RAVI MATHS TUITION CENTER ,GKM COLONY, CH- 82. PH: 8056206308

IMPORTANT 1 MARKS FOR MID TERM Date : 25-Jul-19

11th Standard

Business Maths

Reg.No. : | | | | | | |

Time : 01:40:00 Hrs Total Marks : 100

FOR ANSWERS GOOGLE ' RAVI MATHS TUITION CNTER ' 100 x 1 = 100

1) The value of x if $\begin{vmatrix} 0 & 1 & 0 \\ x & 2 & x \\ 1 & 3 & x \end{vmatrix} = 0$ is

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

2) The value of $\begin{vmatrix} 2x+y & x & y \\ 2y+z & y & z \\ 2z+x & z & x \end{vmatrix}$ is

(a) xyz (b) x+y+z (c) 2x+2y+2z (d) 0

3) The co-factor of -7 in the determinant $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$ is

(a) -18 (b) 18 (c) -7 (d) 7

4) If $\triangle = \begin{vmatrix} 1 & 2 & 3 \\ 3 & 1 & 2 \\ 2 & 3 & 1 \end{vmatrix}$ then $\begin{vmatrix} 3 & 1 & 2 \\ 1 & 2 & 3 \\ 2 & 3 & 1 \end{vmatrix}$ is

(a) $\triangle$ (b) $-\triangle$ (c) $3\triangle$ (d) $-3\triangle$

5) The value of the determinant $\begin{vmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & c \end{vmatrix}^2$ is

(a) abc (b) 0 (c) $a^2b^2c^2$ (d) -abc

6) If A is a square matrix of order 3, then |kA| is

(a) k|A| (b) -k|A| (c) $k^3|A|$ (d) $-k^3|A|$

7) adj (AB) is equal to

(a) adj A adj B (b) adj A^T adj B^T (c) adj B adj A (d) adj B^T adj A^T

8) The inverse matrix of $\begin{pmatrix} \frac{1}{5} & \frac{5}{25} \\ \frac{2}{5} & \frac{1}{2} \end{pmatrix}$ is

(a) $\frac{7}{30}\begin{pmatrix} \frac{1}{2} & \frac{5}{12} \\ \frac{2}{5} & \frac{4}{5} \end{pmatrix}$ (b) $\frac{7}{30}\begin{pmatrix} \frac{1}{2} & \frac{-5}{12} \\ \frac{-2}{5} & \frac{1}{5} \end{pmatrix}$ (c) $\frac{30}{7}\begin{pmatrix} \frac{1}{2} & \frac{5}{12} \\ \frac{2}{5} & \frac{4}{5} \end{pmatrix}$ (d) $\frac{30}{7}\begin{pmatrix} \frac{1}{2} & \frac{-5}{12} \\ \frac{-2}{5} & \frac{4}{5} \end{pmatrix}$

9) If A = $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ such that ad - bc $\neq$ 0 then A^{-1} is

(a) $\frac{1}{ad-bc}\begin{pmatrix} d & b \\ -c & a \end{pmatrix}$ (b) $\frac{1}{ad-bc}\begin{pmatrix} d & b \\ c & a \end{pmatrix}$ (c) $\frac{1}{ad-bc}\begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$ (d) $\frac{1}{ad-bc}\begin{pmatrix} d & -b \\ c & a \end{pmatrix}$

10) The number of Hawkins-Simon conditions for the viability of an input - output analysis is

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

11) The inventor of input-output analysis is

(a) Sir Francis Galton (b) Fisher (c) Prof. Wassily W. Leontief (d) Arthur Caylay

12) Which of the following matrix has no inverse

(a) $\begin{pmatrix} -1 & 1 \\ 1 & -4 \end{pmatrix}$ (b) $\begin{pmatrix} 2 & -1 \\ -4 & 2 \end{pmatrix}$ (c) $\begin{pmatrix} cos\,a & sin\,a \\ -sin\,a & cos\,a \end{pmatrix}$ (d) $\begin{pmatrix} sin\,a & cos\,a \\ -cos\,a & sin\,a \end{pmatrix}$

13) The Inverse of matrix of $\begin{pmatrix} 3 & 1 \\ 5 & 2 \end{pmatrix}$ is

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

14) If $A = \begin{pmatrix} 2 & -1 \\ -5 & 3 \end{pmatrix}$ then A (adj A) is $\begin{pmatrix} -2 & 5 \\ 1 & -3 \end{pmatrix}$ $\begin{pmatrix} 3 & -1 \\ -5 & -3 \end{pmatrix}$ $\begin{pmatrix} -3 & 5 \\ 1 & -2 \end{pmatrix}$

(a) $\begin{pmatrix} -4 & -2 \\ -1 & -1 \end{pmatrix}$ (b) $\begin{pmatrix} 4 & -2 \\ -1 & 1 \end{pmatrix}$ (c) $\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$ (d) $\begin{pmatrix} 0 & 2 \\ 2 & 0 \end{pmatrix}$

15) If A and B are non-singular matrices then, which of the following is incorrect?

