CA Foundation

Quantitative Aptitude

Question

Question Compiler

(5rd Edition)

Your Maths Buddy

Aman Khedia

Preface

While the paper setting pattern and assessment methodology have been revised many times over and newer criteria devised to help develop more aspirant-friendly entrance test, the need to standardize the selection process and their outcome at the national level has been felt.

While the methodology and scope of a CA Entrance Test (CA Foundation) are prone to change there are two basic objectives that any test need to serve:

1. The Objective to test an aspirant's caliber, aptitude and attitude for the CA field and Profession.
2. The need to test an aspirant's grasp and understanding of concept of the subject of study and their applicability at the grassroot level.

Students appearing for CA Foundation Examination cannot bank solely on conventional shortcut measures to crack the exam. Conventional techniques alone are not enough as most of the questions asked in the examination are based on the concept rather than on just formula. Hence, it is necessary for students appearing for CA Foundation examination to not only gain a thorough knowledge and understanding of the concept but also develop problem-solving skills to be able to relate their understanding of the subject to real-life application based on these concepts

Feature of the book

- **This Book Covers Category Wise Questions of Each Chapters**
- **Chart of Each Chapters Covers Important Questions of Each Category**
- **End of Each Chart Consist of Revision Strategy (Blank) – Students Need to Fill it With Questions Need to See One Day Before Exam & Revise Multiple Times**
- **This Book Has Been Designed to Revise Entire Syllabus in 1.5 Days Before Exam**

Aman Khedia

Dedicated To

My Mother
Seema Khedia

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Chapter 1A Ratio & Proportions

Ratio

1. If a: b = 3: 4, the value of (2a + 3b): (3a + 4b)
(a) 54: 25 (b) 8: 25
(c) 17: 24 (d) none

2. If x: y = 3: 4, the value of: $x^2y + xy^2$: $x^3 + y^3$ is
(a) 13: 12 (b) 12: 13
(c) 21: 31 (d) none

3. If p: q is the sub-duplicate ratio of $p\text{-}x^2$: $q\text{-}x^2$ then x^2 is
(a) $\frac{p}{p+q}$ (b) $\frac{q}{p+q}$
(c) $\frac{pq}{p+q}$ (d) none

4. Ratio compounded of 2: 3, 9: 4, 5: 6 and 8: 10 is
(a) 1: 1 (b) 1: 5
(c) 3: 8 (d) none

5. If p: q = 2: 3 and x: y = 4: 5, then the value of 5px + 3qy: 10px + 4qy is
(a) 71: 82 (b) 27: 28
(c) 17: 28 (d) none of these

6. The ratio compounded of duplicate ratio of 4: 5, triplicate ratio of 1: 3, sub duplicate ratio of 81: 256 and sub-triplicate ratio of 125: 512 is
(a) 4: 512 (b) 3: 32
(c) 1: 12 (d) none of these

7. The ratio compounded of 2: 3, 9: 4, 5: 6 and 8: 10 is
(a) 1: 1 (b) 1: 5
(c) 3: 8 (d) none of these

8. If A = B/2 = C/5, then A: B: C is
(a) 3: 5: 2 (b) 2: 5: 3
(c) 1: 2: 5 (d) none of these

9. The sub-duplicate ratio of 25: 36 is
(a) 6: 5 (b) 36: 25
(c) 50: 72 (d) 5: 6

10. Two numbers are in the ratio 2:3. If 4 be subtracted from each, they are in the ratio 3: 5. The numbers are
(a) (16, 24) (b) (4, 6)
(c) (2, 3) (d) none of these

11. The angles of a triangle are in ratio 2 : 7 : 11. The angles are
(a) (20^o, 70^o, 90^o) (b) (30^o, 70^o, 80^o)
(c) (18^o, 63^o, 99^o) (d) none of these

12. Division of Rs. 324 between X and Y is in the ratio 11: 7. X & Y would get Rupees
(a) (204, 120) (b) (200, 124)
(c) (180, 144) (d) none of these

13. Anand earns Rs. 80 in 7 hours and Pramod Rs. 90 in 12 hours. The ratio of their earnings is
(a) 30: 21 (b) 23: 12
(c) 8: 9 (d) none of these

14. P, Q and R are three cities. The ratio of average temperature between P and Q is 11: 12 and that between P and R is 9: 8. The ratio between the average temperature of Q and R is
(a) 22:27 (b) 27:22
(c) 32:33 (d) none of these

15. If a carton containing a dozen mirrors is dropped, which of the following cannot be the ratio of broken mirrors to unbroken mirrors
(a) 2:1 (b) 3:1
(c) 3:2 (d) 7:5

16. 729 ml of a mixture contains milk and water in the ratio 7:2. How much more water is to be added to get a new mixture containing milk and water in the ratio of 7:3?
(a) 60 ml (b) 70 ml
(c) 81 ml (d) 90 ml

Proportion

17. The fourth proportional to 4, 6, 8 is
(a) 12 (b) 32 (c) 48 (d) none

18. The third proportional to 12, 18 is
(a) 24 (b) 27 (c) 36 (d) none

19. The mean proportional between 25, 81 is
(a) 40 (b) 50 (c) 45 (d) none

20. If x/2 = y/3 = z/7, then the value of (2x – 5y + 4z) / 2y is
(a) 6/23 (b) 23/6 (c) 3/2 (d) 17/6

21. If a: b = 4: 1 then $\sqrt{\frac{a}{b}} + \sqrt{\frac{b}{a}}$ *is*
(a) 5/2 (b) 4 (c) 5 (d) none

22. If a,b,c,d,e are in continued proportion then abde is equal to
(a) a^4 (b) b^4 (c) c^4 (d) d^4

23. The 4th term for which the numbers 14,16,35,32 will be in proportion is
(a) 45 (b) 40 (c) 32 (d) None

24. Find the third proportional to 2.4 kg & 9.6 kg
(a) 34.8 kg (b) 38.4 kg (c) 36.8 kg (d) 35.8 kg

25. The fourth proportional to 2a, a^3, c is:
(a) $a^2c/2$ (b) ac (c) 2/ac (d) None

26. The fourth proportional to $(a^2 - ab + b^2), (a^3 + b^3)$ *and* $(a - b)$ *is equal to*
(a) $a^2 + b^3$ (b) $a^2 - b^2$ (c) 1 (d) None

27. Division of Rs. 750 into 3 parts in the ratio 4: 5: 6 is
(a) (200, 250, 300) (b) (250, 250, 250)
(c) (350, 250, 150) (d) 8: 12: 9

28. The sum of the ages of 3 persons is 150 years. 10 years ago, their ages were in the ratio 7: 8: 9. Their present ages are
(a) (45, 50, 55) (b) (40,60,50)
(c) (35, 45, 70) (d) none of these

Chapter 1B Indices

Basic Level-1

1. $4x^{-1/4}$ is expressed as
(a) -4x ¼ (b) x^{-1}
(c) $4/x^{1/4}$ (d) none of these

2. The value of $8^{1/3}$ is
(a) 4 (b) 3
(c) 2 (d) none of these

3. $\left(\frac{81x^4}{y^{-8}}\right)^{\frac{1}{4}}$ has simplified value equal to
(a) xy^2 (b) x^2y
(c) $9xy^2$ (d) none of these

4. The value of $(\frac{243}{32})^{-4/5}$ is:
(a) 18/16 (b) 16/81
(c)4/9 (d) 9/4

5. Simplification of $9^{x+3} = 27^{x-1}$ gives:
(a) 8 (b) 7
(c) 9 (d) none of these

6. If $(25)^{7.5} \times (5)^{2.5} \div (125)^{1.5} = 5^x$, then value of x is:
(a) 8.5 (b) 13
(c) 16 (d) none of these

7. The value of $(8/27)^{1/3}$ is
(a) 2/3 (b) 3/2
(c) 2/9 (d) none of these

8. The value of $2(256)^{-1/8}$ is
(a) 1 (b) 2
(c) 1/2 (d) none of these

9. The value of $[(10)^{150} \div (10)^{146}]$ is:
(a) 1000 (b) 10000
(c) 100000 (d)$(10)^6$

Basic Level -2

10. If $2^x - 2^{x-1}$=4, then the value of x^x is:
(a) 27 (b) 4
(c)1 (d) 256

11. $\sqrt{x^3\sqrt{x^3\sqrt{x^3}}}$ is
(a) x^7 (b) x^8
(c) $x^{21/8}$ (d) x^9

12. $(a^{1/8} + a^{-1/8})(a^{1/8} - a^{-1/8})(a^{1/4} + a^{-1/4})(a^{1/2} + a^{-1/2})$ is
(a) a + (1/a) (b) $a^2 + (1/a^2)$
(c) a - (1/a) (d) $a^2 - (1/a^2)$

13. If x = $p^{1/3} - p^{-1/3}$, then
(a) $x^3 + 3x$ = p + (1/p)
(b) $x^3 + 3x$ = p - (1/p)
(c) $x^3 + 3x$ = p + 1
(d) None

14. If x = $3^{1/3} + 3^{-1/3}$, *then* $3x^3 - 9x$ is
(a) 15 (b) 10
(c) 12 (d) None

15. If $x = \sqrt{7 + 4\sqrt{3}}$, then $x + \frac{1}{x} =$
(a) 4 (b) 6
(c) 3 (d) 2

16. If $a^b = b^a$ *then the value of* $\left(\frac{a}{b}\right)^{\frac{a}{b}} - a^{\frac{a}{b}-1}$ reduces to
(a) a (b) b
(c) 0 (d) None

"K" Concept Variations

17. If $2^x = 4^y = 8^z$ and $\left(\frac{1}{2x} + \frac{1}{4y} + \frac{1}{6z}\right) = \frac{24}{7}$, then the value of z is:
(a) $\frac{7}{16}$ (b) 7/32
(c) 7/48 (d) 7/64

18. If a^x =b, b^y =c, $c^z = a$, then the value of xyz is:
(a) 1 (b) -1
(c) 0 (d)2

19. If $2^x = 3^y = 6^{-z}$ then value of $\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z}\right)$ *is* :
(a)0 (b) 1
(c) 3/2 (d) – (1/2)

20. If $(5.678)^x = (0.5678)^y = 10^z$ then
(a) $\frac{1}{x} - \frac{1}{y} + \frac{1}{z} = 1$ (b) $\frac{1}{x} - \frac{1}{y} - \frac{1}{z} = 0$
(c) $\frac{1}{x} - \frac{1}{y} + \frac{1}{z} = -1$ (d) None

21. If $3^a = 5^b = (75)^c$ then the value of ab – c(2a + b) reduces to
(a) 1 (b) 0
(c) 3 (d) 5

Additional Question Bank

1. The students of two classes are in the ratio 5:7, if 10 students left from each class, the remaining students are in the ratio of 4: 6 then the number of students in each class is:
(a) 30, 40 (b) 25, 24
(c) 40, 60 (d) 50, 70

2. In a film shooting, A and B received money in a certain ratio and B and C also received the money in the same ratio. If A gets Rs. 1,60,000 and C gets Rs. 2,50,000. Find the amount received by B?
(a) Rs. 2,00,000 (b) Rs. 2,50,000
(c) Rs. 1,00,000 (d) Rs. 1,50,000

3. If the salary of P is 25% lower than that of Q and the salary of R is 20% higher than that of Q, the ratio of the salary of R and P will be:
(a) 5: 8 (b) 8: 5
(c) 5:3 (d) 3: 5

4. A dealer mixes rice costing Rs. 13.84 per Kg. with rice costing Rs. 15.54 and sells the mixture at Rs. 17.60 per Kg. So, he earns a profit of 14.6% on his sale price. The proportion in which he mixes the two qualities of rice is:
(a) 3: 7 (b) 5: 7
(c) 7:9 (d) 9: 11

5. The value of $\frac{2^n+2^{n-1}}{2^{n+1}-2^n}$ is:
(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) 2

6. $\frac{3x-2}{5x+6}$ is the duplicate ratio of $\frac{2}{3}$ then find the value of x:
(a) 2 (b) 6 (c) 5 (d) 9

7. If $a = \frac{\sqrt{6}+\sqrt{5}}{\sqrt{6}-\sqrt{5}}$ and $b = \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}}$ then the value of $\frac{1}{a^2} + \frac{1}{b^2}$ is equal to:
(a) 480 (b) 482 (c) 484 (d) 486

8. If $\sqrt[3]{a} + 3\sqrt{b} + 3\sqrt{c}$ then the value of $\left(\frac{a+b+c}{3}\right)^3 = 0$
(a) abc (b) 9abc (c) $\frac{1}{abc}$ (d) $\frac{1}{9abc}$

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Chapter 1C Logarithm

Basics

1. $\log_2 8$ is equal to
(a) 2 (b) 8
(c) 3 (d) none

2. $\log_{2\sqrt{3}} 1728$ is equal to
(a) $2\sqrt{3}$ (b) 2
(c) 6 (d) none

3. The value of log 0.0001 to the base 0.1
(a) – 4 (b) 4
(c) ¼ (d) none

4. If log x + log y = log (x+y), y can be expressed as
(a) x - 1 (b) x
(c) x/x-1 (d) none

5. If $\log_2 x + \log_4 x + \log_{16} x = 21/4$, then x is equal to
(a) 8 (b) 4
(c) 16 (d) none of these

6. The simplified value of $2\log_{10}5 + \log_{10} 4$ is
(a) ½ (b) 4
(c) 2 (d) none

7. If $2 \log x = 4 \log 3$, the x is equal to
(a)-4 (b) 9
(c) 2 (d) none of these

8. log 0.0625 to the base 2 is equal to
(a)4 (b) 5
(c) 1 (d) none of these

9. $\log\frac{a^2}{bc} - \log\frac{ca}{b^2} + \log\frac{c^2}{ab} =$
(a) 0 (b) 1
(c) log a (d) None of these.

10. The value of
$16\log\frac{64}{60} + 12\ \log\frac{50}{48} + 7\log\frac{81}{80} + \log 2$
(a) 0 (b) 1 (c) 2 (d) -1

Finding Value Problem

11. Given log2 = 0.3010 & log3 = 0.4771 the value of log 6 is
(a)0.9030 (b) 0.9542
(c) 0.7781 (d) none

12. Given that $\log_{10}2 = x$ & $\log_{10}3 = y$, the value of $\log_{10}60$ is expressed as
(a)x – y + 1 (b) x + y +1
(c) x – y - 1 (d) None

13. Given that $\log_{10}2 = x$, $\log_{10}3 = y$, then $\log_{10}1.2$ is expressed as
(a)x + 2y + 1 (b) x + y – 1
(c) 2x + y - 1 (d) None

14. Given that $\log x = m + n$ & $\log y = m - n$, the value of $\log 10x/y^2$ is expressed in terms of m and n as
(a) 1 – m + 3n (b) m – 1 + 3n
(c) m + 3n + 1 (d) None

Advance Problems

22. If $\log(a) = \frac{1}{2}\log(b) = \frac{1}{5}logc$ then value of $a^4b^3c^{-2}$ is
(a) 0 (b) 1
(c) -1 (d) None

23. If $x^{18} = y^{21} = z^{28}$, then 3,3 $\log_y x$, 3 $\log_z y$, 7 $\log_x Z$ are in:
(a) A. P (b) G. P
(c) H. P (d) None

Chain Based Problem

15. The value of $\log_2 \log_2 16$
(a)0 (b) 2
(c) 1 (d) none

16. The value of
$\log_2 [\log_2 \{\log_3 (\log_3 27^3)\}]$ is equal to
(a)1 (b) 2
(c) 0 (d) none

17. On solving the equation
$\log_3 [\log_2(\log_3 t)] = 1$ we get the value of t as
(a) 8 (b) 18
(c) 81 (d) 6561

18. On solving the equation
$\log_{1/2}[\log_t (\log_4 32)] = 2$ we get the value of t as
(a) $^5/_2$ (b) $^{25}/_4$
(c) $^{625}/_{16}$ (d) None

Assuming Value Problem

24. For any three consecutive integers $x\,y\,z$ the equation log (1+xz) – 2logy = 0 is
(a) True (b) False

25. If $x = \log_a bc$, $y = \log_b ca$, $z = \log_c ab$ then the value of xyz – x – y – z is
(a) 0 (b) 1
(c) -1 (d) 2

26. If $\log_x yz = p$, $\log_y zx = q$, $\log_z xy = r$, then $\frac{1}{p+1} + \frac{1}{q+1} + \frac{1}{r+1} =$ is
(a) 0 (b)1
(c) 2 (d) None

Base Changing Theorem

19. $\frac{1}{log_{ab}(abc)} + \frac{1}{log_{bc}(abc)} + \frac{1}{log_{ca}(abc)}$ is equal to
(a)0 (b) 1
(c) 2 (d) -1

20. $\frac{1}{1+log_a(bc)} + \frac{1}{1+log_b(ca)} + \frac{1}{1+log_b(ab)}$ is equal to
(a)0 (b) 1
(c) 3 (d) -1

21. $log_b\left(a^{\frac{1}{2}}\right).log_c(b^3).log_a(c^{\frac{2}{3}})$ is equal to
(a) 0 (b) 1
(c) -1 (d) None

Principle Identity

27. The value of $16^{\log_4 5}$ is
(a)15 (b) 40
(c) 20 (d) 25

28. The value of the expression
$a^{\log_a b.\log_b c.\log_c d.\log_d t}$
(a)t
(b) abcdt
(c) (a + b + c + d + t)
(d) none

Cyclic Order

29. If p + q + r = 0, find the value of
$\frac{1}{a^q+a^{-r}+1} + \frac{1}{a^r+a^{-p}+1} + \frac{1}{a^p+a^{-q}+1}$
(a) (b) 2
(c) 1 (d) None

Additional Question Bank

1. $\log_4 (x^2 + x) - \log_4(x+1) = 2$. Find x
(a) 16 (b) 0
(c) -1 (d) None of these.

