## MCA Entrance Paper – P.U. – 2011

1. In a programming language in which operations are associated right-to-left instead of left-to-right(i.e.,a+b+c=a+(b+c)),the value of the following expression is:
   7- (16/(3+1) □ 2) - 4
   (a) -1      (b) 1
   (c) 7      (d) 9

2. The process of copying files to a CD is known as :
   (a) burning      (b) zipping
   (c) digitizing      (d) ripping

3. The term _____ refers to a combination of text, graphics, animation, video, music, voice, and sound effects used to communicate a message.
   (a) multitasking      (b) hyperlinking
   (c) multicasting      (d) multimedia

4. A (n)_____ port is faster and more flexible than a traditional serial or parallel port.
   (A) peripheral      (b) USB
   (c) monitor      (d) server

5. _____is new technology currently available in India. It uses high bandwidth connections to communicate multimedia over wireless networks.
   (a) 4GL      (b) PDA
   (c) 3G      (d) Wi-Fi

6. WWW means :
   (a) World Wide Web
   (b) World Wide Wonder
   (c) World Wide Wizard
   (d) Wide World Web

7. What is the technological advancement that made it possible for computers to become as small as they are today ?
   (A) Repeater      (b) Vacuum Tube
   (c) Transistor      (d) Silicon Chip

8. The term, _____ ,refers to the amount of information transmitted through a communication medium in a given amount of time.
   (a) dots per inch      (b) bit depth
   (c) bandwidth      (d) broadband

9. Programs such as Internet Explorer that serve as navigable windows into the Web are called:
   (a) Hypertext      (b) Networks
   (c) Internet      (d) Web browsers

10. Organizations use _____ to deny network access to outsiders and to restrict employees' access to sensitive data such as payroll or personnel records.
    (a) drywalls      (b) seawalls
    (c) headwalls      (d) firewalls

11. The circuitry in the system unit usually is part of, or is connected to, a circuit board called the
    (a) billboard      (b) soundboard
    (c) motherboard      (d) snowboard

12. Known as "The first computer programmer" :
    (a) J. M. Jacquard      (b) Charles Babbage
    (c) Ada Lovelace      (d) Grace Hopper

13. In Windows NT, NT stands for New Technology. What does XP in Windows XP stand for ?
    (a) eXtra Powerful
    (b) eXtra Professional
    (C) eXPerience
    (d) X= to cross out P= piracy

14. This technology is used to measure and analyze human body characteristics for authentication purposes :
    (a) Foot-printing
    (b) Biometrics
    (c) Optical Character Recognition
    (d) Ergonomics

15. Disk Defragmenter:
    (a) Regroups fragmented sectors on a hard drive
    (b) Regroups pieces of files together on a hard drive
    (c) Compresses fragmented files
    (d) All of the above

16. A relation can be defined by giving the ordered pairs of elements for which the relation holds. If the relation R over {a, b, c} is given by :
    R = {(a, a), (a, b), (b, a), (b, b), (c, c)}, which of the following properties does R have ?
    i. Symmetry      II. Anti symmetry
    III. Reflexivity      IV. Transitivity
    (a) II and III only      (b) II and IV only
    (c) I, III and IV      (d) II, III and IV

17. Let P and Q denote positive integers. Suppose a function F is defined recursively as :
    $$F(P,Q) = \begin{cases} 0 & if \ P \leq Q \\ P*F(P-Q, Q+Q^2) & if \ Q \leq P. \end{cases}$$
    Value of $F(8,3)$ is:
    (a) 100      (b) 81
    (c) 50      (d) 9

18. How many distinct value can be represented in 17 bits?
    (a) $2^{(17-1)} +1$      (b) $2^{(17-1)}$
    (c) $2^{17}$      (d) $2^{17} - 1$

19. Let A={1,2,3,4}. The cardinality of the relation R={(a,b)| a divides b} over A is:
    (a) 10      (b) 9
    (c) 8      (d) 7

