्रमण  
 (3) d-d transition / d-d संक्रमण  
 (4) Intraligand transition / अंतरालिगैंड संक्रमण

**Correct Answer / सही उत्तर : (1) Charge transfer transition / आवेश स्थानांतरण संक्रमण**

**Solution / हल :** Intense violet of  $KMnO_4$  is due to charge transfer transition. |  $KMnO_4$  का गहरा बैंगनी आवेश स्थानांतरण संक्रमण के कारण है।

**62.** Acid rains are caused due to :  
 अम्ल वर्षा किसके कारण होती है ?

- (1)  $NO_2$  /  $NO_2$   
 (2)  $SO$  /  $SO_2$   
 (3) Both  $SO$  &  $NO$  /  $SO_2$  व  $NO_2$  दोनों  
 (4)  $CO_2$  /  $CO_2$

**Correct Answer / सही उत्तर : (3) Both  $SO$  &  $NO$  /  $SO_2$  व  $NO_2$  दोनों**

**Solution / हल :** Acid rain is caused by both  $SO_2$  and  $NO_2$ . | अम्ल वर्षा  $SO_2$  व  $NO_2$  दोनों से होती है।

**63.** Micelles from the ionic surfactants can be formed only above a certain temperature called as:  
 आयनिक पृष्ठसक्रियकों से मिसेल केवल एक निश्चित ताप के ऊपर बनते हैं, जिसे क्या कहते हैं ?

- (1) Transition temperature / संक्रमण ताप  
 (2) Boyle's temperature / बॉयल ताप  
 (3) Kraft temperature / क्राफ्ट ताप  
 (4) Inversion temperature / व्युत्क्रमण ताप

**Correct Answer / सही उत्तर : (3) Kraft temperature / क्राफ्ट ताप**

**Solution / हल :** Micelles form only above the Kraft temperature. | मिसेल केवल क्राफ्ट ताप के ऊपर बनते हैं।

**64.** Which of the following rubbers is hard and brittle?  
 निम्नलिखित में कौन-सा रबर कठोर व भंगुर है ?

- (1) Complete rubber / पूर्ण रबर  
 (2) Cis rubber / सिस रबर  
 (3) Only at bonding sites / केवल बंधन स्थलों पर  
 (4) Trans rubber / ट्रांस रबर

**Correct Answer / सही उत्तर : (4) Trans rubber / ट्रांस रबर**

**Solution / हल :** Trans rubber (gutta-percha) is hard and brittle. | ट्रांस रबर (गुटा-पर्चा) कठोर व भंगुर है।

**65.** When n-butyl bromide is heated with anhydrous aluminum chloride, it isomerizes to 2-bromobutane. This reaction involves the formation ?

n-ब्यूटिल ब्रोमाइड को निर्जल  $AlCl_3$  के साथ गर्म करने पर 2-ब्रोमोब्यूटेन में समावयवन होता है। इसमें किसका निर्माण होता है ?

- (1) Primary butyl and secondary butyl carbocations / प्राथमिक व द्वितीयक ब्यूटिल कार्बोकैटायन  
 (2) A secondary butyl carbocation / द्वितीयक ब्यूटिल कार्बोकैटायन

(3) A primary butyl carbocation / प्राथमिक ब्यूटिल कार्बोकैटायन

(4) A secondary butyl free radical / द्वितीयक ब्यूटिल मुक्त मूलक

**Correct Answer / सही उत्तर : (1) Primary butyl and secondary butyl carbocations / प्राथमिक व द्वितीयक ब्यूटिल कार्बोकैटायन**

**Solution / हल :** Isomerisation of n-butyl bromide involves primary and secondary butyl carbocations. | n-ब्यूटिल ब्रोमाइड के समावयवन में प्राथमिक व द्वितीयक ब्यूटिल कार्बोकैटायन बनते हैं।

66. Calamine is the ore of ?

कैलेमाइन किसका अयस्क है ?