(a) A^2 = Iimplies $A^{-1} = A$ (b) $I^{-1} = I$ (c) If AX = B, then $X = B^{-1} A$ (d) If A is square matrix of order 3 then $|\text{adj } A| = |A|^2$

16) The value of $\begin{vmatrix} 5 & 5 & 5 \\ 4x & 4y & 4z \\ -3x & -3y & -3z \end{vmatrix}$ is

(a) 5 (b) 4 (c) 0 (d) -3

17) If A is an invertible matrix of order 2, then det (A^{-1}) be equal to

(a) det (A) (b) $\frac{1}{det(A)}$ (c) 1 (d) 0

18) If A is 3 x 3 matrix and $|A| = 4$, then $|A^{-1}|$ is equal to

(a) $\frac{1}{4}$ (b) $\frac{1}{16}$ (c) 2 (d) 4

19) If A is a square matrix of order 3 and IAI = 3 then | adj A| is equal to

(a) 81 (b) 27 (c) 3 (d) 9

20) The value of $\begin{vmatrix} x & x^2 & -yz & 1 \\ y & y^2 & -zx & 1 \\ z & z^2 & -xy & 1 \end{vmatrix}$ is

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

21) If $A = \begin{vmatrix} cos\theta & sin\theta \\ -sin\theta & cons\theta \end{vmatrix}$ then |2A| is equal to

(a) 4 cos 2 θ (b) 4 (c) 2 (d) 1

22) If $\triangle = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$ and A_{ij} is cofactor of a_{ij}, then value of $\triangle$ is given by

(a) $a_{11} A_{31} + a_{12} A_{32} + a_{13} A_{33}$ (b) $a_{11} A_{11} + a_{12} A_{21} + a_{13} A_{31}$ (c) $a_{21} A_{11} + a_{22} A_{12} + a_{23} A_{13}$ (d) $a_{11} A_{11} + a_{21} A_{21} + a_{31} A_{31}$

23) If $\begin{vmatrix} x & 2 \\ 8 & 5 \end{vmatrix} = 0$ then the value of x is

(a) $\frac{-5}{6}$ (b) $\frac{5}{6}$ (c) $\frac{-16}{5}$ (d) $\frac{16}{5}$

24) If $\begin{vmatrix} 4 & 3 \\ 3 & 1 \end{vmatrix} = -5$ then value of $\begin{vmatrix} 20 & 15 \\ 15 & 5 \end{vmatrix}$ is

(a) -5 (b) -125 (c) -25 (d) 0

25) If any three rows or columns of a determinant are identical, then the value of the determinant is

(a) 0 (b) 2 (c) 1 (d) 3

26) If $nC_3 = nC_2$, then the value of nC_4 is

(a) 2 (b) 3 (c) 4 (d) 5

27) The value of n, when $nP_2 = 20$ is

(a) 3 (b) 6 (c) 5 (d) 4

28) The number of ways selecting 4 players out of 5 is

(a) 4! (b) 20 (c) 25 (d) 5

29) If $nP_r = 720$ (nC_r), then r is equal to

(a) 4 (b) 5 (c) 6 (d) 7

30) The possible out comes when a coin is tossed five times

(a) 2^5 (b) 5^2 (c) 10 (d) $\frac{5}{2}$

31) The number of diagonals in a polygon of n seates is equal to
(a) nC_2 (b) $nC_2 - 2$ (c) $nC_2 - n$ (d) $nC_2 - 1$

32) The greatest positive integer which divide n(n + 1) (n + 2) (n + 3) for $n \in N$ is
(a) 2 (b) 6 (c) 20 (d) 24

33) If n is a positive integer, then the number of terms in the expansion $(x + a)^n$ is
(a) n (b) n + 1 (c) n-1 (d) 2n

34) For all n > 0, $nC_1 + nC_2 + nC_3 + ... + nC_n$ is equal to
(a) 2n (b) $2^n - 1$ (c) n^2 (d) $n^2 - 1$

35) The term containing x^3 in the expansion of $(x - 2y)^7$ is
(a) 3^{rd} (b) 4^{th} (c) 5^{th} (d) 6^{th}

36) The middle term in the expansion of $\left(x + \frac{1}{x}\right)^{10}$
(a) $10C_4\left(\frac{1}{x}\right)$ (b) $10C_5$ (c) $10C_6$ (d) $10C_7x^4$

37) The constant term in the expansion of $\left(x + \frac{2}{x}\right)^6$
(a) 156 (b) 165 (c) 162 (d) 160

38) The last term in the expansion of $(3 + \sqrt{2})^8$ is
(a) 81 (b) 16 (c) $8\sqrt{2}$ (d) $27\sqrt{3}$