2. The value of $2 \log x + 2 \log x^2 + 2 \log x^3 + \text{--------} + 2 \log x^n$ will be:
(a) $\frac{n(n+1)\log x}{2}$ (b) $n(n+1) \log x$
(c) $n^2 \log x$ (d) None of these.

3. If n = m! where ('m' is a positive integer > 2) then the value of:
$$\frac{1}{\log_2^n} + \frac{1}{\log_3^n} + \frac{1}{\log_4^n} + \ldots\ldots\ldots + \frac{1}{\log_m^n}$$
(a) 1 (b) 0
(c) -1 (d) 2

4. If $\log_x y = 100$ and $\log_2 x = 10$, then the value of 'y' is
(a) 2^{10} (b) 2^{100}
(c) $2^{1,000}$ (d) $2^{10,000}$

5. For what value of x, the equation $(\log_{\sqrt{x}} 2)^2 = \log_x^2$ is true?
(a) 16 (b) 32
(c) 8 (d) 4

6. The value of $\log_4 9 . \log_3 2$ is:
(a) 3 (b) 9
(c) 2 (d) 1

7. If $x = 1 + \log_p qr$, $y = 1 + \log_0 rp$ and $z = 1 + \log_r pq$ then the value of $\frac{1}{x} + \frac{1}{y} + \frac{2}{z} =$ ___
(a) 0 (b) 1
(c) -1 (d) 3

8. The value of **$\log (1^3 + 2^3 + 3^3 + \ldots\ldots\ldots n^3)$** is equal to:
(a) $3 \log 1 + 3 \log 2 + \ldots\ldots + 3 \log n$
(b) $2 \log n + 2 \log (n+1) - 2 \log 2$
(c) $\log n + \log (n+1) + \log (2n+1) - \log 6$ (1 mark)
(d) 1

9. The value of $\log_5 \left(1 + \frac{1}{5}\right) + \log_5 \left(1 + \frac{1}{6}\right) + \text{----} + \log_5 \left(1 + \frac{1}{624}\right)$
(a) 2 (b) 3
(c) 5 (d) 0

10. $\log_{2\sqrt{2}} (512) : \log_{3\sqrt{2}} 324 =$
(a) 128: 81 (b) 2: 3
(c) 3: 2 (d) None

11. Find the value of $\log(x^6)$, If $\log (x) + 2 \log(x^2) + 3 \log(x^3) = 14$,
(a) 3 (b) 4
(c) 5 (d) 6

Summary Notes

Chapter 2 Equations

Linear Equations

1. The value of y that satisfies the equation $\frac{y+11}{6}-\frac{y+1}{9}=\frac{y+7}{4}$ is
(a)-1 (c) 1
(b)7 (d) $-\frac{1}{7}$

2. The equation $\frac{12x+1}{4}=\frac{15x-1}{5}+\frac{2x-5}{3x-1}$ is true or
(a)x = 1 (c) x = 5
(b)x = 2 (d) x = 7

3. 1.5x + 3.6y = 2.1, 2.5(x +1) = 6y
(a) (0.2, 0.5) (c) (2, 5)
(b) (0.5, 0.2) (d) (-2, -5)

4. $\frac{xy}{x+y}=20, \frac{yz}{y+z}=40, \frac{zx}{z+x}=24$
(a) (120,60, 30)
(b) (60, 30, 120)
(c) (30, 120, 60)
(d) (30, 60, 120)

5. Solving $\frac{1}{x^2}+\frac{1}{y^2}-13=0$ & $\frac{1}{x}+\frac{1}{y}-5=0$ we get the roots as under
(a) $\frac{1}{8},\frac{1}{5}$
(b) $\frac{1}{2},\frac{1}{3}$
(c) $\frac{1}{13},\frac{1}{5}$
(d) $\frac{1}{4},\frac{1}{5}$

6. Solving $4^x.2^y=128$ & $3^{3x+2y}=9^{xy}$ we get the following roots
(a) $\frac{7}{4},\frac{7}{2}$ (b) 2,3
(c) 1,2 (d) 1,3

Quadratic Equation

Roots of Equation

7. Solution of $3x^2-17x+24=0$ are
(a)(2, 3) (c) $(3, 2\frac{2}{3})$
(b)$(2, 3\frac{2}{3})$ (d) $(3, \frac{2}{3})$

8. If x = m is one of the solutions of the equation $2x^2 + 5x - m = 0$ the possible values of m are
(a)(0, 2) (c) (0, 1)
(b)(0, -2) (d) (1, -1)

9. A solution of the quadratic equation
$(a + b - 2c)x^2 + (2a - b - c)x + (c + a - 2b) = 0$
(a) x = 1 (c) x = 2
(b) x = -1 (d) x = -2

10. The satisfying the values of x for the equation $\frac{1}{x+p+q}=\frac{1}{x}+\frac{1}{p}+\frac{1}{q}$ are
(a) (p, q) (c) (p, -p)
(b) (-p, -q) (d) (-p, q)

Nature of Roots

11. If roots of the equation $2x^2 + 8x - m^3 = 0$ are equal then the value of m is
(a)– 3 (b)– 1
(c) 1 (d) – 2

12. The roots of equation $x^2 + (2p - 1)x + p^2 = 0$ are real if
(a)P ≥ 1 (c) p ≥ ¼
(b)P ≤ 4 (d) p ≤ ¼

13. The equation $x^2 - (p+4)x + 2p + 5 = 0$ has equal roots the value of p will be
(a)± 1 (c) ± 2
(b)2 (d) -2

Relation Between Roots & Coefficient

17. If α, β be the roots of the equation $2x^2 - 4x - 3 = 0$ the value of $\alpha^2 + \beta^2$ is
(a)5 (b)7
(c) 3 (d) -4

18. If α and β are the roots of $x^2 = x + 1$ then the value of $\frac{\alpha^2}{\beta}-\frac{\beta^2}{\alpha}$ is
(a)$2\sqrt{5}$ (b)$\sqrt{5}$
(c) $3\sqrt{5}$ (d) $-2\sqrt{5}$

19. If one root of $5x^2 + 13x + p = 0$ be reciprocal of the other then the value of p is
(a)-5 **(c)** 1/5
(b)5 **(d)** -1/5

20. If the root of the equation $x^2 - 8x + m = 0$ exceeds the other by 4 then the value of m is
(a) m = 10 **(c)** m = 9
(b) m = 11 **(d)** m = 12

21. Equation $\left(\frac{l-m}{2}\right)x^2-\left(\frac{l+m}{2}\right)x+m=0$ has got two values of x to satisfy the equation given as
(a) $\left(1,\frac{2m}{l-m}\right)$ **(c)** $\left(1,\frac{2l}{l-m}\right)$
(b) $\left(1,\frac{m}{l-m}\right)$ **(d)** $\left(1,\frac{l}{l-m}\right)$

22. If α and β be the roots of the equation $x^2 + 3x + 4 = 0$, then find the equation whose roots are $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$
(a) $x^2 - 2x - 63 = 0$
(b) $x^2 - 2x + 63 = 0$

14. The values of $4+\frac{1}{4+\frac{1}{4+\frac{1}{4+\cdots\infty}}}$
(a)$1 \pm \sqrt{2}$ (c) $2 \pm \sqrt{5}$
(b)$2 + \sqrt{5}$ (d) none of these

15. If the sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals then $\frac{b^2}{ac}+\frac{bc}{a^2}$ is equal to
(a)2 (c) 1
(b)-2 (d) -1

16. If $2^{2x+3} - 3^2.2^x + 1 = 0$ then the values of x are
(a)0, 1 (b)1, 2
(c) 0, 3 (d) 0, -3

Cubic Equations

23. Cubic equation $x^3 + 2x^2 - x - 2 = 0$ has 3 roots namely.
(a)(1, -1, 2) (c) (-1, 2, -2)
(b)(-1, 1, -2) (d) (1, 2, 2)

24. Factors of the equation $3x^2 + 5x^2 - 3x - 5 = 0$ are
(a) x − 1, x − 2, x − 5/3
(b) x − 1, x + 1, 3x + 5
(c) x + 1, x − 1, 3x − 5
(d) x − 1, x + 1, x − 2

Word Problems

Additional Question Bank

1. Monthly income of two persons are in the ratio 4: 5 and their monthly expenses are in the ratio 7: 9. If each saves Rs 50 per month find their monthly income.
(a)(500, 400) (c) (300, 600)
(b)(400, 500) (d) (350, 550)

2. The age of a person is twice the sum of the ages of his two sons and five years ago his age was thrice the sum of their ages. Find his present age.
(a)60 years (c) 51 years
(b)52 years (d) 50 years

3. The hypotenuse of a right-angled triangle is 20 cm. the difference between its other two sides be 4 cm. the sides are
(a)(11cm, 15cm) (c) (20cm, 24cm)
(b)(12cm, 16cm) (d) none

4. The sides of an equilateral triangle are shortened by 12 units, 13 units and 14 units respectively and a right-angle triangle is formed. The sides of the equilateral triangle is
(a)17 units (c) 15 units
(b)16 units (d) 18 units

5. The sum of two irrational numbers multiplied by the larger one is 70 and their difference is multiplied by the smaller one is 12; the two numbers are
(a)$3\sqrt{2}, 2\sqrt{3}$ (c) $2\sqrt{2}, 5\sqrt{2}$
(b)$5\sqrt{2}, 3\sqrt{5}$ (d) none of these

6. Positive value of 'k' for which the roots of equation $12x^2 + kx + 5 = 0$ are in ratio 3:2, is:
(a) $5/12$ (b) $12/5$
(c) $\frac{5\sqrt{10}}{2}$ (d) $5\sqrt{10}$

7. If roots of equation $x^2 + x + r = 0$ are '$\propto$' and 'β' and $\propto^3 + \beta^3 = -6$. Find the value 'r'?
(a) $\frac{-5}{3}$ (b) $\frac{7}{3}$
(c) $\frac{-4}{3}$ (d) 1

8. If p & q are the roots of the Equation $x^2 - bx + c = 0$ then what is the Equation whose roots are $(pq + p + q)$ *and* $(pq - p - q)$?
(a) $x^2 - 2cx + c^2 - b^2 = 0$
(b) $x^2 - 2bx + c^2 + b^2 = 0$

9. If $|x - 2| + |x - 3| = 7$ then, 'x' will be equal to
(a) 6 (b) -1
(c) 6 and – 1 (d) None of the above

10. The sum of square of any real positive quantity and its reciprocal is never less than:
(a) 1 (b) 2
(c) 3 (d) 4

11. The harmonic mean of the roots of the equation: $(5 + \sqrt{2})\,x\,2 - (4 + \sqrt{5})x + 8 + 2\sqrt{5} = 0$ is
(a) 2 (b) 4
(c) 6 (d) 8

12. The value of P for which the difference between the root of equation $x^2 + px + 8 = 0$ is 2
(a) ± 2 (b) ± 4
(c) ± 6 (d) ± 8

13. If difference between the roots of the equation: $x^2 - kx + 8 = 0$ is 4, then the value of K is:
(a) 0 (b) ± 4
(c) $\pm 8\sqrt{3}$ (d) $\pm 4\sqrt{3}$

14. If α, β are the roots of the equation $x^2 + x + 5 = 0$ then $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$ is equal to
(a) $\frac{16}{5}$ (b) 2 (c) 3 (d) $\frac{14}{5}$

Your Math's Buddy
Aman Khedia

Chapter 3 Linear Inequalities

Formation of Inequality

1. An employer recruits experienced (x) and fresh workmen (y) for his firm under the condition that he cannot employ more than 9 people. X and y can be related by the inequality

(a) $X + y \neq 9$

(b) $x + y \geq 9, x \geq 0, y \geq 0$

(c) $x + y \leq 9, x \geq 0, y \geq 0$

(d) none of these

2. On the average experienced person does 5 units of work while a fresh one 3 units of work daily but the employer has to maintain an output of al least 30 units of work per day. This situation can be expressed as

(a) $5x + 3y \leq 30$

(b) $5x + 3y \geq x \geq 0, y \geq 0$

(c) $5x + 3y > 30$

(d) none of these

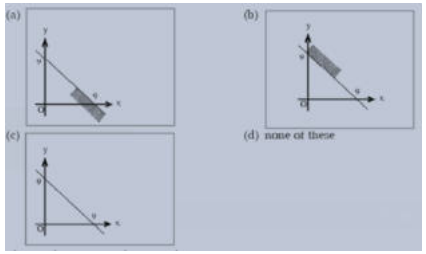
3. The rules and regulations demand that the employer should employ not more than 5 experienced hands to 1 fresh one and this fact can be expressed as

(a) $Y \geq x/5$ **(c)** $5y \geq x$

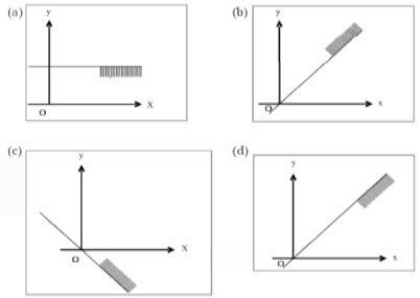
(b) $5y \leq x$ **(d)** none

Inqⁿ is Given Graph is asked

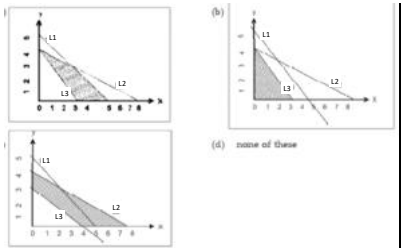
4. The graph to express the inequality $x + y \leq 9$ is



5. The graph to express the inequality $y \leq \left(\frac{1}{2}\right) x$ is indicated by

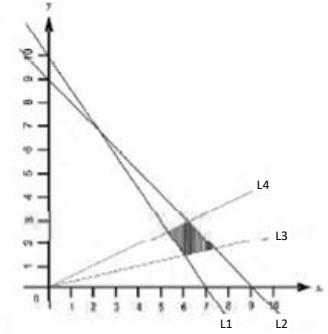


6. The common region satisfying the set of inequalities $\geq 0, y \geq 0$, **L1** : $x + y \leq 5$, **L2** : $x + 2y \leq 8$ and **L3** : $4x + 3y \geq 12$ is indicated by



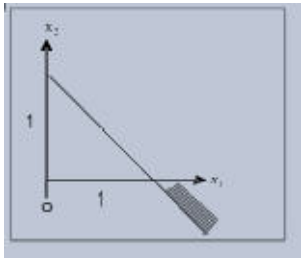
Graph is given Inqⁿ is asked

7. The common region (shaded part) shown in the diagram refers to



(a) $5x + 3y \geq 30$ $x + y \geq 9$ $y \geq x/3$ $y \leq x/2$ $x \geq 0, y \geq 0$	**(b)** $5x + 3y \geq 30$ $x + y \leq 9$ $y \geq x/3$ $y < x/2$

8. The region is expressed as



(a) $x_1 - x_2 \geq 1$
(b) $x_1 + x_2 \leq 1$
(c) $x_1 + x_2 \geq 1$
(d) None of these

Finding Solution

9. On solving the inequalities $6x + y \geq 18, x + 4y \geq 12, 2x + y \geq 10$, we get the following situation

(a) (0, 18), (12, 0), (4, 2) and (2, 6)

(b) (3, 0), (0, 3), (4, 2) and (7, 6)

(c) (5, 0), (0, 10), (4, 2) and (7, 6)

(d) (0, 18), (12, 0), (4, 2), (0, 0) and (7, 6)

Coverage of Inequality

10. If $\left|x + \frac{1}{4}\right| > \frac{7}{4}$, then:

(a) $x < \frac{-3}{2}$ or $x > 2$ **(b)** $x < -2$ or $x > \frac{3}{2}$

(c) $-2 < x < \frac{3}{2}$ **(d)** none of these

11. The common region represented by the inequalities $2x + y \geq 8, x + y \geq 12, 3x + 2y \leq 34$ is

(a) Unbounded

(b) In feasible

(c) Feasible and bounded

(d) Feasible and unbounded

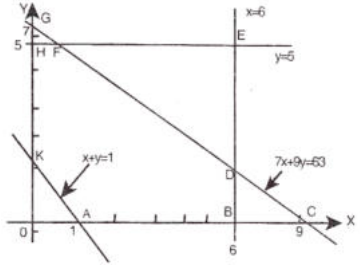
12. If $a > 0$ and $b < 0$, it followings that:

(a) $\frac{1}{a} > \frac{1}{b}$ **(b)** $\frac{1}{a} < \frac{1}{b}$

(c) $\frac{1}{a} = \frac{1}{b}$ **(d)** none of these

Additional Question Bank

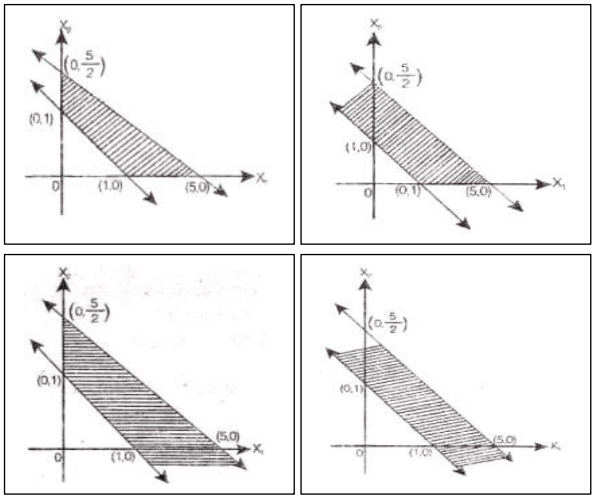
1. The graph of linear inequalities $7x + 9y \leq 63$, $+ y \geq 1, 0 \leq x \leq 6$ is given below



Common region of the inequalities is:

(a) BCDB and DEFD (b) Unbounded
(c) HFGH (d) ABDFHKA

2. The common region by the inequalities $x_1 + 2x_2 \leq 5$, $x_1 + x_2 \geq 1$ $x_1 \geq 0$, $x_2 \geq 0$ is given as shaded portion in:



3. On solving the inequalities; $6x + y \geq 18$, $x + 4y \geq 12$, $2x + y \geq 10$we get

(a) (0,18), (12,0), (4,2), & (7, 6)
(b) (3, 0), (0, 3), (4, 2) & (7, 6)
(c) (5, 0), (0, 10), (4, 2) & (7, 6)
(d) (0,18), (12, 0), (4,2), (0, 0) & (7, 6)

4. Solve for x of the Inequalities $2 \leq \frac{3x-2}{5} \leq 4$ where $x \leftarrow N$

(a) {5, 6, 7}
(b) {3, 4, 5, 6}
(c) {4, 5, 6}
(d) None

5. The common region in the graph of the inequalities $x + y \leq 4$, $x - y \leq 4$, $x \geq 2$ is

(a) Equilateral triangle
(b) Isosceles triangle
(c) Quadrilateral
(d) Square

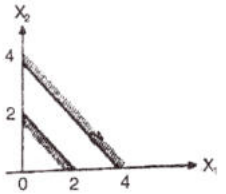
6. XVZ Company has a policy for its recruitment as: it should not recruit more than eight men (x) to three women (y). How can this fact be expressed in inequality?

(a) $3y \geq 8x$
(b) $3y \leq x/8$
(c) $8y \geq 3x$
(d) $8y \leq 3x$

7. If $2x + 5 > 3x + 2$ and $2x - 3 <= 4x - 5$, the 'x' can take which of the following values?

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

8. The region indicated by the shading in the graph is expressed by the inequalities



(a) $x_1 + x_2 \leq 2$; $x_1 + x_2 \geq 4$; $x_1 \geq 0, x_2 \geq 0$

(b) $x_1 + x_2 \leq 2$; $x_2x_1 + x_2 \leq 4$; $x_1 \geq 0, x_2 \geq 0$

(c) $x_1 + x_2 \geq 2$; $x_1 + x_2 \geq 4$; $x_1 \geq 0, x_2 \geq 0$

(b) None

9. A dietitian wishes to mix together two kinds of food so that the vitamin content of the mixture is at least 9 units of vitamin A, 7 units of vitamin B, 10 units of vitamin C and 12 units of vitamin D. the vitamin content per kg of each food is shown below:

	A	B	C	D
Food I:	2	1	1	2
Food II:	1	1	2	3

Assuming x units of food I is to be mixed with y units of food II the situation can be expressed as

(a) $2x + y \leq 9$; $x + y \leq 7$; $x + 2y \leq 10$; $2x + 3y \leq 12$; $x > 0, y > 0$

(b) $2x + y \geq 9$; $x + y \geq 7$; $x + 2y \geq 10$; $2x + 3y \geq 12$; $x > 0, y > 0$

Chapter 4 Mathematics of Finance

Simple Interest

1. S.I on Rs. 3500 for 3 years at 12% per annum is
(a) Rs. 1200 **(b)** 1260
(c) 2260 **(d)** none of these

2. A certain sum of money trebles itself in 10 years at a certain rate of S.I. p.a. then the rate of interest is
(a) 20% **(b)** 10%
(c) 5% **(d)** None

3. A sum of money amount to Rs. 6200 is 2 years and Rs. 7400 in 3 years. The principal and rate of interest are
(a) Rs. 3800 31.57%
(b) Rs. 3000, 20%
(c) Rs. 3500, 15%
(d) none of these

4. A sum of Rs. 46,875 was lent out at simple interest and at the end of 1 year 8 months the total amount was Rs. 50,000. Find the rate of interest per cent per annum.
(a) 4% **(b)** 5%
(c) 7% **(d)** None

5. It the simple interest on Rs. 20,000 increases by Rs. 4,000 with the increase of time by 4 Yrs. Find the rate per cent per annum.
(a) 0.15% **(b)** 0.5%
(c) 5% **(d)** None

6. If the difference between simple interest on Rs. 4,000 and on Rs. 6,500 for 5 Yrs. Be Rs. 800 at same rate of simple interest per annum. Then the rate of interest is
(a) 5.3% **(b)** 6.2%
(c) 6.4% **(d)** None

Compound Interest-Basic

7. If P = Rs. 1000, R = 5% p.a., n = 4; What is Amount and C.I. is
(a) Rs. 1215.50, Rs. 215.50
(b) Rs. 1125, Rs. 125
(c) Rs. 2115, Rs. 115

8. Rs. 100 will become after 20 years at 5% p.a. compound interest amount
(a) Rs. 250 **(b)** Rs. 205
(c) Rs. 265.50 **(d)** None

9. If A = Rs. 1000, n = 2 years, R = 6% p.a. compound interest payable half-yearly, then principal (P) is
(a) 888.80 **(b)** Rs.885
(c) 800 **(d)** None

10. After Mr. Gupta introduced new norms, turnover of Gupta & sons went up from Rs. 100 million to Rs 300 million in 3 yrs. The compounded growth rate of co. is $(3^{1/2} = 1.4422)$
(a) 11.22% **(b)** 33.22%
(c) 40% **(d)** 44.22%

11. Find the amount of Rs.2000 after 10 years at 8% converted quarterly for the 1st 4 years and 6% converted monthly thereafter.
(a) Rs.4025.50 **(b)** Rs.3931.78
(c) Rs.2600.50 **(d)** None

12. A man invested one third of his capital at 7% one fourth at 8% and the remainder at 10%. If the annual income is Rs. 561. The capital is -
(a) Rs. 4,400 (b) Rs. 5,500
(c) Rs. 6,600 (d) Rs. 5,800

Compound Interest-Advance

13. Find the difference between the S.I. and C.I. on Rs.8000 for 3 years at 5% p.a.
(a) Rs.65 (b) Rs.62
(c) Rs.61 (d) None

14. The difference between C.I. and S.I on a certain sum of money invested for 3 years at 6% p.a is Rs. 110.16. The sum is?
(a) Rs. 3000 **(b)** Rs. 3700
(c) Rs. 12000 **(d)** Rs. 10000

15. A sum at C.I. becomes Rs. 1,020 after 3 yrs. & Rs.1,088 after 4 yrs. The rate of interest is
(a) 5.60% **(b)** 6.66%
(c) 7.66% **(d)** 8.66%

16. A sum at C.I. becomes Rs. 6,500 after 6 years &Rs. 7,800 after a further period of 2 more years. The amount due after a further period of 2 more years is –
(a) Rs. 9,360 **(b)** Rs. 6,500
(c) Rs. 9,100 **(d)** Rs. 9,390

17. Sohan deposited Rs.4800 in a bank after 4years it becomes Rs.6000 at a certain rate of compound interest what will be his amount in the bank after 12 years.
(a) Rs.9375 **(b)** Rs.9000
(c) Rs.9525 **(d)** None

18. If the compound Interest on a certain sum of money for 2 years at 4% p.a. be Rs.510, then its simple Interest (S.L) of same time at same rate of interest is
(a) Rs.500 **(b)** Rs.510
(c) Rs.450 **(d)** None

Effective Rate

19. The effective rate of interest corresponding to a nominal rate 3% p.a. payable half yearly is
(a) 3.2%
(b) 3.25% p.a.
(c) 3.0225% p.a.
(d) None of these

20. The effective rate of interest corresponding a nominal rate of 7% p.a. convertible quarterly is
(a) 7% **(b)** 7.5%
(c) 5% **(d)** 7.18%

Depreciation

21. The useful life of a machine is estimated to be 10 years and cost Rs. 10000. Rate of depreciation is 10% p.a. The scrap value at the end of its life is
(a) Rs. 3486 **(b)** Rs. 4383
(c) Rs. 3400 **(d)** Rs. 10000

22. A machine is depreciated at the rate of 10% on reducing balance. The original cost was Rs. 10,000 and the ultimate scrap value was Rs.3,750. Find the effective life of the machine. (Given: log 2 = 0.30103, log 3= 0.47712).
(a) 5 yrs. **(b)** 5.19 yrs.
(c) 9.3 yrs. **(d)** None of these

Phase-2

Present Value

23. The present value of an annuity of Rs. 3000 for 15 years at 4.5% p.a. CI is
(a)Rs. 23809.41 (b)Rs. 32218.63
(c)Rs. 32908.41 (d) none of these

24. A loan of Rs. 10.000 is to be paid back in 30 equal instalments. The amount of each installment to cover the principal and at 4% p.a. CI is
(a)Rs. 587.87 (b)Rs. 587
(c)Rs. 578.87 (d) none

25. Y bought a TV costing Rs. 13,000 by making a down payment of Rs. 3000 and agreeing to make equal annual payment for four years. How much would be each payment if the interest on unpaid amount be 14% compounded annually?
(a) Rs. 3,432.05 (b) Rs. 3,932.05
(c)Rs. 15000 (d) none

26. Munna purchased LED TV paying Rs.5,000 down and promising to pay Rs.200 every quarter for next 10 years. The seller charges interest at the rate of 12% per annum compounded quarterly. If Munna missed the first 10 payments, what must he pay when the 11th payment is due to discharge his entire loan?
(a) Rs.5873.86 (b) Rs.7108.6
(c) Rs.6399.26 (d) None

27. Ram purchased a house for which he agreed to pay Rs.5000 at the beginning of each 3 months until he has made 10 payments. If money is worth 6% compounded quarterly, what is the equivalent cash price of the house?
(a) Rs. 46802.58 (b) Rs. 47108.60
(c) Rs. 46399.26 (d) None

Future Value

28. A person invests Rs. 500 at the end of each year with a bank which pays interest at 10% p. a. C.I. annually. The amount standing to his credit one year after he has made his yearly investment for the 12^{th} time is.
(a)Rs. 11764.50 (b)Rs. 10000
(c)Rs. 12000 (d) none

29. Rs 200 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the future value of this annuity after 10^{TH} payment?
(a) Rs. 2044 (b)Rs. 5000
(c)Rs. 1200 (d) none

30. 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) Rs.73.86 (b) Rs.31.60
(c) Rs.78.64 (d)None

31. At the Beginning of each Period Consisting of 6-months, Rs 500 is deposited into saving account that pays 5% compounded half-yearly. Find the balance in the account at the end of 5^{th} year.
(a) Rs.5724 (b) Rs.5742
(c) Rs.5472 (d) None

Perpetual Annuity

32. Assuming that the discount rate is 7% p.a. how much would pay to. receive Rs. 200 growing at 5% annually forever?
(a) Rs. 2,500 (b) Rs. 5,000
(c) Rs. 7,500 (d) Rs. 10,000

Present Value of Future Money

33. Find the present value of Rs. 1,00,000 to be required after 5 years if the interest rate be 9%. Given that $1{,}09^5 = 1.5386$.
(a) 78,995.98
(b) 64,994.15
(c) 88,992.43
(d) 93,902.12

Net Present Value

34. If the cost of capital be 12% per annual, then the net present value (in nearest Rs. in thousand) from the given cash flow is given as:

Years	0	1	2	3
OP	(100)	60	40	50

(a) 31048 (b) 34185
(c) 21048 (d) 24187

Capital Investment

35. A machine with useful life of 7 years costs Rs. 10,000 while another machine with useful life of 5 years costs Rs. 8,000. The first machine saves labor expenses of Rs. 1900 annually and the second one saves labor expenses by Rs. 2,200 annually. Determine the preferred course of action. Assume cost of borrowing as 10% per annum.
(a) First machine
(b) Second machine
(c) Any of two machines
(d) Both the machine.

Leasing Concept

36. ABC Ltd. wants to lease out an asset costing Rs. 3,60,000 for a five-year period. It has fixed a rental of Rs. 1,05,000 per annum payable annually starting from the end of first year. Suppose rate of interest is 14% per annum compounded annually on which money can be invested by the company. Is this agreement favorable to the company?
(a) Leasing is preferable
(b) Leasing is not preferable

Valuation of Bond

37. What will be the price of a bond with a face value of Rs.1000 carrying a coupon of 10% maturing in 3 Years at 10% premium on par value?
(a) Rs.826.43 (b) Rs.7835.26
(c) Rs.1075.12 (d) Rs.1000

CAGR Model

38. Let the operating profit of a manufacturer for five years is given as:

Years	1	2	3	4	5	6
OP	90	100	106.4	107.14	120.24	157.34

Then the operating profit (OP) of Compound Annual Growth Rate (CAGR) for year 6 with respect to year 2 is
(a) 9% (b) 12%
(c) 11% (d) 13%

39. If the initial investment of 4,00,000 becomes Rs. 6,00,000 in 24 months, then the Compounded Annual Growth Rate (CAGR) is:
(a) 30.33% (b) 22.4%
(c) 19.46% (d) 14.47%

Additional Question Bank

1. The compound interest for a certain sum @ 5% p.a. for first year is Rs. 25. The SI for the same money @ 5% p.a. for 2 years will be.
(a) Rs. 40 (b) Rs. 50
(c) Rs. 60 (d) Rs. 70.