(1) Al / AlCl<sub>3</sub>

(2) Ca / Ca<sup>2+</sup>

(3) Zn / Zn

(4) Fe / Fe

**Correct Answer / सही उत्तर : (3) Zn / Zn**

**Solution / हल :** Calamine (ZnCO<sub>3</sub>) is an ore of zinc (Zn). | कैलेमाइन (ZnCO<sub>3</sub>) जिंक (Zn) का अयस्क है।

67. 6g of urea is dissolved in 90g of boiling water. The vapour pressure of the solution ?

90g उबलते जल में 6g यूरिया घोला गया। विलयन का वाष्पदाब क्या होगा ?

(1) 761.0 mm / 761.0 mm

(2) 760.3 mm / 760.3 mm

(3) 744.8 mm / 744.8 mm

(4) 758.2 mm / 758.2 mm

**Correct Answer / सही उत्तर : (3) 744.8 mm / 744.8 mm**

**Solution / हल :** Vapour pressure of the urea solution is about 744.8 mm. | यूरिया विलयन का वाष्पदाब लगभग 744.8 mm है।

68. Diethyl ether is \_\_\_\_\_ ?

डाइएथिल ईथर \_\_\_\_\_ है।

(1) Heterocyclic compound / विषमचक्रीय यौगिक

(2) Symmetrical ether / सममित ईथर

(3) Unsymmetrical ether / असममित ईथर

(4) Mixed ether / मिश्रित ईथर

**Correct Answer / सही उत्तर : (2) Symmetrical ether / सममित ईथर**

**Solution / हल :** Diethyl ether (C<sub>2</sub>H<sub>5</sub>-O-C<sub>2</sub>H<sub>5</sub>) is a symmetrical ether. | डाइएथिल ईथर (C<sub>2</sub>H<sub>5</sub>-O-C<sub>2</sub>H<sub>5</sub>) सममित ईथर है।

69. Stereochemistry of SN reaction involves: 2 SN ?

Stereochemistry of SN reaction involves: 2 SN ?

(1) Racimisation with inversion / प्रतिलोमन सहित रेसिमीकरण

(2) Retention / प्रतिधारण

(3) Racimisation with retention / प्रतिधारण सहित रेसिमीकरण

(4) Inversion / प्रतिलोमन (Inversion)

**Correct Answer / सही उत्तर : (4) Inversion / प्रतिलोमन (Inversion)**

**Solution / हल :** Correct option: Inversion | सही विकल्प: प्रतिलोमन (Inversion)

70. Which of the following are favourable conditions for physical adsorption?

भौतिक अधिशोषण हेतु अनुकूल दशाएँ कौन-सी हैं ?

(1) Low temperature, low pressure / निम्न ताप, निम्न दाब

(2) High temperature, low pressure / उच्च ताप, निम्न दाब

(3) Low temperature, high pressure / निम्न ताप, उच्च दाब

(4) High temperature, high pressure / उच्च ताप, उच्च दाब

**Correct Answer / सही उत्तर : (3) Low temperature, high pressure / निम्न ताप, उच्च दाब**

**Solution / हल :** Physical adsorption is favoured by low temperature and high pressure. | भौतिक अधिशोषण निम्न ताप व उच्च दाब पर अनुकूल है।

71. A cubic unit cell has \_\_\_\_\_ ?

घनीय इकाई कोष्ठिका में कितने त्रिगुणन अक्ष होते हैं ?

(1) 4 axes / 4 axes

(2) 1 twofold axes / 1 द्विगुणन अक्ष

(3) 2 axes / 2 axes

(4) 3 axes / 3 axes

**Correct Answer / सही उत्तर : (1) 4 axes / 4 axes**

**Solution / हल :** A cubic unit cell has 4 threefold axes. | घनीय इकाई कोष्ठिका में 4 त्रिगुणन अक्ष होते हैं।

72. Zeeman effect corresponds to the splitting of spectral lines in the presence of \_\_\_\_\_ ?

ज़ीमन प्रभाव किसकी उपस्थिति में वर्णक्रम रेखाओं के विभाजन से संबंधित है ?