39) If $\frac{kx}{(x+4)(2x-1)} = \frac{4}{x+4} + \frac{1}{2x-1}$ then k is equal to
(a) 9 (b) 11 (c) 5 (d) 7

40) The number of 3 letter words that can be formed from the letters of the word number when the repetition is allowed are
(a) 206 (b) 133 (c) 216 (d) 300

41) The number of parallelograms that can be formed from the set of four parallel lines intersecting another set of three parallel lines is
(a) 18 (b) 12 (c) 9 (d) 6

42) There are 10 true or false questions in an examination. Then these questions can be answered in
(a) 240 ways (b) 120 ways (c) 1024 ways (d) 100 ways

43) The value of $(5C_o + 5C_1) + (5C_1 + 5C_2) + (5C_2 + 5C_3) + (5C_3 + 5C_4) + (5C_4 + 5C_5)$ is
(a) 2^6-2 (b) 2^5-1 (c) 2^8 (d) 2^7

44) The total number of 9 digit number which have all different digit is
(a) 10! (b) 9! (c) $9 \times 9!$ (d) $10 \times 10!$

45) The number of ways to arrange the letters of the word "CHEESE" is
(a) 120 (b) 240 (c) 720 (d) 6

46) 13 guests have participated in a dinner. The number of handshakes happened in the dinner is
(a) 715 (b) 78 (c) 286 (d) 13

47) Number of words with or without meaning that can be formed using letters of the word "EQUATION" , with no repetition of letters is
(a) 7! (b) 3! (c) 8! (d) 5!

48) Sum of Binomial co-efficient in a particular expansion is 256, then number of terms in the expansion is
(a) 8 (b) 7 (c) 6 (d) 9

49) The number of permutation of n different things taken r at a time, when the repetition is allowed is
(a) r^n (b) n^r (c) $\frac{n!}{(n-r)!}$ (d) $\frac{n!}{(n+r)!}$

50) Sum of the binomial co-efficients is
(a) 2^n (b) n^2 (c) 2n (d) n + 17

51) If m_1 and m_2 are the slopes of the pair of lines given by $ax^2 + 2hxy + by^2 = 0$, then the value of $m_1 + m_2$ is
(a) 2h/b (b) -2h/b (c) 2h/a (d) -2h/a

52) The angle between the pair of straight lines $x^2 - 7xy + 4y^2 = 0$

(a) $tan^{-1}\left(\frac{1}{3}\right)$ (b) $tan^{-1}\left(\frac{1}{2}\right)$ (c) $tan^{-1}\left(\frac{\sqrt{33}}{5}\right)$ (d) $tan^{-1}\left(\frac{5}{\sqrt{33}}\right)$

53) If the lines 2x - 3y - 5 = 0 and 3x - 4y - 7 = 0 are the diameters of a circle, then its centre is

(a) (-1, 1) (b) (1,1) (c) (1, -1) (d) (-1, -1)

54) The x - intercept of the straight line 3x + 2y - 1 = 0 is

(a) 3 (b) 2 (c) 1/3 (d) 1/2

55) The slope of the line 7x + 5y - 8 = 0 is

(a) 7/5 (b) -7/5 (c) 5/7 (d) -9/7

56) The locus of the point P which moves such that P is at equidistance from their coordinate axes is

(a) $y = \frac{1}{x}$ (b) y=-x (c) y=x (d) $y = -\frac{1}{x}$

57) The locus of the point P which moves such that P is always at equidistance from the line x + 2y+ 7 = 0 is

(a) x+2y+2=0 (b) x - 2y + 1 = 0 (c) 2x - y + 2 = 0 (d) 3x + y + 1=0

58) If $kx^2 + 3xy - 2y^2 = 0$ represent a pair of lines which are perpendicular then k is equal to

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

59) (1, - 2) is the centre of the circle $x^2 + y^2 + ax + by - 4 = 0$, then its radius

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

60) The length of the tangent from (4,5) to the circle $x^2 + y^2 = 16$ is

(a) 4 (b) 5 (c) 16 (d) 25

61) The focus of the parabola $x^2 = 16y$ is

(a) (4,0) (b) (-4,0) (c) (0,4) (d) (0,-4)

62) Length of the latus rectum of the parabola $y^2 = - 25x$ is

(a) 25 (b) -5 (c) 5 (d) -25

63) The centre of the circle $x^2 + y - 2x + 2y - 9 = 0$ is

(a) (1,1) (b) (-1,-1) (c) (-1,1) (d) (1, -1)

64) The equation of the circle with centre on the x axis and passing through the origin is

(a) $x^2 - 2ax + y = 0$ (b) $y^2 - 2ay + x^2 = 0$ (c) $x^2+y^2=a^2$ (d) $x^2 - 2ay + y = 0$

