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# MAARULA CLASSES

# JAMIA 2023

Topic Wise Weightage & Detailed Trend Analysis

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Syllabus & Important Documents

Topic Wise All PYQ's  
CUET-PG - FREE TEST

Under the Guidance of  
**Amit Katiyar**



Complete Notes



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- Subject  $(2761)_8$  from  $(6357)_8$   
 (a)  $(3076)_8$  (b)  $(3276)_8$   
 (c)  $(2376)_8$  (d)  $(3376)_8$
- Which out of these is not correct pairing?  
 (a) BCD-7 bit (b) EBCDIC-8 bit  
 (c) ASCII-8 bit (d) None of these
- Which out of these does not support VoIP?  
 (a) Whatsapp (b) FaceTime  
 (c) IMO (d) None of these
- By using..... addition or subtraction of signed numbers are performed.  
 (a) 1s complement  
 (b) 2s complement  
 (c) direct addition/subtraction  
 (d) None of these
- Which statement out of these is not correct about multiprocessor systems:  
 (a) They provide fault-tolerance & high speed  
 (b) Tightly coupled multiprocessor system are much more energy-efficient than clusters.  
 (c) Loosely coupled multiprocessor system /clusters are intercorrected via a high speed communication system.  
 (d) None of these
- Which file format is not suitable for SD card in Android phone?  
 (a) FAT32 (b) NTFS  
 (c) exFAT (d) None of these
- Which out of these is not a type of ROM?  
 (a) Masked ROM (b) EEPROM  
 (c) Flash BIOS (d) Flash drive
- Select the next to smallest memory size from given below options:  
 (a) petabyte (b) Exabyte  
 (c) yottabyte (d) zettabyte
- When you simplify algebraically given below expression to a minimum sum of products, how many terms did you get ?  
 $(A+B'+C+E')(A+B'+D'+E)(B'+C'+D'+E')$   
 (a) 7 (b) 4  
 (c) 5 (d) 6
- The simplified form of given below expression is :  
 $A'CD'E+A'B'D'+ABCE+ABD$   
 (a)  $A'B'D'+ABD+BCD'E$  (b)  $A'B'D'+ABD+ACD'E$   
 (c)  $A'B'D'+ABD+BAD'E$  (d) None of these
- Example of 5<sup>th</sup> generation language is:  
 (a) ASP (b) Javascript  
 (c) SQL (d) None of these

- The output of following C language statement is:  
`printf("\nhello"+3);`  
 (a) lo (b) llo  
 (c) ello (d) Run-time error
- Give output of following C code:

```
int count (unsigned x)
{
  int b;
  for(b = 0; x! = 0; x >>= 1)
  if(x & 1)
  b++;
  return b;
}
int main()
{
  unsigned int a=3;
  printf("%d", count(a));
  return 0;
}
```

- (a) 2 (b) 3 (c) 4 (d) None
- What is the data type of following expression:  
 $expr_1 ? expr_2 : expr_3$   
 if  $expr_1$  is of type float &  $expr_2$  is type int.  
 (a) int (b) float (c) double (d) None
- Which operator out of these has got highest precedence?  
 (a), (b) < (c) ?: (d) [ ]
- Which operator out of these has left to right associativity?  
 (a) ! (b) ++ (c), (d) ?:
- Consider the following code segment :  

```
if(n > 0)
  for (i = 0; i < 3; i++)
    if(array[i] > 0) {
      printf("%d\n", array [i]); }
else
  printf("\n n is negative\n");
```

 Here, 'else' is paired with which 'if'?  
 (a) first (b) second (c) both (d) None
- For this kind of declaration of main() function in a C program 'copy.C':  
`int main(int argc, char *argv[] ) {-}`  
 and this call of main function at command prompt:  
`C:\tc\bin>copy file 1 file2 file3`  
 What will be the value passed in parameter argc ?  
 (a) 3 (b) 4 (c) 5 (d) None
- What is the correct file mode that open preexisting file in read and write mode :  
 (a) ab (b) r+b (c) w+b (d) None



20. Which C expression correctly represents this statement: "It decrements pointer p before fetching the character that p points to"  
 (a)\*p-- (b)--\*p (c)\*--p (d)None
21. How many times this statement will execute:  
 for(\*s==\*t&&\*t!='\0';s++,t++)  
 if both character pointers 's' and 't' point to the same string "abc".  
 (a)4 (b)3  
 (c)Run- time error (d)None of these
22. Which out of these statements is not true:  
 (a) The continue statement applies only to loops, not to switch.  
 (b) The break statement provides an early exit from for, while, and do, switch.  
 (c) The continue statement causes the next iteration of the enclosing for, while, or do loop to begin  
 (d) None of these
23. Which out of these is not the keyword C99 has added in addition to 32 keywords defined by ANSI C:  
 (a)\_Bool (b)inline (c)register (d)restrict
24. Which out of these is not a valid C version?  
 (a) 2007-another revised version of c programming language came with name C1X  
 (b) 1989- C89 standard (known as ANSI C or Standard C)  
 (c) 1990- ANSI c adopted by ISO, known as C90  
 (d) None of these
25. Who developed World Wide Web version 3 which is known as "Semantic Web"?  
 (a)Tim Berner Lee (b)Taub Schilling  
 (c)Dennis Richie (d)None of these

**Directions (26-27):** Choose the one which best expresses the meaning of italicized bold part of sentence from the options.