20. If a fair coin is tossed four times, what is the probability that 2 heads and 2 tails will results?
    (a) 3/8      (b) 1/6
    (c) 1/2      (d) 5/8

21. Let the function f(x)=$x^2$ from the set of integers to the set of integers. Then:
    (a) f is one – one and onto

(b) f is one – one but not onto
(c) f is not one – one but onto
(d) f is neither one - one nor onto

22. The value of P and Q for which the identity $f(x+1) - f(x) = 8x+3$ is satisfied, where $f(x)=Px^2+Qx+R$, are:
(a) P=2, Q=1
(b) P=4, Q=-1
(c) P=-1, Q=4
(d) P=-1, Q=1

23. Let $f\left(x+\dfrac{1}{x}\right) = x^2 + 1/x^2 \ (x \neq 0)$, then f(x)=

(a) $x^2$
(b) $x^2-1$
(c) $x^2-2$
(d) $x^2+2$

24. The range of the function $f(x)=1/(2-\cos 3x)=$
(a) $\left(\dfrac{1}{3},1\right)$
(b) $\left[\dfrac{1}{3},1\right]$
(c) $\left[\dfrac{1}{3},1\right)$
(d) $\left(\dfrac{1}{3},1\right]$

25. Let $f(2)=4$ and $f'(2)=1$. Then $\displaystyle\lim_{x\to 2}\dfrac{xf(2)-2f(x)}{x-2}$ is given by:
(a) 2
(b) -2
(c) -4
(d) 3

26. Let $f(x) = \begin{vmatrix} x^3 & \sin x & \cos x \\ 6 & -1 & 0 \\ p & p^2 & p^3 \end{vmatrix}$, where p is constant. Then $f'''(0) =$
(a) $p$
(b) $p + p^2$
(c) $p + p^3$
(d) Independent of $p$

27. If the curve $y^2=16x$ and $9x^2+by^2=16$ cut each other at right angles, then the value of b is
(a) 2
(b) 4
(c) 9/2
(d) 7/2

28. If $f(x)=x^5-20x^3+240x$, then f(x) satisfies which of the following?
(a) It is monotonically decreasing only in $(0,\infty)$
(b) It is monotonically decreasing every where
(c) It is monotonically increasing everywhere
(d) It is monotonically increasing in $(-\infty,0)$

29. If $f(x)= \dfrac{x^2-1}{x^2+1}$ for every real number x, then the minimum value of f:
(a) does not exists because f is bounded
(b) is not attained even through f is bounded
(c) is equal to 1
(d) is equal to -1

30. If f be the quadratic function defined on [a,b] by $f(x)= \alpha x^2 + \beta x + \gamma, \alpha \neq 0$, then the real 'c' guaranted by the Langrange's mean value theorem is equal to:

(a) $\dfrac{1}{2}(a+b)$
(b) $\sqrt{(ab)}$
(c) 2ab/(a+b)
(d) (a/b+b/a)

31. The value of $\displaystyle\int_a^b \dfrac{|x|}{x}dx, a < b$ is:
(a) b-a
(b) a-b
(c) b+a
(d) |b|-|a|

32. $\displaystyle\int_1^5 \dfrac{\sqrt{x}}{\sqrt{(6-x)}+\sqrt{x}}dx =$
(a) 1
(b) 3/2
(c) 2
(d) 5/2

33. Given two vectors:
$$\vec{a} = 2\hat{i} - 3\hat{j} + 6\hat{k}, \vec{b} = -2\hat{i} + 2\hat{j} - \hat{k} \text{ and}$$
$$\lambda = \frac{\text{the projection of } \vec{a} \text{ on } \vec{b}}{\text{the projection of } \vec{b} \text{ on } \vec{a}}, \text{ then the}$$
value of $\lambda$ is:
(a) 3/7
(b) 7/3
(c) 2/7
(d) 7/2

