

Code No.

**T – 2121**

**Entrance Examination for Admission to the P.G. Courses in the  
Teaching Departments, 2024**

**CSS**

**DATA SCIENCE**

**General Instructions**

1. The Question Paper is having 100 Objective Questions, each carrying one mark.
2. The answers are to be (✓) 'tick marked' **only** in the "**Response Sheet**" provided.
3. **Negative marking** : **0.25 marks** will be deducted for each wrong answer .

**Time : 2 Hours**

**Max. Marks : 100**

To be filled in by the Candidate									
Register Number	in Figures								
	in words								

Choose appropriate answer from the options in the questions.

**(100 × 1 = 100 marks)**

1. Find the GCD of 1.08, 0.36 and 0.9

A. 0.03

B. 0.9

C. 0.18

D. 0.108

DO NOT WRITE HERE

---

2. If P is an integer point with a value 1000, then what will be the value of P+5?

A. 1020

B. 1005

C. 1004

D. 2020

3. Simplify the following expression :  $Y = A\bar{B}C + A\bar{B}\bar{C}$

A.  $Y = C$

B.  $Y = B$

C.  $Y = A$

D.  $Y = A\bar{B}$

4. Total number of Boolean functions possible over  $n$  Boolean variables are

A.  $2^{2n}$

B.  $2^n$

C.  $n^{2n}$

D. None of these

5. Two finite sets have  $m$  and  $n$  elements. The total number of subsets of the first is 56 more than the total number of subsets of the second set. Then values of  $m$  and  $n$  are
- A. 7, 6  
B. 6, 3  
C. 5, 1  
D. 8, 7
6. The number of one-to-one functions from  $\{1, 2, 3\}$  to  $\{1, 2, 3, 4, 5\}$  is
- A. 125  
B. 243  
C. 10  
D. 60
7. What is the range of the function  $f(x) = \frac{|x-1|}{x-1}$  ?
- A.  $\{3, 5\}$   
B.  $\{0, 2\}$   
C.  $\{-1, 1\}$   
D.  $\{-2, 4\}$
8. Operations carried out by NOT gate is also known as
- A. converting  
B. reverting  
C. inverting  
D. reversing
9. Find the remainder when the smallest 6-digit number divisible by 12, 15 and 25 is divisible by 9
- A. 3  
B. 7  
C. 2  
D. 0
10. Let  $n(A) = x$  and  $n(B) = y$ , then the total number of non-empty relations that can be defined from  $A$  to  $B$  is
- A.  $2x^y$   
B.  $3y^x - 1$   
C.  $7xy - 1$   
D. None of these
11. What is the range of  $f(x) = \frac{\sin(\pi[x^2 + 1])}{x^4 + 1}$ , where  $[ ]$  is the greatest integer function?
- A.  $[0, 10]$   
B.  $[-1, 11]$   
C.  $\phi$   
D. None of these

12. Which of the following are correct file opening modes in C?  
A.  $r$     B.  $rb$   
C. Both of them                                      D. None of these
13. If  $f(x)+f(y)=f(x+y)f(x-y)\forall x, y$ , then  $f(x)$  is  
A. Even     B. Odd  
C. Neither even nor odd                         D. Both even and odd
14. How many solutions does the equation  $x+y+z=11$  have, where  $x, y, z$  are non negative integers  
A. 78     B. 68  
C. 89     D. 99
15. If the set  $A$  contains 23 elements and  $B$  contains 16 elements, then the number of one-one and onto mapping from  $A$  to  $B$  is :  
A. 720     B. 120  
C. 0    D. None of these
16. The Boolean function  $AB+AC$  is equivalent to  
A.  $AB+AC+BC$                                  B.  $A'B'C'+A'AA+B'CB$   
C.  $AA+BB+CC$                                  D.  $ABC+ABC'+AB'C$
17. Let  $T$  be the set of all triangles in the euclidean plane and let a relation  $R$  on  $T$  be defined as  $aRb$  if  $a$  is congruent to  $b \forall a, b \in T$ . Then  $R$  is  
A. reflexive but not transitive                 B. equivalence  
C. more than one of above                      D. None of these
18. Evaluate  $\lim_{x \rightarrow 4} \frac{3x-4}{x^2-2x-12}$   
A. undefined                                         B. 0  
C.  $\infty$      D. None of these