26. His speech was full of **affectation**  
 (a)boasting (b)pretence  
 (c)pedantry (d)euphemism
27. Reading of poetry is not congenial to her taste.  
 (a)suited (b)possible (c)effective (d)proper
28. Select phrase which means most nearly the same as this idiomatic phrase: "general act of forgiveness on a national occasion"  
 (a)benediction (b)emancipation  
 (c)investiture (d)amnesty
29. Pick the antonym of vacillating  
 (a)fascinating (b)fanaticism  
 (c)indolence (d)resolute
30. Pick the synonym of "patronage"  
 (a)donation (b)support  
 (c)espionage (d)benefit

31. Select the closest meaning of idiom "stick to one's guns"  
 (a)maintain one's stand under attack  
 (b)suspect something  
 (c)make something fail  
 (d)attack someone's faith

**Direction (32-33):** Supply the correct word/correct tense forms of the verb given in the bracket.

32. Did you think you.....(see) me somewhere before?  
 (a)have seen (b)saw  
 (c)had seen (d)wouldsee
33. Having placed..... proposals before you, I now ..... Your decision.  
 (a)alternate, waited for (b)different, wait to  
 (c) alternative, await (d)many, am waiting
34. Choose correct preposition: **He was of a charitable disposition, but did not like a number of his, relatives trying to live ....him without trying to earn their living.**  
 (a)off (b)through  
 (c)with (d)near
35. Select the sentence which best expresses the sentence "A stone struck me on the head" in passive voice.  
 (a)I was struck by a stone on the head.  
 (b)I was struck on the head by a stone.  
 (c)my head was struck by a stone.  
 (d)I had been struck by a stone on the head.

**Direction(36-37):** Fill the missing terms marked by question mark '?'.

- 36.
- |   |   |   |
|---|---|---|
| Z | ? | S |
| R | O | ? |
| ? | G | C |
- (a)WJK (b)KWT (c)WKJ (d)JKW

- 37.
- |     |    |    |
|-----|----|----|
| 72  | 24 | 6  |
| 96  | 16 | 12 |
| 108 | ?  | 18 |
- (a)12 (b)1 (c)18 (d)20
38. In a row of men, Manoj is 30<sup>th</sup> from the right and Kiran is 20<sup>th</sup> from the left. When they interchange their position, Manoj becomes 35<sup>th</sup> from the right. What is total number of men in the row?  
 (a)45 (b)4 (c)54 (d)34
39. If John celebrated his victory day on Tuesday, 5<sup>th</sup> January 1965, when will he celebrate his next victory day on the same day?  
 (a)5<sup>th</sup> January 1970 (b)5<sup>th</sup> January 1971  
 (c)5<sup>th</sup> January 1973 (d)5<sup>th</sup> January 1974



40. A child is looking for his father, he went 90 meters in the east before turning to his right. He went 20 meters before turning to his right again to look for his father at his uncle's place 30 meters from this point. His father was not there.

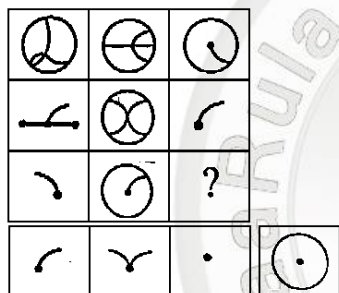
From here he went 100 meters to his north before meeting his father in a street. How far did the son meet his father from the starting point?

- (a) 80m (b) 100m  
(c) 260m (d) 140m

41. Sunil is the son of Kesav. Simran, Kesav's sister, has a son Maruti & daughter Sita. Prem is the maternal Uncle of Maruti. How is Sunil related to Maruti?

- (a) Uncle (b) Brother  
(c) Nephew (d) Cousin B

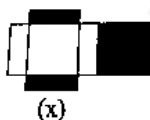
42. Select a suitable figure from the four alternatives that would complete the figure matrix.



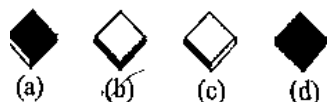
- (1) (2) (3) (4)

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

43. In the following question how does the figure look when folded into a cube along the marked lines?



(x)



- (a) (b) (c) (d)

- (a) a, c, d (b) b, c, d  
(c) a, b, c (d) None

44. Find the missing terms of this series:

b, a, a, b, ?, a, b, a, ?, b, b, a, ?, ?

- (a) bbaa (b) aaaa  
(c) abab (d) baba

45. Complete the series:

Z, L, X, J, V, H, T, F, ..., ..

- (a) D, R (b) R, D (c) D, D (d) R, R

46. How many elements does the set

$P(\{\varphi, a, \{a\}, \{\{a\}\})$  has; where a & b are distinct elements, P denotes power set.

- (a) 2 (b) 4 (c) 16 (d) None

47. What is the cardinality of these sets in the order of their serial number?

- (i)  $\{a\}$  (ii)  $\{\{a\}\}$   
(iii)  $\{a, \{a\}\}$  (iv)  $\{a, \{a\}, \{a, \{a\}\}\}$   
(a) 1, 1, 3, 2 (b) 1, 1, 2, 3  
(c) 1, 2, 2, 3 (d) 1, 2, 3, 4

48. Suppose that  $A_i = \{1, 2, 3, \dots, i\}$  for  $i = 1, 2, 3, \dots$  then find  $\bigcup_{i=1}^{\infty} A_i = ?$ . Here Z is set of integers.

- (a)  $Z^+$  (b) Z  
(c)  $\{1\}$  (d) None

49. Find  $\bigcup_{i=1}^{\infty} A_i$  and  $\bigcap_{i=1}^{\infty} A_i$  for every positive integer i where  $A_i = \{-i, i\}$ . Here Z denotes set of integers.

- (a)  $Z - \{0\}, \phi$  (b)  $Z, \{-1, 0, 1\}$   
(c) Z,  $\phi$  (d) None

50. Which of the following relations are functions?

- (i)  $\{(1, (a, b)), (2, (b, c)), (3, (c, a)), (4, (a, b))\}$   
(ii)  $\{(1, (a, b)), (2, (b, a)), (3, (c, a)), (1, (a, c))\}$   
(iii)  $\{(1, (a, b)), (2, (a, b)), (3, (a, b))\}$   
(iv)  $\{(1, (a, b)), (2, (b, c)), (1, (c, a))\}$   
(a) i, iii (b) i, ii (c) i, iv (d) i, ii

51. There is direct flight from Trichy to New Delhi and 2 direct trains. There are 6 train from Trichy to Chennai and 4 train from Chennai to delhi. Also, there are 2 trains from Trichy to Mumbai and 8 flights from Mumbai to New Delhi. In how many ways can a person travel from Trichy to New Delhi?

