							Code No.	R –	2112
En	Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2023								
				CSS					
DATA SCIENCE									
	General Instructions								
1. The	1. The Question Paper is having 100 Objective Questions, each carrying one mark.								
2. The	answers are to	be (✔) 't	ick mark	ed' <b>only</b>	in the " <b>F</b>	Respor	ise Sheet"	provide	ed.
3. <u>Neg</u> a	ative marking :	0.25 ma	arks will	be dedu	cted for	each w	rong answe	er.	
Time : 2 H	lours						Ма	ax. Mar	ks : 100
To be fille	ed in by the Car	ndidate							
Register	in Figures								
Number	in words								

Choose appropriate answer from the options in the questions.

(100 × 1 = 100 marks)

- 1. The gcd of 49 and 98 is
  - a) 1
  - b) 2
  - c) 49
  - d) 98

DONOTWRITEHERE

# 2. *a* and *b* are two natural numbers with a + b = 24. If $a \ge b$ and $a^2 + b^2$ has minimum value, then *a* and *b* are given by

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- a) 12, 12 b) 0, 24 c) 24, 0 d) 15, 9
- 3. The number of positive integers less than 500 and ends with only one zero is
  - a) 45 b) 46
  - c) 47 d) 44

4.	You get pre\	r pay for a job in a company starts a pay of Rs. 10 and after that yo /ious day. Your pay in the 12 <sup>th</sup> day	s witl our pa is?	h a pay as follows : First day you will ay will be twice as much as it in the
	a)	Rs. 20,450	b)	Rs. 2048
	c)	Rs. 2045	d)	Rs. 20480
5.	The	number of 9 digit prime numbers u	ising	the digits 1, 2, …, 9 exactly once is
	a)	0	b)	infinitely many
	c)	1000	d)	1
6.	In a anir	garden there are altogether 24 go nals are counted to be 64. Then the	oats a e nun	and peacocks. The total legs of these nber of peacocks are
	a)	22	b)	26
	c)	32	d)	16
7.	The	number of two digit numbers dividi	ng 1	13 leaves a remainder 8 is
	a)	1	b)	2
	c)	3	d)	4
8.	If a <sup>2</sup>	$a^{2} + a + 1 = 0$ then $a^{2} + \frac{1}{a^{2}}$ is		
	a)	positive integer	b)	negative integer
	c)	positive fraction but not an integer	d)	negative fraction but not an integer
9.	The 10.	average of 10 different positive in The biggest of the numbers can be	ntege	rs is 200 of which the smallest being
	a)	75	b)	74
	c)	99	d)	126
10.	The	nature of the roots of the quadratic	equ	ation $ax^2 + bx + c = 0$ depends on

- a)  $b^2 4ac$  b)  $b^2 + 4ac$
- c) b+4ac d) b-4ac

11.	lf or othe	ne of the roots of the cubic equations are	on <i>p</i>	$x^3 + qx^2 + rx + t = 0$ is $\alpha + i\beta$ , then the
	a)	lpha-ieta and $-lpha+ieta$	b)	$\alpha + i\beta$ and $-\alpha + i\beta$
	c)	$\alpha - i\beta$ and a real root	d)	real roots
12.	A is	an $n \times n$ square matrix, which has	two r	rows equal. The determinent $\left  {oldsymbol{\mathcal{A}}^{\scriptscriptstyle k}}  ight $ is
	a)	k	b)	n
	c)	<i>k</i> + <i>n</i>	d)	0
13.	The	number of all possible $n \times n$ matric	ces w	ith entries either 0 or 1 are
	a)	n	b)	n <sup>2</sup>
	c)	2 <i>n</i>	d)	2 <sup>n</sup>
14.	The x+	following system of linear equation $y + z = 1$	าร	
	2 <i>x</i> -	$+2y+2z=\frac{1}{2}$ have		
	3 <i>x</i> -	+7y+9z=10		
	a)	no solutions	b)	unique solutions
	c)	infinitely many solutions	d)	finitely many solutions
15.	The	value of $\lim \frac{x^{20} - 1}{x^{10} - 1}$ is		
	a)	infinitely	b)	2
	c)	unknown	d)	0.5
16.	An e	example of an empty relation is		
	a)	$\{\phi\}$	b)	the universal set
	c)	$\{\phi\}$ , the empty set	d)	the power set
17.	In th	ne collection of all straight line in a	place	the relation "perpendicularity" is
	a)	reflective	b)	symmetric
	c)	transitive	d)	anti-symmetric