65) If the centre of the circle is (-a, -b) and radius $\sqrt{a^2 - b^2}$ then the equation of circle is

(a) $x^2+y^2+2ax+2by+2b^2=0$ (b) $x^2+y^2+2ax+2by-2b^2=0$ (c) $x^2 + y^2 - 2ax - 2by - 2b^2 = 0$ (d) $x^2 + y - 2ax - 2by + 2b^2 = 0$

66) Combined equation of co-ordinate axes is

(a) $x^2-y^2=0$ (b) $x^2+y^2=0$ (c) xy=c (d) xy=0

67) $ax^2 + 4xy + 2y^2 = 0$ represents a pair of parallel lines then 'a' is

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

68) In the equation of the circle $x^2 + y^2 = 16$ then y-intercept is (are)

(a) 4 (b) 16 (c) ±4 (d) ±16

69) If the perimeter of the circle is 8π units and centre is (2,2) then the equation of the circle is

(a) $(x - 2)^2 + (y - 2)^2 = 4$ (b) $(x - 2)^2 + (y - 2)^2 = 16$ (c) $(x - 4)^2 + (y - 4)^2 = 2$ (d) $x^2 + y^2 = 4$

70) The equation of the circle with centre (3,-4) and touches the x - axis

(a) $(x - 3)^2 + (y - 4)^2 = 4$ (b) $(x - 3)^2 + (y + 4)^2 = 16$ (c) $(x-3)^2+(y- 4)^2=16$ (d) $x^2+y^2=16$

71) If the circle touches x axis, y axis and the line x = 6 then the length of the diameter of the circle is

(a) 6 (b) 3 (c) 12 (d) 4

72) The eccentricity of the parabola is

(a) 3 (b) 2 (c) 0 (d) 1

73) The double ordinate passing through the focus is

(a) focal chord (b) latus rectum (c) directrix (d) axis

74) The distance between directrix and focus of a parabola $y^2 = 4ax$ is

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

75) The equation of directrix of the parabola $y^2 = -x$ is

(a) 4x+ 1 =0 (b) 4x - 1 = 0 (c) x - 4=0 (d) x + 4 = 0

76) The degree measure of $\frac{\pi}{8}$ is

(a) 20°60' (b) 22°30' (c) 20°60' (d) 20°30'

77) The radian measure of 37°30' is

(a) $\frac{5\pi}{24}$ (b) $\frac{3\pi}{24}$ (c) $\frac{7\pi}{24}$ (d) $\frac{9\pi}{24}$

78) If $\tan\theta = \frac{1}{\sqrt{5}}$ and θ lies in the first quadrant, then $\cos\theta$ is

(a) $\frac{1}{\sqrt{6}}$ (b) $\frac{-1}{\sqrt{6}}$ (c) $\frac{\sqrt{5}}{\sqrt{6}}$ (d) $\frac{-\sqrt{5}}{\sqrt{6}}$

79) The value of $\sin 15^o$ is

(a) $\frac{\sqrt{3}+1}{2\sqrt{2}}$ (b) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ (c) $\frac{\sqrt{3}}{\sqrt{2}}$ (d) $\frac{\sqrt{3}}{2\sqrt{2}}$

80) The value of $\sin(-420^o)$ is

(a) $\frac{\sqrt{3}}{2}$ (b) $-\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

81) The value of $\cos(-480^o)$ is

(a) $\sqrt{3}$ (b) $-\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

82) The value of $\sin 28^o \cos 17^o + \cos 28^o \sin 17^o$ is

(a) $\frac{1}{\sqrt{2}}$ (b) 1 (c) $\frac{-1}{\sqrt{2}}$ (d) 0

83) The value of sin 15° cos 15° is

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{4}$

84) The value of sec A sin(270°+A) is

(a) -1 (b) $\cos^2 A$ (c) $\sec^2 A$ (d) 1

85) If sin A+ cos A=1, then sin 2A is equal to

(a) 1 (b) 2 (c) 0 (d) $\frac{1}{2}$

86) The value of $\cos^2 45^o - \sin^2 45^o$ is

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{1}{2}$ (c) 0 (d) $\frac{1}{\sqrt{2}}$

87) The value of $1-2\sin^2 45^o$ is

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) 0

88) The value $4\cos^3 40^o - 3\cos 40^o$ is

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{-1}{2}$ (c) $\frac{1}{2}$ (d) $\frac{1}{\sqrt{2}}$

89) The value of $\frac{2\tan 30^o}{1+\tan^2 30}$ is

(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\sqrt{3}$

90) If $\sin A = \frac{1}{2}$ then $4\cos^3 A - 3\cos A$ is

(a) 1 (b) 0 (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{\sqrt{2}}$

91) The value of $\frac{3\tan 10^o - \tan^3 10}{1-3\tan^2 10}$ is

(a) $\frac{1}{\sqrt{3}}$ (b) $\frac{1}{2}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{\sqrt{2}}$

