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MCQs

PAPER - 4

BIT QUESTIONS

Fundamentals of
Business Mathematics and Statistics

DIRECTORATE OF STUDIES
THE INSTITUTE OF
COST ACCOUNTANTS OF INDIA
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Behind every successful business decision, there is always a CMA

PAPER - 4
Fundamentals of Business Mathematics and Statistics Bit Questions

FUNDAMENTALS OF BUSINESS MATHEMATICS

I. Choose the correct answer from the given four alternatives:

1. Two numbers are in the ratio 5:7. If the sum of the numbers is 192, then the greater number is
   (A) 112
   (B) 102
   (C) 116
   (D) 108

2. x varies inversely as y and if $x = 3$ then $y = 4$. If $y = 6$ then the value of x is
   (A) 3
   (B) 1
   (C) 2
   (D) 2.5

3. A sum will be double itself at a simple interest p.a. in 8 years. The simple interest is
   (A) 10%
   (B) 10.5%
   (C) 12%
   (D) 12.5%

4. If $(x - 1)$, $(x + 1)$ and $(2x + 3)$ are in A.P, then the value of x is
   (A) -2
   (B) 0
   (C) 2
   (D) 4

5. The 8th term of the series 256, 128, 64 ….. is
   (A) 2
   (B) 4
   (C) 8
   (D) 16

6. If $2^{x-1} + 2^{x+1} = 80$, then the value of x is
   (A) 8
   (B) 4
   (C) 5
   (D) 10

7. If a and b be the roots of the equation $2x^2 + 2x - 3 = 0$ then the value of $2ab$ is
   (A) - 6
   (B) 3
   (C) 1
   (D) - 3

8. The value of ${}^3P_3 - {}^3C_3$ is
   (A) 0
   (B) 5
   (C) 6
   (D) 1

9. P and Q are two non-empty sets. Given:

$n(P) = 12$, $n(Q) = 6$ and $n(P \cup Q) = 10$. Then $n(P \cap Q)$ is
(A) 8
(B) 9
(C) 7
(D) 0

10. Six years before the ratio of the ages of two sisters Mitali and Sonali is 2 : 3. If the present age of Mitali is 30 years, then the present age of Sonali is
(A) 28 years
(B) 42 years
(C) 36 years
(D) 48 years

11. If *I* is the simple interest, *R* is the rate % p.a., *T* is the time period, *P* being the principal, then *I* is expressed as
(A) $I = 100\,(PRT)$
(B) $I = \frac{100}{PRT}$
(C) $I = \frac{PRT}{100}$
(D) $I = PRT$

12. Find the compound interest on ` 4,000 for 2 years at 5% p.a.
(A) ` 400
(B) ` 405
(C) ` 415
(D) ` 410

13. The value of logarithm of 8 to the base 2 is
(A) 3
(B) 0
(C) 1
(D) 2

14. If *p* varies inversely as *q*, it is written as
(A) $p \propto \frac{1}{q}$
(B) $q \propto \frac{1}{p}$
(C) $p^2 \propto q^2$
(D) $\frac{1}{p^2} \propto \frac{1}{q^2}$

15. If ${}^{2n}P_3 = 84.\ {}^{n}P_2$, then the value of *n* is
(A) 16
(B) 11
(C) 9
(D) 6

16. Product of the two roots of the quadratic equation $3x^2 - 5x + 2 = 0$ is
(A) 2/5
(B) 3/2
(C) 2/3
(D) 5/3

17. The value of $\left(2^{\frac{5}{4}}\right)^4$ is

(A) 30
(B) 23
(C) 31
(D) 32

18. If *P* and Q are two disjoint sets, then n (*P* ∩ Q) is
(A) 1
(B) 0
(C) 2
(D) 3

19. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$, then the value of $\frac{a+b+c}{c}$ is
(A) 4
(B) 2
(C) 7
(D) 14

20. If *p* varies directly as *q* and if *q* = 2 then *p* = 4. If *p* = 2, the value of *q* is
(A) 1.5
(B) 2
(C) 1
(D) 3

21. A man deposited a sum of money to a bank at 9% simple interest p.a. The total interest that he will get at the end of 5 years is ` 1,620. The deposited amount is
(A) ` 6,000
(B) ` 4,000
(C) ` 3,600
(D) ` 4,400

