ASPIRE STUDY

MCA ENTRANCE CLASSES By *Shivam Gupta*

JAMIA MILLIA ISLAMIA

MCA 2022 Question Paper

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1. For real numbers x and y define xRy iff $x - y + \sqrt{2}$ is an irrational number . Then the relation R is .
   (a) Reflexive
   (b) Symmetric
   (c) Transitive
   (d) None of these
2. If $f(x) = ax^7 + bx^7 + cx - 5, a, b, c$ are real constants, and $f(-7) = 7$, then the range of $f(7) + 17cosx$ is.
   (a) [-34, 0]
   (b) [0,34]
   (c) [-34, 34]
   (d) None of these
3. The domain of $\sqrt{|x-2|-1} + \sqrt{3-|x-2|}$ is
   (a) [-1,3]∪[5, ∞)
   (b) [-1,5]
   (c) [1,3]
   (d) [-1, 1]∪ [3, 5]
4. If z is any complex number satisfying $|z - 3 - 2i| \leq 2$ then the value of $|2z - 6 + 5i|$ is
   (a) 6
   (b) 5
   (c) 0
   (d) 7
5. $\arg z + \arg \bar{z}\ (z \neq 0)$
   (a) π
   (b) $\frac{\pi}{2}$
   (c) 0
   (d) None of these
6. 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) $-i\sqrt{3}$

7. The coefficient of y in the expansion of $\left(y^2+\frac{c}{y}\right)^5$ is
   (a) $20c$
   (b) $10c^3$
   (c) $10c$
   (d) $2c^2$
8. In the expression of $(1+x)^{50}$ the sum of coefficients of odd power of x is
   (a) 2^{50}
   (b) 0
   (c) 2^{49}
   (d) 2^{50}
9. 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 number that can be formed with the digit 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 person 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, than $P\left(\frac{\bar{A}}{\bar{B}}\right)$ equal :
    (a) $1 - P(A/\bar{B})$
    (b) $1 - P(\bar{A}/B)$
    (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 the 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_2 are independent

18. The sum of 3 numbers in A. P is -3, and their product is 8. Then sum of the 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^{th} term is
    (a) 27
    (b) -27
    (c) 13.5
    (d) -13.5
20. In a sequence of21 terms, the first 11 terms are in A.P. With common difference 2 and the last 11 terms are in G.P with common ration 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 the x equals .
    (a) $\log_3 4$
    (b) $1-\log_3 4$
    (c) $1-\log_4 3$
    (d) $\log_4 3$
22. 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 in maths
    (b) If Ram will not get a smartphone, then he secures 100 marks in maths
    (c) If Ram will get a smartphone, then he secures 100 marks in maths
    (d) Ram gets both the smartphone and the marks
23. Negative of $q \vee \sim (p \wedge r)$ is
    (a) $\sim q \wedge \sim (p \wedge r)$
    (b) $\sim q \wedge (p \wedge r)$
    (c) $\sim q \vee (p \wedge r)$
    (d) $\sim q \vee \sim (p \wedge r)$

24. The median of a set of 9 distinctive observations is20.5. If each of the largest 4 observations of the set is 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
25. The variance of first 50 even natural numbers is
    (a) 699
    (b) 833
    (c) 833/4
    (d) 437/4
26. $(p \wedge \sim q) \wedge (\sim p \wedge q)$ is
    (a) A tautology
    (b) Neither tautology nor a contradiction
    (c) A contradiction
    (d) Contradiction and tautology
27. 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
28. The number 3, 5, 7, 4 have frequencies x, x+4, x-3, x+8. If their arithmetic mean is 4, the value of x is .
    (a) 7/4
    (b) 5/3
    (c) 2/3
    (d) 5/2
29. 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) 11/2
    (d) 13/2

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

(a) 0
(b) 3
(c) – 9
(d) None of the above

31. 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) π
(c) 2π
(d) None of these