2. If the simple Interest on a sum of money at 12% p.a. for two years is Rs. 3,600. The compound interest on the same sum for two years at the same rate is :
(a) Rs. 3,816 (b) Rs. 3,806
(c) Rs. 3,861 (d) Rs. 3,860

3. Mr. X invests 'P' amount at Simple Interest rate 10% and Mr. Y invests 'Q' amount at Compound Interest rate 5% compounded annually. At the end of two years both get the same amount of interest, then the relation between two amounts P and Q is given by :
(a) $P = \frac{41Q}{80}$ (b) $P = \frac{41Q}{40}$
(c) $P = \frac{41Q}{100}$ (d) $P = \frac{41Q}{200}$

4. If a simple interest on a sum of money at 6% p.a. for 7 years is equal to twice of simple interest on another sum for 9 years at 5% p.a. The ratio will be:
(a) 2:15 (b) 7: 15
(c) 15:7 (d) 1:7

5. By mistake a clerk, calculated the simple interest on principal for 5 months at 6.5% p.a. instead of 6 months at 5.5% p.a. If the error in calculation was Rs. 25.40. The original sum of principal was ____.
(a) Rs. 60,690 (b) Rs. 60,960
(c) Rs. 90,660 (d) Rs. 90,690

6. The partners A and B together lent Rs. 3,903 at 4% per annum interest compounded annually. After a span of 7 years, A gets the same amount as B gets after 9 years. The share of A in the sum of Rs. 3,903 would have been:
(a) Rs. 1,875 (b) Rs. 2,280
(c) Rs. 2,028 (d) Rs. 2,820

7. A certain sum of money was invested at simple rate of interest for three years, if the same has been invested at a rate that was seven percent higher, the interest amount would have been Rs. 382 more. The amount of sum invested is:
(a) Rs. 12,600 (b) Rs. 6,800
(c) Rs. 4,200 (d) Rs. 2,800

8. A sum of money doubles itself in 8 years at simple interest. The number of years it would triple itself is _____.
(a) 20 years (b) 12 years
(c) 16 years (d) None of these

9. Mr. X bought an electronic item for Rs. 1,000. What would be the future value of the same item after 2 years, if the value is compounded semi. annually at 22% per annum?
(a) Rs. 1,488.40 (b) Rs. 1,518.07
(c) Rs. 2,008.07 (d) Rs. 2,200.00

10. If an amount is kept at simple interest, it earns an interest of Rs. 600 in first two years but when kept at compound interest it earns an interest of Rs. 660 for the same period, then the rate of interest and principal amount respectively are:
(a) 20%, Rs. 1,200 (b) 10%, Rs. 1,200
(c) 20%, Rs. 1,500 (d) 10%, Rs. 1,500

11. A person borrows Rs. 5,000 for 2 years at 4% per annual simple interest. He immediately lends to another person at $6\frac{1}{4}$ %. Per annual for 2 years find his gain in the transaction for year:
(a) Rs. 112.50 (b) Rs. 225
(c) Rs. 125 (d)Rs. 107.50

12. A certain sum of money Q was deposited for 5 year and 4 months at 4.5% simple interest and amounted to Rs. 248, then the value of Q is
(a) Rs. 200 (b) Rs. 210
(c) Rs. 220 (d) Rs. 240

Summary Notes

Chapter 5 Permutation & Combination

Problems Based on Word

1. How many different words can be formed with letters of the word HARYANA?
(a) 240 (b) 360
(c) 840 (d) 640

2. The number of ways in which the letters of the word 'MOBILE' be
(a) arranged **Ans :720**
(b) re-arranged **Ans :719**
(c) vowels come together **Ans :144**
(d)vowels never come together **Ans :576**

3. The number of ways the letters of the word "TRIANGLE" to be arranged so that the word "ANGLE" will be always present
(a) 20 (b) 60
(c) 24 (d) 32

4. The number of different words that can be formed with 12 consonants and 5 vowels by taking 4 consonants and 3 vowels in each word is
(a) $12_{c_4} x 5_{c_3}$ (b) 17_{c_7}
(c) 4950 x 7! (d)none of these

5. The ways of selecting 4 letters from the word 'EXAMINATION' is
(a) 136 (b) 130
(c) 125 (d) none of these

6. The number of arrangements in which the letters of the word 'MONDAY' be arranged so that the words thus formed begin with M and do not end with N is
(a) 720 (b) 120
(c) 96 (d) none of these

7. The number of words that can be made by rearranging the letters of the word APURNA so that vowels and consonants appear alternate is
(a) 18 (b) 35
(c) 36 (d) none of these

Problems Based on Number

8. How many four-digit number can be formed by using the digit 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 with no digit repeated?
(a) 4536 (b) 3604
(c) 3354 (d) 5554

9. The number of 4-digit numbers greater than 5,000 can be formed out of the digits 3,4,5,6 and 7 (No Digit is repeated) the number of such is
(a) 72 (b) 27
(c) 70 (d)none

10. The number of numbers lying between 100 and 1000 can be formed with the digits 1,2,3,4, 5,6,7 is
(a) 210 (b) 200
(c) 110 (d)none

11. The number of even numbers greater than 300 can be formed with the digits 1,2,3,4,5 without repletion is
(a) 110 (b) 112
(c) 111 (d)none

12. The sum of all 4-digit number containing the digits 2, 4, 6, 8 without repetitions is
(a) 1,33,320 (b) 1,22,220
(c) 2,13,330 (d)none

Circular Permutation

June-2011

13. If 15 persons are to be seated around 2 round tables, one occupying 8 persons and another 7 persons. Find the number of ways in which they can be seated.
(a) $\frac{15!}{18!}$ (b) $^{15}C_7 \frac{7!}{8!}$
(c) 7!.8! (d) $2.^{15}C_7$ 6! 7!

Problems Based on Geometry

14. The number of straight lines obtained by Joining 16 points on a plane, on twice of them being on the same line is
(a) 120 (b) 110
(c) 210 (d) none

15. 8 Points are marked on circumference of a circle. The number of chords obtained by joining these in pairs is
(a)25 (b) 27
(c) 28 (d) none of these

16. There are 12 points in a plane of which 5 are collinear. The number of triangles in
(a) 200 (b) 211
(c) 210 (d) none of these

17. The number of diagonals in a decagon is
(a) 30 (b) 35
(c) 45 (d) none

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

Alternate | Non-Alternate

June-2011

19. A garden is having 6 tall trees in a row. In how many ways can 5 children stand, one in a gap between the trees in order to pose for a photograph?
(a) 24
(b) 120
(c) 720
(d) 30

Problems Based on Theorem

20. A person has 8 friends. The number of ways in which he may invite one or more of them to a dinner is.
(a) 250 (b) 255
(c) 200 (d) none of these

21. The number of ways in which the letters of 10 different things taken 4 at a time in which one particular thing always occurs is
(a) 2015 (b) 2016
(c) 2014 (d) none of these

22. The number of arrangements of 10 things taken 4 at a time in which one particular thing never occurs is
(a) 3,020 (b) 3,025
(c) 3,024 (d) none of these

23. The number of ways in which a person can chose one or more of the four electrical appliances: T.V. Refrigerator. Washing Machine and a cooler is?
(a) 15 (b) 25
(c) 24 (d) none of these

24. The number of ways in which 12 students can be equally divided into three groups is
(a) 5775 (b) 7575
(c) 7755 (d) none of these

25. The number of ways in which 15 mangoes can be equally divided among 3 students is
(a) 15! /5!^{4} (b)15! /5!^{3}
(c)15! /5!^{2} (d) none of these

Additional Question Bank

Algebraic Based

1. The value of 1.3.5.7.9..... (2n – 1) is
(a) $\frac{2n!}{4!}$ (b) $\frac{2n!}{2.n!}$
(c) $\frac{(2n)!}{2^n.n!}$ (d) $\frac{(3n)!}{2^n.n!}$

2. The LCM of 6! 7! & 8! Is
(a) 8! (b) 7!
(c) 6! (d) none

3. HCF of 3! 7! & 5! Is
(a) 5! (b) 7!
(c) 3! (d) none

4. If $\frac{1}{4!}+\frac{1}{5!}=\frac{x}{6!}$; the value of x is
(a) 26 (b) 36
(c) 52 (d) none

5. If ${}^{18}C_r = {}^{18}C_{r+2}$ the value of ${}^{r}C_5$ is
(a) 55 (b) 50
(c) 56 (d) None

6. If ${}^{13}C_6 + 2\ {}^{13}C_5 + {}^{13}C_4 = {}^{15}C_x$, value of x is
(a) 6 or 7 (b) 6 or 8
(c) 6 or 9 (d) None

7. If ${}^{10}P_r = 604800$ and ${}^{10}C_r = 120$. Find the value of r.
(a) 7 (b) 2
(c) 5 (d) 6

8. If ${}^{2n}C_3 : {}^{n}C_2 = 44 : 3$, then value of n is
(a) 8 (b) 6
(c) 18 (d) 5

9. If ${}^{167}C_{90} + {}^{167}C_x = {}^{168}C_x$ then value of x is
(a) 89 (b) 90
(c) 91 (d) 92

10. If ${}^{1000}C_{98} = {}^{999}C_{97} + {}^{x}C_{901}$, find the value of x
(a) 999 (b) 989
(c) 889 (d) 898

11. In how many ways 5 Sanskrit 3 English and 3 Hindi books be arranged keeping the books of the same language together?
(a) 5!.3!.3!.3! (b) 5!.3!.3!
(c) 11! (d) none

12. The number of ways a person can contribute to a fund out of 1 ten-rupee note. 1 five-rupee note 1 two-rupee and 1 one-rupee note is
(a)15 (b) 25
(c) 10 (d) none of these

13. In how many ways can a student choose 5 courses out of 9 courses, if 2 courses are compulsory?
(a) 35 (b) 25
(c) 45 (d) 15

14. There are 5 speakers A, B, C D and E. The number of ways in which A will speak always before B is
(a) 24 (b) 4! 2
(c) 5 (d) none of these

15. Out of 7 gents and 4 ladies a committee of 5 is to be formed. The number of committees such that each committee includes at least one lady is
(a)400 (b) 440
(c) 441 (d) none of these

16. At an election there are 5 candidates and 3 members are to be elected. A voter is entitled to vote for any number of candidates not greater than the number to be elected. The number of ways a voter chooses to vote is
(a) 20 (b) 22
(c) 25 (d) none of these

17. The total number of ways in which six '+' and four '-' signs can be arranged in a line such that no two '-' signs occur together is
(a) $\lfloor\underline{7} / \lfloor\underline{3}$ (b) $\lfloor\underline{6} \times \lfloor\underline{7} / \lfloor\underline{3}$
(c) 35 (d) none of these

18. The number of 4-digit numbers formed with the digits 1,1, 2, 2, 3, 4 is
(a) 100 (b) 101
(c) 201 (d) 102

19. 5 letters are written and there are five letter-boxes. The number of ways the letters can be dropped into the boxes, are in each
(a) 119 (b) 120
(c) 121 (d) none of these

20. How many telephone connections may be allotted with 8 digits from the numbers 0, 1, 2.....9?
(a) 10^8 (b) 10!
(c) 9! (d) ${}^{10}P_8$

21. Six boys and five girls are to be seated for a photograph in a row such that no two girls sit together and no two boys sit together. Find the number of ways in which this can be done.
(a) 86400 (b) 14400
(c) 518400 (d) none

Chapter 6 Sequence & Series

Your Math's Buddy
Aman Khedia

Arithmetic Progression

1. Which term of the progression -1, -3, -5, ... Is -39
(a) 21st (b) 20th
(c) 19th (d) none of these

2. The value of x such that $8x + 4, 6x - 2, 2x + 7$ will form an AP is
(a) 15 (b) 2
(c) 15/2 (d) none of these

3. The number of numbers between 74 and 25556 divisible by 5 is
(a) 5090 (b) 5097
(c) 5095 (d) none of these

4. The sum of all positive integral multiples of 3 less than 100 is
(a) 1584 (b) 1665
(c) 1683 (d) None of these

5. In an A.P. 3rd term is 18 & 7th term is 30, the sum of its 17 terms is
(a) 600 (b) 612
(c) 624 (d) None of these

6. If the 9th term of an A.P. is zero, $\frac{t_{29}}{t_{19}}$ is
(a) 1 (b) 2
(c) 3 (d) 4

7. The 4 arithmetic means between -2 & 23 are
(a) 3, 13, 8, 18 (b) 18, 3, 8, 13
(c) 3, 8, 13, 18 (d) none of these

8. The first and the last term of an AP are -4 and 146. The sum of the terms is 7171. The number of terms is
(a) 101 (b) 100
(c) 99 (d) none of these

9. In an A.P. 3rd term is 18 & 7th term is 30, the sum of its 17 terms is
(a) 600 (b) 612
(c) 624 (d) None of these

Geometric Progression

10. The 7th term of the series 6, 12, 24, ...is
(a) 384 (b) 834
(c) 438 (d) none of these

11. t_8 of the series 6, 12, 24...is
(a) 786 (b) 768
(c) 867 (d) none of these

12. The 4th term of the series 0.04, 0.2, 1.....is
(a) 0.5 (b) ½
(c) 5 (d) none of these

13. If you save 1 paise today, 2 paise the next day 4 paise the succeeding day and soon, then your total savings in two weeks will be
(a)Rs. 163 (b)Rs. 183
(c) Rs. 163.83 (d) none of these

14. The sum of the infinite GP 14, - 2, + 2/7, ...is
(a) $4\frac{1}{12}$ (b) $12\frac{1}{4}$
(c) 12 (d) none of these

15. Four geometric means between 4 and 972 are
(a) 12 ,36 ,108 ,324
(b) 12, 24, 108, 320
(c) 10, 36, 108, 320
(d) none of these

16. The number of terms to be taken so that $1 + 2 + 4 + 8 +$ will be 8191 is
(a) 10 (b) 13 (c) 12 (d) none

17. The sum of the series $\frac{1}{\sqrt{3}} + 1 + \frac{3}{\sqrt{3}} + \cdots$ ... to 18 terms is
(a) $9841\frac{(1+\sqrt{3})}{\sqrt{3}}$ (b) 9841
(c) $\frac{9841}{\sqrt{3}}$ (d) none of these

Actual Que on Seq & Series

18. The nth element of the sequence 1, 3, 5, 7, ...Is
(a)n (b) 2n – 1
(c) 2n + 1 (d) none

19. The sum of n terms of the series $2.4.6 + 4.6.8 + 6.8.10 +$ .....is
(a) $2n(n^3+6n^2+11n+6)$
(b) $2n(n^3-6n^2+11n-6)$
(c) $n(n^3+6n^2+11n+6)$
(d) $n(n^3+6n^2+11n-6)$

20. The first three terms of sequence when nth term t, is $n^2 - 2n$ are
(a) -1, 0, 3
(b) 1, 0, 2
(c) -1, 0, -3
(d) none of these

21. The sum of n terms of an AP is $3n^2 + 5n$. The series is.
(a) 8, 14, 20, 26...
(b) 8, 22, 42, 68...
(c) 22, 68, 114, ...
(d)none of these

22. The nth term of the series whose sum to n terms is $5n^2 + 2n$ is
(a) 3n - 10
(b) 10n – 2
(c) 10n - 3
(d) none of these

Assuming Value Problem

23. If p, q and r are in A. P. and x, y, z are in G.P. then $x^{q-r}, y^{r-p}, z^{p-q}$ is equal to
(a) 0 (b) -1
(c) 1 (d) none of these

24. If x, y, z are in G.P., then
(a) $y^2 = xz$
(b) $y(z^2 + x^2) = x(z^2 + y^2)$
(c) $2y = x + z$
(d) none of these

25. If $\frac{1}{x+y}, \frac{1}{2y}, \frac{1}{y+z}$ are in A.P., then x, y, z are in
(a) G.P. (b) A.P
(c) Both (a)&(b) (d) None

26. The sum of n terms of two A.P are in the ratio of $(7n - 5)/(5n + 17)$. Then the _____ term of the two series are equal.
(a) 12 (b) 6
(c) 3 (d) none

27. The sum of all-natural numbers from 100 to 300 which are exactly divisible by 4 or 5 is
(a) 10200 (b)15200
(c) 16200 (d) None

28. If S_1, S_2, S_3 be the respectively the sum of terms of n, 2n, 3n an A.P. the value of $\frac{S_3}{(S_2 - S_1)}$ is given by___
(a) 1 (b) 2
(c) 3 (d) None

29. If S_1, S_2, S_3 be the sums of n terms of three A.P.s the first term of each being unity and the respective common differences 1, 2, 3 then $\frac{S_3}{(S_2 - S_1)}$ is ____
(a) 1 (b) 2
(c) -1 (d) None

Relation Between AM GM & HM

31. If AM and HM of two numbers are 32 and 2 respectively then G.M. is
(a) 8 (b) $4\sqrt{2}$
(c) 64 (d) None

General Approach Variable Que

30. The mth term of an A.P. is n and nth term is m. The r the term of it is
(a) m + n + r (b) n + m – 2r
(c) m + n + r/2 (d) none

Additional Question Bank

1. If in an A.P., t_n represents n^{th} term. If $t_7 : t_{10} = 5:7$ then $t_8 : t_{11} =$ ____
(a) 13: 16 (b) 17: 23
(c) 14: 17 (d) 15: 19

2. Divide 144 into three parts which are in AP and such that the largest is twice the smallest, the smallest of three numbers will be :
(a) 48 (b) 36
(c) 13 (d) 32

3. If G be Geometric Mean between two numbers a and b, then the value of $\frac{1}{G^2-a^2}+\frac{1}{G^2-b^2}$ is equal to
(a) G^2 (b) $3\,G^2$
(c) $1/G^2$ (d) $2/G^2$

4. If Sum (S_n) of 'n'- terms of an Arithmetic Progression is $(2n^2 + n)$. What is the difference of its 10^{th} and 1^{st} term?
(a) 207 (b) 36
(c) 90 (d) 63

5. If Sum (S_n) of 'n' Find the product of; $(243), (243)^{1/6}, (243)^{1/36}$.....
(a) 1,024 (b) 27
(c) 729 (d) 246

6. Geometric Mean of P, P^2, P^3 ....., P^n will be:
(a) P^{n+1} (b) $P^{\frac{1+n}{2}}$
(c) $P^{\frac{n(n+1)}{2}}$ (d) None

7. The sum of all two Digit odd numbers is
(a) 2475 (b) 2575
(c) 4950 (d) 5049

8. If 5^{th} term of a G.P. is $\sqrt[3]{3}$, then the product of first nine terms is
(a) 8 (b) 27
(c) 243 (d) 9

9. If 5^{th} term of a G.P. is $\sqrt[3]{3}$, then the product of first nine terms is
(a) 8 (b) 27
(c) 243 (d) 9

9. If arithmetic mean between roots of a quadratic equation is 8 and the geometric mean between them is 5, the equation is _____.
(a) $x^2 - 16x - 25 = 0$ (b) $x^2 - 16x + 25 = 0$
(c) $x^2 - 16x + 5 = 0$ (d) None

10. If Geometric mean (G.M.) of a, b, c, d is 3, then G.M. of $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$ will be:
(a) 1/3 (b) 3
(c) 81 (d) 1/81

11. If $S_n = n^2p$ and $S_m = m^2p$ $(m \neq n)$ is the sum of an A.P. then $S_p =$ _____
(a) p^2 (b) p^3
(c) $2p^3$ (d) p^4

