



Question Paper of BHU MCA 2016 (Set 1) by JMA Indore

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BHU MCA - 2015 Result of Jitendra Mishra Academy (JMA)

7 All India Rank in Top **10** (AIR-2, AIR-3, AIR-5, AIR-6, AIR-7, AIR-9, AIR-9)

20 All India Rank in Top **30** with **27** selections out of 46 Seats in BHU

All AIR (All India Rank) are in General Category

More than 135+ questions out of 150 asked in

BHU MCA - 2016 are based on

JMA Test Series, JMA Study Material & JMA Classroom Lectures.

The expected BHU MCA 2016 score of Majority Student at Jitendra Mishra Academy, Indore is between

410 to 390

out of total 450 marks

More than 110+ question can be solved Direct by Shortcut

Question Paper of BHU MCA - 2016 (Set No. 1)

1. Which of the following is true ?

(1) $\log(a \times b) = \log a \times \log b$

(2) $\log(a \times b) = \log a + \log b$

(3) $\log \frac{a}{b} = \log a + \log b$

(4) $\log a^b = \log a \times \log b$

2. If $10^x = x^{50}$, then x is equal to

(1) 100

(2) 200

(3) $\sqrt{10}$

(4) $\sqrt{5}$

3. The value of $7\log \frac{16}{15} + 5\log \frac{25}{24} + 3\log \frac{81}{80}$ is equal to

(1) $\log 2$

(2) zero

(3) unity

(4) 0.2

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4. The logarithms of $24 \times 4\sqrt{9} \times 3\sqrt{9}$ to the base 3 is :

(1) $8\frac{2}{3}$

(2) $4\frac{1}{6}$

(3) 4

(4) 3

5. If $\log z = 0.3010$ and $\log 3 = 0.4771$, then the value of $\log 5$ is :

(1) 0.7781

(2) 0.6990

(3) 0.3010

(4) 1.6990

6. If $a^x = b^y = c^z$ and $b^2 = ac$, then the value of $\frac{1}{x} + \frac{1}{z}$ is equal to

(1) $\frac{1}{y}$

(2) $\frac{1}{z}$

(3) $\frac{2}{z}$

(4) $\frac{2}{y}$

7. If a, b, c are positive numbers, then the value of $\left(\frac{2^a}{2^y}\right)^{a+b} \cdot \left(\frac{2^b}{2^c}\right)^{b+c} \cdot \left(\frac{2^c}{2^a}\right)^{c+a}$ is :

(1) 2 (2) -2 (3) $\frac{1}{2}$ (4) 1

8. The value of $\left(\frac{x^l}{x^{-m}}\right)^{l-m} \left(\frac{x^m}{x^{-n}}\right)^{m-n} \left(\frac{x^n}{x^{-l}}\right)^{n-l}$ is equal to :

(1) 0 (2) -1 (3) 1 (4) 2

9. If $\log \frac{125}{25} = x$, then value of x is :

(1) 1 (2) $\frac{1}{2}$ (3) $\frac{3}{2}$ (4) 5

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10. The value of $\log_2 8 + \log_4 8 + \log_{16} 8$ is equal to :

(1) $\frac{21}{4}$ (2) 5 (3) 6 (4) 4

11. If a and b real numbers and if $a - b$ is negative, then we says :

(1) $a < b$ (2) $a > b$ (3) $a = 0, b = 0$ (4) $a = b = 1$

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12. The value of $\frac{1}{a} < \frac{1}{b}$, if

(1) $a \neq 0, b \neq 0$ and $a < b$ (2) $a \neq 0, b \neq 0$ and $a > b$
 (3) $a \neq 0, b = 0$ and $a < b$ (4) $a = 0, b \neq 0$ and $a > b$

13. The value of $a^x < a^y$, if

(1) $0 < \frac{1}{a} < 1$ and $\frac{1}{x} > \frac{1}{y} > 0$ (2) $0 < \frac{1}{a} < 1$ and $\frac{1}{x} < \frac{1}{y} < 0$
 (3) $0 < a < 1$ and $x > y > 0$ (4) $0 > a > 1$ and $x < y < 0$

14. The arithmetic mean of two positive quantities is greater than or equal to :

- (1) zero
(2) Arithmetic Mean
(3) Geometric Mean
(4) Harmonic mean

15. For all $x > 0$, then value of $x + \frac{1}{x}$ is :

- (1) ≥ 2 (2) ≤ 2 (3) ≥ 0 (4) ≤ 0

16. If n is positive integer, then the value of $\frac{1}{n+1} + \frac{1}{n+2} + \frac{1}{n+3} + \dots + \frac{1}{2n}$ is :

- (1) > 0 (2) < 0 (3) $> -\frac{1}{2}$ (4) $> \frac{1}{2}$

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17. If $a, b, c > 0$ then the value of $\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b}$ is :

- (1) $\geq \frac{1}{2}$ (2) $\geq \frac{3}{2}$ (3) $\geq \frac{5}{2}$ (4) $\geq \frac{7}{2}$

18. If $a > 0, b > 0, c > 0$, then the value of $(a+b+c)\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$ is greater or equal to :

- (1) 9 (2) 6 (3) 3 (4) 0

19. If a, b, c are in H.P. and $n > 1$, then the value of $a^n + c^n$ is greater than

- (1) $\frac{2}{b^n}$ (2) $\frac{1}{2}b^n$ (3) $2b^n$ (4) $\frac{3}{2}b^n$

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20. If a, b, c are real numbers such that $a^3 + b^3 + c^3 = 1$, then the value of $a.b + b.c + c.a$ is greater than :