19. The function  $f(x)=\log x$
- A. has maxima at  $x=e$                       B. has minima at  $x=e$   
 C. has neither maxima nor minima      D. all of these
20. The sum of two numbers is  $k$ , the maximum value of the product of the first and the square of second is
- A. 4    B. 1  
 C. 3    D. 0
21. Number of non negative integer solutions to the inequality  $(x_1 + x_2 + \dots + x_6) \leq 15$  is
- A.  $p(21,6)$                                   B.  $c(15, 6)$   
 C.  $p(15, 6)$                                   D.  $x(21, 6)$
22. A man is known to speak truth 3 out of 4 times. He throws a dice and reports that it is a six. Find the probability that it is actually a six
- A.  $\frac{1}{8}$     B.  $\frac{5}{8}$   
 C.  $\frac{2}{7}$     D.  $\frac{3}{8}$
23. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected is the team has no girl?
- A. 12    B. 21  
 C. 14    D. None of these
24. What is the type of the int data type(in bytes) in C?
- A. 4    B. 8  
 C. 2    D. 7
25. Mean of 9 observations was found to be 35. Later on, it was detected that an observation 81 was misread as 18. Find the correct mean of the observation.
- A. 42    B. 24  
 C. 80    D. None of these

26. The last term of an AP 21, 18, 15, .... is -351. Find  $n^{\text{th}}$  term :
- A. 213  
B. 123  
C. 312  
D. -231
27. If  $A$  and  $B$  are square matrices of order 2, then  $(A+B)^2 = \dots$
- A.  $A^2 + 2AB + B^2$   
B.  $A^2 + AB + BA + B^2$   
C.  $A^2 + 2BA + B^2$   
D. None of these
28. The number of arrangements of six identical balls in three identical bins is
- A. 4  
B. 22  
C. 7  
D. None of these
29. Which of the following is not correct?
- A.  $\log(2+3) = \log(2 \times 3)$   
B.  $\log_{10} = \log_1$   
C. More than one above  
D. None of these
30. If for some numbers  $a$  and  $d$ , if first term is  $\frac{1}{a}$ , second term is  $\frac{1}{a+d}$  third term is  $\frac{1}{a+2d}$  and so on, then 5<sup>th</sup> term of sequence is :
- A.  $a+4d$   
B.  $a-4d$   
C.  $\frac{1}{a+4d}$   
D. None of these
31.  $\int \frac{1}{1+x^2}$  for limit  $[0,1]$
- A.  $\frac{2\pi}{3}$   
B.  $\frac{\pi}{2}$   
C.  $\frac{7\pi}{6}$   
D. None of these



39. If  $R$  is a relation 'less than' from  $A = \{1, 2, 4, 5\}$  to  $B = \{3, 4\}$ , the set of ordered pairs corresponding to  $R$ , then the inverse of  $R$  is
- A.  $\{(3, 1), (3, 2), (3, 3)\}$                       B.  $\{(4, 1), (4, 2), (4, 3)\}$   
 C.  $\{(4, 3), (4, 4), (4, 5)\}$                       D. None of these
40. The following propositional statement  $(P \rightarrow (Q \vee R)) \rightarrow ((P \wedge R) \rightarrow Q)$  is
- A. Satisfiable but not valid                      B. Valid  
 C. Contradiction                                      D. None of these
41. Let  $*$  be a binary operation defined on  $R$  by  $p * q = \frac{p+2q}{2} \forall p, q \in R$ . Then  $*$  is
- A. Commutative but not associative              B. Commutative and associative  
 C. Both of them                                        D. None of these
42. The number of all possible matrices of order  $3 \times 3$  with each entry 0 or 1 is
- A. 18    B. 81  
 C. 512    D. 521
43. The  $AM$  of 10 items is 50. If each item is increased by 5, then new  $AM$  would be :
- A. 50    B. 55  
 C. 60    D. 45
44. Find the maximum value of  $(x+8)(7-x)$
- A.  $\frac{240}{4}$     B.  $\frac{200}{4}$   
 C.  $\frac{255}{4}$     D.  $\frac{225}{4}$
45. If  $8P(4, n) = 6P(2, n-1)$  then  $n$  is
- A. 8    B. 3  
 C. 6    D. None of these