- (a) 42 (b) 40 (c) 43 (d) 41

52. If P, Q, R have truth values T, T, and F, then the truth values of  $(P \rightarrow (Q \rightarrow R)) \rightarrow ((P \rightarrow Q) \rightarrow (P \rightarrow R)) \& P \rightarrow Q \vee R$  are

- (a) F, F (b) T, T (c) F, T (d) T, F

53.  $(A \cap B') \cup (A' \cap B) \cup (A' \cap B')$  is equal to

- (a)  $A \cup B$  (b)  $A' \cup B'$  (c)  $A' \cap B'$  (d)  $A \cup B'$

54. The floor function  $[ ]$  is

- (a) One- one but no onto  
(b) Onto but not one- one  
(c) Neither one--one nor onto  
(d) A bijection from R to Z

55. The domain of real- valued function  $f(x) = \sqrt{x-3} + \sqrt{x-4}$  is the set of all values of x satisfying

- (a)  $3 < x < 4$  (b)  $3 \leq x < \infty$   
(c)  $3 \leq x \leq 4$  (d)  $4 \leq x \leq \infty$

56. The number of students who take both the subjects' mathematics and chemistry are 30. This represents 10% of the enrolment in mathematics and 12% of enrolment in chemistry. How many students take at least one of these two subjects?

- (a) 500 (b) 490 (c) 560 (d) 520





57.  $\frac{1}{\sin 10^\circ} - \frac{\sqrt{3}}{\cos 10^\circ} =$   
 (a)0 (b)4 (c)1 (d)2

58. The value of  $\sin \frac{\pi}{16} \sin \frac{3\pi}{16} \sin \frac{5\pi}{16} \sin \frac{7\pi}{16}$  is  
 (a)  $\frac{\sqrt{2}}{16}$  (b)  $\frac{\sqrt{2}}{32}$  (c)  $\frac{\sqrt{2}}{8}$  (d)  $\frac{\sqrt{2}}{64}$

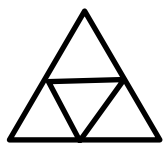
59. Number of unimodular complex number which satisfies the locus  $\arg\left(\frac{z-1}{z+i}\right) = \frac{\pi}{2}$  is  
 (a)0 (b)1 (c)2 (d)3

60. The values of the parameter  $a$  such that the roots  $\alpha, \beta$  of the equation  $2x^2 + 6x + a = 0$  satisfy the inequality  $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} < 2$  are  
 (a)  $a > 0$  (b)  $a < 9/2$   
 (c)  $a < 0$  or  $a > 9/2$  (d) None of these

61. The 120 permutations of MAHES are arranged in dictionary order, as if each were an ordinary 5-letter word. The last letter of 86<sup>th</sup> word in the list is  
 (a)A (b)H (c)S (d)E

62. A person writes letter to 6 friends and addresses the corresponding envelopes. Let 'x' be the number of ways so that at least 2 of letters are in wrong envelopes and 'y' be the number of ways so that all letters are in wrong envelopes. Then  $x - y = ?$   
 (a)719 (b)265 (c)454 (d)None

63. In how many ways can this diagram be colored subject to the following two conditions?  
 (i) Each of the smaller triangle is to be painted with one of three colors: red, blue, or green  
 (ii) No two adjacent regions have the same color.



(a)20 (b)24 (c)28 (d)30

64. The tens digits of  $1! + 2! + 3! + \dots + 49!$  is  
 (a)1 (b)2 (c)3 (d)4

65. The middle term in expansion of  $\left(1 + \frac{1}{x^2}\right) (1 + x^2)^n$  is  
 (a)  $C_n^{2n} x^{2n}$  (b)  $C_n^{2n}$  (c)  $C_{n-1}^{2n}$  (d) None

66. The sum of infinite series  $\frac{2^2}{2!} + \frac{2^4}{4!} + \frac{2^6}{6!} + \frac{2^8}{8!} + \dots$  is equal to  
 (a)  $\frac{e^2 - 1}{2e}$  (b)  $\frac{e^4 + 1}{2e^2}$  (c)  $\frac{(e^2 - 1)^2}{2e^2}$  (d)  $\frac{(e^2 + 1)^2}{2e^2}$

67. If 'a' is the arithmetic mean of 'b' and 'c' and  $G_1$  and  $G_2$  be the two geometric means between them, then  $G_1^3 + G_2^3$  is equal to  
 (a)abc (b)4abc (c)2abc (d)abc/2

68. For  $x \in R$ ,  $\lim_{x \rightarrow \infty} \left(\frac{x-3}{x+2}\right)^x =$   
 (a)e (b)e<sup>-1</sup> (c)e<sup>5</sup> (d)e<sup>-5</sup>

69. The contrapositive of  $p \rightarrow (\sim q \rightarrow \sim r)$  is  
 (a)  $(\sim q \wedge r) \rightarrow \sim p$  (b)  $(q \rightarrow r) \rightarrow \sim p$   
 (c)  $(q \vee \sim r) \rightarrow \sim p$  (d) None of these

70. The mean of 100 observations is 50 and their standard deviation is 5. The sum of squares of all observations is  
 (a)50,000 (b) 2,50,000  
 (c)2,52,500 (d) 2,52,500

71. A card is drawn from a pack of 52 cards. A gambler bets that it is a spade or an ace. What are odds against his winning this bet?  
 (a)9:4 (b)17:52  
 (c)4:9 (d)52:17

72. If Z is an idempotent matrix, then  $(I + Z)^n$   
 (a)  $I + 2^n Z$  (b)  $I + (2^n - 1)Z$   
 (c)  $I - (2^n - 1)Z$  (d) None of these

73. If  $A^2 - A = 3I$  then  $A^{-1}$  is  
 (a)A-I (b)  $\frac{1}{3}(A - I)$   
 (c)A+I (d)  $\frac{1}{3}(A + I)$

74. The system of linear equations  
 $a+2b+3c=7$   
 $2a+4b+c=12$   
 $3a+6b+4c=20$   
 (a)has a unique solution  
 (b)has no solution  
 (c)has infinite number of solutions  
 (d)has two solutions