- (1) 0 (2) 1 (3) $\frac{1}{2}$ (4) $-\frac{1}{2}$

21. If the column vectors of a square matrix A are linearly dependent, then :

- (1) $|A| = 1$ (2) $|A| = \infty$ (3) $|A| \neq 0$ (4) $|A| = 0$

22. If A is non-singular matrix and so is matrix B, and if A and B are square matrices of the same order, then :

- (1) AB is non-singular (2) AB is singular
(3) $(AB)^{-1} = A^{-1} B^{-1}$ (4) $(AB)^{-1}$ does not exist

23. A necessary and sufficient condition that a square matrix A possess an inverse is that :

- (1) A is not a null matrix (2) A is a null matrix
(3) $|A| \neq 0$ (4) $|A| = 0$

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24. If A is 3×3 matrix whose rank is 2 and B is 3×3 matrix whose rank is 3, then rank of AB is :

- (1) 1 (2) 2 (3) 3 (4) 5

25. The matrix $\begin{bmatrix} 0 & 5 & -2 \\ -5 & 0 & -7i \\ 2 & 7i & 0 \end{bmatrix}$ is

- (1) Skew - Hermitian (2) Hermitian
(3) Skew Symmetric (4) Symmetric

26. If $D_1 = \begin{vmatrix} 3 & 7 & 1 \\ -2 & 1 & 4 \\ 6 & -4 & 3 \end{vmatrix}$ and $D_2 = \begin{vmatrix} 3 & -2 & 6 \\ 7 & 1 & -4 \\ 1 & 4 & 3 \end{vmatrix}$, then

- (1) $D_1 = 3D_2$ (2) $D_1 = -D_2$ (3) $D_1 = D_2$ (4) $3 D_1 = D_2$

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27. The determinant $\begin{vmatrix} a & a^2 & 1+a^3 \\ b & b^2 & 1+b^3 \\ c & c^2 & 1+c^3 \end{vmatrix}$ is divided by :

- (1) $a + b$ (2) $a b c$ (3) $1 - a b c$ (4) $1 + a b c$

28. The determinant $\begin{vmatrix} a^2 + b^2 & ac + bd \\ ac + bd & c^2 + d^2 \end{vmatrix}$ is equal to :

- (1) $\begin{vmatrix} a & b \\ c & d \end{vmatrix}^2$ (2) $\begin{vmatrix} a & b \\ c & d \end{vmatrix}$ (3) $\begin{vmatrix} a & d \\ b & c \end{vmatrix}^2$ (4) $\begin{vmatrix} a & d \\ b & c \end{vmatrix}$

29. The value of determinant $\begin{vmatrix} x+\lambda & x & x \\ x & x+\lambda & x \\ x & x & x+\lambda \end{vmatrix}$ is equal to :

- (1) 3λ (2) λ^3 (3) 2λ (4) λ^2

30. Let $A_1 = \begin{vmatrix} 3 & 7 & 4 \\ -2 & 1 & 5 \\ 6 & 18 & 3 \end{vmatrix}$ and $A_2 = \begin{vmatrix} 3 & 7 & 4 \\ -2 & 1 & 5 \\ 2 & 6 & 1 \end{vmatrix}$ then :

- (1) $A_1 = A_2$ (2) $A_1 = -A_2$ (3) $A_1 = 2A_2$ (4) $A_1 = 3A_2$

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31. If the n th term of a series is given by $\frac{3+n}{4}$, then the sum of 105 terms of this series is :

- (1) 1470 (2) 1500 (3) 1570 (4) 1600

32. If m th term of an A.P. is n and its n th term is m , then its p th and $(m+n)$ th terms of the series will be :

- (1) $m-n+p, 0$ (2) $m-n+p, 1$ (3) $m+n-p, 0$ (4) $m+n-p, 1$

33. If the sums of p, q and r terms of A.P. series be a, b and c respectively then the value of

$\frac{a}{p}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q)$ is equal to

- (1) 0 (2) 1 (3) -1 (4) 2

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34. If the sum of three numbers in A.P. is 15 whereas sum of their squares is 83, then the numbers are :

- (1) 2, 3, 4 (2) 3, 5, 7 (3) 1, 4, 9 (4) 4, 5, 6

35. If $x = 1 + a + a^2 + a^3 + \dots \infty$ ($a < 1$) and $y = 1 + b + b^2 + b^3 + \dots \infty$ ($b < 1$), then the value of $1 + ab + a^2b^2 + a^3b^3 + \dots \infty$ is equal to :

- (1) $\frac{xy}{x-y-1}$ (2) $\frac{xy}{x-y+1}$ (3) $\frac{xy}{x+y-1}$ (4) $\frac{xy}{x+y+1}$

37. In a G.P., if the $(m+n)$ th term be p and $(m-n)$ th term be q , then its m th term is :

(1) $\sqrt{\left(\frac{p}{q}\right)}$ (2) $\sqrt{(pq)}$ (3) $\sqrt{(p+q)}$ (4) $\sqrt{(p-q)}$

38. If the harmonic mean of two numbers is 4 and their arithmetical mean A and geometric mean G satisfy the relation $2A + G^2 = 27$, then two numbers are :

- (1) 6 and 3 (2) 7 and 4 (3) 5 and 2 (4) 9 and 5

39. If pth term of H.P. is q, r and qth term is r p, then rth terms is

- (1) \sqrt{pq} (2) p q (3) p + q (4) p - q

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40. If a, b, c be in Arithmetical progression b, c, a be in Harmonical progression, then c, a, b are in :

- (1) Arithmetical progression (2) Geometrical Progression
(3) Arithmetical Geometric (4) Harmonical progression

