

BATCH: GCF-1 to GCF-7, SCF-1 to SCF3, VCF-1 to 3**Test Booklet No.– 110011****DATE: 04.10.2018****MAXIMUM MARKS: 100****PAPER: BUSINESS MATHEMATICS, REASONING & STATISTICS**

1. The solution of the system of equations :

$$\frac{x}{a} + \frac{y}{b} = 2; ax - by = a^2 - b^2 \text{ is :}$$

- (a) a, b
- (b) $-a, b$
- (c) $-a, -b$
- (d) none of these

2. If $\log_8 m + \log_8 2 = \frac{2}{3}$, Then the value of m -

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

3. The area of a rectangle whose length is five more than twice its width is 75 sq. units. The length is :-

- (a) 5 units
- (b) 10 units
- (c) 15 units
- (d) 20 units

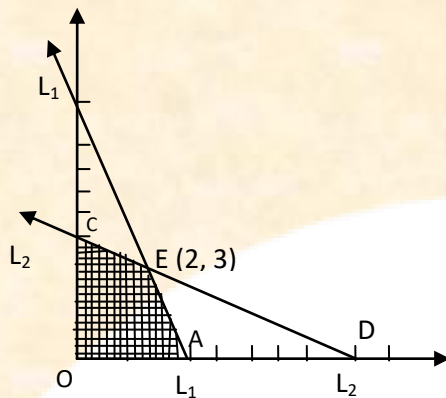
4. Find out sum of the roots of equation $3x^2 + (5m - 2)x + m = 0$ if one root is reciprocal to other.

- (a) $\frac{15}{2}$
- (b) $\frac{-13}{3}$
- (c) $\frac{5m - 2}{3}$
- (d) None of these

5. $\frac{\log_9 11}{\log_5 13} - \frac{\log_3 11}{\log_{\sqrt{5}} 13} =$

- (a) 1
- (b) -1
- (c) 2
- (d) None of these.

- 6 Graph of some constraints are given by the figure:



$$L_1 : (3x + y = 9)$$

$$L_2 : (x + 2y = 8)$$

The shaded region OAEC belongs to the constraint

- (a) $3x + y \leq 9$
 $x + 2y \geq 8$
 $x \geq 0; y \geq 0$
- (b) $3x + y \leq 9$
 $x + 2y \leq 8$
 $x \geq 0; y \geq 0$
- (c) $3x + y \geq 9$
 $x + 2y \leq 8$
 $x \geq 0; y \geq 0$
- (d) None of these
- 7 What is the sum of the squares of the roots of equation $x^2 + 2x - 143 = 0$?
- (a) 170
(b) 180
(c) 190
(d) 290
- 8 In a bag, there are coins of 25 p, 10 p and 5 p in the ratio of 1 : 2 : 3. If there are Rs. 30 in all, how many 5 p coins are there?
- (a) 50
(b) 100
(c) 150
(d) 200
- 9 $\log(1+2+3)$ is equal to :-
- (a) $\log 1 + \log 2 + \log 3$
(b) $\log(1 \times 2 \times 3)$
(c) Both the above
(d) None

- 10 If Rs. 510 be divided among A, B, C in such a way that A gets $\frac{2}{3}$ of what B gets and B gets $\frac{1}{4}$ of what C gets, then the share of A ?
- (a) Rs. 60
(b) Rs. 50
(c) Rs.150
(d) Rs. 200
- 11 A sum of money lent out at simple interest amounts to Rs.720 after 2 years and Rs.1020 after a further period of 5 years. Find the principal.
- (a) Rs.520
(b) Rs.6000
(c) Rs.600
(d) Rs.1740
- 12 $\frac{\sqrt{x+1} + \sqrt{x-1}}{\sqrt{x+1} - \sqrt{x-1}} = 2 \ (x > 1)$, then the value of x is
- (a) 2
(b) $\frac{4}{3}$
(c) $\frac{5}{4}$
(d) $\frac{3}{4}$
- 13 A mixture contains milk and water in the ratio 5:1. In adding 5 liters of water, the ratio of milk and water becomes 5:2 the quantity of milk in the original mixture is:
- (a) 16 liters
(b) 25 liters
(c) 22.75 liters
(d) 32.5 liters
- 14 If $a + b : b + c : c + a = 6 : 7 : 8$ and $a + b + c = 14$, then the value of c is
- (a) 6
(b) 7
(c) 8
(d) 14.
- 15 Value of $\sqrt{a\sqrt{b\sqrt{c\sqrt{d}}}}$, is
- (a) $a^{1/2}b^{1/2}c^{1/2}d^{1/2}$ (b) $a^{1/2}b^{1/4}c^{1/8}d^{1/16}$
(c) $(abcd)^{1/2}$ (d) $(abcd)^{1/8}$