75. If the rank of matrix  $\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$  is 2 then  
 (a)  $abc \neq 0$  (b)  $a \neq 0, bc = 0$   
 (c)  $ab \neq 0, c = 0$  (d)  $a \neq 0, b \neq 0, c \neq 0$

76. Solution of the differential equation  $\frac{dx}{dy} - \frac{x \log x}{1 + \log x} = \frac{e^y}{1 + \log x}$ , if  $y(1)=0$ , is  
 (a)  $x^x = e^{ye^y}$  (b)  $x^x = ye^{e^y}$   
 (c)  $e^y = x^{e^y}$  (d) None of these

77. The general solution of differential equation  $(\tan^{-1} y - x) dy = (1 + y^2) dx$  is  
 (a)  $x = (\tan^{-1} y + 1) + Ce^{-\tan^{-1} y}$   
 (b)  $x = (\tan^{-1} y - 1) + Ce^{-\tan^{-1} y}$   
 (c)  $x = (\tan^{-1} x - 1) + Ce^{-\tan^{-1} x}$   
 (d)  $x = (\tan^{-1} x + 1) + Ce^{-\tan^{-1} x}$

78. A pair of fair dice is thrown independently 3 times. The probability of getting a score of exactly 9 twice is  
 (a)8/729 (b)8/9  
 (c)1/729 (d)8/243



79. Every gram of wheat provides 0.1 gram of proteins and 0.25 gram of carbohydrates. The responding values of rice are 0.05 gram and 0.5 gram respectively. The minimum daily requirements of proteins & carbohydrates for an average child are 50 gram & 200 gram respectively. Then in what quantities wheat & rice be mixed in daily diet to provide minimum daily requirement of proteins & carbohydrates at minimum cost?

- (a)300,400 (b)200,400  
(c)400, 300 (d)400,200

80.  $Z=7x+y$ , subject to constraints:

$$5x + y \geq 5,$$

$$x + y \geq 3$$

$$x \geq 0, y \geq 0, y$$

Then minimum value of Z occurs at:

- (a)(0,5) (b)(3,0) (c)(7,0) (d) $(\frac{1}{2}, \frac{5}{2})$

81. The point of inflection for  $f(x) = 3x^4 - 4x^3$  are

- (a)x=1 and x=2 (b) x=0 and x=2/3  
(c) x=3 and x=-1 (d) x=4/5 and x=-1

82.  $\int_0^{1000} e^{x-[x]} dx$  is

- (a) $e^{1000} - 1$  (b) $\frac{e^{1000}-1}{e-1}$   
(c)1000(e-1) (d) $\frac{e-1}{1000}$

83. Let the equation of a curve passing through point (0,1) be given by  $y = \int x^2 e^{x^3} dx$ . If the equation of curve is written in the form  $x = f(y)$ , then  $f(y)$  is?

- (a) $\sqrt[3]{\log_e(3y-2)}$  (b) $\sqrt[2]{\log_e(3y-2)}$   
(c) $\sqrt[3]{\log_e(2-3y)}$  (d) None of these

84. The value of  $\int_0^\pi x(\sin^4 x \cos^4 x) dx$  is

- (a) $\frac{3\pi^2}{64}$  (b) $\frac{3\pi^2}{128}$   
(c) $\frac{3\pi^2}{256}$  (d) $\frac{5\pi}{256}$

85. If  $49^n + 16n + \lambda$  is divisible by 64 for all  $n \in N$ , then the least negative value of  $\lambda$  is

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

86. A Disk Defragmenter is an example of

- (a)Application software (b)System software  
(c)Compiler (d)Utility program

87. Convert the following decimal number to a number system with radix 3.

$$(106)_{10} = (?)_3$$

- (a)10221 (b)10212  
(c)12201 (d)None

88. Which of the following is an encoding scheme created for Indian scripts:

- (a)Unicode (b)ISCII  
(c)ESCII (d)ASCII

89. Convert  $(10025)_{10} = (?)_{16}$

- (a)64.6 (b)46.4cor  
(c)64.4 (d)None

90. Consider the following C language declaration & statement. Which statement is erroneous?

```
float f1=9.9;
floatf2 =66;
const float *ptrF1;
float*const ptrF2=&f2;
ptrF1=&f1;
ptrF2++;
ptrF1++;
```

- (a)float\* const ptrF2=&; (b)ptrF1++  
(c)ptr F2++ (d)None of these

91. What will be output of following statement?

```
char ch;
ch=130;
printf("\nvalue of ch=%d",ch);
```

- (a)-126 (b)-127 (c)127 (d)None

92. What will be output of following statement?

```
int n1=3, n2=6, a;
printf("\n1^n2)+(a^a)=%d",(n1^n2)+(a^a));
```

- (a)(n1^n2)+( a^a)=6 (b)Compilation error  
(c)run-time error (d)(n1^n2)+(a^a)=5

93. What is output of following C code segment?

```
int i;
for(i=0;i<=2; i++)
{switch(i)
{case 1: printf("%2d", i);
case2:printf("%2d",i);continue;
default: printf("%2d" ,i);
}}
```

- (a)01112 (b)0112  
(c)01121 (d)Syntax error

94. What is the output of following C program:

```
int main()
{ char ch = 'A';
int x = 97;
int y = sizeof(++x);
printf("\nx is %d",x);
while(ch<='F')
{
Switch(ch)
{
case'A':
case'B' :
case'C' :
```





```

        case'D' : ch++; break;
        case'E' :
        case'F' : ch++;
        } putchar (ch);
    }
    return0;

```

- (a)x is 97 ABCDEF (b)x is 98 BCDEFG  
(c)x is 97 BCDEFG (d)Run- time error

95. What is output of following C program :

```

void e(int x)
{
    if(x>0)
    {
        e(- x);
        printf("%2d" , x);
        e(--x);
    }
}
int main()
{
    e(3);
    return0;
}

```

- (a)0120 (b)0220  
(c)Compile-time error (d)Run-time error

96. variables i & c, scanf ("%i%c",&i,&c); when the input given by user is:

- 29 w  
(a)i=29 c="" (b)i=29 c='w'  
(c)i=29 c= garbage value (d)syntax error

97. Minimum & Maximum range of values for 'float' data type in C is:

- (a) Unlimited  
(b)  $1.17 \times 10^{-37}$  to  $3.4 \times 10^{38}$   
(c)  $10^{-37}$  to  $10^{38}$   
(d)  $10^{-38}$  to  $10^{38}$

98. Which out of these is not valid for C language?

- (a) The value of external/ global variable is unaffected by any manipulation of local variable.  
(b) Local variable takes precedence over global variable.  
(c) Global variable takes precedence over local variable.  
(d) None of these

99. C was originally developed in the 1970s by Dennis Ritchie at Bell Telephone Laboratories, Inc. Which is an outgrowth of two earlier languages, called:

- (a)"K & R C" and B  
(b)BCPL and B  
(c)A & B  
(d)ANSI C and B

100. Multiply 1101 by 1011

- (a)10001111  
(b)11001111  
(c)10000111  
(d)10101111





# MAARULA CLASSES

TARGET- NIMCET / CUET.PG By: Amit Katiyar (MCA-JNU)

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## ANSWER KEY

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

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**0512-3163515**



**9935985550**



**9554548576**



## SOLUTION

- $(3376)_8$
- BCD-7bit
- (d)
- (b) 2' compliment
- (d)
- (b) NTFS
- (d) Flash drive
- (b) Exabyte

9.	(c)	10.	(a)	11.	(d)	12.	(d)
13.	(a)	14.	(b)	15.	(d)	16.	(b)
17.	(b)	18.	(b)	19.	(b)	20.	(b)
21.	(a)	22.	(c)	23.	(c)	24.	(d)
25.	(a)	26.	(b)	27.	(a)	28.	(d)
29.	(d)	30.	(d)	31.	(a)	32.	(c)
33.	(c)	34.	(a)	35.	(b)	<b>ANSWER</b>	

36.

Z	?	S
R	O	?
?	G	C

$C \rightarrow 9$

$$3 + 4 = 7 = G$$

Then  $S = 19$

$$19 + 4 = 23 = W$$

$G \rightarrow 7$

$$7 - 4 = 3 = C$$

$$O \rightarrow 15 - 4 = K$$

$$O \rightarrow 15$$

$$15 + 3 = 18 = R$$

$G \rightarrow 7$

$$7 + 3 = 10 = J$$

W K J Answer.

37.

72	24	6
96	16	12
108	?	18

$$(72 \div 6) \times 2$$

$$= 12 \times 2 = 24$$

$$(96 \div 12) \times 2$$

$$= 8 \times 2 = 16$$

$$(108 \div 18) \times 2$$

$$= 6 \times 2 = 12$$

Ans. 12

- Total number of men in the row  
 $= 20 + 35 - 1 = 54$  Ans.
- 5th January 1965 - Tuesday  
 5th January 1966 - Wednesday  
 5th January 1967 - Thursday  
 5th January 1968 - Friday  
 5th January 1969 - Sunday  
 5th January 1970 - Monday  
 5th January 1971 - Tuesday  
 5th January 1971 Ans.

40.



$$(AF)^2 = (AE)^2 + (EF)^2$$

$$= 3600 + 6400$$

$$= \sqrt{10000}$$

$$AF = 100m$$

41. Prem<sup>+</sup> → Keshav → Simran<sup>-</sup>

Sumit<sup>+</sup> Murti<sup>+</sup> - Sita<sup>-</sup>

Sunil related to Murti

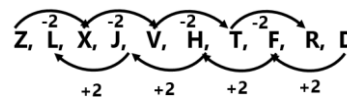
= Cousin Ans.

42. (c)

43. (d)

44. Ans=baba

45.



46. How many element of the set  $P(\{\phi, a\}, \{\{a\}\})$  has where a and b are distinct then P denotes power set of

$$P = \{\phi, a, \{a\}, \{\{a\}\}\}$$

$$\text{Power set} = 2^n, \quad n = \text{no. of element}$$

$$a = 4$$

$$\text{power set} = 2^4 = 16 \text{ Ans. Option (c)}$$

47. Cardinality of these sets in the order of their serial no.

(i) {a}                      (ii) {{a}}

(iii) {a, {a}}              (iv) {a, {a}, {a, {a}}}





Cardinality of  $\{a\} = 1$

Cardinality of  $\{\{a\}\} = 1$

Cardinality of  $\{a, \{a\}\} = 2$  Option (b)

Cardinality of  $\{a, \{a, \{a\}\}\} = 3$  1,1,2,3

48.  $A_i = \{1,2,3,\dots,i\}$   $I = 1,2,3 \dots u_{i=1}^{\infty}$

$A_i = ?$

$Z^+$  positive integers (Option A)

49. (a)

50. Which of the following relation are fun

(i)  $\{(1, (a,b)), (2, (b,c)), (3, (c,a)), (4, (a)(b)(c)(d),b)\}$

(ii)  $\{(1, (a,b)), (2, (b, a)), (3, (c, a)), (1, (a,c))\}$

(iii)  $\{(1,(a,b)), (2, (a,b)) (3, (a,b))\}$

(iv)  $\{(1,(a, b)), (2, (b, c)), (1,(,9))\}$

Option (a) (i, iii)

51. Trichy to new Delhi direct flight = 1

Trichy to new Delhi direct train = 2

Trichy to Chennai = 6 train

Chennai to Delhi = 4 train

Trichy to Mumbai = 2 train

Mumbai to Delhi = 8 flight

Total way Trichy to new Delhi

Direct Trichy to new Delhi total = 3 ways

Trichy to Chennai then Chennai to Delhi total

Way =  $6 \times 4 = 24$  ways

Trichy to Mumbai then Mumbai to delhi total

Ways =  $2 \times 8 = 16$  ways

Total ways =  $3 + 24 + 16 = 43$  ways

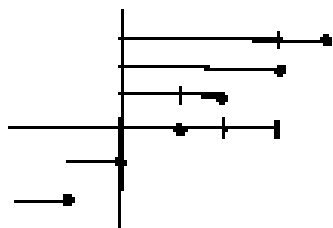
53.  $(A \cap B)' \cup (A' \cap B') \cup (A' \cap B)$  is equal to