41. If ${}^nC_{r-1} = 36$, ${}^nC_r = 84$ and ${}^nC_{r+1} = 126$, then r is equal to :

- (1) 0 (2) 1 (3) 2 (4) 4

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42. The coefficient of x^4 in $\left(\frac{x}{2} - \frac{3}{x^2}\right)^{10}$ is :

- (1) $\frac{405}{256}$ (2) $\frac{504}{259}$ (3) $\frac{450}{263}$ (4) $\frac{540}{256}$

43. The coefficient of y in the expansion of $\left(y^2 + \frac{c}{y}\right)^6$ is

- (1) 20 c (2) 10 c (3) 10 c³ (4) 20 c³

44. The coefficient of x^p and x^q (p and q are positive integers) in the expansion of $(1 + x)^{p+q}$ are :

- (1) equal (2) equal with opposite signs
(3) reciprocal to each other (4) zero

45. Given positive integers $l > 0$, $n > 2$ and that the coefficient of (3r)th and (r + 2)th terms in the binomial expansion of $(1 + x)^{2n}$ are equal, then :

- (1) $n = 2r$ (2) $n = 3r$ (3) $n = 2r + 1$ (4) $n = 2r - 1$

46. The terms independent of x in the expansion of $\left(\sqrt{\frac{x}{3}} + \frac{3}{2x^2}\right)^{10}$ is :

- (1) $-\frac{4}{5}$ (2) $\frac{5}{4}$ (3) $-\frac{5}{6}$ (4) $\frac{6}{5}$

47. If the coefficient of $(2r + 1)$ th term and $(r + 2)$ th term in the expansion of $(1 + x)^{43}$ are equal, then the value of r is equal to :

- (1) 3 (2) 6 (3) 10 (4) 14

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48. If the coefficient of second, third and fourth terms in the expansion of $(1 + x)^{2n}$ are in A.P., then :

- (1) $n^2 - 7n + 9 = 0$ (2) $n^2 + 7n - 9 = 0$
 (3) $2n^2 - 9n + 7 = 0$ (4) $2n^2 - 9n - 7 = 0$

49. The value of $C_1 + 2C_2 + 3C_3 + \dots + nC_n$ is equal to :

- (1) $n \cdot 2^{n+1}$ (2) $n \cdot 2^{n-1}$ (3) $3n \cdot 2^{n+1}$ (4) $3n \cdot 2^{n-1}$

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50. The value of $\frac{1}{1!(n-1)!} + \frac{1}{3(n-3)!} + \frac{1}{5!(n-5)!} + \dots$ is equal to :

- (1) $\frac{2^{n-1}}{n!}$ (2) $\frac{2^{n+1}}{n!}$ (3) $\frac{3^{n-1}}{(2n)!}$ (4) $\frac{3^{n-1}}{(3n)!}$

51. If ${}^{15}C_{3r} = {}^{15}C_{r-3}$, then the value of r is equal to :

- (1) 0 (2) 3 (3) 6 (4) 9

52. If ${}^9P_5 + 5 \cdot {}^9P_4 = {}^{10}P_r$, then the value of r is equal to :

- (1) 2 (2) 3 (3) 4 (4) 5

53. The number of different permutations of the letters of the word BANANA is equal to :

- (1) 15 (2) 30 (3) 45 (4) 60

54. The total number of 9 digit numbers which have all different digits is :

- (1) 3265920 (2) 6345721 (3) 7534723 (4) 9437849

55. Eight chairs are numbered 1 to 8. Two women and three men wish to occupy one chair each. First the women the chairs from amongst the chairs marked 1 to 4; and then men select the chairs from amongst the remaining. The number of possible arrangements is :

- (1) ${}^6C_3 \times {}^4C_2$ (2) ${}^4C_2 \times {}^4P_3$ (3) ${}^6P_2 \times {}^4P_3$ (4) ${}^4P_2 \times {}^6P_3$

56. The total number of permutations of n different things taken not more than r at a time, when each thing may be repeated any number of times is :

- (1) $\frac{n^r(n-1)}{(n+1)}$ (2) $\frac{n^r(n+1)}{(n-1)}$ (3) $\frac{n(n^r-1)}{(n-1)}$ (4) $\frac{n^r-1}{n-1}$

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57. Five balls of different colours are to be palced in three boxes of different sizes. Each box can hold all five balls. In how many different ways can we place the balls so that no box remains empty :

- (1) 180 (2) 150 (3) 120 (4) 90

58. There are six students A, B, C, D, E, F. In how many ways can be committee for four be formed so as to always include C but exclude D.

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

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59. How many numbers can be formed by using all the digits 1, 2, 3, 4, 3, 2, 1 so that the odd digits always occupy the old places.

- (1) 6 (2) 12 (3) 18 (4) 23

60. From 6 gentleman and 4 ladies a committee of 5 is to be formed. In how many ways can this be done if the committee is to include at least one lady :

- (1) 146 (2) 246 (3) 252 (4) 352

61. If α and β are the roots $ax^2 + bx + c = 0$, then the equation whose roots are $\frac{1}{\alpha+\beta}, \frac{1}{\alpha} + \frac{1}{\beta}$ is :

- (1) $b cx^2 + (b^2 + ac)x + ab = 0$ (2) $c ax^2 + (c^2 + ba)x + bc = 0$
(3) $a bx^2 + (a^2 + cb)x + ca = 0$ (4) $b cx^2 + (b^2 - ac)x - ab = 0$

62. If $\alpha \neq \beta$, but $\alpha^2 = 5\alpha - 3$, $\beta^2 = 5\beta - 3$ then the equation whose roots are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is .