34. $\vec{a}, \vec{b}, \vec{c}$ are three non zero vectors, such that $\vec{a}+\vec{b}+\vec{c} = 0$ then the value of $\vec{a}\cdot\vec{b}+\vec{b}\cdot\vec{c}+\vec{c}\cdot\vec{a}$ is:
(a) Les than zero
(b) Equal to zero
(c) Greater than zero
(d) 3

35. If $\log_{10} 3=0.477$, the number of digit in $3^{40}$ is:
(a) 18
(b) 19
(c) 20
(d) 21

36. If the roots of the equation $ax^2+bx+c=0$ are real and of the form $\alpha/(\alpha-1)$ and $(\alpha+1)/\alpha$ then the value of $(a+b+c)^2$ is:
(a) $b^2 - 4ac$
(b) $b^2 - 2ac$
(c) $2b^2 - ac$
(d) $b^2 - 3ac$

37. If $a^2 + b^2 + c^2 = 1$, then ab+bc+ca lies in the interval:
(a) $\left[\dfrac{1}{2},2\right]$
(b) $\left[-1,2\right]$
(c) $\left[-\dfrac{1}{2},1\right]$
(d) $\left[1,\dfrac{1}{2}\right]$

38. The sum of first n terms of the series $\dfrac{1}{2}+\dfrac{3}{4}+\dfrac{7}{8}+\dfrac{15}{16}+\ldots\ldots$ is equal to:
(a) $2^n-n-1$
(b) $1-2^{-n}$
(c) $n+2^{-n}-1$
(d) $2^n-1$

39. In a geometric progression, (p+q)th term is m and (p-q)th term is n, then pth term is:

2

(a) m/n     (b) $\sqrt{mn}$

(c) $\sqrt{m/n}$     (d) $\sqrt{n/m}$

40. The remainder when $5^{99}$ is divided by 13 is:
    (a) 6     (b) 8
    (c) 9     (d) 10

41. A polygon has 44 diagonals, then the number of its sides are:
    (a) 11     (b) 7
    (c) 8     (d) 10

42. A five digits divisible by 3 is to be formed using the numbers 0,1,2,3,4 and 5 without repetitions. The total number of ways this can be done is:
    (a) 216     (b) 600
    (c) 240     (d) 3125

43. If $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$, then $A^{-1}=$

    (a) A     (b) $A^2$
    (c) $A^3$     (d) $A^4$

44. The equation $2x-3y+6z=4$, $5x+7y-14z=1$, $3x+2y-4z=0$, have
    (a) Unique solution
    (b) No solution
    (c) Infinitely many solution
    (d) Exactly two solutions

45. If $\begin{vmatrix} x & x+y & x+y+z \\ 2x & 3x+2y & 4x+3y+2z \\ 3x & 6x+3y & 10x+6y+3z \end{vmatrix} = 64$, then

    the real value of x is:
    (a) 2     (b) 3
    (c) 4     (d) 6

46. The standard deviation of first n natural numbers is:
    (a) $\dfrac{n(n+1)(2n+1)}{6}$

    (b) $\dfrac{n^2-1}{12}$

    (c) $\sqrt{\dfrac{n^2-1}{12}}$

    (d) $\dfrac{n(n+1)}{2}$

47. The arithmetic mean of 9 observation is 100 and that of 6 observations is 80, then the combined mean of all the 15 observations will be:
    (a) 100     (b) 80
    (c) 90     (d) 92

48. The foots of the perpendicular from (0,2,3) to the line $\dfrac{x+3}{5} = \dfrac{y-1}{2} = \dfrac{z+4}{3}$ is:

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

49. The angle between the lines x=1, y=2 and y=-1, z=0 is:
    (a) $90^0$     (b) $30^0$
    (c) $60^0$     (d) $0^0$

50. If $\sin x + \sin^2 x = 1$, then
    $\cos^{12}x + 3\cos^{10}x + 3\cos^8 x + \cos^6 x =$
    (a) 1     (b) 2
    (c) 3     (d) 0