(1) Electric field / विद्युत क्षेत्र

(2) Both electric and magnetic fields / विद्युत व चुंबकीय दोनों

(3) Magnetic field / चुंबकीय क्षेत्र

(4) Neither electric field nor magnetic field / न विद्युत न चुंबकीय क्षेत्र

**Correct Answer / सही उत्तर : (3) Magnetic field / चुंबकीय क्षेत्र**

**Solution / हल :** The Zeeman effect is splitting of lines in a magnetic field. | ज़ीमन प्रभाव चुंबकीय क्षेत्र में रेखाओं का विभाजन है।

73. Release of chemicals to the environment in US is tracked by \_\_\_\_\_ ?

अमेरिका में पर्यावरण में रसायनों का विमोचन किससे ट्रैक होता है ?

(1) Toxics release inventory / टॉक्सिक्स रिलीज़ इन्वेंटरी

(2) International Chemical Laboratory / इंटरनेशनल केमिकल लैब

(3) IUPAC / IUPAC

(4) Pollution prevention control board / प्रदूषण रोकथाम बोर्ड

**Correct Answer / सही उत्तर : (1) Toxics release inventory / टॉक्सिक्स रिलीज़ इन्वेंटरी**

**Solution / हल :** Chemical releases in the US are tracked by the Toxics Release Inventory. | अमेरिका में रसायन विमोचन टॉक्सिक्स रिलीज़ इन्वेंटरी से ट्रैक होता है।

74. In silver chloride, the silver ion is displaced from its lattice points to an interstitial position. Such a in the crystal is termed ?

सिल्वर क्लोराइड में  $Ag^+$  आयन अपनी जालक स्थिति से अंतरालीय स्थिति में चला जाता है — यह दोष क्या कहलाता है ?

(1) Schottky / Schottky

(2) F-Center / F-केंद्र

(3) Wadsley / Wadsley

(4) Frenkel / Frenkel

**Correct Answer / सही उत्तर : (4) Frenkel / Frenkel**

**Solution / हल :** Displacement of  $Ag^+$  to an interstitial site is a Frenkel defect. |  $Ag^+$  का अंतरालीय स्थिति में जाना फ्रेंकेल दोष है।

75. Quantum confinement effect results in \_\_\_\_\_ ?

क्वांटम परिरोध (confinement) प्रभाव का परिणाम क्या होता है ?

(1) Increased kinetic energy / बड़ी गतिज ऊर्जा

(2) Electric discharge / वैद्युत विसर्जन

(3) Inactivity / निष्क्रियता

(4) Magnetic dipole / चुंबकीय द्विध्रुव

**Correct Answer / सही उत्तर : (4) Magnetic dipole / चुंबकीय द्विध्रुव**

**Solution / हल :** Quantum confinement gives a magnetic dipole effect. | क्वांटम परिरोध चुंबकीय द्विध्रुव प्रभाव देता है।

**76. Benzene is less dense than: yeWpeerve ?**

बेन्जीन किससे कम घना है ?

- (1) Alkene / एल्कीन
- (2) Alkane / एल्केन
- (3) Water / जल
- (4) Both Alkane and Alkene / एल्केन व एल्कीन दोनों

**Correct Answer / सही उत्तर : (3) Water / जल**

**Solution / हल :** Benzene is less dense than water. | बेन्जीन जल से कम घना है।

**77. Benzoic acid and Glycine reacts in presence of Acyl synthetase to give \_\_\_\_\_ ?**

बेन्जोइक अम्ल व ग्लाइसीन एसाइल सिंथेटेज की उपस्थिति में क्या बनाते हैं ?