92) The value of $cosec^{-1}\left(\frac{2}{\sqrt{3}}\right)$ is

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$

93) $\sec^{-1}\frac{2}{3} + cosec^{-1}\frac{2}{3} =$

(a) $\frac{-\pi}{2}$ (b) $\frac{\pi}{2}$ (c) π (d) $-\pi$

94) If α and β be between 0 and $\frac{\pi}{2}$ and if $\cos(\alpha+\beta) = \frac{12}{13}$ and $\sin(\alpha-\beta) = \frac{3}{5}$ then $\sin 2\alpha$ is

(a) (b) 0 (c) (d)

95) If $\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$ then tan(2A+B) is equal to $\frac{16}{65}$ $\frac{56}{65}$ $\frac{64}{65}$

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

96) $\tan\left(\frac{\pi}{4} - x\right)$ is

(a) $\left(\frac{1+\tan x}{1-\tan x}\right)$ (b) $\left(\frac{1-\tan x}{1+\tan x}\right)$ (c) 1-tan x (d) 1+tan x

97) $\sin\left(\cos^{-1}\frac{3}{5}\right)$ is

(a) $\frac{3}{5}$ (b) $\frac{5}{3}$ (c) $\frac{4}{5}$ (d) $\frac{5}{4}$

98) The value of $\frac{1}{cosec(-45^o)}$ is

(a) $\frac{-1}{\sqrt{2}}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\sqrt{2}$ (d) $-\sqrt{2}$

99) If p sec 50° = tan 50° then p is

(a) cos 50° (b) sin 50° (c) tan 50° (d) sec 50°

100) $\left(\frac{\cos x}{cosecx}\right) - \sqrt{1-\sin^2 x}\sqrt{1-\cos^2 x}$ is

(a) $\cos^2x - \sin^2x$ (b) $\sin^2x - \cos^2x$ (c) 1 (d) 0

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RAVI MATHS TUITION CENTER PH - 8056206308

Mid term IMPORTANT 2 marks

Date : 25-Jul-19

11th Standard

Business Maths

Reg.No. : | | | | | | |

Time : 01:00:00 Hrs

Total Marks : 60

30 x 2 = 60

1) The technology matrix of an economic system of two industries is $\begin{bmatrix} 0.6 & 0.9 \\ 0.20 & 0.80 \end{bmatrix}$ .Test whether the system is viable as per Hawkins-Simon conditions.

2) Find the minors and cofactors of all the elements of the following determinants $\begin{vmatrix} 5 & 20 \\ 0 & -1 \end{vmatrix}$

3) Solve: $\begin{vmatrix} 2 & x & 3 \\ 4 & 1 & 6 \\ 1 & 2 & 7 \end{vmatrix} = 0$

4) Prove that $\begin{vmatrix} \frac{1}{a} & bc & b+c \\ \frac{1}{b} & ca & c+a \\ \frac{1}{c} & ab & a+b \end{vmatrix} = 0$

5) Solve $\begin{vmatrix} x-1 & x & x-2 \\ 0 & x-2 & x-3 \\ 0 & 0 & x-3 \end{vmatrix} = 0$

6) Evaluate $\begin{vmatrix} 1 & 3 & 4 \\ 102 & 18 & 36 \\ 17 & 3 & 6 \end{vmatrix}$

7) Find adj A for $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$

8) If $A = \begin{vmatrix} -2 & 6 \\ 3 & -9 \end{vmatrix}$ then, find A^{-1}

9) Resolve into partial fractions for the following $\frac{3x+7}{x^2-3x+2}$

10) Expand the following by using binomial theorem. $(2a - 3b)^4$

11) Evaluate the following using binomial theorem:$(101)^4$

12) Evaluate the following using binomial theorem:$(999)^5$

13) a) In how many ways can 8 identical beads be strung on a necklace?

b) In how many ways can 8 boys form a ring?

14) Find the rank of the word 'CHAT' in dictionary.

15) How many triangles can be formed by joining the vertices of a hexagon?

16) If four dice are rolled, find the number of possible outcomes in which atleast one die shows 2.

17) If a polygon has 44 diagonals, find the number of its sides.

18) If $nP_r = 360$, find n and r.

19) How many distinct words can be formed using all the letters of the following words.

MISSISSIPPI

20) If $nC_4 = nC_6$, find $12C_n$

21) If $15C_{3r} = 15C_{r+3}$, find r

22) If $(n + 2)C_n = 45$, find n

23) Find the equation of the following circles having the center (3,5) and radius 5 units

24) Find the center and radius of the circle $x^2 + y^2 - 22x - 4y + 25 = 0$

25) Find the equation of the circle whose centre is (-3, -2) and having circumferences 16π

26) Find the cartesian equation of the circle whose parametric equation are $x = 3\cos\theta$, $y = 3\sin\theta$ $0 \leq \theta \leq 2\pi$

27) Find the acute angle between the lines $2x - y + 3 = 0$ and $x + y + 2 = 0$.

