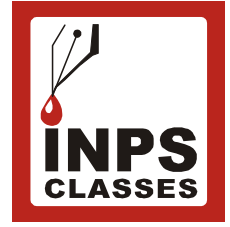


# Jamia Millia Islamia (JMI), University – 2022



01. For real numbers  $x$  and  $y$ , define  $xRy$  iff  $x - y + \sqrt[2]{2}$  is an irrational number. Then the relation  $R$  is:  
 (a) reflexive (b) symmetric (c) transitive (d) None of these
02. If  $f(x) = ax^7 + bx^3 + cx - 5$ ,  $a, b, c$  are real constants, and  $f(-7) = 7$ , then the range of  $f(7) + 17 \cos x$  is  
 (a)  $[-34, 0]$  (b)  $[0, 34]$  (c)  $[-34, 34]$  (d) None of these
03. The domain of  $\sqrt{|x-2|-1} + \sqrt{3-|x-2|}$   
 (a)  $[-1, 3] \cup [5, \infty)$  (b)  $[-1, 5]$  (c)  $[1, 3]$  (d)  $[-1, 1] \cup [3, 5]$
04. If  $z$  is any complex number satisfying  $|z - 3 - 2i| \leq 2$  then the minimum value of  $|2z - 6 + 5i|$  is  
 (a) 6 (b) 5 (c) 0 (d) 7
05.  $\arg z + \arg \bar{z}$  ( $z \neq 0$ )  
 (a)  $\pi$  (b)  $\frac{\pi}{2}$  (c) 0 (d) None of these
06. The value of  $b$  for which the equations  $x^2 + bx - 1 = 0$  and  $x^2 + x + b = 0$  have one root in common is  
 (a)  $\sqrt{2}$  (b)  $-\sqrt{2}$  (c)  $i\sqrt{5}$  (d)  $-i\sqrt{3}$
07. The coefficient of  $y$  in the expansion of  $\left(y^2 + \frac{c}{y}\right)^5$  is  
 (a)  $20c$  (b)  $10c^2$  (c)  $10c$  (d)  $20c^2$
08. In the expansion of  $(1+x)^{50}$  the sum of coefficients of odd powers of  $x$  is  
 (a)  $2^{50}$  (b) 0 (c)  $2^{49}$  (d)  $2^{51}$
09. If  $R$  is the largest equivalence relation on a set  $A$  and  $S$  is any relation on  $A$ , then  
 (a)  $R \subset S$  (b)  $S \subset R$  (c)  $R = S$  (d) None of these
10. The number of 4-digit numbers that can be formed with the digits 0, 1, 2, 3, 4, 5, 6, 7 so that each number contain digit 1 is  
 (a) 1225 (b) 1252 (c) 1522 (d) 480
11. The number of groups that can be made from 5 different green balls, 4 different blue balls and 3 different red balls, if at least 1 green and 1 blue ball is to be included  
 (a) 3700 (b) 3720 (c) 4340 (d) 3600