$A \cap B' =$  only A

$A' \cap B =$  only B

$A' \cap B' = (A \cup B)' = \cup - A \cup B$

$\Rightarrow A' \cup B'$  (Option B)



54. (c) The floor function  $L_j$  is

Onto but not one to one

Neither one her onto

55. (d)  $f(n) = \sqrt{x-3} + \sqrt{x-4}$

$\sqrt{x}, \geq 0$

$x \geq 3$  and  $x \geq 4$

Domain  $x \in [4, \infty)$  (Option D)

56. (d)

10% of  $n = 30$

or 12% of  $y = 30$

$\frac{10 \times x}{100} = 30$

$\frac{12}{100} \times y = 30$

$x = 300$

$y = \frac{3000}{2} = 250$

$n(\text{MUC}) = n(\text{M}) + n(\text{C}) - n(\text{M} \cap \text{C})$

$= 300 + 250 - 30 = 520$  (Option-D)

57.  $A = \frac{1}{\sin 10} \frac{\sqrt{3}}{\cos 10}$

$A \Rightarrow 2 \left( \frac{1}{2 \sin 10} - \frac{\sqrt{3}}{2 \cos 10} \right)$

$\Rightarrow 2 \left( \frac{\sin 30}{\sin 10} = \frac{\cos 30}{\cos 10} \right) \Rightarrow 2 \left( \frac{\sin 30 \cos 10 - \cos 30 \sin 10}{\sin 10 \cos 10} \right)$

$\Rightarrow 2 \left( \frac{\sin(30-10)}{\sin 10 \cos 10} \right)$

$\Rightarrow \frac{2 \sin 20}{\sin 10 \cos 10} = \frac{2 \times 2 \cos 10 \times \sin 10}{\cos 10 \times \sin 10}$

$A = 4$

Option - B

58.  $\sin \frac{\pi}{16} \sin \frac{3\pi}{16} \sin \frac{5\pi}{16} \sin \frac{7\pi}{16}$

$\Rightarrow \frac{1}{4} [2 \sin \frac{\pi}{16} \cdot \sin \frac{7\pi}{16} 2 \sin \frac{3\pi}{16} \sin \frac{5\pi}{16}]$

$\Rightarrow \frac{1}{4} [(\cos(\frac{7\pi}{16} - \frac{\pi}{16}) - \cos(\frac{\pi}{16} + \frac{7\pi}{16})) (\cos(\frac{5\pi}{16} - \frac{3\pi}{16}) - \cos(\frac{8\pi}{16}))]$

$\Rightarrow [(\cos \frac{6\pi}{16} - \cos \frac{\pi}{2}) (\cos \frac{\pi}{8} - \cos(\frac{\pi}{2}))]$

$\Rightarrow \frac{1}{4} [\cos \frac{3\pi}{8} \cdot \cos \frac{\pi}{8}]$

$\Rightarrow \frac{1}{8} (2 \cos \frac{3\pi}{8} \cdot \cos \frac{\pi}{8})$

$\Rightarrow \frac{1}{8} (\cos(\frac{3\pi}{8} + \frac{\pi}{8}) + \cos(\frac{3\pi}{8} - \frac{\pi}{8}))]$

$\frac{1}{8} (\cos \frac{\pi}{2} + \cos \frac{\pi}{4})$

$\frac{1}{8} (0 + \frac{1}{\sqrt{2}}) \Rightarrow \frac{1}{8\sqrt{2}}$

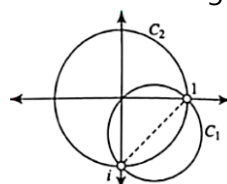
option (a) Ans.

59.  $\arg \left( \frac{z-i}{z+i} \right) = \frac{\pi}{2}$

i.e. line segment joining '1' and '-i' subtends right angle at variable point P(z)

Locus of point P (z) is  $C_1$  as shown in the figure.

Now, unimodular complex numbers lie on the circle  $C_2$  with center at origin and radius 1.



Clearly, two point '1' and '-i' are possible points, but these are not satisfying (1).





(A) + (B)

$$e^2 + e^{-2} = 2 \left( 1 + \frac{2^2}{2!} + \frac{2^4}{4!} + \frac{2^6}{4!} + \dots \right)$$

$$1 + \frac{2^2}{2!} + \frac{2^4}{4!} + \frac{2^6}{4!} = \frac{e^2 + e^{-2}}{2}$$

$$\frac{2^2}{2!} + \frac{2^4}{4!} + \dots = \frac{e^2 + e^{-2} - 2}{2}$$

$$\Rightarrow \frac{(e^2 + (e^{-1})^2 - 2e \cdot e^{-1})}{2}$$

$$\Rightarrow \frac{(e^2 + e^{-1})^2}{2} = \frac{(e^2 + 1)^2}{2e^2}$$

Option -C

67. a is AM of b and c  $G_1$  and  $G_2$  be 2 GM between b and

Let b and c is = 2, 16

$$a = \frac{2+16}{2} = 9$$

2,  $G_1$   $G_2$ , 16

↓ ↓ ↓ ↓

a ar ar<sup>2</sup> ar<sup>3</sup>  $G_1 = 4, G_2 = 8$

$$ar^3 = 16$$

$$2r^3 = 16 \quad r = 2$$

$$G_1^3 + G_2^3 = 4^3 + 8^3 = 64 + 512 = 576$$

Option (c) 2abc

$$= 2 \times 9 \times 2 \times 16 = 576$$

68.  $x \in \mathbb{R} \quad \lim_{n \rightarrow \infty} \left( \frac{x-3}{x+2} \right)^x$

$$\lim_{n \rightarrow \infty} \left( 1 + \frac{x-3}{x+2} - 1 \right)^x$$

$$\lim_{n \rightarrow \infty} \left( \frac{-5}{x+2} \right)^x$$

$$e^{\lim_{n \rightarrow \infty} \left( \frac{-5}{x+2} \right)^x} = e^{-5}$$

Option (d)