28) If the lines $3x-5y-11=0$, $5x+3y-7=0$ and $x+ky=0$ are concurrent, find the value of k.

29) Find the parametric equations of the circle $x^2+y^2=25$

30) The supply of a commodity is related to the price by the relation $x=\sqrt{5p-15}$. Show that the supply curve is a parabola.

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RAVI MATHS TUITION CENTER ,GKM COLONY, CH- 82. PH: 8056206308

IMPORTANT 3 MARKS WITH ANSWERS FOR MID TERM Date : 25-Jul-19

11th Standard

Business Maths

Reg.No. : | | | | | | |

Time : 02:30:00 Hrs Total Marks : 150

FOR ANSWERS GOOGLE **' RAVI MATHS TUITION CNTER '** OR MY YOUTUBE CHANNEL **' SR MATHS TEST PAPERS'** 50 x 3 = 150

1) Prove that $\begin{vmatrix} -a^2 & ab & ac \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{vmatrix} = 4a^2b^2c^2$

2) Solve: $\begin{vmatrix} x & 2 & -1 \\ 2 & 5 & x \\ -1 & 2 & x \end{vmatrix} = 0.$

3) Show that $\begin{vmatrix} 0 & ab^2 & ac^2 \\ a^2b & 0 & bc^2 \\ a^2c & b^2c & 0 \end{vmatrix} = 2a^3b^3c^3.$

4) If $A = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$ show that $A^2-4A+5I_2 = 0$ and also find A^{-1}.

5) If $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ then verify that A (adj A) = |A| I and also find A^{-1}.

6) If $A = \begin{bmatrix} 2 & -2 & 2 \\ 2 & 3 & 0 \\ 9 & 1 & 5 \end{bmatrix}$ then, show that (adj A)A=0.

7) If $A = \begin{bmatrix} 3 & 7 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & 8 \\ 7 & 9 \end{bmatrix}$ then, verify that $(AB)^{-1}=B^{-1}A^{-1}$

8) If $A = \begin{bmatrix} 2 & 3 \\ 1 & -6 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 4 \\ 1 & -2 \end{bmatrix}$ then verify adj(AB)=(adj B) (adj A).

9) If $X = \begin{bmatrix} 8 & -1 & -3 \\ -5 & 1 & 2 \\ 10 & -1 & -4 \end{bmatrix}$ and $Y = \begin{bmatrix} 2 & 1 & -1 \\ 0 & 2 & 1 \\ 5 & p & q \end{bmatrix}$ then, find p, q if $Y = X^{-1}$

10) Evaluate $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}$ = (a–b) (b–c) (c–a)

11)

The technology matrix of an economic system of two industries is $\begin{bmatrix} 0.8 & 0.2 \\ 0.9 & 0.7 \end{bmatrix}$ Test whether the system is viable as per Hawkins – Simon conditions.

12) Resolve into partial fractions for the following:
$\frac{4x+1}{(x-2)(x+1)}$

13) Resolve into partial fractions for the following:
$\frac{1}{(x-1)(x+2)^2}$

14) Find the middle terms in the expansion of $\left(x+\frac{1}{x}\right)^{11}$

15) Find the middle terms in the expansion of $\left(2x^2-\frac{3}{x^3}\right)^{10}$

16) Show that the middle term in the expansion of $(1+x)^{2n}$ is $\frac{1.3.5....(2n-1)2^n.x^n}{n!}$

17) Find the term independent of x in the expansion of $\left(x^2-\frac{2}{3x}\right)^9$

18) How many number lesser than 1000 can be formed using the digits 5,6,7,8 and 9 if no digit is repeated?

19) In how many ways can a cricket team of 11 players be chosen out of a batch of 15 players?
(i) There is no restriction on the selection.
(ii) A particular player is always chosen.
(iii)A particular player is never chosen

20) Find the Co-efficient of x^{11} in the expansion of $\left(x+\frac{2}{x^2}\right)^{17}$

21) Using binomial theorem, evaluate $(101)^5$

22) If the distance of a point from the points (2,1) and (1, 2) are in the ratio 2:1 then find locus of the point

23) If A (-1,1) and B (2,3) are two fixed points, then find the locus of a point P So that the are of triangle APB = 8 Sq.units

24) Show that the straight lines x + y -4 = 0, 3x + 2 = 0 and 3x -3y + 16 = 0 are concurrent

25) Determine whether the points p(1,0), Q(2,1) and R(2,3) lie outside the circle, on the ciircle or inside the circle $x^2 + y^2 - 4x- 6y + 9 = 0$

26) Find the value of P if the line 3x +4y -P = 0 is tangent to the circle $x^2 +y^2 = 16$

27) If the slope of one of the straight lines $ax^2+2hxy + by^2=0$ is thrice that of the other then show that $3h^2=4ab$.