- 18. A function  $f: X \to Y$  is onto when
  - a) |X| is finite b) X = Yc) Range of *f* is Y d) |Y| is finite

19. The derivative of  $y = c^x$ , where *c* is any constant is

- a)  $c^x \log c$  b)  $c^x$ c)  $\log x$  d)  $c \log x$
- 20.  $\int_{0}^{n} x^{k}$  is
  - a) k+1b)  $\frac{n+1}{K}$ c)  $\frac{n^{k+1}}{k+1}$ d)  $\frac{k^{n+1}}{k+1}$
- 21. The shaded region in the following figure represents



- a)  $X \cup Y$
- c)  $U-X \cap Y$
- 22. If X is the set of all positive integers and multiples of 5 and Y is the set of all integers of multiplies of 10, then  $X \cap Y$  is
  - a) the set of all integers
  - b) the set of all positive integers which are multiplies of 10
  - c) the set of all integers which are multiplies of 10
  - d) the set of all integers which are multiplies of 5

- 23. If *X* is the set of all words in "FOLLOW" and *Y* is the set of all words in "WOLF", then
  - a)  $X \cap Y = \phi$  b)  $X \cup Y = \phi$
  - c) X = Y d)  $x \neq Y$

24. The solution set of  $x^2 - 5x + 6 = 0$  in roster form is

- a) {3, 2} b) 3, 2
- c) 3 d) {2}
- 25. If  $X^c$  denotes the complement of X, then  $(X \cup Y)^c$  is
  - a)  $X^c \cap Y^c$ b)  $X^c \cup Y^c$ c)  $X^c \cap Y$ d)  $X \cap Y^c$
- 26. The number of permutations with repetitions allowed of *k* different objects taken  $\ell$  at a time is
  - a)  ${}^{k}P_{\ell}$  b)  ${k}^{\ell}$ c)  ${\binom{k}{\ell}}$  d)  ${\ell}^{k}$
- 27. A committee consists of 5 persons is to be constituted from a group of 3 men and 4 women. The number of committee consists of 2 men and 3 women are
  - a) 120 b) 60 c) 12 d) 10
- 28. The number of possible different outcomes when 3 dice rolled are
  - a) 54 b) 53 c) 55 d) 56
- 29. The number of ways to color 10 buildings of which 4 of them should be green, 2 of them is blue, 2 of them is violet 2 white is

a) 18900 b) 198
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c) 10980 d) 10890

- 30. The number of ways 7 indistinguishable towels to be kept in 3 distinct baskets so that any two boxes together contain more than the other one is
  - a) 5 b) 6
  - c) 7 d) 4
- 31. The rules of University eleven-a-side cricket competition specify that the members of each team must have birthdays in the same month. The minimum number of mathematics students needed to be enrolled in the department to guarantee that they can raise a team of students is
  - a) 120 b) 119 c) 121 d) 122
- 32. An example of an odd function is
  - a)  $e^{x}$  b)  $x^{3} \sin x$ c)  $x^{2} + \sin x$  d)  $x^{5} \cos x$
- 33. An even function in the following is
  - a)  $\tan x$  b)  $\log x$ c)  $e^{-x}$  d)  $x^3 \sin x$
- 34. The derivative of  $\sin^2 x$  is
  - a)  $\cos 2x$  b)  $2\cos 2x$ c)  $\sin 2x$  d)  $2\sin 2x$
- 35. If  $y^2 = x$ , then  $\frac{dy}{dx}$  is a)  $\frac{1}{2\sqrt{x}}$ b)  $-\frac{1}{2\sqrt{x}}$ c)  $-\frac{1}{\sqrt{2x}}$ d)  $\frac{1}{\sqrt{2x}}$
- 36. The are of the region  $y = x^2$  and the *x*-axis on the interval [-b, b] is
  - a)  $\frac{b}{3}$  b) 0 c)  $2\frac{b^3}{3}$  d)  $-2\frac{b^3}{3}$