46. If each exterior angle of regular polygon are  $24^\circ$ , then how many sides does regular polygon have
- A. 10                                      B. 8  
C. 15                                      D. 12
47. Which of the following propositions is not a tautology?
- A.  $q \vee (q \rightarrow p)$                                       B.  $(q \vee q) \rightarrow q$   
C.  $p \rightarrow (p \rightarrow q)$                                       D. None of these
48. If  $A = \{1, 2, 5, 7\}$  and  $B = \{2, 4, 6\}$ , then find the number of proper subsets of  $A \cup B$
- A. 127                                      B. 64  
C. 63                                      D. 77
49.  $P \rightarrow (Q \rightarrow R)$  is equivalent to
- A.  $(P \vee Q) \rightarrow R$                                       B.  $(P \wedge Q) \rightarrow R$   
C.  $(P \vee Q) \rightarrow Q$                                       D. None of these
50. In every  $n+1$  element subset of the set  $(1, 2, 3, \dots, 2n)$ , which of the following is correct?
- A. At least two natural numbers which are prime to each other  
B. At least three natural numbers which are prime to each other  
C. There exists no consecutive natural numbers  
D. None of these
51. The negation of the statement  $(p \rightarrow q) \wedge r$  is
- A.  $p \wedge \sim p \vee (\sim p)$                                       B.  $(p \sim p \wedge q) \wedge (\sim r)$   
C.  $(q \wedge \sim q) \wedge p$                                       D. None of these
52. The sides of an equilateral triangle is increasing at the rate of  $2 \text{ cm/sec}$ . At what rate is its area increasing when the side of the triangle is  $40 \text{ cm}$ .
- A.  $20\sqrt{3} \text{ cm}^2 \text{ sec}$                                       B.  $3\sqrt{5} \text{ cm}^2 \text{ sec}$   
C.  $144 \text{ cm}^2 \text{ sec}$                                       D. None of these

53. If the 9-digit number  $45069 \times 4y8$  is divisible by 44, then what is the value of  $(x-2y)$  for the minimum value of  $y$  :
- A. 6  
B. 4  
C. 2  
D. None of these
54. Let  $f(x) = (-1)^{[6x]}$  where  $[ ]$  denotes the greatest integer function, then
- A. Range of  $f$  is  $\{-1, 1\}$   
B.  $f$  is even  
C.  $f$  is odd  
D. None of these
55. If  $A = \{1\}$ . How many elements  $P[P(P(A))]$  contains
- A. 16  
B. 8  
C. 14  
D. 6
56. If  $A$  is a skew symmetric matrix, then trace of  $A$  is
- A. 1  
B. -1  
C. 0  
D. None of these
57. A man has two parents, 4 grandparents, 8 great grand parents and so on. Find the number of ancestors during the 8 generations preceding his own
- A. 455  
B. 450  
C. 767  
D. 510
58. The simplest measure of dispersion which defines the difference between values of the extreme items of a series
- A. MD  
B. Range  
C. SD  
D. HM
59. How many words can be formed from the word 'DATA SCIENCE'?
- A. 335654  
B. 657499  
C. 100000  
D. None of these
60. Empty set is always
- A. universal set  
B. finite set  
C. empty set  
D. unknown set

61. How many elements are there in the complement of set X?  
A. 0  
B. 6  
C. All the elements of A  
D. None of these

62. What is the output of the following # include <stdio.h>

```
int main ( ) {  
    for (int x = 10; x >= 0; x --){  
        int z=x&(x>>1);  
        if (z);  
        printf ("% d", x); }  
}
```

- A. 763  
B. 769  
C. 678  
D. 679

63. What will be the output of the following pseudocode; # include <stdio.h>  
int main ( )

```
{  
    float x = 0.0;  
    long int y = 10;  
    printf ("% d", size of (x) == size of (x+y));  
    return 0;  
}
```

- A. 1  
B. 0  
C. 4  
D. 8

64. The domain of the function  $\log(\log(\sin x))$

- A.  $0 < x < \pi$   
B.  $2n\pi < x < (2n+1)\pi$   
C. empty set  
D. none of these

65. The period of the function  $f(x) = |\sin x| + |\cos x|$  is

- A.  $\pi$   
B.  $\pi/2$   
C.  $2\pi$   
D. None of these



72. Let  $f(x) = x^2, g(x) = \tan x, h(x) = \ln x$  What is  $[f \circ (f \circ f)](2)$ ?
- A. 2  
B. 8  
C. 16  
D. 256
73. Let  $A$  be a  $3 \times 3$  matrix and  $B$  be its adjoint matrix. If  $|B| = 64$ , then  $|A| = ?$
- A.  $\pm 2$   
B.  $\pm 4$   
C.  $\pm 8$   
D.  $\pm 12$
74. Let  $A = \frac{1^{55} + 2^{55} + 3^{55} + 4^{55}}{3}, B = \frac{1^{55} + 3^{55}}{4}, C = \frac{2^{55} + 4^{55}}{2}$  then
- A.  $B < A > C$   
B.  $A > B < C$   
C.  $B > C > A$   
D. None of these
75. The solution of the equation  $(x+1)(x+3)(x+2)(x+4) = 120$  is
- A. -1  
B. 2  
C. 1  
D. 0
76. Find the number of ways of arranging the letters of the word "MATERIAL" such that all the vowels in the word are to come together?
- A. 720  
B. 1440  
C. 1860  
D. 2120
77. If  $\log 2, \log(2^x - 1)$  and  $\log(2^x + 3)$  are in AP then the value of  $x$  is
- A.  $5/2$   
B.  $\log_2 5$   
C.  $\log_5 2$   
D.  $\log_3 5$
78. If  $y = \ln(e^x \cdot \ln x)$ , then  $y' = ?$
- A. 1  
B.  $1 + 1/x$   
C.  $\frac{1}{x} e^x$   
D.  $\ln e^x$