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

(a) 4
(b) 8
(c) 16
(d) 32

33. 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

34. Evaluate the following integral :

$\int_{-2}^{2} \frac{3x^2+2|x|+1}{x^2+|x|+1} dx$

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

35. Evaluate the following integral : $\int_{-\pi/2}^{\pi/2} log\left(\frac{2-sinx}{2+sinx}\right) dx$
    (a) 1
    (b) 0
    (c) -1
    (d) 2
36. 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) $y = -\log |x|$
37. If the matrix AB is zero, then
    (a) It is necessary that either A = 0 or, B = 0
    (b) A = 0 or B = 0
    (c) A = 0 and B =0
    (d) None of these
38. 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
39. 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
40. 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
41. The instructions for starting the computer are housed in ____
    (a) RAM
    (b) CD-ROM

(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 closely 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?
$printf(3 + \text{goodbye});$
(a) Goodbye
(b) Bye
(c) Odbye
(d) dbye

46. What will be output of following statement ?
$int\ i = 1, j; j = i - - - -2; printf(\text{d\%}, j);$
(a) -2
(b) -1
(c) -3
(d) 0

47. What will be output of following statement ?
$int\ i = 1, j; j = - - i - 2; printf(\text{d\%}, j);$
(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 the 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) Run time error

50. Which one is not a reserve 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 location
(b) First and last memory location
(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 structures
(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 characteristic 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 charged ?
(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 1011011111000101, be easily converted to ?
(a) Decimal system
(b) Gray
(c) Octal
(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 $(\_\_\_\_\_)_3$.
(a) 1102
(b) 1201
(c) 1100
(d) 1200

64. Convert$(1278)_2$ into $(\_\_\_\_\_)_4$
(a) 200330
(b) 220330
(c) 12302

(d) 200300

65. Convert$(110100)_2$ into $(\_\_\_\_\_)_{16}$.
    (a) CD
    (b) 43
    (c) 34
    (d) D

66. Simplify the following Boolean expression for three 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 the above

68. The inputs of a NAND gate are connected together. The resulting circuit is .....
    (a) OR gate
    (b) AND gates
    (c) NOT gates
    (d) None of these

69. Exclusive – OR (XOR) logic gates can be constructed from ..... logic gates.
    (a) OR gate 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 3 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 trust worthy/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 ROM
(d) Dynamic RAM

80. USB-type storage device is
(a) Secondary
(b) Axillary
(c) Tertiary
(d) Primary

81. **Choose the best word from the options:**
Climate change is one of the most ____ contested environment debates of our time.
(a) Hot
(b) Heated
(c) Hotly
(d) hoting

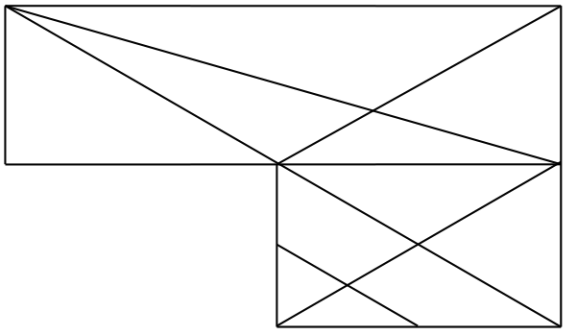
82. **Choose the best word from the options:**
Gulf stream ocean current _____disrupted? _____way, Antartica

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 then nothing" Here the word ACTULLY is .
(a) Noun
(b) Verb
(c) Adjective

(d) adverb

85. Noun form is INTELLECTUAL is
    (a) Intellectually
    (b) Intellect
    (c) Intelligence
    (d) Intelligent
86. The verb form is PRESSURE is
    (a) Pressuring
    (b) Pressuringly
    (c) Press
    (d) Pressing
87. Supply the correct tense forms of the verbs given in the brackets
    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 had left before I _____(reach) the station.
    (a) Reach
    (b) Was reaching
    (c) Reached
    (d) Reaches
90. Shyam 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 the figure?



(a) 19
(b) 21
(c) 24
(d) 25

92. I am facing South, I turn right and walk 20m. Then I turn right again and walk 10m. Then I turn left and walk 10m and then turning right walk 20m. Then I turn right again and walk 60m. 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 * 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 that Q is the grandmother of T?
(a) Q-P+R%T
(b) P*Q%R-T
(c) P*Q%R+T
(d) P+Q%R-T

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 the code?
(a) OPSUI
(b) GSQNM
(c) FRPML
(d) IUSPO