- (1) Hippuric acid / हिप्पुरिक अम्ल
- (2) Salicylic acid / सैलिसिलिक अम्ल
- (3) N-acetylprocainamide / N-एसिटाइलप्रोकेनामाइड
- (4) Acylic acid / एसाइलिक अम्ल

**Correct Answer / सही उत्तर : (1) Hippuric acid / हिप्पुरिक अम्ल**

**Solution / हल :** Benzoic acid + glycine gives hippuric acid. | बेन्जोइक अम्ल + ग्लाइसीन हिप्पुरिक अम्ल देते हैं।

**78. Which of the following polymers is non-polar?**

निम्नलिखित में कौन-सा बहुलक अध्रुवीय है ?

- (1) Polypropylene / पॉलिप्रोपिलीन
- (2) Acrylonitrile / एक्रिलोनाइड्राइल
- (3) PVC / PVC
- (4) Both Acrylonitrile & PVC / एक्रिलोनाइड्राइल व PVC दोनों

**Correct Answer / सही उत्तर : (1) Polypropylene / पॉलिप्रोपिलीन**

**Solution / हल :** Polypropylene is a non-polar polymer. | पॉलिप्रोपिलीन अध्रुवीय बहुलक है।

**79. Which of following compounds shows octahedral geometry?**

निम्नलिखित में कौन-सा यौगिक अष्टफलकीय ज्यामिति दर्शाता है ?

- (1) XeF / XeF<sub>4</sub>
- (2) XeF<sub>2</sub> / XeF<sub>2</sub>
- (3) XeO / XeO<sub>3</sub>
- (4) SF<sub>3</sub> / SF<sub>6</sub>

**Correct Answer / सही उत्तर : (4) SF<sub>3</sub> / SF<sub>6</sub>**

**Solution / हल :** SF<sub>6</sub> shows octahedral geometry. | SF<sub>6</sub> अष्टफलकीय ज्यामिति दर्शाता है।

**80. According to Langmuir adsorption isotherm, when the pressure of a gas is very large, the extent of adoption ?**

लैंगम्यूर अधिशोषण समतापी अनुसार, गैस का दाब बहुत अधिक होने पर अधिशोषण की सीमा कैसी होती है ?

- (1) directly proportional to pressure / दाब के समानुपाती
- (2) independent of pressure / दाब से स्वतंत्र
- (3) directly proportional to the square of the pressure / दाब के वर्ग के समानुपाती
- (4) inversely proportional to pressure / दाब के व्युत्क्रमानुपाती

**Correct Answer / सही उत्तर : (2) independent of pressure / दाब से स्वतंत्र**

**Solution / हल :** By Langmuir isotherm, at very high pressure adsorption is independent of pressure. | लैंगम्यूर अनुसार बहुत उच्च दाब पर अधिशोषण दाब से स्वतंत्र होता है।

**81. Takai reaction of aldehydes gives which of the following products?**

एल्डिहाइड की ताकाई अभिक्रिया कौन-सा उत्पाद देती है ?

- (1) Alkane / एल्केन
- (2) Alkene / एल्कीन
- (3) Alkyne / एल्काइन
- (4) Epoxide / एपॉक्साइड

**Correct Answer / सही उत्तर : (2) Alkene / एल्कीन**

**Solution / हल :** Takai reaction of aldehydes gives alkenes. | एल्डिहाइड की ताकाई अभिक्रिया एल्कीन देती है।

82. % yield of any reaction is given by \_\_\_\_\_ ?

किसी अभिक्रिया का % उपज किससे दिया जाता है ?

- (1) [(Actual weight-Theoretical weight) / (वास्तविक-सैद्धांतिक)...
- (2) (Actual weight obtained / प्राप्त वास्तविक भार/सैद्धांतिक भार x100
- (3) (Theoretical weight obtained / सैद्धांतिक भार
- (4) [(Theoretical weight- Actual weight) / (सैद्धांतिक-वास्तविक)...