(1) $x^2 - 15x - 3 = 0$

(2) $3x^2 + 15x + 3 = 0$

(3) $x^2 + 19x + 3 = 0$

(4) $3x^2 - 19x + 3 = 0$

63. If the coefficient of x in the quadratic equation $x^2 + px + q = 0$ was taken as 17 in place of 13, its roots were found to be -2 and -15, then the roots of the original equation are :

(1) 9, 4

(2) 10, 3

(3) -10, -3

(4) -9, -4

64. If α be a root of the equation $4x^2 + 2x - 1 = 0$, then the other root is :

(1) $3\alpha^4 - 4\alpha$

(2) $4\alpha^3 - 3\alpha$

(3) $4\alpha^3 + 3\alpha$

(4) $3\alpha^4 + 4\alpha$

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65. If α, β be the roots of $ax^2 + 2bx + c = 0$ and $\alpha + \delta, \beta + \delta$ be those of $Ax^2 + 2Bx + C = 0$ then :

(1) $\frac{b^2 - ac}{B^2 - AC} = \left(\frac{a}{A}\right)^2$

(2) $\frac{b^2 + ac}{B^2 + AC} = \left(\frac{A}{a}\right)^2$

(3) $\frac{C^2 - BA}{c^2 - ba} = \left(\frac{B}{b}\right)^2$

(4) $\frac{C^2 + BA}{c^2 + ba} = \left(\frac{B}{b}\right)^2$

66. If the roots of $px^2 + qx + 2 = 0$ are reciprocals of each other, then :

(1) $p = 0$

(2) $p = -2$

(3) $q = 0$

(4) $p = 2$

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67. If one root of the equation $ax^2 + bx + c = 0$ be square of the other, then :

(1) $c^3 + ba^2 + b^2a = 3abc$

(2) $b^3 + ac^2 + a^2c = 3abc$

(3) $a^3 + cb^2 + c^2b = 3abc$

(4) $b^3 - ac^2 + a^2c = -3abc$

68. If the sum of the roots of the equation $ax^2 + bx + c = 0$ is equal to sum of the squares of their reciprocals, then bc^2, ca^2, ab^2 are in :

(1) Airthmetical Progression

(2) Geometrical Progression

(3) Airthmetical Geometrical series

(4) Harmonical Progression

69. If the ratio of the roots of the equation $lx^2 + nx + n = 0$ be $p : q$, then :

$$(1) (p+q+nl) = \sqrt{(pq)}$$

$$(2) \sqrt{\left(\frac{p}{n}\right)} + \sqrt{\left(\frac{q}{l}\right)} + \sqrt{(nl)} = 0$$

$$(3) \sqrt{\left(\frac{p}{n}\right)} + \sqrt{\left(\frac{q}{l}\right)} + \sqrt{\left(\frac{n}{l}\right)} = 0$$

$$(4) \sqrt{(p)} + \sqrt{(q)} + \sqrt{(nl)} = 0$$

70. If p, q, r are real and $p \neq q$, then the roots of the equation

$$(p - q)x^2 - 5(p + q)x - 2(p - q) = 0 \text{ are :}$$

(1) Real and equal

(2) Complex and equal

(3) Real and unequal

(3) Complex and unequal

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71. If the relations is a function, then determine its domain and range :

(1) Domain = {1, 2, 3}, Range = {2}

(2) Domain = {1, 2, 3}, Range = {3}

(3) Domain = {1, 2}, Range = {2}

(4) Domain = {2, 3}, Range = {1}

72. If A and B are two non-empty sets such that $A \times B = B \times A$, then

(1) $A = 0$

(2) $B = 0$

(3) $A \neq B$

(4) $A = B$

73. If R be the relation on the set N of natural numbers defined by $a + 3b = 12$, then R is equal to

(1) {(1, 9), (2, 6), (3, 1)}

(2) {(9, 1), (6, 2), (3, 3)}

(3) {(1, 9), (6, 3)}

(4) {(6, 2), (3, 1)}

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74. If $A = \{x, y, z\}$ and $B = \{1, 2\}$, then the number of relations from A into B is :

(1) 16

(2) 27

(3) 64

(4) 81

75. If a function $f : A \rightarrow B$ which is both one-to-one and onto, then it is called as a :

(1) Linear function

(2) Surjective function

(3) Injective function

(4) Bijective function

76. Put the following $\left(\frac{1}{1-2i} + \frac{3}{1+i}\right)\left(\frac{3+4i}{2-4i}\right)$ in the $A + iB$:

(1) $\frac{1}{4} + \frac{9}{4}i$ (2) $\frac{1}{4} - \frac{9}{4}i$ (3) $\frac{1}{4} - \frac{9}{4}i$ (4) $\frac{1}{5} - \frac{7}{5a}i$

77. The square root of the complex number $-8 - 6i$ is :

(1) $\pm(3 + 4i)$ (2) $\pm(3 - 4i)$ (3) $\pm(4 + 3i)$ (4) $\pm(4 - 3i)$

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78. Put the number $\frac{1+7i}{(2-i)^2}$ in trigonometrical form, that is, in the form $r(\cos \theta + i \sin \theta)$, where r is a positive real number and $-\pi < \theta \leq \pi$.