28) Find the values of a and b if the equation $(a-1)x^2+by^2+(b-8)xy+4x+4y-1=0$ represents a circle.

29) Show that the equation $2x^2+5xy+3y^2+6x+7y+4=0$ represents a pair of straight lines. Also find the angle between them.

30) The slope of one of the straight lines $ax^2+2hxy+by^2=0$ is twice that of the other, show that $8h^2=9ab$.

31) Find the value of k so that the line 3x+4y-k = 0 is a tangent to $x^2+y^2-64 = 0$

32) Find the axis, vertex, focus, equation of directrix and length of latus rectum for the parabola $x^2+6x-4y+21=0$

33) Solve: $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$

34) Evaluate $\cos\left(\sin^{-1}\left(\frac{4}{5}\right)+\sin^{-1}\left(\frac{12}{13}\right)\right)$

35) Prove that $\tan\left(-225^o\right)\cot\left(-405^o\right)-\tan\left(-765^o\right)\cot\left(675^o\right)=0$

36) Prove that: $\frac{\sin(180-\theta)\cos(90+\theta)\tan(270-\theta)\cot(360-\theta)}{\sin(360-\theta)\cot(360+\theta)\sin(270-\theta)\csc(-\theta)} = -1$

37) Show that $\cos^{-1}\left(\frac{12}{13}\right) + \sin^{-1}\left(\frac{3}{5}\right) = \sin^{-1}\left(\frac{56}{65}\right)$

38) Prove that: $(cos\alpha - cos\beta)^2 + (sin\alpha - sin\beta)^2 = 4sin^2\left(\frac{\alpha-\beta}{2}\right)$

39) Prove that: sinA sin(60°+A) sin(60°-A)=$\frac{1}{4}$ sin3A

40) If $\cos A = \frac{13}{14}$ and $\cos B = \frac{1}{7}$ where A, B are acute angles, prove that A-B=$\frac{\pi}{3}$

41) If A+B=45°, Prove that (1 + tan A) (1+ tan B) = 2 and hence deduce the value of $\tan 22\frac{1}{2}^\circ$

42) Prove that tan 4A tan 3A tan A + tan 3A + tan A - tan 4A = 0

43) Prove that $\frac{sin(-\theta)tan(90^o-\theta)sec(180^o-\theta)}{sin(180+\theta)cot(360-\theta)cosec(90^o-\theta)} = 1$

44) If tan A = m tanB, prove that $\frac{sin(A+B)}{sin(A-B)} = \frac{m+1}{m-1}$

45) If tan α =$\frac{1}{2}$ and tan β =$\frac{1}{7}$ then prove that (2α +β)=$\frac{\pi}{4}$.

46) Show that sin20°sin 40° sin80°=$\frac{\sqrt{3}}{8}$

47) Show that sin20°sin 40° sin 60° sin80°=$\frac{3}{16}$

48) Prove that $\frac{tan5x-2sin3x+sinx}{cos5x-cosx} = tanx$

49) Prove that (cos α +cosβ)²+ (sinα +sinβ)² =cos2$\frac{\alpha-\beta}{2}$

50) Solve $tan^{-1}\left(\frac{x-1}{x-2}\right) + tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$

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RAVI MATHS TUITION CENTER ,GKM COLONY, CH- 82. PH: 8056206308

IMPORTANT 5 MARKS MID TERM Date : 25-Jul-19

11th Standard

Business Maths

Reg.No. : | | | | | | |

Time : 02:30:00 Hrs Total Marks : 150

FOR ANSWERS GOOGLE**' RAVI MATHS TUITION CNTER ' OR ' SR MATHS TEST PAPERS'** MY YOUTUBE CHANNEL 30 x 5 = 150

1) If $A = \begin{bmatrix} 1 & 1 & 1 \\ 3 & 4 & 7 \\ 1 & -1 & 1 \end{bmatrix}$ verify that A (adj A) = (adj A) A = $|A| I_3$.

2) Suppose the inter-industry flow of the product of two industries are given as under.

Production sector	Consumption sector		Domestic demand	Total output
	X	Y		
X	30	40	50	120
Y	20	10	30	60

Determine the technology matrix and test Hawkin's -Simon conditions for the viability of the system. If the domestic demand changes to 80 and 40 units respectively, what should be the gross output of each sector in order to meet the new demands.

3) Solve by using matrix inversion method: x - y + z = 2; 2x- y = 0 , 2y - z = 1.

4) The cost of 2 Kg of Wheat and 1 Kg of Sugar is Rs.70. The cost of 1 Kg of Wheat and 1 Kg of Rice is Rs.70 The cost of 3 Kg of Wheat, 2 Kg of Sugar and 1 Kg of rice is Rs.170. Find the cost of per kg each item using matrix inversion method.