- 16 A man divides Rs.8600 among 5 sons, 4 daughters and 2 nephews. If each daughter receives four times as much as each nephew, and each son receives five times as much as each nephew, how much does each daughter receive?
- (a) 500
(b) 800
(c) 900
(d) None of these
- 17 Sum of a number and its reciprocal is $\frac{10}{3}$ then find out the square of the number.
- (a) 9
(b) 1
(c) 4
(d) 16
- 18 The value of the expression $\frac{x+y+z}{x^{-1}y^{-1}+y^{-1}z^{-1}+z^{-1}x^{-1}}$ is
- (a) $\frac{1}{x+y+z}$
(b) $\frac{xyz}{x+y+z}$
(c) $\frac{1}{xyz}$
(d) xyz .
- 19 The third proportional to $(x^2 - y^2)$ and $(x - y)$ is
- (a) $\frac{x+y}{x-y}$
(b) $\frac{x-y}{x+y}$
(c) $x+y$
(d) $x-y$.
- 20 If $x + \frac{1}{x} = \sqrt{2}$ then $x^2 + \frac{1}{x^2}$ is equal to
- (a) 1
(b) 2
(c) 0
(d) 4
- 21 Using the digits 1, 2, 3, 4 and 5 only once, how many numbers greater than 41000 can be formed ?
- (a) 41
(b) 48
(c) 50

- (d) 60
- 22 The present value of Rs. 10000 due in 2 years at 5% p.a. compound interest when the interest is paid on half-yearly basis is:
(a) Rs. 9070.50
(b) Rs. 9069.50
(c) Rs. 9065.50
(d) Rs. 9059.50
- 23 Which Statement is correct in the following?
Linear system of equation
 $2x + 3y = 4$ and $4x + 6y = 7$ has
(a) no solution
(b) Unique solution
(c) exactly 2 solution
(d) Infinite solution.
- 24 A function $f(x)$ is defined as
 $f(x) = x+2$ when $x \leq 1$
 $f(x) = 5-Px$ when $x > 1$ then find the value of P for $f(x)$ is continuous at $x=1$?
(a) 1
(b) 2
(c) -1
(d) -2
- 25 An annuity consisting of equal payments at the end of each month for 2 years is to be purchased for Rs. 2000. If the interest rate is 6% compounded monthly, how much is each payment?
(a) 78.61
(b) 76.80
(c) 68.70
(d) 68.50
- 26 A Polygon has 27 diagonals. Number of sides of this polygon is:
(a) 12
(b) 15
(c) 16
(d) 9
- 27 The sum of all odd natural numbers between 36 and 120 is:
(a) 2000
(b) 2040
(c) 3276
(d) 3726
- 28 In an organization Employer required maximum ten employees. X and Y are numbers of male and female respectively then which inequality shows right relation.
(a) $x + y = 10$
(b) $x + y \leq 10$
(c) $x + y \geq 10$

- (d) $x \geq 10$
- 29 An examination paper consists of 12 questions divided into two parts A and B. Part A contains 7 questions and part B contains 5 questions. A candidate is required to attempt 8 questions selecting at least 3 from each part. In how many maximum ways can the candidate select the questions ?
- (a) 350
(b) 210
(c) 520
(d) None
- 30 $x^y = e^{x+y}$ then $\frac{dy}{dx} =$
- (a) $\frac{2 \log x}{(\log x - 1)^2}$
(b) $\frac{-\log x - 2}{(\log x - 1)}$
(c) $\frac{\log x}{(\log x - 1)}$
(d) $\frac{\log x - 2}{(\log x - 1)^2}$
- 31 On a certain sum, the simple interest at the end of $6\frac{1}{4}$ year becomes $\frac{3}{8}$ of the sum. The rate of Percentage is:
- (a) 7%
(b) 6%
(c) 5%
(d) $5\frac{1}{2}\%$
- 32 What is the number of ways that 4 boys and 3 girls can be seated so that boys and girls alternate ?
- (a) 12
(b) 72
(c) 120
(d) 144
- 33 What is the number of digits in the numeral form of 8^{17} ? (Given that $\log 2 = 0.3010$)
- (a) 51
(b) 16
(c) 15
(d) 14
- 34 If $f(x) = 2x+7$ and $g(x) = x^2+7$, $x \in \mathbb{R}$, then which value of x will satisfy $f(g(x)) = 25$?
- (a) -1, 1
(b) -2, 2