70.  $\bar{x} = 50 \quad n = 100$

$$\sigma = 50 = 5 \quad \Delta x_1^2 = ?$$

$$\sigma^2 = \frac{\Delta x_1^2}{1000} - (50)^2$$

$$\frac{\Delta x_1^2}{1000} = 25 + 2500$$

$$\Delta x_1^2 = 100 \times (2525)$$

$$\Delta x_1^2 = 25, 25, 00$$

Option (d)

71. Total card = 52

Total card of spade or ace =  $(13+4-1) = 16$

Odds against he win the bet

$$\frac{\text{Unfavourable}}{\text{favourable}}$$

$$\Rightarrow \frac{36}{9} = 4$$

9:4 (option A)

72. Z is an idempotent matrix, then

$$(I + Z)^n$$

$$Z^2 = Z \quad Z^n = Z$$

$$(I + Z)^n = {}^n C_0 Z^0 + {}^n C_1 Z^1 + {}^n C_2 Z^2 + \dots$$

$$\Rightarrow I + Z ({}^n C_1 + {}^n C_2 + \dots + {}^n C_n)$$

$$I + Z (2^n - 1)$$

$$= I + (2^n - 1)Z$$

Option (B)

$$73. A^2 - A = 3I$$

then  $A^{-1}$

$$A^{-1} A^2 - A^{-1} A = 3A^{-1} I$$

$$A - I = 3A^{-1} \quad \text{Option B}$$

$$A^{-1} = \frac{1}{3} (A - I)$$

$$74. a + 2b + 3c = 7$$

$$2a + 4b + c = 12$$

$$3a + 6b + 4c = 20$$

$$\begin{matrix} c_1 & c_2 & c_3 \\ R_1 & [1 & 2 & 3 & : & 7] \\ R_2 & [0 & 0 & -5 & : & -2] \\ R_3 & [3 & 6 & 4 & : & 20] \end{matrix} = \begin{bmatrix} a \\ b \\ c \end{bmatrix}$$

$$R_2 \rightarrow R_2 - 2R_1 / R_3 \rightarrow R_3 - 3R_1$$

$$\begin{bmatrix} 1 & 2 & 3 & : & 7 \\ 0 & 0 & -5 & : & -2 \\ 0 & 0 & -5 & : & -1 \end{bmatrix}$$

$$R_3 \rightarrow R_3 - R_2$$

$$\begin{bmatrix} 1 & 2 & 3 & : & 7 \\ 0 & 0 & -5 & : & -2 \\ 0 & 0 & 0 & : & 1 \end{bmatrix}$$

Rank (AB)  $\neq$  Rank (A)

No Solution

Option B

$$\text{Rank A} = 2$$

$$\text{Rank of AB} = 3.$$

75. Rank of matrix  $\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$  is 2.

If matrix Rank is 2

Then, one of the a, b, c, is 0

Option (C)  $ab \neq 0, C = 0$

$$76. \frac{dy}{dx} = \frac{e^y}{1+\log n} + \frac{x \log x}{1+\log x}$$

77. To solve the differential equation

$(1 + y^2) dx = (\tan^{-1} y - x) dy$ , we will follow these steps:

### Step 1: Rearranging the Equation

We start by rewriting the given equation in the form of

$$\frac{dx}{dy}$$

$$(1 + y^2) dx = (\tan^{-1} y - x) dy$$

Dividing both sides by dy and  $1 + y^2$ , we get:

$$\frac{dx}{dy} = \frac{\tan^{-1} y - x}{1 + y^2}$$

### Step 2: Writing in standard Linear form





Next, we rearrange the equation to fit the standard linear form

$$\frac{dx}{dy} + P(y)x = Q(y):$$

$$\frac{dx}{dy} + \frac{1}{1+y^2}x = \frac{\tan^{-1}y}{1+y^2}$$

$$\text{Here, } P(y) = \frac{1}{1+y^2}x = \frac{\tan^{-1}y}{1+y^2}$$

**Step 3 :** Find the integrating Factor

The integrating factor  $\mu(y)$  is given by:

$$\mu(y) = e^{\int P(y)dy} = e^{\int \frac{1}{1+y^2}dy} = e^{\tan^{-1}y}$$

**Step: 4:** Now, we multiply the entire differential equation by the integrating factor:

$$e^{\tan^{-1}y} \frac{dx}{dy} + e^{\tan^{-1}y} \frac{1}{1+y^2}x = e^{\tan^{-1}y} \frac{\tan^{-1}y}{1+y^2}$$

$$\frac{d}{dy}(e^{\tan^{-1}y}x) = e^{\tan^{-1}y} \frac{\tan^{-1}y}{1+y^2}$$

$$\int \frac{d}{dy}(e^{\tan^{-1}y}x)dy = \int e^{\tan^{-1}y} \frac{\tan^{-1}y}{1+y^2} dy$$

$$e^{\tan^{-1}y}x = \int e^{\tan^{-1}y} \frac{\tan^{-1}y}{1+y^2} dy$$

Let  $t = \tan^{-1}y$ ,  $dy = \frac{1}{1+y^2} dt$ . The integral becomes

$$\int te^t dt$$

Using integration by parts, where  $u = t$  and  $dv = e^t dt$ , we have

$$\int te^t dt = te^t - \int e^t dt = te^t - e^t + C$$

$$e^{\tan^{-1}y}x = e^{\tan^{-1}y}(\tan^{-1}y - 1) + C$$

Dividing by  $e^{\tan^{-1}y}$

$$x = \tan^{-1}y - 1 + Ce^{-\tan^{-1}y}$$

78. 2 dice thrown total sample space = 36

Getting 9 = (3, 6) (6, 3) (5, 4) (4, 5)

$$P(E) = \frac{4}{36} = \frac{1}{9} = P$$

$$P(\bar{E}) = \left(\frac{8}{9}\right) = q$$

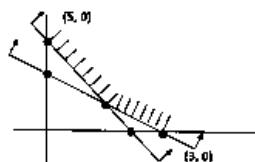
Getting exactly 9 levice

in 3 in depend

Thrown

$${}^3C_2 \left(\frac{1}{9}\right)^2 \cdot \left(\frac{8}{9}\right)^1$$

$$3 \times \frac{1}{81} \times \frac{8}{9} = \frac{8}{243}$$



option (d)