**Correct Answer / सही उत्तर : (2) (Actual weight obtained / प्राप्त वास्तविक भार/सैद्धांतिक भार x100**

**Solution / हल :** % yield = (actual weight/theoretical weight) x 100. | % उपज = (वास्तविक भार/सैद्धांतिक भार) x 100।

83. Lithium differs from other alkali metals due to otmejs Suke ?

Lithium differs from other alkali metals due to otmejs Suke ?

- (1) the high ionic mobility / उच्च आयनिक गतिशीलता
- (2) the low hydration energy of Li+ / Li+ की निम्न जलयोजन ऊर्जा
- (3) its small atomic size and ionic size / इसका छोटा परमाणु व आयनिक आकार
- (4) its extremely high electropositivity / इसकी अत्यधिक विद्युतधनात्मकता

**Correct Answer / सही उत्तर : (3) its small atomic size and ionic size / इसका छोटा परमाणु व आयनिक आकार**

**Solution / हल :** Correct option: its small atomic size and ionic size | सही विकल्प: इसका छोटा परमाणु व आयनिक आकार

84. The metal lead is readily soluble in meermee Oeeleg legjvle efJeues ?

The metal lead is readily soluble in meermee Oeeleg legjvle efJeues ?

- (1) hydrochloric acid / हाइड्रोक्लोरिक अम्ल
- (2) sulphuric acid / सल्फ्यूरिक अम्ल
- (3) nitric acid / नाइट्रिक अम्ल
- (4) acetic acid / एसीटिक अम्ल

**Correct Answer / सही उत्तर : (3) nitric acid / नाइट्रिक अम्ल**

**Solution / हल :** Correct option: nitric acid | सही विकल्प: नाइट्रिक अम्ल

85. Calculate the limiting value of molar conductance when degree of ionisation is 2.02 and molar conductance is 4.04 Sm<sup>2</sup> mole ?

यदि आयनन की मात्रा 2.02 व मोलर चालकता 4.04 Sm<sup>2</sup>/mol हो, तो सीमांत मोलर चालकता क्या है ?

- (1) 2Sm / 2Sm
- (2) Sm / Sm
- (3) 2Sm<sup>2</sup> mole / 2Sm<sup>2</sup>/mol
- (4) Sm<sup>2</sup>mole / Sm<sup>2</sup>/mol

**Correct Answer / सही उत्तर : (3) 2Sm<sup>2</sup> mole / 2Sm<sup>2</sup>/mol**

**Solution / हल :** Limiting molar conductance = 4.04/2.02 = 2 Sm<sup>2</sup> mol<sup>-1</sup>. | सीमांत मोलर चालकता = 4.04/2.02 = 2 Sm<sup>2</sup>/mol।

**SECTION D - COMPUTER / खण्ड D - कंप्यूटर**

86. Normally, A QWERTY keyboard has \_\_\_\_\_ keys ?

Normally, A QWERTY keyboard has \_\_\_\_\_ keys ?

- (1) 98 / 98
- (2) 120 / 120
- (3) 100 / 100
- (4) 104 / 104

**Correct Answer / सही उत्तर : (4) 104 / 104**

Solution / हल : Correct option: 104 | सही विकल्प: 104

87. What is the size of the following array declaration in 'c', if character requires one- byte memory space?

What is the size of the following array declaration in 'c', if character requires one- byte memory space?

- (1) 6 bytes / 6 bytes
- (2) 7 bytes / 7 bytes
- (3) 5 bytes / 5 bytes
- (4) 4 bytes / 4 bytes

**Correct Answer / सही उत्तर : (1) 6 bytes / 6 bytes**

Solution / हल : Correct option: 6 bytes | सही विकल्प: 6 bytes

88. Which type of printers uses light to produce the dots needed to form the characters to be printed on a page?

कौन-सा प्रिंटर पृष्ठ पर अक्षर बनाने हेतु बिंदु उत्पन्न करने के लिए प्रकाश का उपयोग करता है ?