- (c) $-\sqrt{2}, \sqrt{2}$
(d) None
- 35 If $f(x) = 2x^2 + 3x - 5$, then what is $f'(0) + 3f'(-1)$ equal to :
(a) -1
(b) 0
(c) 1
(d) 2
- 36 If 20% of $(P + Q) = 50\%$ of $(P - Q)$ Then, $P:Q =$
(a) 5 : 7
(b) 3 : 7
(c) 7 : 3
(d) 7 : 8
- 37 The age of a man is three times the sum of the ages of his two sons and 5 years hence his age will be double the sum of their ages. Find the present age of the man?
(a) 35
(b) 40
(c) 45
(d) 50
- 38 The number of straight lines can be formed out of 10 point of which 7 are collinear
(a) 24
(b) 21
(c) 25
(d) 26
- 39 If a matrix has 16 elements; what are the possible orders it can have
(a) $2 \times 8; 8 \times 1; 4 \times 4; 1 \times 16; 16 \times 1$ (b) $2 \times 8; 8 \times 2; 4 \times 4; 1 \times 16; 16 \times 1$
(c) $2 \times 8; 8 \times 2; 4 \times 1; 1 \times 16; 16 \times 1$ (d) $2 \times 4; 8 \times 2; 4 \times 4; 1 \times 16; 16 \times 1$
- 40 $\begin{pmatrix} x & y \\ 2 & 3 \end{pmatrix} \times \begin{pmatrix} 1 & 2 & 3 \\ x & y & z \end{pmatrix}$
(a) $\begin{bmatrix} x+2xy & 3x+y^2 & 3xyz \\ 2+3x & 4+3y & 6+3z \end{bmatrix}$ (b) $\begin{bmatrix} x+xy & 2x+y^2 & 3x+yz \\ 2+3x & 4+3y & 6+3z \end{bmatrix}$
(c) $\begin{bmatrix} x+2xy & 2xy+y^2 & 12yz \\ 2+3x & 4+3y & 6+3z \end{bmatrix}$ (d) $\begin{bmatrix} x-xy & 2x-y^2 & 3x-yz \\ 2+3x & 4+3y & 6+3z \end{bmatrix}$
- 41 If the number of observations of the groups G_1 and G_2 are in the ratio 1 : 2 and their arithmetic means are 16 and 10 respectively, then Arithmetic Mean of the combined group is
(a) 13
(b) 12
(c) 14
(d) none of these

- 42 The mean marks of 300 students were 40. Later on it was discovered that 66 marks of A were read as 60, 14 marks of B were read as 41 and 60 marks of C were not included. Find the corrected mean on the basis of this information.
- (a) 40.13 Marks
(b) 47 Marks
(c) 38.15 Marks
(d) None of the above
- 43 A variable x have 10 values $x_1, x_2, \dots, x_5, -x_1, -x_2, \dots, -x_5$. and $\sum_{i=1}^5 x_i^2 = 80$, find the standard deviation of x
- (a) 2
(b) 4
(c) $2\sqrt{2}$
(d) 16
- 44 For a variable the mean is 10 and the coefficient of variation is 50. Then the variance is
- (a) 5
(b) 20
(c) 400
(d) 25
- 45 If the maximum and minimum values of 10 observations are 40 and 10 then coefficient of range is
- (a) $\frac{5}{3}$
(b) $\frac{3}{5}$
(c) 30
(d) none of these
- 46 The median of $X, \frac{x}{2}, \frac{x}{3}, \frac{x}{5}$ is 10.
Find x where $X > 0$
- (a) 24
(b) 32
(c) 8
(d) 16
- 47 The average salary of 50 men was Rs. 80 but if was found the salary of two of them were Rs. 82 and 96 which was wrongly taken as Rs. 28 and 69. The revised average salary is -
- (a) 78.56
(b) 82.92
(c) 85.26
(d) 81.62