37. The value of  $\int_{0}^{1} \sqrt{1 + \cos x} \, dx$  is never equal to

a) 1 b) -1c)  $\sqrt{1.5}$  d)  $\sqrt{2}$ 

38. For a binary operation \* defined on the set of rationals  $\mathbb{Q}$ , as  $a^*b = \frac{ab}{2}$ , the element  $e \in \mathbb{Q}$ , for which  $a^*e = a = e^*a$  for all  $a \in \mathbb{Q}$  is

- a) 2 b)  $\frac{2}{a}$
- c)  $\frac{2}{ab}$  d) None of these

39. For a continuous function *f* on [*a*, *b*] and  $a \neq b$  with  $\int_{a}^{b} f(x) dx = 0$  then on [*a*, *b*]

- a) *f* is always infinite b) *f* vanishes at least once
- c) *f* never vanishes d) None of these
- 40. The income of a person is Rs. 40,000 in the first year and he receives an increase of Rs. 2,000 to his income per year for the next 9 years. The total amount received after 10 years is
  - a) Rs. 4,80,000 b) Rs. 4,85,000 c) Rs. 4,95,000 d) Rs. 4,90,000
- 41. The 5 numbers lies between 11 and 35 so that the resulting sequence is in A.P is
  - a) 15, 19, 23, 27, 31 b) 12, 13, 14, 15, 16
  - c) 13, 15, 17, 19, 21 d) None of these
- 42. The number of subsets of  $\{a, b, c, \{d, e\}\}$ 
  - a) 2<sup>5</sup> b) 2<sup>4</sup>
  - c) 2<sup>3</sup> d) None of these

43. If f: defined  $\mathbb{R}^+ \to \mathbb{R}^+$  by  $f(x) = x^2 - 1$ , then the inverse of f is

	a)	X	b)	$\sqrt{X}$
	c)	$\sqrt{x+1}$	d)	$\sqrt{x^2-1}$
44.	The	simplest form of $-69 (mod 13)$ is		
	a)	-8(mod13)	b)	0
	c)	9	d)	9(mod13)
45.	The	value of x in $3x = 2 \pmod{5}$ is		
	a)	4(mod 5)	b)	4
	c)	0(mod 5)	d)	None of the above
46.	For	a square matrix <i>A</i> of order <i>n</i> and t	for an	by scalar <i>k,</i> the determinant $ kA $ is
	a)	k A	b)	$k^{-1} A $
	c)	$\kappa^n  A $	d)	$k^{-n} A $

47. For a non-singular matrix *A* of order *n*,  $|A^{-1}|$  is

- a)  $\frac{1}{|A^c|}$  b)  $|A^c|$ c) |A| d)  $\frac{1}{|A|}$
- c) |A| d)  $\frac{1}{|A|}$

48. The set  $\{(-1, 5), (0, 1), (1, 5), (2, 4), (3, 6)\}$  represents

- a) a function b) a relation but not a function
- c) a one-one function d) none of these
- 49. The range of the function  $f: \mathbb{Z}_6 \to \mathbb{Z}_6$  Defined by  $f(x) = x^2$  is
  - a)  $\mathbb{Z}_6 = \{5\}$  b)  $\mathbb{Z}$
  - c) {0, 1, 4, 3} d) None of these
    - 9

50. For  $n \in \mathbb{Z}$ ,  $X^n = \{a \in \mathbb{R} : a \le n^2\}$ , the set  $X^0$  is

- a)  $\bigcup_{i=1}^{n} X^{n}$  b) {0} c)  $\phi$  d) None of these
- 51. Output of the following code is :

52. The output of the following code is def calculate :

if x > y: greater = x else : greater = y while (True) : if ((greater % x == 0) and (greater % y == 0)): abc = greater break greater +=1

return abc

a) gcd of *x* and *y* 

b) Icm of x and y

- c) greater among *x* and *y*
- d) smallest among x and y

```
53. The output of the following code is
    def calculate:
    if x > y:
    smaller = y
    else :
    smaller = x
    for i in range(1, smaller +1):
    if((x\% i == 0) and (y\% i == 0)):
    abc = i
    return abc
          hcf of x and y
                                                  lcm of x and y
    a)
                                             b)
          gcd x and y
                                                  smallest among x and y
     c)
                                             d)
```

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54. For two given integers m < n the output of the following code is for number in range (m, n + 1) :
```

if number > 1 :