- (1) Laser / लेज़र
- (2) Chain Printers / चेन प्रिंटर
- (3) Dot Matrix Printers / डॉट मैट्रिक्स प्रिंटर
- (4) Line / लाइन

**Correct Answer / सही उत्तर : (1) Laser / लेज़र**

Solution / हल : Laser printers use light to form characters on the page. | लेज़र प्रिंटर अक्षर बनाने हेतु प्रकाश का उपयोग करते हैं।

89. Gray code of decimal number 2 is ..... oMeceueJe ([sefmeceue) 2 ?

Gray code of decimal number 2 is ..... oMeceueJe ([sefmeceue) 2 ?

- (1) 0101 / 0101
- (2) 0010 / 0010
- (3) 1000 / 1000
- (4) 0011 / 0011

**Correct Answer / सही उत्तर : (4) 0011 / 0011**

Solution / हल : Correct option: 0011 | सही विकल्प: 0011

90. Which drive is made up of series of circular platters?

कौन-सी ड्राइव गोलाकार प्लेटों की श्रृंखला से बनी होती है ?

- (1) Static disk drive / स्टैटिक डिस्क ड्राइव
- (2) Solid state / सॉलिड स्टेट
- (3) Floppy disk drive / फ्लॉपी डिस्क ड्राइव
- (4) Hard disk drive / हार्ड डिस्क ड्राइव

**Correct Answer / सही उत्तर : (4) Hard disk drive / हार्ड डिस्क ड्राइव**

Solution / हल : A hard disk drive is made of circular platters. | हार्ड डिस्क ड्राइव गोलाकार प्लेटों से बनी होती है।

91. The name of the 1st electronic digital computer of the world is ?

The name of the 1st electronic digital computer of the world is ?

- (1) UNIVAC / UNIVAC

(2) PROLOG / PROLOG

(3) ENIAC / ENIAC

(4) PARAM / PARAM

**Correct Answer / सही उत्तर : (3) ENIAC / ENIAC**

**Solution / हल :** Correct option: ENIAC | सही विकल्प: ENIAC

92. Shift key and Print Screen key in a computer keyboard are known as ?

Shift key and Print Screen key in a computer keyboard are known as ?

(1) Navigation keys / Navigation keys

(2) Special purpose keys / Special purpose keys

(3) Standard / Standard

(4) Function / कार्य

**Correct Answer / सही उत्तर : (2) Special purpose keys / Special purpose keys**

**Solution / हल :** Correct option: Special purpose keys | सही विकल्प: Special purpose keys

93. Digital Versatile Disk (DVD) is a ef[efpe ?

Digital Versatile Disk (DVD) is a ef[efpe ?

(1) Virtual / Virtual

(2) Random access memory / रैंडम एक्सेस मेमोरी

(3) Sequential access memory Deveg / Sequential access memory Deveg

(4) Destructive memory / Destructive memory

**Correct Answer / सही उत्तर : (2) Random access memory / रैंडम एक्सेस मेमोरी**

**Solution / हल :** Correct option: Random access memory | सही विकल्प: रैंडम एक्सेस मेमोरी

94. Which of the following is a computer utility programme?

निम्नलिखित में कौन-सा कंप्यूटर यूटिलिटी प्रोग्राम है ?

(1) Disk defragmenter / डिस्क डीफ्रैग्मेंटर

(2) Shareware / शेयरवेयर

(3) Inventory control / इन्वेंटरी कंट्रोल

(4) Package / पैकेज

**Correct Answer / सही उत्तर : (1) Disk defragmenter / डिस्क डीफ्रैग्मेंटर**

**Solution / हल :** Disk defragmenter is a utility programme. | डिस्क डीफ्रैग्मेंटर एक यूटिलिटी प्रोग्राम है।

95. What is the octal (base 8) equivalent of the binary number 1010101000101?

बाइनरी संख्या 1010101000101 का अष्टक (आधार 8) तुल्यांक क्या है ?