- 48 What is the G.M. for the numbers 2,4,8,16,32,64?
(a) $2^{5/2}$
(b) $2^{7/2}$
(c) 33
(d) None
- 49 Find the harmonic mean of the following numbers : $1, \frac{1}{3}, \frac{1}{5}, \dots, \frac{1}{2n-1}$
(a) $\frac{1}{n+1}$
(b) $\frac{1}{n-1}$
(c) $\frac{2}{n}$
(d) $\frac{1}{n}$
- 50 In the line $y=19-\frac{5x}{2}$, b_{yx} is equal to
(a) $19/2$
(b) $5/2$
(c) $-5/2$
(d) None
- 51 If the rank coefficient between debenture price and share price is found to be 0.143 and the sum of squares of the difference in the rank is 48, what is the number of share selected for study?
(a) 5
(b) 7
(c) 12
(d) 6
- 52 If Fisher's index = 150 and Paasche's index = 144, then Laspeyre's index is
(a) 147
(b) 156.25
(c) 160.17
(d) 138
- 53 During a certain period the cost of living Index number goes up from 110 to 200 and the salary of the worker is also raised from Rs. 325 to Rs. 500. Does the worker :
(a) gain
(b) loses
(c) fully compensated
(d) gain lay 10%
- 54 For Finding correlation between two attributes, we consider

- (a) Pearson's correlation coefficient
(b) Scatter diagram
(c) Spearman's rank correlation coefficient
(d) Coefficient of document deviations.
- 55 Regression coefficient are
- (a) dependent of change of origin and of scale.
(b) independent of both change of origin and of scale.
(c) dependent of change of origin but not of scale.
(d) independent of change of origin but not of scale
- 56 The regression equation of y on x is $y = -3 + 0.5x$ and that of x on y is $x = -7 + By$. If the correlation co-efficient between x and y is 0.1, then B=
- (a) 0.5
(b) -0.5
(c) 0.02
(d) -0.02.
57. If the ranks for x are 1,2,3,4,5 and ranks for y are 5,4,3,2,1 then r is.
- (a) 0.2
(b) -1
(c) 0.5
(d) 1
- 58 Purchasing power of money is
- (a) Inversely proportional to price index number
(b) Directly proportional to price index number
(c) Both (a) and (b)
(d) None of these
- 59 Given the prices of 2 commodities are increased by 10% and 20% respectively and the price of another commodity is decreased by 30%. The relative importance of 3 commodities are in the ratio 3:3:1. Find weighted price index number.
- (a) 80
(b) 109
(c) 108.5
(d) 110
- 60 When b_{yx} and b_{xy} are given, $r = ?$
- (a) $r = -\sqrt{b_{yx} \times b_{xy}}$
(b) $r = \frac{b_{yx} + b_{xy}}{2}$
(c) $r = \pm \sqrt{b_{yx} \times b_{xy}}$
(d) All of the above
- 61 Which of the following statements are true?

- I. Correlation coefficient is the arithmetic mean between regression coefficients.
II. Regression coefficients are independent of the change of origin but not of scale.
III. If one of the regression coefficient is > 1 , then the other must be less than unity.
- (a) I and II
(b) III and I
(c) II and III
(d) I, II and III
- 62 If $4y - 5x = 15$ is the regression line of y on x and the coefficient of correlation between x and y is 0.75, what is the value of the regression coefficient of x on y ?
- (a) 0.45
(b) 0.9375
(c) 0.6
(d) none of these
- 63 Given the following data :
- | Commodity | P_0 | Q_0 | P_1 | Q_1 |
|-----------|-------|-------|-------|-------|
| A | 1 | 10 | 2 | 5 |
| B | 1 | 5 | X | 2 |
- where p and q represent price and quantity respectively and subscript for the time period. The value of X if the ratio between Laspeyres (L) and Paasche's (P) index numbers is 28 : 27 i.e., $L : P = 28 : 27$ is :
- (a) 3
(b) 4
(c) 5
(d) 6
- 64 When two or more related time series are expressed in different units, we use
- (a) logarithmic or ratio
(b) multiple line chart
(c) multiple axis chart
(d) none
- 65 A pie chart is drawn to show the areas in millions of square kms. of several continents. The area 11.7 sq. km. of Africa is shown by a sector subtending an angle of 82° . If the subtended angle corresponding to North America be 66° , find its area
- (a) 9.8 km^2
(b) 9.4 km^2
(c) 88 km^2
(d) 5.6 km^2
- 66 Hidden trend, if any, in the data can be noticed in
- (a) Textual presentation
(b) Tabulation
(c) Diagrammatic representation
(d) All of these