```
for i in range (2, number) :
```

```
if (number % i) = = 0 :
```

break

else :

print(number)

- a) all the prime number between *m* and *n*
- b) all the number between *m* and *n*
- c) all the even number between *m* and *n*
- d) all the odd number between m and n

55. Given an integer n > 1, the output of the following code is :

```
z=1
for i in range (1, n + 1):
z = z^*i
print(z)
a) sum of any n integers
```

- b) product of any *n* integers
- c) sum of first *n* integers
- d) factorial *n*

56. For given integers m, n > 0 the following code gives us :

for x in range(1, m+1): print(n, 'x', x, '=', n\*x)

- a) sum of any n + m integers b) product of any n integers
- c) multiplication table of n upto m d) None of these

#### 57. Probability that an odd number is appeared while rolling a dice is

- a)  $\frac{1}{6}$ c)  $\frac{1}{3}$ b)  $\frac{1}{2}$ d) None of these
- 58. 3 balls are "randomly drawn" from a bowl containing 6 red and 5 balls, then the probability that one of the balls is red and the other two blue is
  - a)  $\frac{3}{11}$  b)  $\frac{5}{11}$ c)  $\frac{6}{11}$  d)  $\frac{4}{11}$
- 59. Mr. X is undecided as to whether to take a Mathematics course or a Physics course. He estimates that his probability of receiving an A grade would be  $\frac{1}{2}$  in a

Mathematics course and  $\frac{2}{3}$  in a Physics course. If he decides to base his decision on the flip of a fair coin, then the probability that he gets an A in Physics is

- a)  $\frac{1}{2}$ b)  $\frac{3}{2}$ c)  $\frac{1}{3}$ d) None of these
- 60. If two cards are drawn at random from a well-shuffled pack of 52 cards, then the chance of drawing two aces is
  - a)  $\frac{1}{221}$  b)  $\frac{1}{52}$ c)  $\frac{1}{26}$  d)  $\frac{2}{22}$

61. If three cards are drawn at random from a forma well-shuffled pack of 52 cards, then the probability that these cards are a kind, a queen, and a knave is

a) 
$$\frac{26}{5525}$$
 b)  $\frac{16}{5525}$   
c)  $\frac{11}{5525}$  d)  $\frac{36}{5525}$ 

62. Out of (2n+1) cards consecutively numbered three are drawn at random, the probability that the numbers on them are in A.P is

a)	$\frac{n}{4n^2-1}$	b)	$\frac{2n}{4n^2-1}$
c)	$\frac{3n}{4n^2-1}$	d)	$\frac{4n}{4n^2-1}$

- 63. A basket contains 4 tickets numbered 3, 5, 7, 9 and another basket contains 6 numbered 6, 12, 16, 21, 23, 24. One of the baskets and a ticket are choosen randomly, then the probability that the ticket number 3 is chosen
  - a)  $\frac{5}{12}$  b)  $\frac{5}{24}$ c)  $\frac{1}{9}$  d)  $\frac{1}{8}$
- 64. The probability that two numbers choosen at random are prime is
  - a)  $\frac{1}{2}$  b)  $\frac{6}{\pi}$ c)  $\frac{6}{\pi^2}$  d) None of these
- 65. Two special dice are prepared such that the probabilities of throwing 1, 2, 3, 4, 5, 6 are  $\frac{1-k}{6}$ ,  $\frac{1+2k}{6}$ ,  $\frac{1-k}{6}$ ,  $\frac{1+k}{6}$ ,  $\frac{1-2k}{6}$  and  $\frac{1+k}{6}$  respectively. The probability that getting a sum equal to 9 by throwing these two dice is

a) 
$$\frac{1}{18}(1+k)(2-3k)$$
  