22. The mean proportional between 4 and 16 is
(A) 8
(B) 10
(C) 9
(D) ± 8

23. The 6th term of an A.P 2, 5, 8 …… is
(A) 18
(B) 16
(C) 17
(D) 19

24. The 7th term of the series 16, 8, 4, 2 …… is
(A) 1/8
(B) 1/4
(C) 1/2
(D) 1/16

25. If *A* ⊂ *B* and *n* (*A*) = 18, *n* (*B*) = 40, then *n* (*A* ∩ *B*) is
(A) 18
(B) 22
(C) 58
(D) 40

26. The value of $\left(\frac{1}{3}\ log_{10}125 - 2log_{10}4 + log_{10}32\right)$ is
(A) 2

(B) 1
(C) 0
(D) -2

27. The ratio of work done by (x + 2) men in (x – 2) days to that (x – 1) men in (x + 1) days is 4 : 5, the value of x is
(A) $\pm$ 4
(B) 6
(C) 4
(D) 8

28. The mean proportional between 2 and 8 is
(A) 4
(B) 16
(C) 3
(D) 1

29 The simple interest (SI) on ` 100 at the rate of 5% p.a. for 5 years is
(A) ` 10
(B) ` 5
(C) ` 1
(D) ` 25

30. The 7th term of the Arithmetic Progression (AP) 7, 10, 13, 16, …… is
(A) 28
(B) 22
(C) 25
(D) 20

31. The value of logarithm of 1 to the base 10 is
(A) 2
(B) 10
(C) 0
(D) 1

32. The set $p = \{2, 3, 5\}$ and the set Q = $\{1, 4\}$. Then the set $P \cap Q$ is
(A) Null set
(B) $\{0\}$
(C) $\{\emptyset\}$
(D) $\{P\}$

33. If ${}^nP_4 = 30 \times {}^nP_2$, then the value of *n* is
(A) 10
(B) 8
(C) 6
(D) 5

34. The sum of the roots of the quadratic equation $x^2 - 3x = 0$ is
(A) 1
(B) 0
(C) -3
(D) 3

35. If $3^{x-1} - 3^{x-3} = 8$, then the value of $(x^2 - x + 4)$ is
(A) 10
(B) 8

(C) 12
(D) 15

36. The mean proportional between 9 and 25 is
(A) 17
(B) 15
(C) 225
(D) 16

37. *p* varies inversely as *q*. If *p* = 2 then *q* = 3. Find *p* if *q* = 2.
(A) 3
(B) 4
(C) 1
(D) 0

38. A person deposits ` 2,000 at 6% p.a. simple interest for 3 years. The amount he will get back after 3 years is
(A) ` 2,300
(B) ` 2,400
(C) ` 2,360
(D) ` 2350

39. Find the 10th term of the A.P 3, 6, 9, 12, 15, ……..
(A) 20
(B) 25
(C) 23
(D) 30

40. The produce of 3 terms in a G.P is 125. The middle term is
(A) 3
(B) 4
(C) 5
(D) 6

41. The value of ${}^5C_2$ is
(A) 10
(B) 9
(C) 11
(D) 5

42. For a quadratic equation $x^2 - 2x + 1 = 0$, the product of the roots is
(A) - 1
(B) 1
(C) 0
(D) 2

43. The value of logarithm of 1/10 to the base 10 is
(A) 1
(B) -1
(C) 0
(D) 10

44. The Set A = $\{1, 2, 3\}$ and the set B = $\{1, 2\}$, then A – B is
(A) $\{0\}$
(B) $\{2\}$
(C) $\{3\}$

(D) $\emptyset$

45. Three numbers are in the ratio 5 : 7 : 12 and the sum of the first and third numbers is greater than the second by 50. The sum of the three numbers is
(A) 130
(B) 120
(C) 128
(D) 125

46. In a certain time Rs. 1400 becomes Rs. 1848 at 8% p.a. simple interest. When ` 2,100 will become ` 2,604 at the same time, the rate of interest is
(A) 8.2%
(B) 7%
(C) 10%
(D) 6%

47. The year by which a sum of rupees would be 1.21 times of itself at 10% per annum C.I is
(A) 2 years
(B) 3 years
(C) 3.5 years
(D) 2.5 years

48. If S be the set of all prime numbers and $M = \{x : 0 \leq x \leq 9\}$ then $M - (S \cap M)$ is
(A) $\{0, 1, 4, 6, 8, 9\}$
(B) $\{0, 4, 6, 8\}$
(C) $\{1, 2, 4, 6, 8\}$
(D) $\{1, 3, 5, 7\}$