- 67 Mean and S.D. of a given set of observations is 1,500 and 400 respectively. If there is hiked by 20% in the first year and each observation is an increment of 100 in 2nd year, then find new mean and S.D.
- (a) 1920, 480
 - (b) 1900, 480
 - (c) 1600, 480
 - (d) 1600, 400
- 68 If two regression lines are $3x+4y-18=0$ and $5x+2y=10$. Then $\sigma_x : \sigma_y = ?$
- (a) 0.53
 - (b) 0.73
 - (c) 0.60
 - (d) None
- 69 Chronological classification is :
- (a) classification of units on the basis of time
 - (b) classification of units on the basis of geographical area
 - (c) classification of units according to the characteristic of attributes
 - (d) classification of units according to the characteristic of variables
- 70 For Normal distribution the relation between quartile deviation (Q.D) and standard deviation (S.D) is:
- (a) $Q.D > S.D$
 - (b) $Q.D < S.D$
 - (c) $Q.D = S.D$
 - (d) None of the above
- 71 The average age of a group of 10 students was 20 years. The average age increased by 4 years when two new students joined the group. What is the average age of two new students who joined the group?
- (a) 22 years
 - (b) 30 years
 - (c) 44 years
 - (d) 32 years
- 72 If the difference between mean and Mode is 63, then the difference between mean and Median will be _____.
- (a) 63
 - (b) 31.5
 - (c) 21
 - (d) None of the above
- 73 Age of applicants for life insurance and the premium of insurance-correlation are :
- (a) positive
 - (b) negative
 - (c) zero
 - (d) None
- 74 If $u = 2x+5$, $v = -3y + 1$, and the regression coefficient of y on x is -1.2 , the regression coefficient of v on u is :

- (a) 1.8
(b) -1.8
(c) 3.26
(d) 0.8
- 75 The odds are 9:5 against a person who is 50 years living till he is 70 and 8:6 against a person who is 60 living till he is 80. Find the probability that at least one of them will be alive after 20 years:
- (a) $\frac{11}{14}$
(b) $\frac{22}{49}$
(c) $\frac{31}{49}$
(d) $\frac{35}{49}$
- 76 The area of a normal Curve is
- (a) 90%
(b) 95%
(c) Unity
(d) Infinity
- 77 If the difference between the mean and the variance of binomial distribution for 5 trials is $\frac{5}{9}$, the distribution is of the form
- (a) $\left(\frac{1}{4} + \frac{3}{4}\right)^5$
(b) $\left(\frac{1}{9} + \frac{8}{9}\right)^5$
(c) $\left(\frac{2}{3} + \frac{1}{3}\right)^5$
(d) None of these
- 78 If the 1970 index with base 1965 is 200 and 1965 index with base 1960 is 150, the index 1970 on base 1960 will be:
- (a) 700
(b) 300
(c) 500
(d) 600
- 79 When the two curves of ogive intersect, the point of intersection provides:

- (a) First Quartile
(b) Second Quartile
(c) Third Quartile
(d) Mode
- 80 Cost of paper for a week under the heads raw material, labour, direct production and others were Rs. 23, Rs. 18, Rs. 32, Rs. 17 respectively. What is the difference between the central angles for the largest and smallest components of cost of the paper?
(a) 60
(b) 68
(c) 72
(d) 56
- 81 10, 18, 28, 40, 54, ?, 88
(a) 70
(b) 86
(c) 87
(d) 98
- 82 10, 100, 200, 310, 430 ?
(a) 560
(b) 540
(c) 550
(d) 590
- 83 165, 195, 255, 285, ?, 375
(a) 345
(b) 390
(c) 335
(d) 395
- 84 7, 26, 63, 124, 215, ?, 511
(a) 342
(b) 343
(c) 441
(d) 421
- 85 5, 2, 7, 9, 16, 25, 41, ?
(a) 65
(b) 66
(c) 67
(d) 68
- 86 If RAMAN is written as 12325 and DINESH as 675489 how HAMAM is written ?
(a) 92323
(b) 92233
(c) 93233
(d) 93292
- 87 If DELHI is coded as CCIDD, how would you encode BOMBAY ?
(a) AJMTVT
(b) AMJXVS
(c) MJXVSU
(d) WXYZAX
- 88 From her home Prerna wishes to go to school. From home she goes towards North and then turns left and then turns right, and finally she turns left and reaches school. In which direction her school is situated with respect to her home?
(a) North-East
(b) North-West
(c) South-East
(d) South-West
- 89 A man started walking West. He turned right, then right again and finally turned left. Towards which direction was he walking now ?

- (a) North (b) South
(c) West (d) East
- 90 Six person A, B, C, D, E and F are sitting in two row, three in each row. (MAT 2011)
(i) E is not at the end of any row
(ii) D is second to the left of F
(iii) C, the neighbour of E, is sitting diagonally opposite of D.
(iv) B is the neighbour of F.
Which of the following are in one of the two rows ?
(a) D, B and F (b) C, E and B
(c) A, E and F (d) F, B
- 91 P, T, V, R, M, D, K and W are sitting around a circular table facing the centre. V is second to the left of T. T is fourth to the right of M. D and P are not immediate neighbours of T. D is third to the right of P. W is not an immediate neighbor of P. P is to the immediate left of K.
What is R's position with respect to V ?
(a) Third to the right (b) Fifth to the right
(c) Third to the left (d) Second to the left
- 92 Based on the statements given below, find out who is the uncle of P ?
(i) K is the brother of J
(ii) M is the sister of K
(iii) P is the brother of N
(iv) N is the daughter of J
(a) K (b) J
(c) N (d) M
- 93 A and B are brothers. E is the daughter of F. F is the wife of B. What is the relation of E to A?
(a) Sister (b) Daughter
(c) Niece (d) Daughter-in-law
- 94 Seema is the daughter-in-law of Sudhir and sister-in-law of Ramesh. Mohan is the son of Sudhir and only brother of Ramesh. Find the relation between Seema and Mohan.
(a) Sister-in-law (b) Aunt
(c) Cousin (d) Wife

Directions (Qs. 95 - 97): Each of the following questions contains two statements followed by conclusions numbered I and II. You have to consider the two statements to be true, even if they to be at variance at the commonly known facts. You have to decide which of the given conclusion definitely follows from the given statements.

Given answer (a) if only I follows; (b) if only conclusion II follows; (c) if either I or II follows; (d) neither I nor II follows and (e) if both I and II follows.

- 95 **Statement:** Some cats are kittens.
All Rats are kittens.
Conclusions: I. Some cats are Rats.
II. Some rats are cats.

- 96 **Statement:** All names are dogs.
No dogs are foxes.
Conclusions: I. All names are foxes.
II. No dogs are names.

- 97 **Statement:** All pens are dogs.
Some pens are lights.
Conclusions: I. Some dogs are lights.
II. Some lights are not dogs.

Directions (Q 98–100): Study the following carefully and answer the questions given below:

A, B, C, D, E, F, G, H and K are sitting around a circle facing the centre. B is fourth to the left of G, who is second to the right of C. F is fourth to the right of C and is second to the left of K. A is fourth to the right of K. D is not an immediate neighbour of either K or B. H is third to the right of E.

- 98 In which of the following combinations is the third person sitting between the first and the second persons?
- | | |
|---------|---------|
| (a) EKB | (b) CHB |
| (c) AGC | (d) FGD |
- 99 who is fourth to the left of E ?
- | | |
|-------|---------------------|
| (a) A | (b) C |
| (c) G | (d) Data inadequate |
- 100 Who is the second to the right of K ?
- | | |
|-------|-------|
| (a) C | (b) H |
| (c) F | (d) E |

MITTAL COMMERCE CLASSES

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