(1) 5AB1 / 5AB1

(2) 50521 / 50521

(3) 12505 / 12505

(4) 51205 / 51205

**Correct Answer / सही उत्तर : (3) 12505 / 12505**

**Solution / हल :** Octal of 1010101000101 is 12505. | 1010101000101 का अष्टक 12505 है।

## SECTION E - MENTAL ABILITY / खण्ड E - मानसिक योग्यता

96. An HR Company employes 4800 people, out of which 45 percent are males and 60 percent of the males are either 25 years or older. How many males are employed in that HR Company who are younger than 25 years ? ( ?

An HR Company employes 4800 people, out of which 45 percent are males and 60 percent of the males are either 25 years or older. How many males are employed in that HR Company who are younger than 25 years ? ( ?

(1) 2640 / 2640

(2) 2160 / 2160

(3) 864 / 864

(4) 1296 / 1296

**Correct Answer / सही उत्तर : (3) 864 / 864**

Solution / हल : Correct option: 864 | सही विकल्प: 864

97. The compound interest accrued in two years on a principle amount of Rs.16,250 is Rs. 5,616. What is the rate of interest pcpa?

₹16,250 मूलधन पर दो वर्षों का चक्रवृद्धि ब्याज ₹5,... है — ब्याज दर क्या है ?

(1) 16% / 16

(2) 22% / 22

(3) Cannot be determined / निर्धारित नहीं

(4) 18% / 18%

**Correct Answer / सही उत्तर : (1) 16% / 16**

Solution / हल : From CI of Rs.5,xxx on Rs.16,250 in 2 yr, rate = 16%. | ₹16,250 पर 2 वर्ष के CI ₹5,xxx से ब्याज दर = 16%।

98. 28% members of a certain group are married. What is the respective ratio between the number of married members to the number of unmarried members ?

28% members of a certain group are married. What is the respective ratio between the number of married members to the number of unmarried members ?

(1) 7 : 18 / 7 : 18

(2) 5 : 18 / 5 : 18

(3) Cannot be determined / निर्धारित नहीं

(4) 7 : 17 / 7 : 17

**Correct Answer / सही उत्तर : (1) 7 : 18 / 7 : 18**

Solution / हल : Correct option: 7 : 18 | सही विकल्प: 7 : 18

99. Raman gave 80% of his monthly salary to his wife and the remaining he invested in mutual fund. From the money his wife got, she spent 30% on groceries, 20% on rent and remaining amount of Rs. 12000 she spent on buying gold. What is Ramans monthly salary? ( ?

रमन ने अपना 80% मासिक वेतन पत्नी को दिया व शेष म्यूचुअल फंड में लगाया। पत्नी ने 30% किराना, 20% किराया व शेष ₹12000 सोने पर खर्च किए। रमन का वेतन क्या है ?

(1) 32000 / 32000

(2) 41500 / 41500

(3) 30000 / 30000

(4) 34400 / 34400

**Correct Answer / सही उत्तर : (3) 30000 / 30000**

Solution / हल : Working back from Rs.12000, Raman's salary is Rs.30000. | ₹12000 से पीछे गणना => रमन का वेतन ₹30000।

100. The simple interest accrued on an amount of Rs. 22,500 at the end of four years is Rs. 10,800. What would be the compound interest accrued on the same amount at the same rate at the end of two years ? ( ?

The simple interest accrued on an amount of Rs. 22,500 at the end of four years is Rs. 10,800. What would be the compound interest accrued on the same amount at the same rate at the end of two years ? ( ?

(1) Rs. 5,724 / Rs. 5,724

(2) Rs. 28,224 / Rs. 28,224

(3) Rs. 8,586 / Rs. 8,586

(4) Rs. 16,908 / Rs. 16,908

**Correct Answer / सही उत्तर : (1) Rs. 5,724 / Rs. 5,724**

Solution / हल : Correct option: Rs. 5,724 | सही विकल्प: Rs. 5,724