49. If $a = b^2 = c^3$, then the value of $log_a(abc)$ is
(A) 13/3
(B) 11/6
(C) 8/3
(D) 4

50. Which term 128 is of the progression 1, 2, 4, 8, …….?
(A) 8th term
(B) 7th term
(C) 9th term
(D) 10th term

51. If ${}^5C_r - {}^3C_2 = {}^7C_1$, then r is
(A) 4
(B) 3
(C) 2
(D) both 2 and 3

52. $y = A + B$ where A and B vary directly and inversely respectively with x; $x = 1$ when $y = 11$ and $x = 2$ when $y = 13$. The value of y when $x = 3$ is
(A) 15
(B) 17
(C) 19
(D) 20

53. The value of $log_7 7$ is
(A) 0
(B) - 1

(C) 1/2
(D) 1

Answer Key:

1. (A) 112
2. (C) 2
3. (D) 12.5%
4. (B) 0
5. (A) 2
6. (C) 5
7. (D) - 3
8. (B) 5
9. (A) 8
10. (B) 42 years
11. (C) $I = \frac{PRT}{100}$
12. (D) Rs. 410
13. (A) 3
14. (A) $p \propto \frac{1}{q}$
15. (B) 11
16. (C) 2/3
17. (D) 32
18. (B) 0
19. (B) 2
20. (C) 1
21. (C) ` 3,600
22. (D) ± 8
23. (C) 17
24. (B) 1/4
25. (A) 18
26. (B) 1
27. (C) 4
28. (A) 4
29. (D) ` 25
30. (C) 25
31. (C) 0
32. (A) Null set
33. (B) 8
34. (D) 3
35. (A) 10
36. (B) 15
37. (A) 3
38. (C) ` 2,360
39. (D) 30
40. (C) 5
41. (A) 10
42. (B) 1
43. (B) -1
44. (C) $\{3\}$
45. (B) 120
46. (D) 6%
47. (A) 2 years
48. (A) $\{0, 1, 4, 6, 8, 9\}$
49. (B) 11/6

50. (A) 8th term
51. (D) both 2 and 3
52. (B) 17
53. (D) 1

II. State whether the following statement is True or False:

1. **The mean proportional between 2 and 8 is 4.**
2. **If 1 + 2 + 3 + ……. + *n* = 231 then the value of *n* is 21.**
3. **$\log_a mn = (\log_a m)(\log_a n)$**
4. **$\frac{1}{2}({}^nP_3) = 3({}^nC_3)$**
5. **If $3^x = 1/243$ then the value of x is 5.**
6. **The roots of the quadratic equation $2x^2 - 12x + 18 = 0$ are not equal.**
7. **The cardinal number of a null set is zero.**
8. **log 2 + log 5 = log 7**
9. **${}^5C_3 = {}^5C_2$**
10. **The sum of first 6 terms of the arithmetic progression (A.P) 6, 4, 2, 0, …… is 12.**
11. **The sum of the roots of the quadratic equation $x^2 - x + 1 = 0$ is 1.**
12. **The geometric mean of two quantities *p* and *q* is *pq*.**
13. **Some money is distributed between Amal and Ashoke in the ratio 3:5. If Amal receives ` 72, then Ashoke receives ` 108.**
14. **Factorial 5 is equal to 120.**
15. **Speed (*s*) is inversely proportional to time (*t*). Then *st* = constant.**
16. **The set $\{0\}$ is a null set.**
17. **$(A \cup B)` = A` \cup B`$**
18. **$(-2)^5 = 32$**
19. **The set of all the subsets of a given set *A* is called the Power Set of *A*.**
20. **The value of $(32)^{1/5}$ is ½.**
21. **The value of ${}^5C_2$ is equal to ${}^5C_3$.**
22. **The geometric mean of 3 and 1/3 is -1.**
23. **The value of x when $2^x = 3^x$ is 0.**
24. **If $p = 2 + \sqrt{3}$, then $1/p = 2 - \sqrt{3}$.**
25. **Null set is a subset of every set.**
26. **If ${}^nP_1 = {}^nC_1$, the ${}^nP_3 = {}^nC_3$.**
27. **The series 1, 11, 111, 111, ……. is an AP Series.**
28. **The 7th term of the progression 3, -9, 27,…… is 2187.**
29. **One root of the quadratic equation $3x^2 + 10x + 3 = 0$ is reciprocal to the other.**
30. **$1 + 3 + 5 + 7 + \ldots\ldots + (2n - 1) = n^2$.**
31. **If ${}^{16}P_r = 240$, then *r* is 2.**
32. **If a set 'A' has 6 elements and a set 'B' has 8 elements, then the minimum number of elements in the set A U B is 14, when A ⊂ B.**
33. **If $\log_3(\log_3 x) = 0$, then x is 1.**
34. **${}^nC_r + {}^nC_{n-r} = 2({}^nC_r)$.**
35. **The sum of the roots of the quadratic equation $3x^2 + 2x - 5 = 0$ is -2/3.**