12. If S be the sum, P the product and R is the sum of reciprocals of n- terms in G.P then $P^2R^n =$ _
(a) S^{2n} (b) S^n
(c) S^{2n} (d) S^{-n}

13. The sum of n terms of the series: $\log x + \log\frac{x^2}{y} + \log\frac{x^3}{y^2} +$.....is
(a) $\frac{n}{2}\left[2n\log\left(\frac{x}{y}\right)+\log xy\right]$ (b) $\frac{n}{2}\left[n\log xy+\log\left(\frac{x}{y}\right)\right]$
(c) $\frac{n}{2}\left[n\log\left(\frac{x}{y}\right)-\log xy\right]$ (d) $\frac{n}{2}\left[n\log\left(\frac{x}{y}\right)+\log xy\right]$

14. G. P. (Geometric Progression) consists of 2n terms. If the sum of the terms occupying the odd places is S_T and that of terms in the even places is S_2, the common ratio of the progression is:
(a) n (b) $2S_1$
(c) $\frac{S_2}{S_1}$ (d) $\frac{S_1}{S_2}$

15. If $\frac{(b+c-a)}{a}, \frac{(c+a-b)}{b}, \frac{(a+b-c)}{c}$ are in AP then a, b, c are in:
(a) AP (b) GP
(c) HP (d) None

16. The largest value of n for which $\frac{1}{2}+\frac{1}{2^2}+\ldots\frac{1}{2^n} < 0.998$ is.
(a) 9 (b) 6
(c) 7 (d) 8

17. The n^{th} term of series 9,7,5....and 15,12, 9... are same. Find the n^{th} term?
(a) 7 (b) 8
(c) 9 (d)10

Chapter 7A Sets

Basics

1. If A = {2, 5, 6, 8}, then n (A) is
(a) 2 (c) 5
(b) 4 (d) 1

2. If A has 70 elements, B has 32 elements and A ∩ *B* has 22 elements then A ∪ B is
(a) 60 (c) 80
(b)124 (d) none of these

3. E is a set of positive even number and O is a set of positive odd numbers, then E ∪ O is a
(a) Set of whole numbers
(b) N
(c) a set of rational number
(d) none of these

4. If A has 32 elements, B has 42 elements and A ∪ B has 62 elements, the number of elements in A ∩ B is
(a) 12 (c) 10
(b) 74 (d) none of these

5. If n (P) = 3 and n (Q) = 4, then n (P × Q) is
(a) 3 (c) 12
(b) 4 (d) 1

6. If the set P has 3 elements, Q four and R two then the set P × Q × R contains
(a) 9 elements (c) 24 elements
(b) 20 elements (d) none

7. Write each given set in the Set-Builder Form:
(i) {2, 4, 6, 8, 10}
(ii) {2, 3, 5, 7, 11}
(iii) {January, June, July}
(iv) {a, e, i, o, u}
(v) {Tuesday, Thursday}
(vi) {1, 4, 9, 16, 25}
(vii) {5, 10, 15, 20, 25, 30}

Types of Set

8. If N is the set of natural numbers and I is the set of positive integers, then
(a)N = I (c) N⊂ I
(b)N⊆ I (d) none

9. The set of cubes of the natural number is
(a)A finite set (c) a null set
(b)An infinite set (d) none

10. The set of squares of positive integers is
(a) A finite set (c) an infinite set
(b) Null set (d) none

11. The set $\{2^x \mid x$ is any positive rational number$\}$ is
(a) An infinite set (c) a finite set
(b)A null set (d) none

12. The range set of a constant function is a –
(a) Disjoint set (c) void set
(b) Singleton set (d) infinite set

13. The number of subsets of a set containing n elements is
(a) 2^n (c) n
(b) 2^{-n} (d) none

14. A set containing 4 elements have –
(a) 15 subsets (c) 14 subsets
(b) 16 subsets (d) 13 subsets

Operations on Set

15. If P = {1, 2, 3, 4}: Q = {2, 4, 6} then P ∪ Q
(a) {1, 2, 3, 6} (c){1, 2, 3, 4, 6}
(b) {1, 4, 6} (d) none of these

16. (A ∪ B) is equal to
(a) (A ∩ B)
(b) A ∪ B`
(c) A` ∩ B`
(d) none of these

17. (A∩ B)` is equal to
(a) (A` ∪ B`)
(b) A ∪ B`
(c) A`∩ B`
(d) none of these

18. If V= {0, 1, 2, ...9}, X= {0, 2, 4, 6, 8}, Y= {3, 5, 7} and Z= {3 7} then

(i) Y ∪ Z, (V ∪ Y) ∩ X, (X ∪ Z) ∪ V are respectively: -
(a) {3, 5, 7}, {0, 2, 4, 6, 8}, {0, 1, 2, .9}
(b) {2, 4, 6}, {0, 2, 4, 6, 8}, {0, 1, 2, .9}
(c) {2, 4, 6}, {0, 1, 2, ...9}, {0, 2, 4, 6, 8}
(d) None

(ii) (X ∪ Y) ∩ Z and (ϕ∪ V) ∩ ϕ are respectively: -
(a) {0, 2, 4, 6, 8}, ϕ
(b){3, 7}, ϕ
(c) {3, 5, 7}, ϕ
(d) None

Difference of Set

19. If A = {1,2,3,4,5,6,7} and B = {2,4,6,8}. Cardinal number of A − B is:
(a) 4 (b) 3
(c) 9 (d) 7

Venn Diagram

20. Out 2000 staff 48% preferred coffee 54% tea and 64% cocoa. Of the total 28% used coffee and tea 32% tea and cocoa and 30% coffee and cocoa. Only 6% did none of these.

(i) Find the number having all the three.
(a) 360 (b) 280
(c) 160 (d) None

(ii) As per above question with the same order of options (a), (b), (c) and (d) find the number having tea and cocoa but not coffee.
(a) 360 (b) 280
(c) 160 (d) None

(iii) As per above question with the same order of options (a), (b), (c) and (d) find the number having only coffee.
(a) 360 (b) 280
(c) 160 (d) None

21. Out of total 150 students 45 passed in Accounts 50 in Math's. 30 in Costing 30 in both Accounts and Math's. 32 in both Math's and Costing 35 in both Accounts and Costing. 25 students passed in all the three subjects. Find the number who passed at least in any one of the subjects.
(a) 63 (b) 53
(c) 73 (d) None

22. Out of 60 students 25 failed in paper (1), 24 in paper (2), 32 in paper (3), 9 in paper (1) alone, 6 in paper (2) alone, 5 in papers (2) and (3) and 3 in papers (1) and (2). Find how many failed in all the three papers.
(a) 10 (b) 60
(c) 50 (d) None

Your Math's Buddy
Aman Khedia

Chapter 7B Relations & Function

Function or not?

1. $\{(x, y), Y = x^2\}$ is
(a) Not a function
(b) **(c)** inverse mapping
(c) A function
(d) **(d)** none of these

2. $\{(x, y)\ x = 4\}$ is a
(a) Not a function
(b) **(c)** one – one mapping
(c) Function
(d) none of these

3. If $A = \{1, 2, 3\}$ and $B = \{4, 6, 7\}$ then the relation $R = \{(2, 4)\ (3, 6)\}$ is
(a) A function from A to B
(b) A function from B to A
(c) both **(a)** and **(b)**
(d) **(d)** not a function

4. $\{(x, y) I x<y\}$ is a
(a) Not a function
(b) **(c)** one-one mapping
(c) A function
(d) **(d)** none of these

5. If $A = \{1, 2, 3, 4,\}$
$B = \{2, 4, 6, 8,\}$
$f(1) = 2, f(2) = 4, f(3) = 6$ and
$f(4) = 8$, And $f: A \to B$ then f^{-1} is :
(a) $\{(2,1), (4, 2), (6,3), (8,4)\}$
(b) $\{(1,2), (2,4), (3,6), (4,8)\}$
(c) $\{(1,4), (2, 2), (3, 6), (4, 8)\}$
(d) None of these

Domain & Range

6. Range of function $f(x) = \frac{1}{(1-x)}$ is –
(a) Set of rational numbers
(b) Set of real numbers (except zero)
(c) Set of natural numbers
(d) Set of integers

7. The range of the function
$f(x) = \log_{10}(1 + x)$ for the domain of real values of x when $0 \le x \le 9$ is
(a) {0}
(b) {0, 1, 2}
(c) {0, 1}
(d) none

8. The domain and range of $\{(x, y): y = x^2\}$ is
(a) (reals, natural numbers)
(b) (reals, reals)
(c) (reals, positive reals)
(d) none of these

9. The range of the function
$f: N \to N; f(x) = (-1)^{x-1}$, is
(a) $\{0, -1\}$ (b) $\{1, -1\}$
(c) $\{1,0\}$ (d) $\{1,0, -1\}$

10. The domain of $\{(1, 7), (2, 6)\}$ is
(a) (1, 6) (b) (1, 2)
(c)7, 6) (d) (6, 7)

11. The range of $\{(3, 0), (2, 0), (1, 0), (0, 0)\}$ is
(a) (0, 0) (c) (0)
(c) {0, 0, 0, 0} (d) none of these

12. For the function $h(x) = 10^{1+x}$ the domain of real values of x where $0 \le h(x) \le 9$, the range is
(a) $10 \le x(x) \le 10^{10}$
(b) $0 \le h(x) \le 10^{10}$
(c) $0 < h(x) < 10$
(d) none of these

Types of Function

13. If $f(x) = x^2, x > 0$, then the function is
(a) Not one to one function
(b) into function
(c) One to one function
(d) none of these

14. N is the set of all-natural numbers and E is the set of all even numbers. If f: N E defined by $f(x) = 2x$, for all $x \varepsilon$ N is:
(a) One – one and onto
(c) Many one onto
(c) one – one into
(d) can't say

15. The function $f(x) = 2^x$ is
(a) One One **(b)** many one
(c) One many **(d)** none of these

16. $\{(x, y)\ I\ x + y = 5\}$ is
(a) Not a function
(b) one – one mapping
(c)A composite function
(d) none of these

17. Let $f: Z \to Z\ f(x) = x^2 + x\ for\ all\ x \in z$, then f is:
(a) Many-one **(b)** One-One
(c) Onto **(d)** None

18. The inverse $h^{-1}(x)$ when $h(x) = \log_{10}x$ is
(a) $\text{Log}_{10}x$ **(c)** $\log_{10}(1/x)$
(b) 10^x **(d)** none of these

19. If $f(x) = 1/1\text{-}x$, then $f^{-1}(x)$ is
(a) 1-x **(c)** x/x-1
(b) (x-1)/x **(d)** none of these

Types of Relation

20. "is equal to" over the set of all rational numbers is
(a) Transitive **(c)** reflexive
(b) Symmetric **(d)** equivalence

21. is perpendicular to" over the set of straight lines in a given plane is
(a) Symmetric **(c)** transitive
(b) Reflexive **(d)** equivalence

22. "is the squares of" over n set of real numbers is
(a) Reflexive **(c)** transitive
(b) Symmetric **(d)** none of these

23. If $A = \{1, 2, 3\}$
then $R = \{(1, 1), (2, 2), (3, 3), (1, 2)\}$ is
(a) Reflexive and transitive but not symmetric
(b) Reflexive and symmetric but nor transitive
(c) Symmetric and transitive but not reflexive
(d) Identity relation

24. "Is greater than" over the set of all-natural number if known as
(a) Transitive
(b) reflexive
(c) Symmetric
(d) equivalence

Additional Question Bank

1. There are 40 students, 30 of them passed in English, 25 of them passed in Math's and 15 of them passed in both. Assuming that every Student has passed at least in one subject. How many students passed in English only but not in Math's.
(a) 15 (b) 20
(c) 10 (d) 25

2. If A = {± 2, ± 3}, B = {1,4,9} and F = {(2, 4), (- 2, 4), (3, 9), (- 3, 4)} then 'F' is defined as
(a) One to one function from A into B.
(b) One to one function from A onto B.
(c) Many to one function from A onto B.
(d) Many to one function from A into B

3. If $f(x) = \frac{x}{\sqrt{1+x^2}}$ and $g(x) = \frac{x}{\sqrt{1-x^2}}$ Find fog?
(a) x (b) $\frac{1}{x}$
(c) $\frac{x}{\sqrt{1-x^2}}$ (d) $x\sqrt{1-x^2}$

4. The range of the function f: N → N; $f(x) = (-1)^{x-1}$, is
(a) {0,-1} (b) {1,-1}
(c) {1,0} (d) (d) {1,0,-1}

5. The minimum value of the function $x^2 - 6x + 10$ is __
(a) 1 (b) 2
(c) 3 (d) 10

6. The domain (D) and range (R) of the function: f(x) = 2 - | x+1 | is
(a) D = Real numbers, R = (2, ∞)
(b) D = Integers, R = (0, 2)
(c) D = Integers, R = (- ∞, ∞)
(d) D = Real numbers, R = (- ∞, 2)

7. The number of subsets of the set formed by the word Allahabad is:
(a) 128 (b) 16
(c) 32 (d) 64

8. The range of function f defined by $f(x) = \frac{x}{x^2+1}$ is:
(a) $\{x: \frac{-1}{2} < x < \frac{1}{1}\}$ (b) $\{x: \frac{-1}{2} \le x < \frac{1}{2}\}$
(c) $\{x: \frac{-1}{2} \le x \le \frac{1}{2}\}$ (d) $\{x: x > \frac{1}{2} \text{ or } x < \frac{-1}{2}\}$

9. If $f(x) = \frac{x+1}{x+2}$, then $f\left\{f\left(\frac{1}{x}\right)\right\} =$ _____.
(a) $\frac{2x+3}{3x+5}$ (b) $\frac{2x+5}{3x+2}$
(c) $\frac{3x+2}{5x+3}$ (d) $\frac{5x+2}{2x+3}$

10. Let N be the set of all natural numbers; E be the set of all even natural numbers then the function; F: N ⇒ E defined as $f(x) = 2x : x \in N$ is =
(a) One-one-into (b) Many-one-into
(c) One-one onto (d) Many-one-onto

11. A is {1,2,3,4} and B is {1,4,9,16,25} if a function f is defined from set A to B where $f(x) = x^2$ then the range of f is:
(a) {1,2,3,4} (b) {1,4,9,16}
(c) {1,4,9,16,25} (d) None

12. A = {1 2 34 10} a relation on A, R = {(x, y)/x + y = 10, x ∈ A, Y ∈ A, x ≥ Y} then domain of R^{-1} is
(a) {1, 2, 3, 4, 5} (b) {0, 3, 5, 7, 9}
(c) {1, 2, 4, 5, 6, 7} (d) None

13. Let F: R R be defined by $f(x) = \begin{cases} 2x \text{ for } x > 3 \\ x^2 \text{ for } 1 < x \le 3 \\ 3x \text{ for } x \le 1 \end{cases}$ The value of f(-1) + f(2) + f(4)
(a) 9 (b) 14
(c) 5 (d) 6

14. The range of the function f defined by $f(x) = \sqrt{16 - x^2}$ is
(a) [-4, 0] (b) [-4, 4]
(c) [0, 4] (d) [+4, 4]

15. If $f(x) = x^2 - 1$ and $g(x) = |2x + 3|$, then fog (3) - gof (-3) =?
(a) 71 (b) 61
(c) 41 (d) 51

Summary Notes

Your Math's Buddy
Aman Khedia

Chapter 8A Derivation

Basics & Chain Rule

1. If y= 2x+x^2 then dy/dx is:
(a) 2(x+1) (b) 2(x-1)
(c) x+1 (d) x-1

2. The gradient of the curve y= $2x^3 - 5x^2 - 3x$ *at* $= 0$ *is*:
(a) 3 (b) -3
(c) 1/3 (d) none

3. if y= x (x-1) (x-2) then $\frac{dy}{dy}$is:
(a)$3x^2 - 6x + 2$ (b)$-6x + 2$
(c)$3x^2 + 2$ (d) none

4. If (x) = e^{ax^2+bx+c}, *the* $f'(x)$*is*:
(a)e^{ax^2+bx+c}
(b)e^{ax^2+bx+c} (2ax+b)
(c) 2ax+b
(d) none

5. If $y = 2^{log_2 x}$, then $dy/dx$is:
(a)$1/x$ (b)$2/x$
(c) 1 (d) none

6. The derivative of y =$\sqrt{x+1}$is:
(a) $1/\sqrt{x+1}$ (b) $-1/\sqrt{x+1}$
(c) $(1/2)\sqrt{x+1}$ (d) None

7. The speed of a train at a distance x is given by $3x^2 - 5x + 4$. What is the rate of change (of distance) at x = 1?
(a) -1 (b) 0
(c) 1 (d) 2

8. Let y = $\sqrt{2x} + 3^{2x}$ then $\frac{dy}{dx}$ is equal to
(a) $(1/\sqrt{2x}) + 2.3^{2x} \log_e 3$
(b) $1/\sqrt{2x}$
(c) $2.3^{2x} \log_e 3$
(d) none of these