12. In a unique hockey series between India & Pakistan, they decide to play on till a team wins 5 matches. The number of ways in which the series can be won if no match ends in a draw is  
(a) 126 (b) 252 (c) 225 (d) 200
13. 20 persons are sitting in a particular arrangement around a circular table. 3 persons are to be selected for leaders. The number of ways of selection of 3 persons such that no 2 were sitting adjacent to each other is  
(a) 600 (b) 900 (c) 800 (d) 700
14. If A and B are two independent events in a sample space, then  $P\left(\frac{\bar{A}}{\bar{B}}\right)$  equals:  
(a)  $1 - P\left(\frac{A}{B}\right)$  (b)  $1 - P\left(\frac{\bar{A}}{B}\right)$  (c)  $1 - P(B)$  (d)  $1 - P(A)$
15. 100 identical coins, each with probability p, of showing heads are tossed. If  $0 < p < 1$  and the probability of showing heads on 50 coins is equal to that of heads showing up on 51 coins, then value of p is  
(a) 1/2 (b) 49/101 (c) 51/101 (d) 52/101
16. At any time, the total no. of people on the earth shake hands an odd no. of times is  
(a) Odd (b) Even (c) Can't say (d) Less information provided
17. Let 2 fair six-faced dice A and B be thrown simultaneously. If  $E_1$  the event that die A shows up 4,  $E_2$  is the event that die B shows up 2 and  $E_3$  is the event is that the sum of the two no.'s both on the dice is odd then which statement is false  
(a)  $E_1$  and  $E_2$  are independent (b)  $E_2$  and  $E_3$  are independent  
(c)  $E_1$  and  $E_3$  are independent (d)  $E_1, E_2$  and  $E_3$  are independent
18. The sum of 3 numbers in A.P. is  $-3$ , and their product is 8. Then sum of squares of the number is  
(a) 9 (b) 10 (c) 21 (d) 12
19. If  $x, 2x + 2, 3x + 3$  are in G.P., then the 4<sup>th</sup> term is  
(a) 27 (b)  $-27$  (c) 13.5 (d)  $-13.5$
20. In a sequence of 21 terms, the first 11 terms are in A.P. with common difference 2 and the last 11 terms are in G.P. with common ratio 2. If the middle term of A.P. is equal to the middle term of G.P., then the middle term of the entire sequence is  
(a)  $-10/31$  (b)  $10/31$  (c)  $32/31$  (d)  $-31/32$
21. If 1,  $\log_9(3^{1-x} + 2)$ , and  $\log_3(4 \times 3^x - 1)$  are in A.P., then x equals  
(a)  $\log_3 4$  (b)  $1 - \log_3 4$  (c)  $1 - \log_4 3$  (d)  $\log_4 3$
22. The median of a set of 9 distinctive observation is 20.5. If each of the largest 4 observations of the set of increased by 2 then the median of the new set  
(a) Is increased by 2 (b) Is decreased by 2  
(c) Is two times the original median (d) Remains same as that of original set
23. The variance of first 50 even natural number is  
(a) 699 (b) 833 (c)  $833/4$  (d)  $437/4$

24. Marks obtained by 4 students are: 25, 35, 45, 55. The average deviation from the mean is  
 (a) 10 (b) 9 (c) 7 (d) 8
25. The number 3, 5, 7, 4 have frequencies  $x, x + 4, x - 3, x + 8$ . If their arithmetic mean is 4, then value of  $x$  is  
 (a)  $7/4$  (b)  $5/3$  (c)  $2/3$  (d)  $5/2$
26. For two datasets, each of size 5, the variances are given to be 4 and 5 and the corresponding means are given to be 2 and 4 respectively. The variance of combined dataset is  
 (a)  $5/2$  (b) 6 (c)  $11/1$  (d)  $13/2$

27. If  $\begin{vmatrix} x & 3 & 6 \\ 3 & 6 & x \\ 6 & x & 3 \end{vmatrix} = \begin{vmatrix} 2 & x & 7 \\ x & 7 & 2 \\ 7 & 2 & x \end{vmatrix} = \begin{vmatrix} 4 & 5 & x \\ 5 & x & 4 \\ x & 4 & 5 \end{vmatrix} = 0$  then  $x$  is equal to

- (a) 0 (b) 3 (c) -9 (d) None of these

28. If A, B, C are angles of a triangle then value of determinant  $\begin{vmatrix} \sin 2A & \sin C & \sin B \\ \sin C & \sin 2B & \sin A \\ \sin B & \sin A & \sin 2C \end{vmatrix}$

- (a) 0 (b)  $\pi$  (c)  $2\pi$  (d) None of these

29. If  $\begin{vmatrix} a & p & x \\ b & q & y \\ c & r & z \end{vmatrix} = 16$ , then the value of  $\begin{vmatrix} p+q & a+x & a+p \\ q+y & b+y & b+q \\ x+z & c+z & c+r \end{vmatrix}$  is

- (a) 4 (b) 8 (c) 16 (d) None of the above

30. If  $\begin{vmatrix} x & 3 & 6 \\ 3 & 6 & x \\ 6 & x & 3 \end{vmatrix} = \begin{vmatrix} 2 & x & 7 \\ x & 7 & 2 \\ 7 & 2 & x \end{vmatrix} = \begin{vmatrix} 4 & 5 & x \\ 4 & x & 4 \\ x & 4 & 5 \end{vmatrix} = 0$  then  $x$  is equal to

- (a) 0 (b) 3 (c) -9 (d) None of these

31. Evaluate the following integral:  $\int_{-2}^2 \frac{3x^3 + 2|x| + 1}{x^2 + |x| + 1} dx$

- (a)  $3 \log_e 7$  (b)  $\log_e 6$  (c)  $2 \log_e 7$  (d)  $\log_e 7$

32. Evaluate the following integral:  $\int_{-\pi/2}^{\pi/2} \log \left( \frac{2 - \sin x}{2 + \sin x} \right) dx$

- (a) 1 (b) 0 (c) -1 (d) 2

33. Solve the following differential equation:  $x \frac{dy}{dx} + 1 = 0; y(-1) = 0$

- (a)  $y = \log |x|$  (b)  $y = 2 \log |x|$  (c)  $y = \log |2x|$  (d)  $y = -\log |x|$