Answer Key:

1. True
2. True
3. False
4. True
5. False
6. False

7. True
8. False
9. True
10. False
11. True
12. False
13. False
14. True
15. True
16. False
17. False
18. False
19. True
20. False
21. True
22. False
23. True
24. True
25. True
26. False
27. False
28. True
29. True
30. True
31. True
32. False
33. False
34. True
35. True

FUNDAMENTALS OF BUSINESS STATISTICS

I. Choose the correct answer from the given four alternatives:

1. **The necessary diagram to compare among the various components or between a part and the whole is:**
   (A) Bar diagram
   (B) Step diagram
   (C) Pie diagram
   (D) Histogram

2. **A random variable X can take the values -1, 0 and 1 with respective probabilities 0.2, 0.5 and 0.3. The expected value of X is:**
   (A) 0.3
   (B) 0.5
   (C) 0.2
   (D) 0.1

3. **Consider the following data:**

Marks in Mathematics	0 – 9	10 – 19	20 – 29	30 – 39	40 – 49	Total
No. of students (f)	10	8	12	15	5	50

   Frequency density of the second class is
   (A) 0.8
   (B) 8
   (C) 1.2
   (D) 1

4. **The measure of central tendency of a statistical data which takes into account all the data**
   (A) Median
   (B) Mean
   (C) Mode
   (D) Range

5. **The A.M. of the numbers 1, 3, 5, ……. (2*n* – 1) is**
   (A) n^2
   (B) $n + 1$
   (C) n
   (D) $2n$

6. **The Harmonic Mean (H.M.) of the series 1, 2, 4 is**
   (A) 5
   (B) 7
   (C) 7/5
   (D) 12/7

7. **For a symmetrical distribution first quartile and median are respectively 20 and 24. The third quartile of the distribution is**
   (A) 28
   (B) 26
   (C) 22
   (D) 32

8. Standard Deviation (S.D) for two observations 1 and 4 is
   (A) 1
   (B) 1.5
   (C) 2
   (D) 3

9. If the two regression coefficients are b_{yx} = - 0.4 and b_{xy} = - 0.9 then the value of correlation coefficient (r) is
   (A) 0.6
   (B) 0.65
   (C) - 0.6
   (D) - 0.65

10. For a frequency distribution coefficient of skewness = 0.6; mean = 172 and mode = 163. The value of the variance is
   (A) 169
   (B) 215
   (C) 196
   (D) 225

11. For two mutually exclusive events A and B if $P(A) = 3/4$ and $P(B) = 1/6$, then $P(A \text{ or } B)$ is
   (A) 11/12
   (B) 5/12
   (C) 7/8
   (D) 1/8

12. Two unbiased coins are tossed simultaneously. The problem of getting a head and a tail is
   (A) 1/4
   (B) 1/2
   (C) 1
   (D) ¾

13. The vertical axis of an ogive shows
   (A) Cumulative frequencies
   (B) Absolute frequencies
   (C) Frequency densities
   (D) Class boundaries

14. The basis of classification according to differences in time is called
   (A) Ordinal classification
   (B) Temporal classification
   (C) Spatial classification
   (D) Qualitative classification

15. The frequencies of three class intervals 54 – 58, 59 – 63, 64 – 68 of a distribution are respectively 4, 8 and 12. The frequency density of the 2nd class is
   (A) 1
   (B) 1.2
   (C) 1.6
   (D) 2

16. The mean of five observations 5, 10, 15, 20, 25 is
   (A) 19
   (B) 16
   (C) 17

(D) 15

17. The variance of two observations 10 and 17 is
(A) 12.25
(B) 12
(C) 1.225
(D) 13

18. If a variable x takes the values 12 and 24 with equal frequencies, then mean of x is
(A) 36
(B) 18
(C) 22
(D) 28

19. The quartile deviation of the following data 12, 10, 17, 14, 19, 21, 27, 30, 32, 38, 34 is
(A) 11
(B) 18
(C) 9
(D) 16