b)  $\frac{1}{18}(1-k)(2-3k)$   
c)  $\frac{1}{18}(1+k)(2+3k)$   
d)  $\frac{1}{18}(1-k)(2+3k)$ 

66. Cards are drawn one by one from a full deck. The probability that exactly 10 cards will precede the first ace is

b)

Only (ii) is a proposition

(i) and (iv) are propositions

- a)  $\frac{163}{4165}$  b)  $\frac{164}{4165}$ c)  $\frac{165}{4165}$  d)  $\frac{166}{4165}$
- 67. Consider the following statements :
  - (i) Pythagores was a philosopher
  - (ii) Let us go!
  - (iii) x = 3 = 5
  - (iv) 1+1=1000 and sun is made of cheese

Which of the following is true?

- a) Only (i) is a proposition
- c) None of them are propositions d)
- 68. Among the following is 'true' statements?
  - (i) (5 < 8) and (2 + 3 = 4)
  - (ii) If 1 = 2, then 3 = 3
  - a) both of them are true b) Only (i) is true
  - c) only (ii) is true d) none of them are true
- 69. The negation of  $p \lor q$  is
  - a)  $\neg p \land q$  b)  $\neg p \land \neg q$
  - c)  $p \wedge \neg q$  d)  $p \wedge q$

70. Which of the following propositions is a tautology?

- a)  $[p \land (p \rightarrow q)] \rightarrow q$  b)  $[p \land (p \rightarrow q)] \rightarrow \neg q$
- c)  $[p \land \neg p] \rightarrow p$  d) all of the above
- 71. Which of the following is a contradiction?
  - a)  $\neg p \leftrightarrow (p \lor \neg p)$  b)  $p \land \neg p$
  - c)  $p \leftrightarrow \neg p$  d) none of the above

72. Representation of the following switch is symbolic form is



- a)  $(A \lor B) \land (B' \lor C') \land (A \lor C)$  b)  $(A \lor B)$
- c)  $(A \lor B) \land (B' \lor C') \lor (A \lor C)$

b) 
$$(A \lor B) \lor (B' \lor C') \land (A \lor C)$$
  
d)  $(A' \land C) \lor (B' \lor C') \lor (A \land B)$ 

73. Which of the following are equivalent?

a) 
$$p \rightarrow q \equiv \neg p \lor q$$
 b)  $p \equiv q$  and  $\neg q$ 

c) 
$$p \equiv q$$
 and  $\neg q$  d)  $p \rightarrow q \equiv \neg p \lor \neg q$ 

74. The domain of the function  $f(x) = x^2$  is  $(-\infty, \infty)$  and the domain of the function  $g(x) = \sqrt{x-1}$  is  $[1, \infty)$ . The domain of the function f + g is

- a)  $(-\infty, \infty)$  b)  $(-\infty, 1]$
- c)  $(0, \infty)$  d)  $[1, \infty)$
- 75. *X* and *Y* be two non empty finite sets with |X| = m > |Y| = n > 2 and *f* is any function from *X* and *Y*. Then

a) 
$$f(x_1) \neq f(x_2)$$
 for all  $x_1 \neq x_2 \in X$ 

- b)  $f(x_1) = f(x_2)$  for all  $x_1 \neq x_2 \in X$
- c) There exists at least two  $x_1 \neq x_2$  such that  $f(x_1) = f(x_2)$
- d) None of these
- 76. If the decimal expansion of a number is periodic, then the number is periodic, then the number is a
  - a) irrational number b) rational number
  - c) complex number d) none of these

- 77. Let *g* be a function from  $\mathbb{N}$  to set of all 2 × 2 matrices defined by  $g(m) = \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}^m$ , then g(4) is
  - a)  $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ b)  $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ c)  $\begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix}$ d) None of these