(1) $\sqrt{2}\left(\cos \frac{3\pi}{4} - i \sin \frac{3\pi}{4}\right)$ (2) $\sqrt{3}\left(\cos \frac{\pi}{4} - i \sin \frac{\pi}{4}\right)$
(3) $\sqrt{2}\left(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4}\right)$ (4) $\sqrt{3}\left(\cos \frac{\pi}{4} + i \sin \frac{\pi}{4}\right)$

79. The real values of x and y for which the equations $\frac{(1+i)x - 2i}{3+i} + \frac{(2-3i)y + i}{3-i} = i$ are satisfied, are :

(1) $x = 3, y = -1$ (2) $x = -1, y = 3$
(3) $x = 5, y = -2$ (4) $x = -2, y = 5$

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80. If $1, \omega, \omega^2$ are the three cube roots of unity, then the value of $(1 - \omega + \omega^2)^5 + (1 + \omega - \omega^2)^5$ is equal to :

(1) 4 (2) 8 (3) 16 (4) 32

81. If $x = a + b, y = a\alpha + b\beta$ and $z = a\beta + b\alpha$, where α and β are complex cube roots of unity, then the value of $a^3 + b^3$ is equal to :

(1) $xy z$ (2) $\frac{xy}{z}$ (3) $\frac{yz}{x}$ (4) $\frac{zx}{y}$

82. If the complex numbers z_1, z_2 and z_3 be the vertices of an equilateral triangle and z_0 be the circumference of the triangle, then the value of $z_1^2 + z_2^2 + z_3^2$ is equal to :

(1) z_0^2 (2) $2z_0^2$ (3) $3z_0^2$ (4) $4z_0^2$

83. The equation of the straight line passing through the point of intersection $3x + y + 4 = 0$, $3x - 5y + 34 = 0$ and perpendicular to the line $2x + 3y - 11 = 0$ is :

- (1) $9x + 7y - 17 = 0$ (2) $4x + 5y + 8 = 0$ (3) $3x - 4y + 1 = 0$ (4) $3x - 2y + 19 = 0$

84. The point of intersection of the straight line given by equation $3y^2 - 8xy - 3y^2 - 29x + 3y - 18 = 0$ is :

- (1) $(-1, 1)$ (2) $(1, -1)$ (3) $(2, 1)$ (4) $\left(-\frac{3}{2}, -\frac{5}{2}\right)$

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85. The equation of the circle passing through $(-1, 2)$ and concentric with $x^2 + y^2 - 2x - 4y - 4 = 0$ is :

- (1) $x^2 + y^2 - 2x - 4y + 1 = 0$ (2) $x^2 + y^2 - 2x - 4y + 2 = 0$
 (3) $x^2 + y^2 - 2x - 4y + 4 = 0$ (4) $x^2 + y^2 - 2x - 4y + 8 = 0$

86. The radius of the circle on which the four points of intersection of the lines $(2x - y + 1)(x - 2y + 3) = 0$ with the axis lie, is :

- (1) 5 (2) $\frac{5}{\sqrt{2}}$ (3) $\frac{5}{2\sqrt{2}}$ (4) $\frac{5}{4\sqrt{2}}$

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87. The focal distance of any point $P(x_1, y_1)$ on the parabola $y^2 = 4ax$ is equal to :

- (1) $x_1 + y_1$ (2) $x_1 y_1$ (3) ax_1 (4) $a + x_1$

88. If PQ be a double ordinate of a parabola, the locus of its point of trisection is :

- (1) $y^2 = \frac{1}{3}ax$ (2) $y^2 = \frac{2}{3}ax$ (3) $y^2 = \frac{1}{9}ax$ (4) $y^2 = \frac{4}{9}ax$

89. The locus of the middle points of chords of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ which are drawn through the positive end of the minor axis is :

- (1) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{x}{a}$ (2) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{y}{b}$ (3) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{x}{b}$ (4) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{y}{a}$

90. The line $y = mx + c$ touches the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, if c equal to :

(1) $\pm\sqrt{a^2 - m^2b^2}$ (2) $\pm\sqrt{a^2 + m^2b^2}$ (3) $\pm\sqrt{a^2m^2 - b^2}$ (4) $\pm\sqrt{a^2m^2 + b^2}$

91. If $f(x) = \sqrt{\frac{x - \sin x}{x + \cos^2 x}}$, then $\lim_{x \rightarrow \infty} f(x)$ is :

(1) 0 (2) ∞ (3) 1 (4) -1

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92. For a real number y , let $[y]$ denote the greatest integer less than or equal to y . Then

$$f(x) = \frac{\tan \pi[x - \pi]}{1 + [x]^2}$$

- (1) discontinuous at some x ,
 (2) continuous at all x , but the derivative $f'(x)$ does not exist for some x ,
 (3) $f'(x)$ exists for all x but second derivative $f''(x)$ does not exist
 (4) $f'(x)$ exists for all x .

93. A cone is circumscribed to a sphere of a radius r . When the volume of the cone is minimum, its altitude is :

(1) $2r$ (2) $\frac{1}{3}r^2$ (3) $4r$ (4) $\frac{1}{2}r^2$

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94. The value of $\int e^x \left(\frac{1+x \log x}{x} \right) dx$ is equal to :

(1) xe^x (2) $e^x \log x$ (3) $\frac{e^x}{x}$ (4) $e^x + \log x$

95. The value of $\int_0^{\pi/4} \sin^4 x \cos^2 x dx$ is equal to :

(1) $\frac{\pi}{12}$ (2) $\frac{\pi}{16}$ (3) $\frac{\pi}{24}$ (4) $\frac{\pi}{32}$

96. The area under the curve $y = \sin x$ between $x = 0$ and $x = \pi$ is :

- (1) 1 (2) 2 (3) $\frac{1}{2}$ (4) $\frac{3}{2}$

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97. The probability that at least one of the events A and B occurs 0.6. If A and B occur simultaneously with probability 0.2, then $P(\bar{A}) + P(\bar{B})$ is :

- (1) 0.4 (2) 0.8 (3) 1.2 (4) 1.4

(Here \bar{A} and \bar{B} are complements of A and B respectively)