9. If f (x) = x^2- 6x+8 then f' (5) -f' (8) is equal to:
(a) f'(2) (b) 3f'(2)
(c) 2f' (2) (d) None

Multiplication & Division Rule

10. If y= $5xy, then\ dx/dy\ is$:
(a) $\frac{5y}{1-5x}$ (b) $\frac{4y}{1+x}$
(c) $\frac{x}{1+5y}$ (d) none

11. The derivative of x^2log x is:
(a) 1+2log x (b) x (1+2logx)
(c) 2logx (d) None

12. If f (x)= $\frac{x^2+1}{x^2-1}$then f' (x) is:
(a) -4x/ $(x^2-1)^2$ (b) 4x $(x^2-1)^2$
(c) x$(x^2-1)^2$ (d)None

13. If f (x) =$\frac{x^2}{e^x}$ then f (- 1) is equal to
(a)-1/e (b)$1/e$
(c) -3e (d) none

Parametric Equation

14. If x= $3t^2 - 1, y = t^3 - t\ them$ $\frac{dy}{dx}$is equal to
(a)$\frac{3t^2-1}{6t}$ (b) $3t^2$-1
(c)$\frac{3t-1}{6t}$ (d) none

15. Given x= t+ t^{-1} *and* y = t − t^{-1} then the value of $\frac{dy}{dx}$ at t = 2 is:
(a) 3/5 (b) -3/5
(c) 5/3 (d) none

16. If x = log t, y = e^t, then $\frac{dy}{dx}$ =
(a)1/t
(c) -1/t^2 (d) none

Let's Deal with $\sqrt{f(x)}$ & $\frac{1}{\sqrt{f(x)}}$

23. If y= $e^{\sqrt{2x}}$then $\frac{dy}{dx}$ is equal to
(a)$\frac{e^{\sqrt{2x}}}{\sqrt{2x}}$ (b)$e^{\sqrt{2x}}$
(c)$\frac{e^{\sqrt{2x}}}{\sqrt{2x}}$ (d) none

Geometry Based

17. The slope of the tangent to the curve y=x^2- x at the point where the line y=2 cuts the curve in the lst quadrant is:
(a) 2 (b) 3
(c) -3 (d) none

18. The slope of the tangent at the point (2, 2) to the curve x^2+xy+ y^2-4=0 is given by:
(a) 0 (b) 1
(c) -1 (d) none

19. The slope of the tangent to the curve y= $\sqrt{4-x^2}$ at the point where the ordinate and the abscissa are equal is:
(a) -1 (b) 1
(c) 0 (d) None

Log & Implicit Function

20. If y = $\sqrt{x^2+m^2}$ then y.$\frac{dy}{dx}$
(a) -x (b) x
(c) 1/x (d) None

21. If y= $\sqrt{x}^{\sqrt{x}\ldots\infty}$ then $\frac{dy}{dx}$ is equal to
(a)$\frac{y^2}{2-ylog\ x}$ (b)$\frac{y^2}{x(2-ylog\ x)}$
(c)$\frac{y^2}{log\ x}$ (d) none

22. Given $e^{-xy} - 4xy$=0 then $dyldx$ can be proved to be equal to
(a) -y/x (b) y/x
(c) x/y (d)none

24. . if y=$\frac{1}{\sqrt{x}}$ *then* $\frac{dy}{dy}$is equal to:
(a)$\frac{1}{2x\sqrt{x}}$ (b)$\frac{-1}{x\sqrt{x}}$
(c)$\frac{-1}{2x\sqrt{x}}$ (d) none

Application of Derivation

25. A company charges Rs. 550 for a transistor set on orders of 50 or less sets. The charge is reduced by Rs. 5 per set for each set ordered in excess of 50. Find the largest size order company should allow so as to receive maximum revenue.
(a) 60 (c) 80
(b) 70 (d) none

26. A manufacture can sell x items per day at a price p rupee each, where p = 125 -(5/3)x. The cost of production for x items is $500 + 13x + 0.2x^2$. Find how much he should produce to have a maximum profit assuming that all items produced can be sold. What's the maximum profit.
(a) 30 units, Rs.1180
(b) 40 units, Rs.1280
(c) 60 units, Rs.1300
(d) none of these

Higher Order Derivation

27. For the functions y = x^3 – 3x, the value of $\frac{d^2y}{dx^2}$ at which $\frac{dy}{dx}$ is zero, is
(a)± 1 (b) ± 6
(c)± 3 (d) none

28. If y = $ae^{nx} + be^{-nx}$, then $\frac{d^2y}{dx^2}$ is equal to _____.
(a) n^2y (b) ny
(c) $-n^2y$ (d) none

Additional Question Bank

1. Find the second derivative of $y = \sqrt{x + 1}$
(a) ½ $(x + 1)^{-½}$ (b) -1/4 $(x + 1)^{3/2}$
(c) 1/4 $(x + 1)^{-½}$ (d) None

2. If $x^2 + y^2 = 4$ then
(a) $y\frac{d^2y}{dx^2} - \left(2\frac{dy}{dx}\right)^2 + 1 = 0$ (b) $y\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + 1 = 0$
(c) $y\frac{d^2y}{dx^2} - \left(\frac{dy}{dx}\right)^2 - 1 = 0$ (d) $y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 + 1 = 0$

3. If $f(x) = {}^xC_3$; then $f'(1) = ?$
(a) $\frac{1}{6}$ (b) $\frac{-1}{6}$
(c) $\frac{5}{6}$ (d) $\frac{-5}{6}$

4. If $-x = c\,t$, $y = c/t$, then $\frac{dy}{dx}$ is equal to:
(a) 1/t (b) $t.e^t$
(c) $-1/t^2$ (d) None

5. If $y = e^{a\log x} + e^{x\log a}$, then $\frac{dy}{dx} =$
(a) $x^a + a^x$ (b) $a\,x^{a-1} + a^x \log a$
(c) $a\,x^{a-1} + x\,a^{x-1}$ (d) $x^x + a^a$

6. If $y = \log_y x$, then $\frac{dy}{dx}$ is equal to:
(a) $\frac{1}{x + \log y}$ (b) $\frac{1}{x+x\log y}$
(c) $\frac{1}{1 + x\log y}$ (d) $\frac{1}{y + \log x}$

8. If $y = 1 + \frac{x}{\lfloor 1} + \frac{x^2}{\lfloor 2} + \ldots\ldots\ldots\ldots + \frac{x^n}{\lfloor n} + \ldots\ldots$, then the value of $\frac{dy}{dx} - y =$ _____
(a) 1 (b) 0
(c) 2 (d) – 1

9. If $y = x^x$, then $\frac{dy}{dx}$ at $x = 1$ is equal to
(a) 0 (b) 1
(c) -1 (d) 2

7. If $y = \sqrt{\frac{1-x}{1+x}}$, then $\frac{dy}{dx}$ is equal to -
(a) $\frac{y}{x^2-1}$ (b) $\frac{y}{1-x^2}$
(c) $\frac{y}{1+x^2}$ (d) $\frac{y}{y^2-1}$

10. If $f(x) = \log_e\left(\frac{x-1}{x+1}\right)$, then the value of x at which $f'(x) = 1$, is
(a) 0 (b) 1
(c) $\pm\sqrt{3}$ (d) $\pm\sqrt{2}$

11. If $y = \log x^x$ then $\frac{dy}{dx}$ is equal to:
(a) log ex (b) $\log\frac{e}{x}$
(c) $\log\frac{x}{e}$ (d) 1

12. $\frac{d}{dx}(x.\log x)$
(a) x (1 + logx) (b) 1 + logx
(c) $e^x x.\log x$ (d) $x^2(\log x)$

14. The average cost function of a good is $2Q + 6 + \frac{13}{Q}$ where Q is the quantity produced. The approx. cost at Q = 15 is:
(a) 42 (b) 36
(c) 66 (d) 130

15. If $f(x) = 3e^{x^4}$ then $f'(x) - 4x^3 f(x) + \frac{1}{3}f(0) - f'(0)$ is equal to:
(a) 0 (b) e^{x^2}
(c) 1 (d) -1

16. If $x^6 + y^4 - 5xy = 0$ then $\frac{dy}{dx}$ is
(a) $\frac{y+x^4}{x+y^4}$ (b) $\frac{y-x}{y-x}$
(c) $\frac{x-y}{x^3-y}$ (d) $\frac{x+y^4}{x^4+y}$

Chapter 8B Integration

Basics

1. Given f (x) = $4x^3+3x^2-2x+5$ and $\int f(x)dx$ is
(a)$x^4+x^3-x^2+5x+k$
(b) $x^4+x^3-x^2+5x$
(c)$12x^2+6x-2x^2$
(d) none of these

2. $\int\left(x^4+\frac{3}{x}\right)dx$ *is equal to*
(a) $x^5/5+\log|x|$
(b) $1/5x^5+3\log|x|+k$
(c) $1/5x^5+k$
(d) none of these

3. Evaluate $\int(x^2-1)\ dx$
(a) $x^5/5-2/3x^3+x+k$ (b) $\frac{x^3}{3}-x+k$
(c) 2x (d) none of these

Method of Substitution

4. Use method of substitution to evaluate $\int x(x^2+4)^5\ dx$and the answer is
(a) $(x^2+4)^6+k$ (b) $1/12\ (x^2+4)^6+k$
(c) $(x^2+4)^{6/}+k$ (d) none of these

5. $\int x^x(1+\log x)$ dx is equal to
(a) $x^2\log x+k$ (b) $e^{x2}+k$
(c) $\frac{x^2}{2}+k$ (d) x^x+c

6. $\int x^x(1+\log x)$ dx is equal to
(a) $x^2\log x+k$ (b) $e^{x2}+k$
(c) $\frac{x^2}{2}+k$ (d) x^x+c

7. $\int\frac{\log(logx)}{x}xdx$ *is*
(a) log (logx-1) +k (b) log x-1+k
(c) [log ($\log^x$-1)] log x +k (d) none

8. Evaluate $\int(\frac{e^x-e^{-x}}{e^x+e^{-x}})$ dx and the value is
(a) $\log_e|e^x+e^{-x}|$ (b) $\log_e|e^x+e^{-x}|+k$
(c) $\log_e|e^x-e^{-x}|+k$ (d) none

By Parts

9. Use integration by parts to evaluate $\int x^2e^{3x}dx$
(a)$\frac{x^2e^{3x}}{3}-2x\frac{e^{3x}}{9}+\frac{2}{27}e^{3x}+K$
(b) $x^2e^{3x}-2xe^{3x}+2e^{3x}+k$
(c) $\frac{e^{3x}}{3}-\frac{xe^{3x}}{9}+2e^{3x}+k$
(d) none of these

10. $\int(logx)^2x\ dx$ *and the result is*
(a) $\frac{x^2}{2}[(logx)^2-\log+½]+K$
(b) x $(\log)^2$ -2x+k
(c) 2x $(\log x-1)+k$
(d) None of these

11. $\int\log x^2$ dx is equal to
(a) x (log x -1)+k (b) 2x (logx -1)+k
(c) 2 (log x- 1)+k (d) none of these

12. Using integration by parts $\int x^3\log x\ dx$
(a) $x^4/16+k$ (b) $x^4/16\ (4\log x-1)+k$
(c) 4 log x-1+k (d) none of these

Exponential Based

13. Evaluate $\int\frac{(2-x)e^x}{(1-x)^2}$dx and the value is
(a) $\frac{e^x}{1-x}+k$ (b) e^x+k
(c) $\frac{1}{1-x}+k$ (d) none of these

14. $\int\frac{e^x(xlogx+1)}{x}$ dx is equal to
(a) $e^x\log x+k$ (b) e^x+k
(c) logx +k (d) none

15. $\int(x-1)e^x/x^2dx$ is equal to
(a) $e^x/x+k$ (b) $e^{-x}/x+k$
(c) $-e^x/x+k$ (d) none

Partial Fraction

16. $x\ (x-1)^{-1}(2x+1)^{-1}dx$ *is*:
(a) (1/3)[log |x-1|+log|2x+1|] +k
(b)(1/3)[log |x-1|+(1/6) log|2x+1|] k
(c)(1/3)[log |x-1| + (1/2) log|2x+1|] +k
(d)none of these.

17. Evaluate using partial fraction $\int(x+5)dx/(x+1)(x+2)^2$ we get
(a) 4 log (x+1) - 4 log (x+2) $+\frac{3}{x}+2+K$
(b) 1 log (x+2)-3/x+2)+K
(c) 4log (x+1)-4log (x+2)
(d) none of these

18. $\int\frac{x}{(x^2+1)(x^2+2)}$dx is equal to _____
(a) $\log\left(\frac{x^2+1}{x^2+2}\right)+c$ (b) $\frac{1}{2}\log\left(\frac{x^2+1}{x^2+2}\right)+c$
(c) $\frac{1}{2}\log\left(\frac{x^2+2}{x^2+1}\right)+c$ (d) $-\log\left(\frac{x^2+1}{x^2+2}\right)+c$

Geometry Based

19. The equation of the curve which passes through the point (1,3) and has the slope 4x-3 at any point (x,y) is
(a) $y=2x^3-3x+4$
(b) $y=2x^2-3x+4$
(c) $x=2y^2-3y+4$
(d) none of these

20. find the area under the curve $f(x)=x^2+5x+2$ with the limits 0 to 1
(a) 3.833
(b) 4.388
(c) 4.833
(d) 3.338

Definite Integration

21. Evaluate $\int_2^4(3x-2)^2$ dx and the value is
(a) 104 (b) 100
(c) 10 (d) none

22. Evaluate $\int_0^1 xe^x\ dx$ and the value is
(a) -1 (b) 10
(c) 10/9 (d) +1

23. Evaluate $\int_1^4(2x+5)$ dx and the value
(a) 3 (b) 10
(c) 30 (d) none

24. $\int_1^2\frac{2x}{1+x^2}$ dx is equal to
(a) $log(5/2)$
(b) log_e5-log_e2+k
(c) $log_e(2/5)$
(d) none of these

25. $\int_0^2\sqrt{3x+4}$ dx is equal to
(a) 9/112
(b) 112/9
(c) 11/9
(d) none of these

26. The value of $\int_2^3 f(5-x)\,dx-\int_2^3 f(x)\,dx$ *is*
(a) 1 (b) 0
(c) -1 (d) none

27. $\int_1^2\frac{x\,dx}{x^2+2}=$ _____
(a) $\log\sqrt{2}$ (b) $\log\sqrt{3}$
(c) $\log\frac{1}{\sqrt{2}}$ (d) $\log\frac{1}{\sqrt{3}}$

Additional Question Bank

1. $\int \left(\sqrt{x}+\frac{1}{\sqrt{x}}\right) dx$

(a) $2x^{1/2}\left(\frac{1}{3}x-1\right)$ (b) $2x^{1/2}\left(\frac{1}{3}x+1\right)$

(c) $2\left(\frac{1}{3}x+x^{1/2}\right)$ (d) None

2. $\int_0^1 \left(\frac{1-x}{1+x}\right) dx$

(a) 2 log 2 - 1 (b) 4 log 2 - 1

(c) 2 log 2 (d) None

3. $\int \frac{6x+4}{(x-2)(x-3)} dx$ is equal to

(a) 22 log (x-3) -16 (x-2) (b) 11 log (x-3) - 8 (x-2)

(c) 22 log (x-3) -16 log (x-2) (d) 22 log (x-3) + 16 log (x-2)

4. $\int \frac{1}{x(1+\log x)^2} dx$ is equal to

(a) $-\frac{1}{2(1+\log x)^2}+c$ (b) $\frac{1}{(1+\log x)}+c$

(c) $-\frac{1}{(1+\log x)}+c$ (d) None

5. Solve: $\int \frac{(\log x^x)^2}{x^3}.dx$

(a) $\frac{3}{2}(\log x)^3+C$ (b) $\frac{1}{3}(\log x)^3+C$

(c) $\frac{1}{6}(\log x)^3+C$ (d) $\frac{3}{7}(\log x)^3+C$

6. $\int_{-1}^1 \frac{|x|}{x} dx =$ _____

(a) - 1 (b) 0

(c) 1 (d) 2

7. $\int_0^1 \frac{dx}{[ax+b(1-x)]^2} =$ _____

(a) a/b (b) b/a

(c) ab (d) 1/ab

8. $\int 2^{3x}.3^{2x}.5^x.dx =$ _____

(a) $\frac{2^{3x}.3^{2x}.5^x}{\log(720)}+c$ (b) $\frac{2^{3x}.3^{2x}.5^x}{\log(360)}+c$

(c) $\frac{2^{3x}.3^{2x}.5^x}{\log(180)}+c$ (d) $\frac{2^{3x}.3^{2x}.5^x}{\log(90)}+c$

9. $\int_0^5 \frac{x^2dx}{x^2+(5-x)^2}$ is equals to ____.