- 78. Suppose a task *U* can be done in  $\ell_1$  ways, take *V* in  $\ell_2$  ways, and both can be accomplished in  $\ell_2$  different ways. Then task *U* or *V* can be done in
  - a)  $\ell_1 + \ell_2 \ell_3$  ways b)  $\ell_1 + \ell_2 + \ell_3$  ways
  - c)  $\ell_1 \ell_2 \ell_3$  ways d)  $\ell_1 \ell_2 + \ell_3$  ways
- 79. Suppose a task *U* is made up of two subtasks says  $U_1$  followed by  $U_2$ . If subtask  $U_1$  can be done in  $\ell_1$  ways and subtask  $U_2$  in  $\ell_2$  different ways for each subtask  $U_1$  can be done, then task *U* can be done in
  - a)  $\ell_1 + \ell_2$  ways b)  $\ell_1 \ell_2$  ways c)  $\ell_1 / \ell_2$  ways d)  $\ell_2 / \ell_1$  ways

80. If 
$$\begin{vmatrix} x+5 & 4 \\ x+2 & 3 \end{vmatrix} = 6$$
, then x is  
a) 0 b) -1  
c) 1 d)  $\pm 1$ 

81. If 
$$X = \begin{bmatrix} n & -n \\ -n & n \end{bmatrix}$$
 and  $X^2 = X$ , then the value of *n* is

- a) not defined b)  $-\frac{1}{2}$
- c) Any real number d)  $\frac{1}{2}$

82. If x, y, z are all positive and distinct then the value of  $\begin{vmatrix} x & y & z \\ y & z & x \\ z & x & y \end{vmatrix}$  in always

- a) 0 b) negative
- c) positive d) non-zero

83. The value of  $\lim_{x\to a} \frac{x^n - a^n}{x - a}$ , a > 0,  $n \in \mathbb{Q}$  is

a) 
$$nx^{n-1}$$
 b)  $x^{n-1}$   
c)  $na^{n-1}$  d)  $a^n$ 

84. The function  $x^2 - |x|$  is

- a) an integer function
- b) differentiable function at x = 0
- c) differentiable everywhere
- d) continuous everywhere but not differentiable at x = 0

85. If the function  $g(t) = \begin{cases} at-3 & if \ t \le 5 \\ bt+6 & if \ t > 5 \end{cases}$  is continuous at t = 5, then the relation between *a* and *b* is

- a)  $a-b=\frac{9}{5}$ b)  $a+b=\frac{9}{5}$ c)  $a-b=\frac{9}{3}$ d)  $a-b=\frac{6}{5}$
- 86. If the rate of change of a sphere in same as that of the rate of change of its radius, then the radius is
  - a)  $2\sqrt{\pi}$  units b)  $\frac{2\sqrt{\pi}}{3}$  units
  - c)  $\frac{1}{2\sqrt{\pi}}$  units d)  $2\pi$  units

87. The volume of the largest cylinder that can be inscribed in a sphere of radius  $\ell$  is

a)  $4\pi\ell^3$  b)  $\frac{4\pi\ell^3}{3}$ 

c) 
$$\frac{4\pi\ell^3}{\sqrt{3}}$$
 d)  $\frac{4\pi\ell^3}{3\sqrt{3}}$ 

88. The range of the function *f* defined on  $\mathbb{R}^+$  by  $f(t) = t^2 + 8$  to be invertible is

 a) [8, ∞] b) [0, ∞] 

 c) [-∞, ∞] d) none of these

89. If *R* be a relation on  $\mathbb{N}$  defined by  $R = \{(a, b) : a = b + 2, b < 6\}$ , then

- a)  $(2, 6) \in R$  b)  $(7, 5) \in R$
- c)  $(7,5) \notin R$  d)  $(2,4) \in R$

90. The operation \* on  $\mathbb{R}$  defined by  $a * b = \frac{a+b}{4}$  is

- a) not commutative
- b) neither a binary operation nor commutative
- c) commutative but not associative
- d) commutative and associative

91. The value of  $\int \frac{3x^2}{1+x^3} dx$  is

- a)  $\log(1+x^3)+C$ , where C is any arbitrary constant
- b)  $\log(1+x^3)+C$ , where C is a constant
- c)  $\log(1+x^3)+C$ , where C is any real number
- d)  $\log(1+x^3)$