34. If the matrix  $AB$  is zero, then  
(a) It is not necessary that either  $A = 0$  or  $B = 0$  (b)  $A = 0$  or  $B = 0$   
(c)  $A = 0$  and  $B = 0$  (d) None of these
35. Which statement is false?  
(a) If  $f(x)$  is continuous at  $x = a$ , then  $|f(x)|$  is also continuous at  $x = a$   
(b) If  $f(x)$  is continuous at  $x = a$ , then  $f^{-1}(x)$  is also continuous at  $x = a$   
(c) If  $|f(x)|$  is continuous at  $x = a$ , then  $f(x)$  is also continuous at  $x = a$   
(d) None of these
36. The function  $f$  is defined in  $(-5, 5)$  as  $f(x) = x$ , if  $x$  is rational and  $f(x) = -x$ , if  $x$  is irrational. Then  
(a)  $f(x)$  is continuous at every  $x$ , except  $x = 0$   
(b)  $f(x)$  is discontinuous at every  $x$ , except  $x = 0$   
(c)  $f(x)$  is continuous everywhere  
(d)  $f(x)$  is discontinuous everywhere
37. The relation  $R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3)\}$  on a set  $A = \{1, 2, 3\}$  is  
(a) Neither symmetric nor transitive (b) Reflexive but not transitive  
(c) Reflexive but not symmetric (d) symmetric and transitive
38. Ram secures 100 marks in Maths, then he will get a smartphone. Converse of this statement is:  
(a) If Ram will get a smartphone, then he does not secure 100 marks of maths.  
(b) If ram will not get a smartphone, then he secure 100 marks in maths  
(c) If Ram will get a smartphone, then he secures 100 marks in maths  
(d) Ram get both the smartphone and the marks.
39. Negation of  $p \vee \sim (p \wedge r)$  is  
(a)  $\sim q \wedge \sim (p \wedge r)$  (b)  $\sim q \wedge (p \wedge r)$  (c)  $\sim q \vee (p \wedge r)$  (d)  $\sim q \vee \sim (p \wedge r)$
40.  $(p \wedge \sim q) \wedge (\sim p \wedge q)$  is  
(a) A tautology (b) Neither tautology nor a contradiction  
(c) A contradiction (d) Contradiction and tautology
41. The instructions for starting the computer are housed in \_\_\_\_\_  
(a) RAM (b) CD-COM (c) ROM chip (d) None of these
42. \_\_\_\_\_ is the process of dividing the disk into tracks and sectors  
(a) Tracking (b) Crashing (c) Allotting (d) Formatting
43. In MICR, C stands for \_\_\_\_\_  
(a) Computer (b) Color (c) Code (d) Character

44. The terms Goodput, Throughput and Maximum throughput are most clearly associated with which among the following in computers?  
(a) Response Time (b) Bit Rate (c) Command line Interface (d) Random Memory
45. What will be the output of following statement?  
`printf(3 + "goodbye");`  
(a) goodbye (b) bye (c) odbye (d) dbye
46. What will be output of following statements?  
`int i = 1, j; j = i - - 2; printf(%d, j);`  
(a) -2 (b) -1 (c) -3 (d) 0
47. What will be output of following statements  
`int i = 1, j; j = - - i - 2; printf("%d", j);`  
(a) -2 (b) -1 (c) -3 (d) 0
48. What is the output of following C Program?  
`#include<stdio.h>  
int main ()  
char grade [] = { 'A', 'B', 'C' };  
printf ("GRADE=%c,", *grade);  
printf ("GRADE=%d", grade);  
return 0;  
}`  
(a) GRADE = some address of array, GRADE = A  
(b) GRADE = A, GRADE = some address of array  
(c) GRADE = A, GRADE = A  
(d) Syntax error
49. What is the output of following C program  
`int main ()  
{  
int a[3] = (10, 12, 14);  
a[1] = 20; int i = 0;  
while (i < 3) {  
printf ("%d", a[i]);  
i++;  
return 0;  
}`  
(a) 20 12 14 (b) 10 12 20 (c) 10 20 14 (d) Ran-time error
50. Which one is not a reverse keyword in C language?  
(a) auto (b) main (c) case (d) register
51. Prototype of a function means \_\_\_\_\_  
(a) Name of function (b) Output of function (c) Declaration of function (d) Input of function
52. Far pointer can access \_\_\_\_\_  
(a) Single memory (b) First and last memory locatio  
(c) All memory location (d) No memory location