20. For a frequency distribution mean = 68.2; median = 69 and coefficient of skewness of the distribution is – 0.6. The variance of the distribution is
(A) 9
(B) 25
(C) 36
(D) 16

21. If *r* be the correlation coefficient between two variables x and *y*, b_{xy} and b_{yx} being the two regression coefficients, then
(A) $r = \sqrt{b_{xy} \text{ x } b_{yx}}$
(B) $r = b_{xy} \text{ x } b_{yx}$
(C) $r = \frac{b_{xy}}{b_{yx}}$
(D) $r = \frac{b_{yx}}{b_{xy}}$

22. If two regression equations x + 5*y* = 13 and 3x – 2*y* = 5, then the mean values of x and *y* are respectively.
(A) (2, 3)
(B) (3, 2)
(C) (4, 5)
(D) (5, 4)

23. Given that $P(A) = \frac{2}{3}, P(B) = \frac{3}{5}$ and $P(A \text{ U } B) = \frac{13}{15}$. The events A and B are
(A) Equally likely
(B) Independent
(C) Mutually exclusive
(D) Exhaustive

24. Two dice are thrown simultaneously, the probability of obtaining a total sum 8 is
(A) 1/6
(B) 5/6
(C) 5/36
(D) 7/36

25. Mode of a frequency distribution can be determined with the help of

(A) Pie diagram
(B) Histogram
(C) Bar graph
(D) Ogive

26. If the A.M of 14, 16, x, 25, 21 be 19, then the value of *x* is
(A) 16
(B) 19
(C) 12
(D) 21

27. The G.M of 3 and 24 with weight 2 and 1 respectively is
(A) 8
(B) 4
(C) 6
(D) 9

28. The mean deviation about median of 28, 7, 16, 14, 24, 15, 34, 30 is
(A) 8
(B) 6
(C) 10.5
(D) 12

29. The A.M of first *n* natural numbers is 6. The value of *n* is
(A) 12
(B) 9
(C) 11
(D) 16

30. The 1st and 3rd quartiles of a frequency distribution are respectively 25 and 45. If the coefficient of skewness be – 0.1, then the median is
(A) 36
(B) 32
(C) 24
(D) 28

31. If A.M and the coefficient of variation of *x* are 6 and 50% respectively, then the variable of *x* is
(A) 3
(B) 6
(C) 9
(D) 11

32. Given : $Q_3 - Q_1 = 8$, $Q_3 + Q_1 = 22$, Median (Q_2) = 10.5. The coefficient of skewness is
(A) 1/8
(B) 1/7
(C) 1/5
(D) 1

33. The correlation coefficient between two variables *x* and *y* is
(A) sum of two regression coefficients.
(B) Arithmetic Mean of two regression coefficients.
(C) Harmonic Mean of two regression coefficients.
(D) Geometric Mean of two regression coefficients.

34. For sure event A

(A) $P(A) = 1$
(B) $P(A) > 1$
(C) $P(A) = 0$
(D) $P(A) = -1$

35. For two mutually exclusive events A and B, $P(A \cup B)$ is equal:
(A) $P(A) - P(B)$
(B) $P(A) + P(B)$
(C) $\frac{1}{2}[P(A) + P(B)]$
(D) $P(A) \times P(B)$

36. Out of total outlay ` 40,000 (crore) during an annual plan of a country, the central angle represented by education of amount Rs. x crore is 72^0. The value of x (in crore) is
(A) ` 10,000
(B) ` 9,000
(C) ` 6,000
(D) ` 8,000

37. Given a table:

Value (greater than)	100	150	200	250
Frequency	50	32	9	0

The number of observations between 150 and 200 is
(A) 23
(B) 15
(C) 8
(D) 18

38. Given the table:

Class Interval	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35
Frequency	5	7	4	6	8

The class mark for the second class is
(A) 27.5
(B) 17.5
(C) 12.5
(D) 32.5

39. The Arithmetic Mean for the series 2, 6, 5, 7, 9, 4, 2 is
(A) 7
(B) 4
(C) 5
(D) 6

40. The Geometric Mean (GM) for the series 1, 3, 9 is
(A) 3
(B) 2
(C) 1/3
(D) ½

41. The Standard Deviation for two observations is
(A) square of their difference.
(B) half of their absolute difference
(C) their absolute difference
(D) twice of their absolute difference