79. (d)

$$80. Z = 7x + y$$

$$5x + y \geq 5$$

$$X + y \geq 3$$

$$x \geq 0, y \geq 0, y$$

$$5x + y = 5 \dots\dots\dots(i) \quad n + y = 3$$

$$(0, 5) \quad (1, 0)$$

$$(0, 3) \quad (3, 0)$$

$$Y = 3 - x$$

$$5n + 3 - x = 5$$

$$4x = 2,$$

$$x = 1/2, y = 5/2$$

Z	Point	Z	Min Value at (0, 5)
7x+y	(0, 5)	5	Option (A)
7 x 3 + 0	(3, 0)	21	
$7 \times \frac{1}{2} + \frac{5}{2}$	$\left(\frac{1}{2}, \frac{5}{2}\right)$	6	

81.  $1(x) = 3x^4 - 4x^3$  point of inflection

$$f(x) = 3x^4 - 4x^3$$

$$f'(x) = 12x^3 - 12x^2$$

$$f''(x) = 0$$

$$f'''(x) = 0$$

$$36x^2 - 24x = 0$$

$$12x(3x-2) = 0$$

$$X = 2 \quad \text{and } x = 2/3$$

Point of inflation = 2, 2/3.

$$82. \int_n^{1000} e^{x-[x]} dx$$

$$\Rightarrow \int_n^1 e^{x-0} dx + \int_1^2 e^{x-1} dx \dots \dots \int_{n-1}^n e^{x-(n-1)} dx \dots \dots \int_{999}^{1000} e^{x-999} dx$$

$$\sum_{n=1}^{1000} \int_{n-1}^n e^{x-(n-1)} dx$$

$$\sum_{n=1}^{1000} [e^{n-(n-1)}]_{n-1}^n$$

$$\sum_{n=1}^{1000} (e-1) \quad \text{option (c)}$$

$$83. y = \int x^2 e^{x^3} dx$$

$$x^3 = t$$

$$3x^2 dx = dt$$

$$y = \frac{1}{3} \int e^t dt$$

$$y = \frac{1}{3} e^t, \quad y = \frac{1}{3} e^{x^3} + C$$

(0, 1) pass

$$1 - \frac{1}{3} = C \quad C = \frac{2}{3}$$

$$3y = e^{x^3} + 2$$

$$\text{Log}(3y - 2) = x^3 \text{loge}$$

$$\log(3y-2) = x^3$$

$$x = \sqrt[3]{\log(3y-2)}$$

$$x = f(y)$$

$$f(y) = \sqrt[3]{\log(3y-2)}$$

option (a)



84. (c)

The value of  $\int_0^\pi x(\sin^4 x \cos^4 x) dx$

$$I = \int_0^\pi x \sin^4 x \cos^4 x dx$$

$$I = \int_0^\pi (\pi - x) x \sin^4 x \cos^4 x dx$$

$$2I = \int_0^\pi \pi (\sin x \cos x)^4 dx$$

$$2I = \frac{\pi}{2^4} \int_0^\pi \pi (\sin 2x)^4 dx$$

$$2I = \frac{\pi}{2^4} \int_0^\pi \left( \frac{1 - \cos 4x}{2} \right)^2 dx$$

$$2I = \frac{\pi}{2^4} \left[ \int_0^\pi \left( 1 + \frac{1 + \cos^2 4x - 2 \cos 4x}{2} \right) dx \right]$$

$$\frac{\pi}{2^6} \left[ \int_0^\pi 1 dx + \frac{1}{2} \int_0^\pi (\cos^2 4x) - 2 \int_0^\pi (\cos 4x) dx \right]$$

$$\Rightarrow \frac{\pi}{2^6} \left[ x + \frac{1}{2} x + \frac{1 \sin 4x}{2 \cdot 4} - \frac{2 \sin 4x}{4} \right]_0^\pi$$

$$\Rightarrow \frac{\pi}{2^6} \left[ \pi + \frac{\pi}{2} \frac{\sin 4\pi}{4} - \frac{2 \sin 4\pi}{4} - 2 \right]$$

$$2I \Rightarrow \frac{\pi}{2^6} \times \frac{3\pi}{2} \frac{3\pi^2}{2^7}$$

$$I = \frac{3\pi^2}{2^8} = \frac{3\pi^2}{256}$$

85. For  $n = 1$ , we have

$$49n + 16n + \lambda = 49 + 16 + \lambda = 65 + \lambda = 64 + (\lambda + 1)$$

Which is divisible by 64 if  $\lambda = -1$ .

For  $n = 2$ , we have

$$49n + 16n + \lambda = 49 \times 2 + 16 \times 2 + \lambda = 243 + \lambda$$

$$= (64 \times 38) + (\lambda + 1)$$

Which is divisible by 64 if  $\lambda = -1$

Hence,  $\lambda = -1$ .

86. Utility Program

87.  $(106)_{10} = ( )_3$

3	106	1
3	35	2
3	11	2
3	3	3
	1	

$(10221)_3$

88. ISCI

90. ptr F2++

91.	(d)	92.	(d)	93.	(b)	94.	(c)
95.	(a)	96.	(a)	97.	(b)	98.	(c)
99.	(b)	100.	(a)				

$(1101)_2 \rightarrow (13)_{10}$

$(1011)_2 \rightarrow (11)_{10}$

$13 \times 11 = (143)_{10}$

$(143)_{10} \rightarrow$

128,	64,	32,	16,	8,	4	2	1
1	0	0	0	1	1	1	1

$(10001111)_2$  Ans.