5) The data are about an economy of two industries A and B. The values are in crores of rupees.

Producer	**User**		**Final demand**	**Total output**
	A	**B**		
A	50	75	75	200
B	100	50	50	200

Find the output when the final demand changes to 300 for A and 600 for B.

6) Solve by matrix inversion method : 2x - z = 0; 5x +y = 4; y + 3z = 5.

7) The prices of three commodities A, B and C are Rs x, Rs y and Rs z per unit respectively. P purchases 4 units of C and sells 3 units of A and 5 units of B. Q purchases 3 units of B and sells 2 units of A and 1 unit of C. R purchases 1 unit of A and sells 4 units of B and 6 units of C. In the process P, Q and R earn Rs 6,000, Rs 5000, and Rs 13000 respectively. By using matrix inversion method, find the prices per unit of A, B and C.

8) An economy produces only coal and steel. These two commodities serve as intermediate inputs in each other's production. 0.4 tonne of steel and 0.7 tonne of coal are needed to produce a tonne of steel. Similarly 0.1 tonne of steel and 0.6 tonne of coal are required to produce a tonne of coal. No capital inputs are needed. Do you think that the system is viable? 2 and 5 labour days are required to produce a tonne s of coal and steel respectively. If economy needs 100 tonnes of coal and 50 tonnes of steel, calculate the gross output of the two commodities and the total labour days required.

9) $2^n > n$,for all $n \in N$.

10) Resolve into partial fractions for the following:

$$\frac{x-2}{(x+2)(x-1)^2}$$

11) Prove that the term independent of x in the expansion of $\left(x + \frac{1}{x}\right)^{2n}$ is $\frac{1.3.5.....,(2n-1)2^n}{n!}$

12) How many code symbols can be formed using 5 out of 6 of the letters of A, B, C, D, E, F so that the letters
a) cannot be repeated
b) can be repeated
c) cannot be repeated but must begin with E
d) cannot be repeated but end with CAB.

13) By the principle of mathematical induction, prove the following.
$1^3+2^3+3^3+.....+n^3=\frac{n^2(n+1)^2}{4}$ for all $n \in N$.

14) By the principle of mathematical induction, prove the following.
4+8+12+.....+4n=2n(n+1), for all $n \in N$.

15) By the principle of mathematical induction, prove the following.
3^{2n}-1 is a divisible by 8, for all $n \in N$.

16) By the principle of mathematical induction, prove the following.
a^n-b^n is divisible by a-b, for all $n \in N$.

17) Resolve into partial fraction : $\frac{x+1}{(x^2-4)(x+1}$

18) Resolve into partial fractions: $\frac{2x+1}{(x-1)(x^2+1)}$

19) Find the middle term in the expansion of $(\frac{x}{3}+9y)^2$

20) Show that the equation $12x^2$ -10xy $+2y^2$ +14x -5y +2 = 0 represents a pair of straight lines also find the separate equations of the straight lines

21) Show that the pair of straight lines $4x^2$ +12xy $+9y^2$ -6x -9y +2 = 0 represents two parallel straight lines and also find the separate equations of the straight lines..

22) The average variable cost of a monthly output of x tonnes of a firm producing a valuable metal is Rs. $\frac{1}{5}x^2-6x+100$ Show that the average variable cost curve is a parabola. Also find the output and the average cost at the vertex of the parabola

23) Find the equation of the circle passing through the points (0,0), (1, 2) and (2,0).

24) Solve: $\tan^{-1}(x+1)+\tan^{-1}(x-1)=\tan^{-1}\left(\frac{4}{7}\right)$

25) If $\cos(\alpha+\beta)=\frac{4}{5}$ and $\sin(\alpha-\beta)=\frac{5}{13}$ where $(\alpha+\beta)$ and $(\alpha-\beta)$ are acute, then find $\tan 2\alpha$

26) If $\sin A=\frac{3}{5}$ where $0<A<\frac{\pi}{2}$ and $cosB=\frac{-12}{13}, \pi<A<\frac{3\pi}{2}$ find the value of
$\tan(A-B)$

27) Prove that:
$\cos 20°\cos 40°\cos 80°=\frac{1}{8}$

28) Prove that $\cos 20° \cos 40° \cos 60° \cos 80^0=\frac{1}{16}$

29) If tan A - tan B = x and cot B - cot A = y, prove that cot (A - B) = $\frac{1}{x}+\frac{1}{y}$

30) If $\tan\alpha=\frac{1}{7}, \sin\beta=\frac{1}{\sqrt{10}}$, Prove that $\alpha+2\beta=\frac{\pi}{4}$ where $0<\alpha<\frac{\pi}{2}$ and $0<\beta<\frac{\pi}{2.}$

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