42. The absolute deviations of the values of a variables from the mean are 10, 15, 19, 2, 14. The mean deviation is

(A) 16
(B) 14
(C) 12
(D) 9

43. A.M of 40 observations of a variable is 25 and S.D is 4. The sum of squares of all observations is
(A) 25640
(B) 26540
(C) 24560
(D) 26450

44. If $y + 2x = 10$; $\bar{x} = 3$ and $Var(y) = 25$, then C.V. of y is
(A) 100%
(B) 150%
(C) 125%
(D) 50%

45. The coefficient of skewness of a distribution is 0.4. Its S.D and mean are respectively 8 and 30. The mode of the distribution is
(A) 26
(B) 26.2
(C) 26.4
(D) 26.8

46. If $\sigma_y = 4$, $b_{yx} = 0.48$, $r = 0.6$, then is σ_x
(A) 5
(B) 7
(C) 9
(D) 6.5

47. If A and B be two mutually exclusive events and $P(A) = 3/4$; $P(A \cup B) = 5/6$ then $P(B)$ is
(A) 2/3
(B) 3/5
(C) 5/12
(D) 1/12

48. The mode for the series 2, 5, 7, 6, 3, 7, 4, 7, 9, 2 is
(A) 6
(B) 2
(C) 7
(D) 9

49. The median of the numbers 94, 33, 86, 68, 32, 80, 48 and 70 is
(A) 68
(B) 69
(C) 64
(D) 70

50. The Geometric Mean (G.M) for the series 1, 2, 4 is
(A) 2
(B) 7/3
(C) 3/7
(D) 2.5

51. The Standard Deviation (S.D) for 2 and 8 is

(A) 5
(B) 4
(C) 3
(D) 6

52. The mean deviation of the observations 3, 5, 9, 1 and 2 about their median is
(A) 2.4
(B) 2.2
(C) 3
(D) 2.8

53. If the sum of squares of the deviations of 10 observations taken from mean 50 is 250, then C.V is
(A) 10%
(B) 12%
(C) 20%
(D) 15%

54. If the relation between two variables x and *y* be 5x + 7*y* = 28 and median of *y* be 3, then the median of x is
(A) 1.4
(B) - 4.2
(C) 3
(D) 13/7

55. For a symmetric distribution, skewness is
(A) 0
(B) 1
(C) -1
(D) 0.5

56. If *cov* (x, *y*) = 0.6, $\sigma_x = 2$, $\sigma_y = 1$, then r_{xy} is
(A) 0.1
(B) 0.3
(C) 0.2
(D) 0

57. The value of the correlation coefficient lies between
(A) 0 and 1
(B) - 1 and 1
(C) -1 and 0
(D) - 0.5 and 0.5

58. For two independent events A and B, P(AB) is
(A) P (A|B)
(B) P(A) P(B)
(C) P (A – B)
(D) P (B|A)

59. For two mutually exclusive events A and B, if P(A) = 0.4 and P(B) = 0.3, then P (A or B) is
(A) 0.6
(B) 0.58
(C) 0.7
(D) 0.75

60. If the Harmonic Mean of 2, *a*, 8 be 24/7, the value of *a* is

(A) 4
(B) 6
(C) 12
(D) 9

61. The variance of first 5 natural numbers is
(A) 3
(B) 4
(C) 8
(D) 2

62. Two variables x and y are given by the relation $y = 3x - 2$. If the mode of x be 5, the mode of y will be
(A) 13
(B) 10
(C) 15
(D) 9

63. If for a symmetrical distribution 1st and 3rd quartiles are respectively 16 and 22, then the Median of the distribution is
(A) 20
(B) 18
(C) 24
(D) 19

64. If Mean = 50 cm and C.V. = 60%, then the S.D. is
(A) 25 cm
(B) 30 cm
(C) 28 cm
(D) 20 cm

65. For a given frequency distribution C.V = 30%, variance = 36 and Pearson's Coefficient of Skewness = - 0.25, the mode of the distribution is
(A) 24
(B) 20
(C) 21.5
(D) 24.5

66. The regression equation of y on x is $3x - 5y = -12$ and regression equation of x on y is $2x - y = 7$. The value of y when $x = 10$ is
(A) 8.4
(B) 6.5
(C) 7
(D) 9