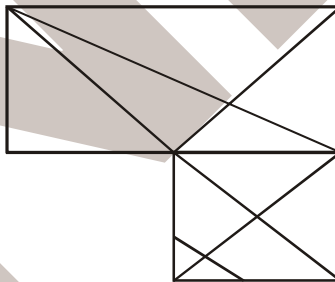
53. A pointer that is pointing to nothing is called \_\_\_\_\_  
(a) Dangling pointer (b) Null pointer (c) Far pointer (d) Void pointer
54. What is the similarity between a structure, union and enumeration?  
(a) All of them let you define new structure (b) All of them let you define new values  
(c) All of them let you define new data types (d) All of them let you define new pointers
55. How will you free the allocated memory?  
(a) remove(var); (b) free(var); (c) delete(var); (d) dalloc(var);
56. Which of the following describes the characteristics of SRAM?  
(a) Based on combination of transistor and capacitor  
(b) Less consumption of power  
(c) More clear and more consumption of power  
(d) Cheap but slow
57. The primary memory (also called main memory) of a personal computer consists of  
(a) RAM only (b) ROM only (c) both RAM and ROM (d) Cache memory
58. Which of the following has the fastest speed in the computer memory hierarchy?  
(a) Cache (b) Register in CPU (c) Main memory (d) Disk cache
59. In which type of memory, once the program or data is written, it cannot be changed?  
(a) EPROM (b) PROM (c) EEPROM (d) None of these
60. In which type of ROM, data can be erased by ultraviolet light and then reprogrammed by the user or manufacturer?  
(a) PROM (b) EPROM (c) EEPROM (d) both (a) and (b)
61. In which numbering system can the binary number 1011 0111 1100 0101 be easily converted to  
(a) Decimal number (b) Gray (c) Octal number (d) Hexadecimal system
62. Which bitwise operator is suitable for turning off a particular bit in a number?  
(a) && operator (b) || operator (c) & operator (d) ! operator
63. Convert  $(231)_4$  into  $(\quad)_3$ .  
(a) 1102 (b) 1201 (c) 1100 (d) 1200
64. Convert  $(1278)_{12}$  into  $(\quad)_4$ .  
(a) 200330 (b) 220330 (c) 12302 (d) 200300
65. Convert  $(110100)_2$  into  $(\quad)_{16}$   
(a) CD (b) 43 (c) 34 (d) D
66. Simplify the following Boolean expression for these variables.  
 $F = A'BC + A'B'C + ABC' + A'B'C' + ABC + AB'C'$   
(a)  $A'B + AB'$  (b)  $AB' + B' + A'B$  (c)  $AB' - A' + A'B$  (d)  $A' - B' + A'B$

67. The universal gate is \_\_\_\_\_  
(a) NAND gate (b) OR gate (c) AND gate (d) None of these
68. The inputs of a NAND gate are connected together. The resulting circuit is \_\_\_\_\_  
(a) OR gate (b) AND gate (c) NOT gate (d) None of the above
69. Exclusive-OR (XOR) logic gates can be constructed from \_\_\_\_\_ logic gates.  
(a) OR gates only (b) AND gates and NOT gates  
(c) AND gates, OR gates, and NOT gates (d) OR gates and NOT gates
70. \_\_\_\_\_ truth table entries are necessary for a four-input circuit  
(a) 16 (b) 4 (c) 8 (d) 12
71. Minimize following variable function.  
 $F(A, B, C) = \sum(0, 1, 6, 7)$   
(a)  $A'B' + AB$  (b)  $A'B + AB'$  (c)  $AB$  (d)  $AB' + AB$
72. When some unidentified/unknown person/firm sends you mail in a trustworthy/lucrative way asking for sensitive banks and online payment information, this is a case of \_\_\_\_\_?  
(a) Spam (b) Hacking (c) Phishing (d) Vishing
73. Which memory card format is most widely used in smartphones?  
(a) Compact flash (b) Secure Digital (c) Smart Media (d) Memory Stick
74. Which of the following is a popular VoIP application?  
(a) Google chat (b) Skype (c) iPhone (d) WiFi
75. Computer language used for Internet is  
(a) HTML (b) Python (c) Java (d) R
76. Convert the following number to decimal:  $(1032.2)_4$   
(a) 78 (b) 78.5 (c) 79 (d) 68.5
77. \_\_\_\_\_ controls the way in which the computer system functions and provides a means by which users can interact with the computer.  
(a) Platform (b) Application software (c) Operating system (d) Motherboard
78. Python was conceived in the late \_\_\_\_\_ by Guido van Rossum.  
(a) 1960s (b) 1970s (c) 1980s (d) 1990s
79. Which of the following memories must be refreshed many times per second?  
(a) EPROM (b) ROM (c) Static RAM (d) Dynamic RAM
80. USB-type storage device is  
(a) Secondary (b) Axillary (c) Tertiary (d) Primary
81. Climate change is one of the most \_\_\_\_\_ contested environmental debates of our time.  
(a) hot (b) heated (c) hotly (d) hoting