- 92. The are bounded by the two regions  $y = x^2$  and  $x = y^2$  is
  - a)  $\frac{1}{2}$  b)  $\frac{1}{3}$ c)  $2-\frac{1}{2}$  d)  $2-\frac{1}{3}$

93. Some where in Asian contient, there is a country having 9 digits telephone numbers. Of these 9 digits first two shows the area which are same in the given area and begin with 0 and last 7 digits shows the local number, which cannot be begin with 0. The number of different possible phones numbers are

- a) 90000 b) 900000 c) 9000000 d) 9000000
- 94. A particular club in an academic institution has 20 members of which five are seniors, four are juniors, two are sophomores and the rest are freshmen. The number of possible ways the groups of five be chosen with the condition that there must be atleast one member from each class is
  - a) 288 b) 28800
  - c) 28 d) 2880
- 95. Eight important heads of state, including the Indian and the Pakisthan Premier, are present at a conference. For the perfunctory group photo, these eight dignitaries are lined up randomly next to one other. The probability that the Indian and Pakisthan Premier will stand next to each other is
  - a)  $\frac{1}{2}$  b)  $\frac{1}{3}$ c) 0 d)  $\frac{1}{4}$
- 96. While rolling a fair die twice, it is known that one of the rolls turned up a face value of five. The probability that the other roll also turning up a five as well is
  - a)  $\frac{1}{6}$  b)  $\frac{1}{12}$ c)  $\frac{1}{11}$  d)  $\frac{1}{10}$

The questions from 97 - 100 will be based on the following figure which represents three function *f*, *g*, *h*, *k* respectively.



100. The function which has the both the axis are tangent is

a)	k	b)	g
c)	h	d)	f

#### ANSWER SHEET

1	А	В	С	D	Е
2	А	В	С	D	Е
3	А	В	С	D	Е
4	Α	В	С	D	Е
5	Α	В	С	D	Е
6	А	В	С	D	Е
7	А	В	С	D	Е
8	А	В	С	D	Е
9	А	В	С	D	Е
10	А	В	С	D	Е
11	А	В	С	D	Е
12	А	В	С	D	Е
13	Α	В	С	D	Е
14	Α	В	С	D	Е
15	Α	В	С	D	Е
16	А	В	С	D	Е
17	Α	В	С	D	Е
18	Α	В	С	D	Е
19	А	В	С	D	Е
20	Α	В	С	D	Е
21	Α	В	С	D	Е
22	Α	В	С	D	Е
23	Α	В	С	D	Е
24	Α	В	С	D	Е
25	Α	В	С	D	Е

26	Α	В	С	D	Е
27	Α	В	С	D	Е
28	Α	В	С	D	Е
29	Α	В	С	D	Е
30	Α	В	С	D	Е
31	Α	В	С	D	Е
32	А	В	С	D	Е
33	А	В	С	D	Е
34	Α	В	С	D	Е
35	Α	В	С	D	Е
36	Α	В	С	D	Е
37	Α	В	С	D	Е
38	Α	В	С	D	Е
39	Α	В	С	D	Е
40	А	В	С	D	Е
41	А	В	С	D	Е
42	Α	В	С	D	Е
43	А	В	С	D	Е
44	Α	В	С	D	Ε
45	Α	В	С	D	Ε
46	Α	В	С	D	Ε
47	Α	В	С	D	Е
48	Α	В	С	D	Е
49	А	В	С	D	Е
	۸	Б	$\mathbf{c}$		_

26	Α	В	С	D	Ε	51	Α	В	С	D	Ε
27	А	В	С	D	Ε	52	Α	В	С	D	E
28	Α	В	С	D	Е	53	Α	В	С	D	Е
29	А	В	С	D	Е	54	Α	В	С	D	Е
30	А	В	С	D	Е	55	Α	В	С	D	Е
31	А	В	С	D	Е	56	Α	В	С	D	Ε
32	Α	В	С	D	Е	57	Α	В	С	D	Е
33	Α	В	С	D	Е	58	Α	В	С	D	Е
34	А	В	С	D	Е	59	Α	В	С	D	Е
35	А	В	С	D	Е	60	Α	В	С	D	Е
36	А	В	С	D	Е	61	Α	В	С	D	Е
37	А	В	С	D	Е	62	Α	В	С	D	Е
38	Α	В	С	D	Е	63	Α	В	С	D	Е
39	Α	В	С	D	Е	64	Α	В	С	D	Е
40	Α	В	С	D	Е	65	Α	В	С	D	Е
41	А	В	С	D	Ε	66	Α	В	С	D	Е
42	Α	В	С	D	Е	67	Α	В	С	D	Е
43	Α	В	С	D	Е	68	Α	В	С	D	Е
44	А	В	С	D	Е	69	А	В	С	D	Е
45	Α	В	С	D	Е	70	Α	В	С	D	Е
46	Α	В	С	D	Е	71	Α	В	С	D	Е
47	Α	В	С	D	Е	72	Α	В	С	D	Е
48	А	В	С	D	Е	73	Α	В	С	D	Е
49	Α	В	С	D	Е	74	Α	В	С	D	Е
50	Α	В	С	D	Е	75	Α	В	С	D	E



R - 2112

## **ROUGH WORK**

## **ROUGH WORK**

### **ROUGH WORK**