(a) 5 (b) $\frac{5}{2}$

(c) 1 (d) None

10. The value of definite integral $\int_0^2 |1-x|\,dx =$ _____.

(a) 0 (b) 1/2

(c) 3/2 (d) 1

11. $\int_0^2 \frac{3^{\sqrt{x}}}{\sqrt{x}} dx$ is equal to _____

(a) $\frac{2\sqrt{2}}{\log_e 3}$ (b) 0

(c) $\frac{2}{\log_e 3}\left(3^{\sqrt{2}}-1\right)$ (d) $\frac{3^{\sqrt{2}}}{\sqrt{2}}$

12. $\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}} dx =$

(a) 1 (b) 1/2

(c) 2 (d) 3/2

13. $\int_1^2 e^x\left(\frac{1}{x}-\frac{1}{x^2}\right) dx =$

(a) $e\left(\frac{e}{2}-1\right)$ (b) a (e - 1)

(c) a (d) e^2 (e - 1)

Chapter 8C Limits & Continuity

Factorization

1. $\lim_{x\to 2}\frac{x^2-5x+6}{x^2-4}$
2. $\lim_{x\to\infty}\frac{2x^2-7x+5}{4x^2+3x-1}$
3. $\lim_{x\to 4}\frac{x^2-16}{x-4}$
4. $\lim_{x\to 5}\frac{x^3-125}{x^2-7x+10}$
5. $\lim_{x\to 5}\frac{x^2-11x+30}{x-5}$

L-Hospital

10. $\lim_{x\to 5}\frac{x^3-125}{x^2-7x+10}$
11. $\lim_{x\to 1}\frac{x^3-5x^2+2x+2}{x^3+2x^2-6x+3}$
12. $\lim_{x\to t}\frac{x^3-t^3}{x^2-t^2}$
13. $\lim_{x\to\infty}\frac{2x^2-7x+6}{5x^2-11x+2}$
14. $\lim_{x\to 1/2}\left(\frac{8x^3-1}{6x^2-5x+1}\right)$

Mis Questions

20. $\lim_{x\to 0}\frac{3x+|x|}{7x-5|x|}$
21. $\lim_{x\to 1}\left(\frac{1}{x^2+x-2}-\frac{x}{x^3-1}\right)$
22. $\lim_{x\to\infty}\frac{1^3+2^3+3^3+....+n^3}{n^4}$
23. Evaluate $\lim_{x\to 4} f(x)$ if $f(x) = \begin{cases} x^3, \text{where } x \neq 4 \\ 0, \text{where } x = 4. \end{cases}$
24. $\lim_{x\to 0}\frac{4^{x+1}-4}{2x}$

(a) a does not exist
(b) exists and is equal to 4
(c) exists and is equal to $4\log_e 2$
(d) none of these.

Types of Relation

25. A function f is defined as follows

$f(x) = \begin{cases} -4x, \text{when } x < 5 \\ 2x, \text{when } x > 5 \end{cases}$.

Test the existence of $\lim_{x\to 5} f(x)$.

(a) limit exist but not finite
(b) limit does not exist
(c) infinite limit
(d) none of these.

26. A function f (x) defined in (0, 3) as follows.

$f(x) = x^2$ when $0 < x < 1$
$= x$ when $1 \le x < 2$
$= (1/4)x^3$ when $2 \le x < 3$

Then f (x) at x = 1 is:
(a) Continuous
(b) Discontinuous
(c) limit not defined
(d) none of these.

27. If $f(x) = \frac{x^2-1}{x-1}$ for $x \neq 1$
$f(x) = 2$ for $x = 1$.
Then the function f (x) at x = 1 is:
(a) Not defined
(b) Continuous
(c) Discontinuous
(d) None of these.

28. If $f(x) = 5 + 3x$ for $x \ge 0$ and
$f(x) = 5 - 3x$ for $x < 0$
then f (x) is:
(a) continuous at x = 0
(b) discontinuous and undefined at x = 0
(c) discontinuous and defined at x = 0
(d) none of these.

Rationalization

6. $\lim_{x\to 0}\frac{\sqrt{1+2x^2}-\sqrt{1-2x^2}}{x^2}$
7. $\lim_{x\to 1}\frac{x^2-1}{\sqrt{3x+1}-\sqrt{5x-1}}$
8. $\lim_{x\to 0}\frac{\sqrt{a+x}-\sqrt{a-x}}{x}$
9. $\lim_{x\to 1}\frac{\sqrt{x+4}-\sqrt{5}}{x-1}$

Standard Function

15. $\lim_{x\to 0}\frac{3^x-1}{x}$
16. $\lim_{x\to 0}\frac{5^x+3^x-2}{x}$
17. $\lim_{x\to a}\frac{x^5-a^5}{x^2-a^2}$ =
18. $\lim_{x\to 0}\frac{\log(1-7x)}{x}$
19. $\lim_{x\to 0}\frac{(5^x-1)^2}{x\log(1+x)}$

Summary Notes

Chapter 9 Statistical Description of Data

Phase-I

1. In terms of numerical data in the
(a) Singular sense (b) Plural sense
(c) Either (a) or (b) (d) Both (a) and (b).

2. Statistics is applied in
(a) Economics
(b) Business management
(c) Commerce and industry
(d) All these.

3. Statistics is concerned with
(a) Qualitative information
(b) Quantitative information
(c) (a) or (b)
(d) Both (a) and (b).

4. An attribute is
(a) A qualitative characteristic
(b) A quantitative characteristic
(c) A measurable characteristic
(d) All these.

5. Annual income of a person is
(a) An attribute
(b) A discrete variable
(c) A continuous variable
(d) (b) or (c).

6. Marks of a student is an example of
(a) An attribute
(b) A discrete variable
(c) A continuous variable
(d) None of these.

7. Nationality of a student is
(a) An attribute
(b) A continuous variable
(c) A discrete variable
(d) (a) or (c).

8. Drinking habit of a person is
(a) An attribute
(b) A variable
(c) A discrete variable
(d) A continuous variable.

9. Some important sources of secondary data are
(a) International and Government sources
(b) International and primary sources
(c) Private and primary sources
(d) Government sources.

10. Internal consistency of the collected data can be checked when
(a) Internal data are given
(b) External data are given
(c) Two or more series are given
(d) A number of related series are given.

11. The accuracy and consistency of data can be verified by
(a) Internal checking (b) External checking
(c) Scrutiny (d) Both (a) and (b).

12. The mode of presentation of data are
(a)Textual, tabulation and diagrammatic
(b) Tabular, internal and external
(c) Textual, tabular and internal
(d) Tabular, textual and external.

13. The best method of presentation of data is
(a) Textual (b) Tabular
(c) Diagrammatic (d) (b) and (c).

14. The most attractive method of data presentation is
(a) Tabular (b) Textual
(c) Diagrammatic (d) (a) or (b).

15. For tabulation, 'caption' is
(a) The upper part of the table
(b) The lower part of the table
(c) The main part of the table
(d) The upper part of a table that describes the column and sub-column.

16. The entire upper part of a table is known as
(a) Caption (b) Stub
(c) Box head (d) Body.

17. Multiple line chart is applied for
(a) Showing multiple charts
(b) Two or more related time series when the variables are expressed in the same unit
(c) Two or more related time series when the variables are expressed in different unit
(d) Multiple variations in the time series.

18. Multiple axis line chart is considered when
(a) There is more than one time series
(b) The units of the variables are different
(c) (a) or (b)
(d) (a) and (b).

19. Horizontal bar diagram is used for
(a) Qualitative data
(b) Data varying over time
(c) Data varying over space
(d) (a) or (c).

20. Vertical bar diagram is applicable when
(a) The data are qualitative
(b) The data are quantitative
(c) When the data vary over time
(d) (a) or (c).

21. Divided bar chart is considered for
(a) Comparing different components of a variable
(b) The relation of different components to the table
(c) (a) or (b)
(d) (a) and (b).

22. In order to compare two or more related series, we consider
(a) Multiple bar chart
(b) Grouped bar chart
(c) (a) or (b)
(d) (a) and (b).

23. Pie-diagram is used for
(a) Comparing different components and their relation to the total
(b) Representing qualitative data in a circle
(c) Representing quantitative data in circle
(d) (b) or (c).

Phase-1

24. Mutually exclusive classification
(a) Excludes both the class limits
(b) Excludes the upper-class limit but includes the lower-class limit
(c) Includes the upper-class limit but excludes the upper-class limit
(d) Either (b) or (c).

25. Mutually inclusive classification is usually meant for
(a) A discrete variable
(b) A continuous variable
(c) An attribute
(d) All these.

26. Mutually exclusive classification is usually meant for
(a) A discrete variable
(b) A continuous variable
(c) An attribute
(d) Any of these.

27. The LCB is
(a) An upper limit to LCL
(b) A lower limit to LCL
(c) (a) and (b)
(d) (a) or (b).

28. The UCB is
(a) An upper limit to UCL
(b) A lower limit to LCL
(c) Both (a) and (b)
(d) (a) or (b).

29. length of a class is
(a) The difference between the UCB and LCB of that class
(b) The difference between the UCL and LCL of that class
(c) (a) or (b)
(d) Both (a) and (b).

30. Mode of a distribution can be obtained from
(a) Histogram
(b) Less than type ogives
(c) More than type ogives
(d) Frequency polygon.

31. Median of a distribution can be obtained from
(a) Frequency polygon
(b) Histogram
(c) Less than type ogives
(d) None of these.

32. A comparison among the class frequencies is possible only in
(a) Frequency polygon
(b) Histogram
(c) Ogives
(d) (a) or (b).

33. Frequency curve is a limiting form of
(a) Frequency polygon
(b) Histogram
(c) (a) or (b)
(d) (a) and (b).

34. Most of the commonly used frequency curves are
(a) Mixed
(b) Inverted J-shaped
(c) U-shaped
(d) Bell-shaped.

35. The distribution of profits of a company follows
(a) J-shaped frequency curve
(b) U-shaped frequency curve
(c) Bell-shaped frequency curve
(d) Any of these

36. Relative frequency for a particular class
(a) Lies between 0 and 1
(b) Lies between 0 and 1, both inclusive
(c) Lies between -1 and 0
(d) Lies between -1 to 1.

Phase-2

37. Simple random sampling is
(a) A probabilistic sampling
(b) A non – probabilistic sampling
(c) A mixed sampling
(d) Both (a) and (c)

38. According to Neyman's allocation, in stratified sampling
(a) Sample size is proportional to the population size
(b) Sample size is proportional to the sample SD
(c) Sample size is proportional to the sample variance
(d) Population size is proportional to the sample variance

39. Which sampling provides separate estimates for population means for different segments and also an overall estimate?
(a)Multistage sampling
(b) Stratified sampling
(c)Simple random sampling
(d) Systematic sampling

40. Which sampling adds flexibility to the sampling process?
(a) Simple random sampling
(b) Multistage sampling
(c) Stratified sampling
(d) Systematic sampling

41. Which sampling is affected most if the sampling frame contains an undetected periodicity?
(a) Simple random sampling
(b) Stratified sampling
(c) Multistage sampling
(d) Systematic sampling

42. Which sampling is subjected to the discretion of the sampler?
(a) Systematic sampling
(b) Simple random sampling
(b) Purposive sampling
(d) Quota sampling

43. As the sample size increases, standard error
(a) Increases
(b) Decreases
(c) Remains constant
(d) Decreases proportionately

Your Math's Buddy
Aman Khedia

Chapter 10A Measures of Central Tendency

Mean

1. If there are 3 observations 15, 20, 25 than the sum of deviation of the observation from their AM is
(a) 0 (b) 5
(c) -5 (d) none

2. If there are two groups containing 30 and 20 observations and having 50 and 60 as arithmetic means, then the combined arithmetic mean is
(a)55 (b)56
(c) 54 (d) 52

3. The average salary of a group of unskilled workers is Rs 10,000 and that of a group of skilled workers is Rs 15,000. If the combined salary is Rs 12,000, then what is the percentage of skilled workers?
(a)40% (b)50%
(c) 60% (d) none

4. The mean salary of a group of 50 persons is Rs 5,850. Later on it is discovered that the salary of one employee has been wrongly taken as Rs 8,000 instead of Rs 7,800. The corrected mean salary is
(a)Rs 5,854 b)Rs 5,846
(c) Rs 5,650 (d) none

5. The average age of 15 students of a class is 15 years. Out of them, the average age of 5 students is 14 years and that of other 9 students is 6 years. The age of the 15th students is:
(a)11 years (c) 15 years
(b)14 years (d) none

Patriation Value

6. What is the median for the following observations? 5, 8, 6, 9, 11, 4.
(a)6 (c) 8
(b)7 (d) none of these

7. What is the value of the first quartile for observations 15, 18, 10, 20, 23, 28, 12, 16?
(a)17 (c) 12.75
(b)16 (d) 12

8. The third decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12 is
(a)13 (c) 11
(b)10.70 (d) 11.50

9. If the difference between mean and mode is 63, then the difference between mean and median will be_____.
(a)63 (c) 21
(b)31.5 (d) none of the above

Mode

10. What is the modal value for the numbers 5, 8, 6, 4, 10, 15, 18, 10?
(a)18 (c) 14
(b)10 (d) none

11. Find the mode of the following:

0-10	10-20	20-30	30-40	40-50	50-60
7	14	22	34	20	19

(a) 32 (b)34.61
(c) 25.42 (d) 35

GM & HM

12. What is the GM for the numbers 8, 24 and 40?
(a)24 (b)12
(c) $8.\sqrt[3]{15}$ (d) 10

13. If GM of x is 10 and GM of y is 15, then the GM of xy is
(a)150 (c) log 150
(b)Log 10 × log 15 (d) none

14. The harmonic mean for the numbers 2, 3, 5 is
(a) 2. 00 (c) 2.90
(b) 3.33 (d) $-\sqrt[3]{30}$

15. An aero plane flies from A to B at the rate of 500 km/hour and comes back from B to A at the rate of 700 km/hour. The average speed of the aero plane is
(a)600 km/hr
(b) 583.33 km/hr
(c) $100\sqrt{35}$ km/hr
(d) 620 km/hr

16. Given the weights for the numbers 1,2,3....n are respectively $1^2,2^2,3^2...n^2$ then weighted HM is _
(a) $\frac{2n+1}{4}$
(b) $\frac{2n+1}{6}$
(c) $\frac{2n+1}{3}$
(d) $\frac{2n+1}{2}$

Property Based

17. Two variables x and y are given by $y = 2x - 3$. If the median of x is 20, what is the median of y?
(a)20 (c) 37
(b)40 (d) 35

18. If the relationship between two variables u and v are given by $2u + v + 7 = 0$ and if the AM of u is 10, then the AM of v is
(a) 17 (c) -27
(b) -17 (d) 27

Relation B/W GM & HM

19. If the Arithmetic mean between two numbers is 64 and the geometric mean between them is 16. The Harmonic mean between them is _____.
(a)64 (b) 16
(c) 4 (d) 40

20. The harmonic mean H of two numbers is 4 and their arithmetic mean A and the geometric mean G satisfy the equation $2A + G^2 = 27$, then the numbers are
(a)(1, 3) (c) (6, 3)
(b)(9, 5) (d) (12, 7)

Additional Question Bank

1. The average salary of 50 men was Rs. 80 but it was found that salary of 2 of them were Rs. 46 and Rs. 28 which was wrongly taken as Rs. 64 and Rs. 82. The revised average salary is :
(a) Rs. 80 (b) Rs. 78.56
(c) Rs. 85.26 (d) Rs. 82.92

2. The sum of squares of deviation from mean of 10 observations is 250. Mean of the data is 10. Find the co-efficient of variation.
(a) 10% (b) 25%
(c) 50 % (d) 0 %

3. If variance of x is 5, then find the variance of (2 - 3x)
(a) 10 (b) 45
(c) 5 (d) -13

4. The harmonic mean of 1, 1/2, 1/3 ..... 1/n is
(a) 1/(n + 1) (b) 2/(n + 1)
(c) (n + 1)/2 (d) 1/(n - 1)

5. In a class of 11 students, 3 students were failed in a test. 8 students who passed secured 10, 11, 20, 15, 12, 14, 26 and 24 marks respectively. What will be the median marks of the students:
(a) 12 (b) 15
(c) 13 (d) 13.5

6. 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

7. The standard deviation of the weights (in kg) of the students of a class of 50 students was calculated to be 4.5 kg. Later on it was found that due to some fault in weighing machine, the weight of each student was under measured by 0.5 kg. The Correct standard deviation of the weight will be:
(a) Less than 4.5 (b) Greater than 4.5
(c) Equal to 4.5 (d) Can not be determined

8. The median of following numbers, which are given is ascending order is 25. Find the Value of X :11 ,13, 15, 19, (x + 2), (x + 4), 30, 35, 39, 46
(a) 22 (b) 20
(c) 15 (d) 30

9. Geometric Mean of three observations 40, 50 and X is 10. The value of X is
(a) 2 (b) 4
(c) 1/2 (d) None

10. The mean of the following data is 6. Find the value of 'P'.

x:	2	4	6	10	P+5
f:	3	2	3	1	2

(a) 4 (b) 6
(c) 8 (d) 7

11. 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

12. The harmonic mean H of two numbers is 4 and their arithmetic mean A and the geometric mean G satisfy the equation $2A + G^2 = 27$, then the numbers are
(a) (1,3) (b) (9,5)
(c) (6,3) (d) (12,7)