79. The area bounded by the lines  $y=|x|-2$  and  $y=1-|x-1|$  is  
A. 4 square units    B. 6 square units  
C. 2 square units    D. 8 square units
80. Consider a vocabulary with only four propositions  $A$ ,  $B$ ,  $C$  and  $D$ . How many models are there for the following sentence  $B \vee C$ .  
A. 10    B. 12  
C. 15    D. 16
81. For any two sets  $A$  and  $B, A - (A - B) = ?$   
A.  $B$     B.  $A - B$   
C.  $A \cap B$     D.  $A^C \cap B^C$
82. What is the time 100 hrs after 7 am?  
A. 7 pm    B. 12 am  
C. 11 am    D. 6 pm
83. The geometric mean of the sequence  $1, 2, 4, 8, \dots, 2^n$  :  
A.  $2^{n/2}$     B.  $2^{(n+1)/2}$   
C.  $2^{(n+1)-1}$     D.  $2^{(n-1)}$
84. The value of  $n$  for which  $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$  is a AM of  $a$  and  $b$  is  
A.  $-1$     B.  $0$   
C.  $1$     D.  $1/2$
85. If  $x$  and  $y$  are prime numbers which of the following CANNOT be the sum of  $x$  and  $y$ ?  
A. 5    B. 9  
C. 16    D. 23







# ANSWER SHEET

1	A	B	C	D	E	26	A	B	C	D	E	51	A	B	C	D	E	76	A	B	C	D	E
2	A	B	C	D	E	27	A	B	C	D	E	52	A	B	C	D	E	77	A	B	C	D	E
3	A	B	C	D	E	28	A	B	C	D	E	53	A	B	C	D	E	78	A	B	C	D	E
4	A	B	C	D	E	29	A	B	C	D	E	54	A	B	C	D	E	79	A	B	C	D	E
5	A	B	C	D	E	30	A	B	C	D	E	55	A	B	C	D	E	80	A	B	C	D	E
6	A	B	C	D	E	31	A	B	C	D	E	56	A	B	C	D	E	81	A	B	C	D	E
7	A	B	C	D	E	32	A	B	C	D	E	57	A	B	C	D	E	82	A	B	C	D	E
8	A	B	C	D	E	33	A	B	C	D	E	58	A	B	C	D	E	83	A	B	C	D	E
9	A	B	C	D	E	34	A	B	C	D	E	59	A	B	C	D	E	84	A	B	C	D	E
10	A	B	C	D	E	35	A	B	C	D	E	60	A	B	C	D	E	85	A	B	C	D	E
11	A	B	C	D	E	36	A	B	C	D	E	61	A	B	C	D	E	86	A	B	C	D	E
12	A	B	C	D	E	37	A	B	C	D	E	62	A	B	C	D	E	87	A	B	C	D	E
13	A	B	C	D	E	38	A	B	C	D	E	63	A	B	C	D	E	88	A	B	C	D	E
14	A	B	C	D	E	39	A	B	C	D	E	64	A	B	C	D	E	89	A	B	C	D	E
15	A	B	C	D	E	40	A	B	C	D	E	65	A	B	C	D	E	90	A	B	C	D	E
16	A	B	C	D	E	41	A	B	C	D	E	66	A	B	C	D	E	91	A	B	C	D	E
17	A	B	C	D	E	42	A	B	C	D	E	67	A	B	C	D	E	92	A	B	C	D	E
18	A	B	C	D	E	43	A	B	C	D	E	68	A	B	C	D	E	93	A	B	C	D	E
19	A	B	C	D	E	44	A	B	C	D	E	69	A	B	C	D	E	94	A	B	C	D	E
20	A	B	C	D	E	45	A	B	C	D	E	70	A	B	C	D	E	95	A	B	C	D	E
21	A	B	C	D	E	46	A	B	C	D	E	71	A	B	C	D	E	96	A	B	C	D	E
22	A	B	C	D	E	47	A	B	C	D	E	72	A	B	C	D	E	97	A	B	C	D	E
23	A	B	C	D	E	48	A	B	C	D	E	73	A	B	C	D	E	98	A	B	C	D	E
24	A	B	C	D	E	49	A	B	C	D	E	74	A	B	C	D	E	99	A	B	C	D	E
25	A	B	C	D	E	50	A	B	C	D	E	75	A	B	C	D	E	100	A	B	C	D	E

## **ROUGH WORK**

## **ROUGH WORK**

## **ROUGH WORK**