98. The probability that a card drawn out of a packet of 52 is of diamond is :

- (1) $\frac{1}{4}$ (2) $\frac{1}{13}$ (3) $\frac{1}{52}$ (4) 1

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99. A die is tossed twice. The probability of 'a number greater than 4 on each toss' is :

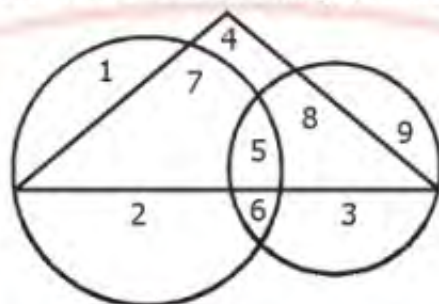
- (1) $\frac{1}{3}$ (2) $\frac{2}{3}$ (3) $\frac{1}{9}$ (4) $\frac{1}{12}$

100. A bag contains 5 red and 4 green balls. If three balls are selected at random from the bag, the probability that they are of same colour is :

- (1) $\frac{1}{2}$ (2) $\frac{1}{6}$ (3) $\frac{2}{9}$ (4) $\frac{1}{3}$

Directions : Question No. 101 to 106.

These questions are based on the following diagram in which the triangle represents female graduates. Small circle represents self – employed females and the big circle represents self employed females with bank loan facility. Numbers are shown in the different of the diagram. On the basis of these numbers, answer the following questions :



101. How many self-employed female graduates are with bank loan facility ?

- (1) 5 (2) 12 (3) 20 (4) 7

102. How many non-graduate self-employed females are with bank loan facility ?

- (1) 3 (2) 8 (3) 9 (4) 12

103. How many female graduates are not self-employed ?

- (1) 4 (2) 10 (3) 12 (4) 15

104. How many female graduates are self-employed ?

- (1) 12 (2) 13 (3) 20 (4) 15

105. How many non-graduate females are self-employed ?

- (1) 11 (2) 12 (3) 9 (4) 21

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106. In a survey, 30% of the people surveyed owned a cellular telephone and 75% owned a personal computer. If 25% owned both a cellular telephone and a personal computer, the percentage of people who owned a cellular telephone or a personal computer or both is :

- (1) 60% (2) 80% (3) 70% (4) 75%

Directions Questions No. 107 to 111. Data on the candidates, who took an examination in Social Sciences, Mathematics and Science are given below :

Passed in all subjects 167

Failed in all subjects 60

Failed in Social Sciences 175

Failed in Mathematics 199

Failed in Science 191

Passed in Social Science only 62

Passed in Mathematics only 48

Passed in Science only 52

Answer the following questions based on above data :

107. How many failed in one subject only ?

- (1) 56 (2) 61 (3) 144 (4) 152

108. How many failed in two subject only ?

- (1) 56 (2) 61 (3) 144 (4) 162

109. How many failed in Social Science only ?

(1) 15

(2) 21

(3) 30

(4) 42

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110. How many passed at least in one subject ?

(1) 167

(2) 304

(3) 390

(4) 450

111. How many passed in Mathematics and at least in one more subject ?

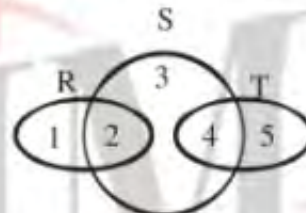
(1) 94

(2) 170

(3) 203

(4) 210

112. In the following diagram, R represents businessmen, S represents rich man, T represents honest man. Which number will represent honest rich man ?



(1) 2

(2) 3

(3) 5

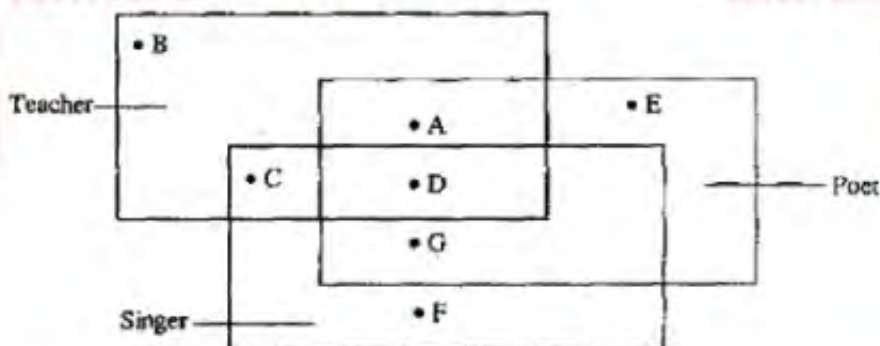
(4) 4

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MCA Entrance

Directions : Question No. 113 to 116. In the following figure, three are given some rectangles which represents the particular qualities. Read the question and find out the appropriate answer from the figure.



113. The teacher who is neither a singer nor a poet is :
 (1) A (2) B (3) D (4) G
114. The teacher who is a singer but *not* a poet is :
 (1) A (2) B (3) C (4) D
115. The teacher, who is singer and poet, both is:
 (1) A (2) B (3) C (4) D
116. The poet, who is neither a singer nor a teacher, is
 (1) D (2) E (3) G (4) A

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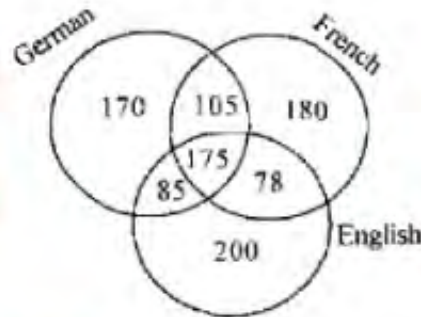
Directions : Question No. 117 to 119 : These questions are based on the diagram given below. In the diagram, the triangle stands for graduates, square for membership of professional organizations and the circle for membership of social organizations. Read each statement and find out the appropriate numbers to represent the people covered by statement.