82. Gulf stream ocean current \_\_\_\_\_ disrupted? \_\_\_\_\_ way Antarctica is a crucial element in this debate.  
 (a) be, either (b) was, neither (c) is, either (d) are, neither
83. Identify the word which means the same as HEAVING UP.  
 (a) hiding (b) running away (c) climbing (d) raising
84. "Science is actually doing less than nothing". Here the word ACTUALLY is  
 (a) Noun (b) Verb (c) Adjective (d) Adverb
85. Noun form of INTELLECTUAL is  
 (a) Intellectually (b) Intellect (c) Intelligence (d) Intelligent
86. The verb form of PRESSURE is  
 (a) Pressuring (b) Pressuringly (c) Press (d) Pressing

**Direction for 87 to 90: Supply the correct tense form of the verbs given in the brackets.**

87. I certainly \_\_\_\_\_ (help) my colleague if I had been there  
 (a) will help (b) helped (c) would have helped (d) should have helped
88. He always \_\_\_\_\_ (try) to prove that the earth revolves round the sun.  
 (a) tried (b) tries (c) was trying (d) is trying
89. The train has left before I \_\_\_\_\_ (reach) the station.  
 (a) reach (b) was reaching (c) reached (d) reaches
90. Syam told Sita that she \_\_\_\_\_ (play) tennis.  
 (a) was playing (b) had been playing (c) is playing (d) will play
91. How many triangles are there in this figure?



- (a) 19 (b) 21 (c) 24 (d) 25
92. I am facing South, I turn right and walk 20 m, Then I turn right again and walk 10 m. Then I turn left and walk 10 m and then turning right walk 20 m. Then I turn right again and walk 60 m. In which direction am I from the starting point?  
 (a) North (b) North-west (c) East (d) North-east
93. Identify the wrong term in this series: 31, 29, 31, 30, 28, 30, 29, 27, 26.  
 (a) 29 (b) 28 (c) 27 (d) 26
94. If D = 23, H = 19, decode 8767  
 (a) IGFH (b) STUR (c) STUT (d) ZYXW



95. If BEAT is written as GIDV, then SOUP may be written as  
(a) YSXR (b) ZSYS (c) XSYS (d) ZYXW
96. If  $213 = 419$ ,  $322 = 924$ ,  $415 = 16125$ ; then  $215 = ?$   
(a) 425 (b) 1625 (c) 4125 (d) 2541
97. If  $A + B$  means B is the brother of A;  $A \times B$  means B is the husband of A;  $A - B$  means A is the mother of B;  $A \% B$  means A is the father of B, which of the following expression shows of Q is the grandmother of T?  
(a)  $Q - P + R \% T$  (b)  $P \times Q \% R - T$  (c)  $P \times Q \% R + T$  (d)  $P + Q \% R - T$
- Direction for Q. 98 to 100:** Find the relation or order in which letters have been grouped together in first two sets and then find a set of letters to fit the place of question mark?
98. ARUN : CTWP :: RITA : ?  
(a) TKCV (b) JMOP (c) TKVC (d) TVCK
99. THIN : MCFM :: PRTV : ?  
(a) IMQU (b) INQU (c) INRV (d) IMRV
100. If 'HEALTH' is written as 'GSKZDG', then how will 'NORTH' be written in that code?  
(a) OPSUI (b) GSQNM (c) FRPML (d) IUSPO