51. The solution of the equation $\cos^2\theta + \sin\theta + 1 = 0$, lies in the interval:
    (a) $\left(-\dfrac{\pi}{4}, \dfrac{\pi}{4}\right)$     (b) $\left(\dfrac{\pi}{4}, \dfrac{3\pi}{4}\right)$
    (c) $\left(\dfrac{3\pi}{4}, \dfrac{5\pi}{4}\right)$     (d) $\left(\dfrac{5\pi}{4}, \dfrac{7\pi}{4}\right)$

52. If the angles of the triangle are in the ratio 1:2:3, then the corresponding sides are in the ratio:
    (a) 2:3:1     (b) $\sqrt{3}:2:1$
    (c) $2:\sqrt{3}:1$     (d) $1:\sqrt{3}:2$

53. For any complex number z, the solution of the equation :
    $|z+1|=z+2+2i$, $i=\sqrt{-1}$ is:
    (a) $\dfrac{1}{2}(3+4i)$     (b) $\dfrac{1}{2}(1+6i)$
    (c) $\dfrac{1}{2}(3-4i)$     (d) $\dfrac{1}{2}(1-4i)$

54. If the coordinates at one end of a diameter of the circle $x^2+y^2-8x-4y+c=0$ are (-3,2), then the coordinates at the other end are :
    (a) (5,3)     (b) (6,2)
    (c) (1,-8)     (d) (11,2)

55. Vertices of a quadrilateral ABCD are A (0, 0), B (3, 4), C (7,7) and D (4,3). Then quadrilateral ABCD is :
    (a) Rhombus     (b) Rectangle
    (c) Square     (d) triangle

56. Two pipes A and B can fill a tank in 20 and 30 minutes, respectively. If both the pipes are used together, then how long will it take to fill the tank ?
    (a) 12minutes     (b) 15minutes
    (c) 25 minutes     (d) 50minutes

57. A library has an average of 510 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is :
    (a) 250     (b) 276
    (c) 280     (d) 285

58. A number is increased consecutively two times by 20% each. The original number is actually increased by :

(a) 40 %    (b) 42%
(c) 44%    (d) 20%

59. If A is B's mother, C is A's father, and D is A's husband. Then how are C and D related ?
    (a) C is D's father-in-law
    (b) C is D's brother-in-law
    (c) C is D's uncle
    (d) C is D's brother

60. If in a code 6145 stands for FADE, and 9451 stands for IDEA; what does 8978 stand for ?
    (a) SIGH    (b) HIGH
    (c) BITE    (d) KITE

61. Mr. M is taller than Mr. K, who is shorter than Mr. R. If Mr. N is taller than Mr. R but shorter than Mr. M, then who among these is the shortest ?
    (a) K    (b) M
    (c) R    (d) N

**Question 62-65**
Nine individuals - Z, Y, X, W, V, U, T, S and R - are the only candidates, who can serve on three committees - A, B and C, and each candidate should serve on exactly one of the committees.
Committee A should consist of exactly one member more than committee B.
It is possible that there are no members of committee C.
Among Z,Y and X none can serve on committee A.
Among W, V and U none can serve on committee B.
Among T, S and R none can serving on committee C.

62. In case T and Z are the individuals serving on committee B, how many of the nine individuals should serve on committee C ?
    (a) 3    (b) 4
    (c) 5    (d) 6
    (e) 7

63. Of the nine individuals, the largest number that can serve together on committee C is :
    (a) 8    (b) 7
    (c) 6    (d) 5

64. In case R is the only individual serving on committee B, which among the following should serve on committee A ?
    (a) V and U    (b) V and T
    (c) U and S    (d) T and S

65. In case T, S and X are the only individuals serving on committee B, the total membership of committee C should be :
    (a) Z and Y    (b) Z and W
    (c) Y and V    (d) Y and U

**Questions 66-68.**
**Directions :** Each of the following questions consists of a pair of capitalized words followed by four choices lettered A to D. The capitalized words bear some meaningful relationship to each other. Choose the lettered pair of words whose relationship is most similar to that expressed by the capitalized pair.