117. Number of graduates in social organizations is represented by
 (1) 1 (2) 5 (3) 6 (4) 5 and 6
118. Number of graduates in social organisations only, is represented by
 (1) 3 (2) 4 (3) 5 (4) 6
119. Number of graduates in professional organisations is represented by
 (1) 5 and 7 (2) 4, 5 and 6 (3) 6 and 7 (4) 5, 6 and 7

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120. A survey was conducted on a sample of 1000 persons with reference to their knowledge of English, French and German. The result is presented in the Venn diagram. The ratio of the number of persons who do not know the three languages to those who know all the three languages is



(1) $\frac{1}{27}$

(2) $\frac{1}{25}$

(3) $\frac{7}{550}$

(4) $\frac{175}{1000}$

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Directions : Questions No. 121 to 125. The following question are to be answered on the basis of the table given below. Which gives the growth of regular monthly investments at 7% return.

Number of years	Monthly Investment			
	Rs. 50	Rs. 100	Rs. 250	Rs. 500
2	1292	2583	6458	12915
5	3601	7201	18003	36005
10	8705	17109	42524	87047
20	26198	52397	130991	261983

121. How much total interest is earned on a 7% investment for a 5-year period with monthly investment of Rs. 100 ?

- (1) Rs. 8,201 (2) Rs. 1,201 (3) Rs. 6,000 (4) Rs. 7,201

122. How much more is earned on a Rs. 500 monthly investment for 10 years, than a Rs. 250 monthly investment for 20 years ?

- (1) Rs. 43944 (2) Rs. 7201 (3) Rs. 18003 (4) Rs. 36005

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123. How much more is earned on a Rs. 50 monthly investment for 10 years, then on a Rs. 100 monthly investment for 5 years ?

- (1) Rs. 701 (2) Rs. 150 (3) Rs. 870 (4) Rs. 1504

124. What is the approximate ratio of the interest earned on a 10-year period to the interest earned over a 5 – year period with monthly investment of Rs. 100 ?

- (1) 8 : 1 (2) 4 : 1 (3) 2 : 1 (4) 9 : 2

125. How much total interest is earned on a 7% investment for a 10-year period with monthly investment of Rs. 100 ?

- (1) Rs. 5400 (2) Rs. 8705 (3) Rs. 10208 (4) 17409

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Directions : Questions No. 126 to 130. Read the following table and answer the questions given below it.

Age Group (in years)	Magazines Read						Total sample Surveyed (including nor-reader)	
	Sports		Film		Both		Male	Female
	Male	Female	Male	Female	Male	Female		
10 - 15	40	30	30	20	10	15	100	120
16 - 35	160	120	180	100	80	65	240	150
36 - 60	50	40	40	50	30	20	200	430

126. The number of people, who read at least one type of magazine and are over 35 years in age is :

- (1) 26 (2) 130 (3) 230 (4) 180

127. The number of people in the age-group 10-15 who read only one type of magazine is :

- (1) 25 (2) 70 (3) 95 (4) 120

128. The number of females in the age-group 16-35 who do not read 'sports' magazines is :

- (1) 120 (2) 90 (3) 60 (4) 30

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129. The number of males in the age-group 16-35 who do not read 'film' magazines is :

- (1) 60 (2) 80 (3) 140 (4) 190

130. What percent of people over 35 years do not read either type of magazine ?

- (1) 14% (2) 50.27% (3) 54% (4) 79%

Direction : Questions No. 131 to 135. Study the following table carefully and answer the questions given below it.

Production (in thousands) of five different types of Toys and Percentage Defect over the years.

Years	Types of Toys									
	A		B		C		D		E	
	Prod.	% Defect	Prod.	% Defect	Prod.	% Defect	Prod.	% Defect	Prod.	% Defect
1991	76	5	58	11	39	5	59	9	28	8
1992	82	6	46	9	37	9	62	8	36	4
1993	65	8	49	8	45	6	47	12	42	15
1994	70	12	52	12	42	13	54	4	31	9
1995	85	9	64	14	38	11	57	7	49	11
1996	80	11	54	10	40	8	68	5	38	7

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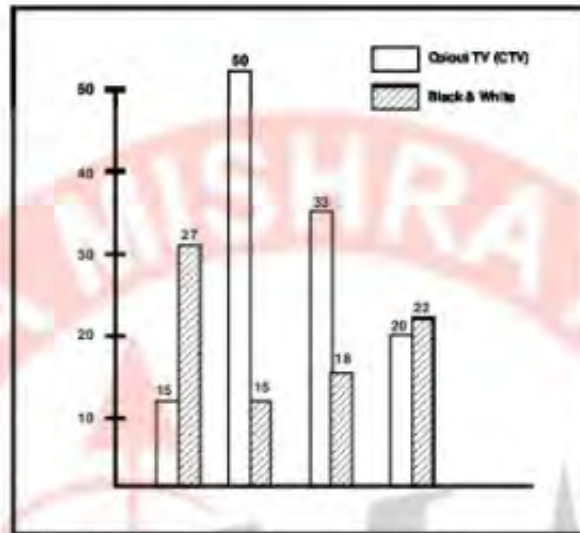
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131. The average production of the given years of which of the following types of the toys was highest ?
 (1) E (2) B (3) A (4) C
132. What was the total number of defective B-type toys in 1995 and defective D-type toys in 1993 ?
 (1) 11120 (2) 14600 (3) 13920 (4) 14260
133. Among the given years in which year the average percentage defect of all the five types of toys was lowest ?
 (1) 1992 (2) 1993 (3) 1995 (4) 1996
134. What was the difference in the number of defect free B-type toys between 1992 and 1993 ?
 (1) 3220 (2) 2730 (3) 7700 (4) 3860
135. What was the average number of defect free toys of all types in 1994 ?
 (1) 42790 (2) 45680 (3) 38700 (4) 44790