67. If $y = 3x + 30$ and mean of x is 20, then the mean of y is
(A) 90
(B) 80
(C) 70
(D) 100

68. If the events A and B are mutually exclusive then
(A) P (A + B) = P (A) + P (B)
(B) P (A + B) = P (A) – P (B)
(C) P (A + B) = P (A) P (B)
(D) P (A + B) = 0

69. If $\sigma_x = 10$, $\sigma_y = 12$, and b_{xy} = - 0.8, then the value of correlation coefficient (*r*) is
(A) - 0.84
(B) - 0.96
(C) - 0.75
(D) 0.86

70. When *Var* (x) = 2.25, *Var* (*y*) = 1 and *Cov* (x, *y*) = 0.9, then correlation coefficient is
(A) 0.45
(B) 0.8
(C) 0.6
(D) 0.75

71. If the odds against an event 3:5, the probability of that event is
(A) 3/8
(B) 5/8
(C) 2/3
(D) 1/3

Answer Key:

1. (C) Pie diagram
2. (D) 0.1
3. (A) 0.8
4. (B) Mean
5. (C) n
6. (D) 12/7
7. (D) 32
8. (B) 1.5
9. (C) - 0.6
10. (D) 225
11. (A) 11/12
12. (B) ½
13. (A) Cumulative frequencies
14. (A) Ordinal classification
15. (D) 2
16. (D) 15
17. (A) 12.25
18. (B) 18
19. (C) 9
20. (D) 16
21. (A) $r = \sqrt{b_{xy} \text{ x } b_{yx}}$
22. (B) (3, 2)
23. (D) Exhaustive
24. (B) 5/6
25. (B) Histogram
26. (B) 19
27. (C) 6
28. (A) 8
29. (C) 11
30. (A) 36
31. (C) 9
32. (A) 1/8
33. (D) Geometric Mean of two regression coefficients.

34. (A) $P(A) = 1$
35. (B) $P(A) + P(B)$
36. (D) Rs. 8,000
37. (A) 23
38. (B) 17.5
39. (C) 5
40. (A) 3
41. (B) half of their absolute difference
42. (C) 12
43. (A) 25640
44. (C) 125%
45. (D) 26.8
46. (A) 5
47. (D) 1/12
48. (C) 7
49. (B) 69
50. (A) 2
51. (C) 3
52. (B) 2.2
53. (A) 10%
54. (A) 1.4
55. (A) 0
56. (A) 0.1
57. (B) - 1 and 1
58. (B) P(A) P(B)
59. (C) 0.7
60. (A) 4
61. (D) 2
62. (A) 13
63. (D) 19
64. (B) 30 cm
65. (C) 21.5
66. (A) 8.4
67. (A) 90
68. (A) P (A + B) = P (A) + P (B)
69. (B) - 0.96
70. (C) 0.6
71. (B) 5/8

II. <u>State whether the following statement is True or False:</u>

1. **Runs in a cricket match is a continuous variable.**
2. **Mode for a frequency distribution is calculated from Histogram.**
3. **The sum of the deviations of $x_1, x_2, \ldots, x_n$ from their A.M. $\bar{x}$ is zero.**
4. **Variance is always positive.**
5. **A variable x takes the values 10 and 20 with equal frequencies then the mean of x is 30.**
6. **Median divides the whole statistical data into two equal parts.**
7. **The standard deviation (S.D) is independent of change of origin but dependent on scale.**
8. **50th percentile is known as 2nd quartile.**
9. **For a negatively skewed distribution it is found that mean, median and mode are respectively 58, 54 and 48.**