66. JUDGE : IMPARTIAL::
    (a) acrobat : limber    (b) dignitary : proud
    (c) prisoner : repentant    (d) politician : liberal

67. WORKER : UNEMPLOYED ::
    (a) Purchase : Unnecessary
    (b) Crop : Barren
    (c) Effluence : Confidence
    (d) Exile : Country

68. PROTAGONIST : CHARACTER ::
    (a) brush: applicator
    (b) lawmaker : government
    (c) costume :gala
    (d) novice : competitor

**Directions (69-71):**
For each word in capital letters, select the word or phrase among the four choices that is most nearly opposite in meaning to the word.

69. QUALM:
    (a) pleasant fragrance    (b) loud noise
    (c) confident attitude    (d) stable condition

70. AFFILATE:
    (a) Honor    (b) Cutaway
    (c) Associate oneself    (d) Peaceful

71. MERITORIOUS:
    (A) uneven    (b) stationary
    (C) narrow-minded    (d) un-praiseworthy

**Questions :72-73.**
**Directions :** For each word in capital letters, select the word or phrase among the four choices that is most nearly opposite in meaning to the word.

72. OBSCURE:
    (a) Outspoken    (b) Conclusion
    (c) Hidden    (d) Display

73. SCAFFOLD:
    (a) platform    (b) table
    (c) prop    (d) curtain

**Directions :** Question 74 consists of a sentence in which one word has been underlined. From the four choices given, you should choose the one choice, which could be substituted for the underlined word without changing the meaning of the sentence.

74. The frown on man's face showed that he was displeased.

(a) Look of fear    (b) Look of anger
(c) Look of delight    (d) Look of surprise

75. Considering the way and the speed with which the issue is being sought to be resolved by the government, it is amply clear that it is _____ several important details crucial to the nature of the murder case.
(a) Examining    (b) Overlooking
(c) Focusing on    (d) Negating

### Answer Key

| | | | |
|---|---|---|---|
| 1. (d) | 2. (a) | 3. (d) | 4. (b) |
| 5. (c) | 6. (a) | 7. (d) | 8. (c) |
| 9. (d) | 10. (d) | 11. (c) | 12. (c) |
| 13. (c) | 14 (b) | 15.(b) | 16. (c) |
| 17. (b) | 18. (c) | 19. (c) | 20. (a) |
| 21. (d) | 22. (b) | 23. (c) | 24. (b) |
| 25. (a) | 26. (d) | 27. (c) | 28. (c) |
| 29. (d) | 30. (a) | 31. (d) | 32. (c) |
| 33. (b) | 34. (a) | 35. (c) | 36. (a) |
| 37. (c) | 38. (c) | 39.(b) | 40. (b) |
| 41. (a) | 42. (a) | 43. (c) | 44. (b) |
| 45. (c) | 46. (c) | 47. (d) | 48. (c) |
| 49. (a) | 50. (a) | 51. (d) | 52. (d) |
| 53. (d) | 54. (d) | 55. (a) | 56. (a) |
| 57. (d) | 58. (c) | 59. (a) | 60. (b) |
| 61. (a) | 62. (X) | 63. (c) | 64. (d) |
| 65. (a) | 66. (a) | 67. (b) | 68. (a) |
| 69. (c) | 70. (b) | 71. (d) | 72. (c) |
| 73. (a) | 74. (b) | 75. (b) | |

**Note:** An 'X' in the key indicates that either the question is ambiguous or it has printing mistake. All candidates will be given credit for this question.