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Directions : Question No. 136 to 140. Annual percentage growth of sale of Television sets over the years :



136. If the difference between the sale of black and white TVs in 1993 and 1994 was 3000. What was the number of black and white TVs sold in 1994 ?
 (1) 54000 (2) 18000 (3) 9000 (4) Data inadequate

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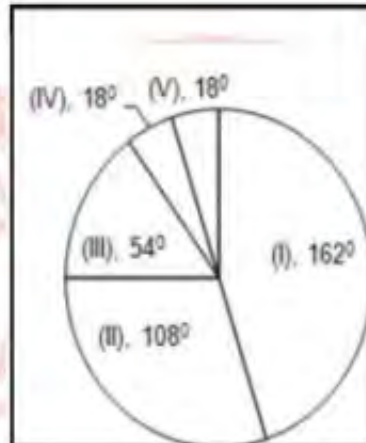
137. In which of the following years was there a maximum drop in sales of CTVs ?
 (1) 1992 (2) 1993 (3) 1994 (4) 1995
138. Approximately what was the average percentage growth in sale of black and white TVs over the given years ?
 (1) 16 (2) 22 (3) 18 (4) 20
139. In the total number of colour TVs sold in 1994 was 140000. What was the number of colour TVs sold in 1995 ?
 (1) 160000 (2) 168000 (3) 170000 (4) Data inadequate
140. What was the increase in the number TVs sold from 1992 to 1993 ?
 (1) 31000 (2) 70000 (3) 105000 (4) Data inadequate

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Directions : Questions No. 141 to 145 : The total population of a city is 5000. The various section are indicated below in the circle diagram.

- I. Employees of the Public sector

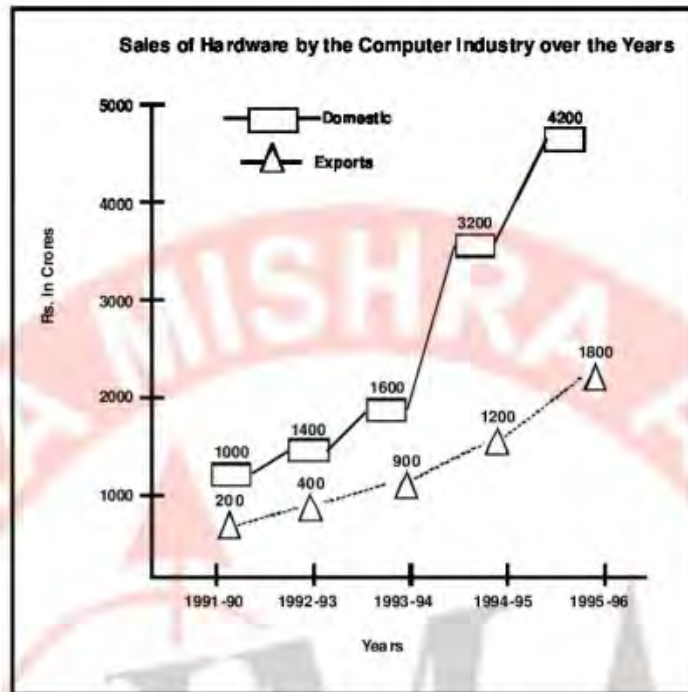
- II. Employees of the Private sector
- III. Employees of the corporate sector
- IV. Self-Employed
- V. Unemployed



141. What percentage of the employed persons is self employed?
 (1) 5% (2) $5\frac{5}{19}\%$ (3) 19% (4) 20%
142. Number of persons employed in the Corporate Sector is
 (1) 250 (2) 500 (3) 750 (4) 1500
143. The number of Unemployed persons is
 (1) 250 (2) 150 (3) 100 (4) 50
144. The number of persons employed in both the Public Sector and Corporate Sector is
 (1) 3750 (2) 3000 (3) 2500 (4) 2200
145. What percentage of the employed persons is employed in Private Sector ?
 (1) $5\frac{5}{19}\%$ (2) $15\frac{15}{19}\%$ (3) $31\frac{11}{19}\%$ (4) $52\frac{12}{19}\%$

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Directions : Question No. 146 to 150. Study the following graph carefully and answer the questions given below it.



146. What was the difference in sale of hardware between domestic and exports in 1993 – 94 ?
- (1) Rs. 1,000 crores (2) Rs 500 crores
(3) Rs. 1200 crores (4) Rs. 700 crores

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147. In which of the following years was the percentage increase in sale of hardware in domestic sector maximum over the preceding years ?
- (1) 1992-93 (2) 1993-94 (3) 1994-95 (4) 1995-96
148. What was the difference between the total hardware sale in exports sector in 1992-93 and 1993-94 together and that of domestic sector in 1993-94 ?
- (1) Rs.300 crores (2) Rs.200 crores (3) Rs.400 crores (4) Rs.150 crores
149. Approximately what was the percentage increase in sale in domestic sector from 1994- 95 to 1995-96 ?
- (1) 35 (2) 5 (3) 40 (4) 20
150. What was the difference in the average sale between the domestic and export sectors?
- (1) Rs.900 crores (2) Rs.1380 crores (3) 1560 crores (4) Rs.600 crores

**The expected BHU MCA 2016 score of Majority Student at
Jitendra Mishra Academy, Indore is between**

410 to 390

out of total 450 marks

More than 110+ question can be solved Direct by Shortcut