10. The correlation coefficient between two variables is independent of change or origin as well as change of scale.
11. If two events A and B are mutually exclusive then $P(A \cap B) = P(A)\,P(B)$.
12. The coefficient of range is calculated as $\frac{Maximum\ observation - Minimum\ observation}{Maximum\ observation + Minimum\ observation}$ x 100.
13. The colour of a flower is an attribute.
14. The data collected from census reports are primary data.
15. Harmonic mean of a set of observations is the reciprocal of the arithmetic mean of the reciprocal values of the observations.
16. Variance is the positive square root of standard deviation.
17. C.V x mean = S.D x 100.
18. If two regression coefficients b_{yx} and b_{xy} are negative, then the correlation coefficient (r) is positive.
19. For a symmetric distribution skewness is zero.
20. The coefficient of correlation is independent of origin but dependent on the unit of measurement.
21. The probability of an absurd event is zero.
22. Probability of an event is a real number lying between – 1 and 1.
23. For a skew distribution, Mean $\neq$ Median $\neq$ Mode.
24. The total number of cases is 12 when two dice are thrown together.
25. Proportion of girls in a class of 100 students is a discrete variable.
26. The median for the set of observations 5, 7, 2, 1, 4, 3, 6 is 1.
27. The sum of cumulative frequencies of less than type and more than type of a class interval is equal to total frequency.
28. Standard deviation is defined as Root Mean Square Deviation about mean.
29. S.D is independent of change of scale, but is dependent on change of origin.
30. For a positively skewed distribution, Mean > Median > Mode.
31. The correlation between sale of woolen garments and day temperature is positive.
32. For two mutually exclusive events A and B, $P(AB) = 0$.
33. The correlation coefficient is a measure of linear association.
34. The probability of an event may exceed unity.
35. The conditional probability $P\,(A/B) = \frac{P\,(AB)}{P\,(B)}$.
36. Three perfect coins are tossed together. The probability of getting at least one head is $\frac{5}{8}$.
37. In any group frequency distribution class intervals are of equal width always.
38. Frequency densities are necessary for drawing histogram.
39. The statistical data collected during the census are primary data to the census department.
40. The value of the standard deviation of a series of observations can never be negative.
41. For a frequency distribution Median (Q_2), 5th Decile (D_5) and 50th Percentile (P_{50}) have the same value.
42. The standard deviation of a series of observations is defined as a root mean square deviation from any central value A.
43. Standard deviation is a kind of relative measure of dispersion.
44. Empirical relation between mean, median and mode is expressed as Mean – Mode = 3 (Mean – Median).
45. When one regression coefficient is negative and other regression coefficient is also negative.
46. The event neither A nor B occurs is represented by $A \cap B^c$
47. For any two independent events A and B, $P\,(A/B) = P(A)$.
48. Monthly income of workers of a factory is a continuous variable.
49. Cumulative frequencies are necessary for drawing ogive.
50. In a moderately skewed distribution, mode – 3, median + k mean. Then k = -2.
51. The coefficient of variation = (mean / s.d) x 100.
52. If C.V of series A is less than that of series B, then A is more stable than B.

53. **For a positively skewed distribution, it is found that mean, median and mode are respectively 62, 61 and 59.**
54. **The sum of the deviations of the observations from their Arithmetic Mean (A.M) is always zero.**
55. **The relation between A.M, G.M and H.M is expressed as A.M < G.M < H.M.**
56. **Skewness of a frequency distribution is defined as the measure of its extent of asymmetry.**
57. **Correlation coefficient r_{xy} of two variables x and y is the geometric mean of two regression coefficients b_{xy} and b_{yx}.**
58. **If $b_{xy} = -0.8$ and $b_{yx} = -0.2$, then $r_{xy} = -0.6$.**
59. **The sum of the probability of an event and its complement is always zero.**
60. **A discrete variable assumes only integral values.**
61. **(Class Frequency) / (Width of the Class) is defined as Frequency Density.**
62. **If C.V of series A is more than that of Series B, then B is more stable than A.**
63. **The meeting point of two regression lines $y - \bar{y} = b_{yx}(x - \bar{x})$ and $(x - \bar{x}) = b_{yx}(y - \bar{y})$ gives $(\bar{x}, \bar{y})$.**
64. **The stub of a table is the space meant for the row head.**
65. **Covariance of x and y is expressed as $\frac{1}{n}\sum(x - \bar{x})(y - \bar{y})$.**
66. **For a symmetrical distribution Mean ≠ Median ≠ Mode.**
67. **For a negatively skewed distribution it is found that Mean, Median and Mode are respectively 50, 51 and 49.**
68. **For two events A and B, P (A – B) = P (B – A).**
69. **Variance is always non – negative.**
70. **Mode is the value of the observation having minimum frequency.**

Answer Key:

1. True
2. True
3. True
4. True
5. False
6. True
7. False
8. True
9. False
10. True
11. False
12. False
13. True
14. True
15. True
16. True
17. True
18. False
19. True
20. False
21. True
22. False
23. True
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25. True
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47. True
48. True
49. True
50. True
51. False
52. True
53. True
54. True
55. False
56. True
57. True
58. False
59. False
60. True
61. True
62. True
63. True
64. True
65. True
66. False
67. False
68. False
69. True
70. False

Notes

Behind every successful business decision, there is always a CMA

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