13. If total frequencies of three series are 50, 60 and 90 and their means are 12, 15 and 20 respectively, then the mean of their composite series is
(a) 16 (b) 15.5
(c) 16.5 (d) 14.5

14. There are n numbers. When 50 is subtracted from each of these number the sum of the numbers so obtained is - 10. When 46 is subtracted from each of the original n numbers, then the sum of numbers. So obtained is 70. What is the mean of the original n numbers?
(a) 56.8 (b) 25.7
(c) 49.5 (d) 53.8

Chapter 10B Measures of Dispersion

Your Math's Buddy
Aman Khedia

Range

1. What is the coefficient of range for the following wages of 8 workers?
Rs 80, Rs 65, Rs 90, Rs 60, Rs 75, Rs 70, Rs 72, Rs 85.
(a) Rs 30 (c) 30
(b) Rs 20 (d) 20

2. For the observation of 6, 4, 1, 6, 5, 10, 4, 8 the range is :
(a)10 (c) 8
(b) 9 (d) none

3. What is the coefficient of range for the following distribution?

Class Interval	Frequency
10-19	11
20-29	25
30-39	16
40-49	7
50-59	3

(a) 22 (c) 72.46
(b)50 (d) 75.82

4. If the range of x is 2, what would be range of -3x + 50?
(a) 2 (c) -6
(b) 6 (d) 44

5. If the range of a set of values is 65 and maximum value in the set is 83, then the minimum value in the set is
(a) 74 (b) 9
(c) 18 (d) None

6. If the relationship between x and y is given by 2x + 3y = 10 and the range of y is 10, then what is the range of x?
(a) 10 (b) 18
(c) 8 (d) 15

Mean Deviation

7. Coefficient of mean deviation about mean for the first 9 natural numbers is
(a)200/9 (c) 400/9
(b)80 (d) 50

8. What is the value of mean deviation about mean for the numbers?
5, 8, 6, 3, 4.
(a) 5.20 (c) 1.44
(b) 7.20 (d) 2.23

9. What is the value of mean deviation about for the following observations?
50, 60, 50, 50, 60, 60, 60, 50,50, 50, 60, 60, 60, 50.
(a) 5 (c) 35
(b) 7 (d) 10

Quartile Deviation

10. If mean = 5, standard deviation = 2.6, median = 5 & quartile deviation = 1.5, then the coefficient of quartile deviation equals
(a)35 (c) 30
(b)39 (d) 32

11. The quartile deviation is:
(a) 2/3 of S.D
(b) 4/5 of S.D
(c) 5/6 of S.D
(d) None of these

12. The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is
(a) 10 (c) 25
(b) 20 (d) 8.30

Standard Deviation

13. If mean and coefficient of variation of the marks of 10 students is 20 and 80 respectively. What will be variance of them?
(a)256 (b) 16
(c) 25 (d) None

14. The mean and SD of a sample of 100 observations were calculated as 40 and 5.1 respectively by a CA student who took one of the observations as 50 instead of 40 by mistake. The current value of SD would be
(a)4.90 (c) 4.88
(b)5.00 (d) 4.85

15. The variance of data: 3,4,5,8 is
(a) 4.5 **(b) 3.5**
(c) 5.5 (d) 6.5

16. The standard deviation of a variable x is known to be 10. The standard deviation of 50 + 5x is
(a) 50 (b) 100
(c) 10 (d) 500

17. If the S.D. of the 1st n natural Nos. is $\sqrt{30}$, Then the value of n is
(a) 19 (b) 20
(c) 21 (d) None

18. If variance = 148.6 and $\bar{x} = 40$, then the coefficient of variation is:
(a) 37.15 (b) 30.48
(c) 33.75 (d) None

19. If the variance of 5, 7, 9 and 11 is 4, then the coefficient of variation is:
(a) 15 (b) 25
(c) 17 (d) 19

Variance

20. Which of the following companies A or B is more consistent so far as the payment of dividend is concerned?
Dividend paid by A:
5 9 6 12 15 10 8 10
Dividend paid by B:
4 8 7 15 18 9 6 6
(a) A (b) B
(c) Both A & B (d) Neither A nor B

21. If variance = 148.6 and $\bar{x} = 40$, then the coefficient of variation is:
(a) 37.15 (b) 30.48
(c) 33.75 (d) None

22. In a given set if all data are of same value, then variance would be:
(a) 0 (b) 1
(c) -1 (d) 0.5

Common Property

23. If a variance of a random variable 'x' is 23, then what is variance of 2x + 10?
(a)56 (b)33
(c) 46 (d) 92

Relation Between QD, MD, SD

24. Standard deviation is _____ times of $\sqrt{MD \times QD}$
(a) 2/3
(b) 4/5
(c) $\sqrt{\frac{15}{8}}$
(d) $\sqrt{\frac{8}{15}}$

Additional Question Bank

1. Inter Quartile Range is _____ of Quartile Deviation.
(a) Half (b) Double
(c) Triple (d) Equal

2. The equation of a line is $5x + 2y = 17$. Mean deviation of y about mean is 5. Calculate mean deviation of x about mean.
(a) -2 (b) 2
(c) -4 (d) None

3. The average of 5 quantities is 6 and the average of 3 is 8. what is the average of the remaining two.
(a) 4 (b) 5
(c) 3 (d) 3.5

4. If standard deviation of first 'n' natural numbers is 2 then value of 'n' is
(a) 10 (b) 7
(c) 6 (d) 5

5. If sum of squares of the values = 3390, N = 30 and standard deviation = 7, find out the mean.
(a) 113 (b) 210
(c) 8 (d) None

6. Find at the variance given that the Arithmetic Mean $= (8 + 4)/2$
(a) 2 (b) 6
(c) 1 (d) 4

7. If the mean of a frequency distribution is 100 and coefficient of variation is 45% then standard deviation is:
(a) 45 (b) 0.45
(c) 4.5 (d) 450

8. If mean = 5, Standard deviation = 2.6, median = 5 and quartile deviation = 1.5, then the coefficient of quartile deviation equals
(a) 35 (b) 39
(c) 30 (d) 32

9. If mean = 5, Standard deviation = 2.6, median = 5 and quartile deviation = 1.5, then the coefficient of quartile deviation equals
(a) 35 (b) 39
(c) 30 (d) 32

10. What will be the probable value of mean deviation? When $Q_3 = 40$ and $Q_1 = 15$
(a) 17.50 (b) 18.75
(c) 15.00 (d) None

11. The formula for range of middle 50% items of a series is :
(a) $Q_3 - Q_1$ (b) $Q_3 - Q_2$
(c) $Q_2 - Q_1$ (d) $\frac{Q_3 - Q_1}{2}$

12. If the first quartile is 142 and semi-inter quartile range is 18, then the value of median is:
(a) 151 (b) 160
(c) 178 (d) None

13. If a variance of a random variable 'x' is 23, then what is variance of $2x + 10$?
(a) 56 (b) 33
(c) 46 (d) 92

14. If arithmetic mean and coefficient of variation of x are 10 and 40, respectively then the variance of $-15 + \frac{3x}{2}$ will be:
(a) 64 (b) 81
(c) 49 (d) 36

15. For 899, 999, 391, 384, 390, 480, 485, 760, 111, 240 Rank of median is
(a) 2.75 (b) 5.5
(c) 8.25 (d) none

16. The standard deviation of 1 to 9 natural number is:
(a) 6.65 (b) 2,58
(c) 6.75 (d) 5.62

Chapter 11A Correlation Analysis

Karl Pearson Method

1. Compute the co-efficient between x & y from the following data n = 10 $\sum xy = 220, \sum x^2 = 200, \sum y^2 = 262, \sum x = 40, \sum y = 50$
(a)0.91 (c) 0.4
(b)0.625 (d) 0.5

2. If for two variables x and y, the covariance, variance of x and variance of y are 40, 16 and 256 respectively, what is the value of the correlation coefficient?
(a)0.01 (c) 0.4
(b)0.625 (d) 0.5

3. If the covariance between two variables is 20 and the variance of one of the variables is 16, what would be the variance of the other variable?
(a) More than 100
(b) More than 10
(c) less than 10
(d) more than 1.25

4. If the sum of the product of deviations of x and y series from their means is zero, then the coefficient of correlation will be
(a) 1 (b) -1
(c) 0 (d) None

5. The covariance between two variables X and Y is 8.4 and their variances are 25 and 36 respectively. Calculate Karl Pearson's coefficient of correlation between them.
(a) 0.82 (b) 0.28
(c) 0.01 (d) 0.09

Spearman Rank

6. If the sum of squares of difference of ranks, given by two judges A and B, of 8 students in 21, what is the value of rank correlation coefficient?
(a)0.7 (c) 0.75
(b)0 .65 (d) 0.8

7. If the rank correlation coefficient between marks in management and mathematics for a group of students in 0.6 and the sum of squares of the differences in ranks in 66, what is the number of students in the group?
(a)10 (c) 8
(b)9 (d) 11

8. While computing rank correlation coefficient between profit and investment for the last 6 years of a company the difference in rank for a year was taken 3 instead of 4. What is the rectified rank correlation coefficient if it is known that the original value of rank correlation coefficient was 0.4?
(a)0.3 (c) 0.25
(b)0.2 (d) 0.28

9. Ranks of two ___characteristics by two judges are in reverse order then find the value of Spearman rank correlation co-efficient.
(a) -1 (b) 0
(c) 1 (d) 0.75

Coefficient of Concurrent

10. For 10 pairs of observations no. of concurrent deviations was found to be 4. What is the value of the coefficient of concurrent deviation?
(a)$\sqrt{0.2}$ (c) 1/3
(b) $-\sqrt{0.2}$ (d) -1/3

11. The coefficient of concurrent deviation for p pairs of observations was found to be $1/\sqrt{3}$. If the number of concurrent deviations was found to be 6, then the value of p is
(a)10 (c) 8
(b)9 (d) none

12. If the rank correlation co-efficient between marks in Management and Mathematics for a group of students is 0.6 and the sum of the squares of the difference in ranks is 66. Then what is the number of students in the group?
(a) 9 (b) 10
(c) 11 (d) 12

Scatter Diagram

13. If there is a constant increase in a series, then the corresponding graph will be
(a) Convex curve
(b) Concave curve
(c) Parabola
(d) Straight line from the left to the right

Property Based

14. If u + 5x = 6 and 3y – 7v = 20 and the correlation coefficient between x and y is 0.58 then what would be the correlation coefficient between u and v?
(a) 0.58 (c) -0.84
(b)-0.58 (d) 0.84

15. If the relation between x and u is 3x + 4u + 7 = 0 and the correlation coefficient between x and y is -0.6, then what is the correlation coefficient between u and y?
(a)-0.6 (c) 0.6
(b)0.8 (d) -0.8

Other

16. If r = 0.6 then the coefficient of non-determination is
(a)0.4
(b)-0.6
(c) 0.36
(d) 0.64

17. A relationship $r^2 = 1 - \frac{500}{300}$ is not possible
(a)True
(b)False
(c) both
(d) none

Additional Question Bank

1. Correlation coefficient between X and Y will be negative when: -
(a) X and Y are decreasing (b) X is increasing, Y is decreasing
(c) X and Y are increasing (d) None

2. If 'P' is the simple correlation coefficient, the quantity P^2 is known as:
(a) Coefficient of determination (b) Coefficient of non-determination
(c) Coefficient of alienation (d) None

3. _____ of the regression Coefficients is greater than the correlation coefficient
(a) Combined mean (b) Harmonic mean
(c) Geometric mean (d) Arithmetic mean

4. The Coefficient of correlation between x and y series is - 0.38. The linear relation between x & u and y & v are $3x + 5v = 3$ and $- 8x - 7v = 44$, what is the coefficient of correlation between u & v?
(a) 0.38 (b) -0.38
(c) 0.40 (d) None

5. If 'r' be the Karl's Pearson's coefficient of correlation in a bivariate distribution then the two regression lines are at right angle if
(a) $r = \pm 1$ (b) $r = 0$
(c) $r = \pm$ any finite value whose numerical value is less than 1 (d) None

6. The coefficient of correlation between two variables x and y is 0.28. Their covariance is 7.6. If the variance of x is S, then the standard deviation of y is:
(a) 8.048 (b) 9.048
(c) 10 048 (d) 11.048

7. Determine the coefficient of correlation between x and y series:

	x-Series	y-Series
No. of items	15	15
Arithmetic Mean	25	18
Sum of Squares of Deviations from Mean	136	138

Sum of products of Deviations of x and y series from Mean = 122
(a) -0.89 (b) 0.89
(c) 0.69 (d) - 0.69

8. When each individual gets the exactly opposite rank by the two Judges, then the rank correlation will be _____.
(a) 0 (b) -1
(c) +1 (d) $\frac{1}{2}$

9. If $r = 0.6$, then the coefficient of determination is.
(a) 0.4 (b) -0.6
(c) 0.36 (d) 0.64

10. The coefficient of correlation between two variables x and y is 0.28. Their covariance is 7.6. If the variance of x is S, then the standard deviation of y is:
(a) 8.048 (b) 9.048
(c) 10 048 (d) 11.048

11. If the correlation coefficient between the variables X and Y is 0.5, then the correlation coefficient between the variables 2x - 4 and 3 - 2y is
(a) 1 (b) 0.5
(c) -0.5 (d) 0

12. Find the probable error if $r = \frac{2}{\sqrt{10}}$ and $n = 36$
(a) 0.6745 (b) 0.067
(c) 0.5287 (d) None

13. If the sum of the product of the deviations of X and Y from their means is zero the correlation coefficient between X and Y is:
(a) Zero (b) Positive
(c) Negative (d) 10

14. If Coefficient of correlation $3x + 4y = 0.6$ is 0.5. Find the coefficient for $3u + 9v$ for u and v.
(a) -(0.5) (b) +(0.5)
(c) $\pm$ 0.5 (d) 0.25

Chapter 11B Regression Analysis

AIM-1 Regression Coefficient

1. The regression coefficient of X on Y of the following data.
N = 10; ΣX = 250; ∑Y = 210; Σ(X-25)² = 262; ∑(Y - 21)² = 322 , Σ(X - 25)(Y - 21) = 192 is
(a) 0.596 (b) -0.414
(c) 0.568 (d) None

2. The regression coefficient of Y on X (b_{yx}) of the following data cov. (X ; Y) = 121; $\sigma_x = 15$; $\sigma_y = 14$ is
(a) 0.54 (b) 0.55
(c) 0.6875 (d) None

3. In a correlation study of two variables X and Y, the following values are obtained: $\overline{X} = 45$, $\overline{Y} = 54$, $\sigma_x = 4$; $\sigma_y = 5$; r = 0.8, The two regression coefficients (b_{xy}, b_{yx}) are
(a) (5 . 57,3. 12)
(b) (0.64, 1.00)
(c) (7.12,2.67)
(d) None of these

4. The regression equation x and y is 3x + 2y = 100, the value of b_{xy}
(a) $-\frac{2}{3}$ (b) $\frac{3}{2}$ (c) $\frac{100}{3}$ (d) $\frac{2}{3}$

AIM-3 Regression Lines

5. Find the regression equation from the following data:
If ∑X = 34, ΣY = 56, ΣXY = 351, $\Sigma X^2 = 234$, $\Sigma Y^2 = 554$, N = 6
Hence estimate Y when X is 10 and estimate also x when Y is 12.
(a) 12 & 13 **(b)** 12.60 & 15.89
(c) 11.76 & 15.30 **(d)** none

AIM-2 Regression Line

6. Following are the two normal equations obtained for deriving the regression line of y and x:
5a + 10b = 40
10a + 25b = 95
The regression line of y on x is given by
(a) 2x + 3y = 5 (b) y = 2 + 3x
(c) 2y + 3x = 5 (d) y = 3 + 5x

7. Given the regression equations as 3x + y = 13 and 2x + 5y = 20, which one is the regression equation of y on x?
(a) 1st equation
(b) both (a) and (b)
(c) 2nd equation
(d) none of these

8. Given that the variance of x is equal to the square of standard deviation by and the regression line of y on x is y = 40 + 0.5 (x-30). Then regression line of x on y is
(a) y = 40 + 4 (x – 30)
(b) y = 40 + (x - 30)
(c) y = 40 + 2 (x - 30)
(d) x = 30 + 2 (x - 40)

Correlation & Regression

9. If the regression line of y on x and that of x on y are given by y = -2x + 3 and 8x = -y + 3 respectively, what is the coefficient of correlation between x and y?
(a) 0.5 (b) -0.5
(c) $-1/\sqrt{2}$ (d) none of these

10. If the regression coefficient of y on x, the coefficient of correlation between x and y and variance of y are -3/4, $\frac{\sqrt{3}}{2}$ and 4 respectively, what is the variance of x?
(a) $2/\sqrt{3/2}$ (b) 4/3
(c) 16/3 (d) 4

11. In a bivariate distribution $b_{xy} = 0.49$ and $b_{yx} = 0.25$, then the coefficient of determination is given by:
(a) 0.1313 (b) 0.1225
(c) 0.1523 (d) None

12. If the correlation coefficient between two variables X and Y is 0.5 and the regression coefficient of X on Y is 0.2, then the regression coefficient of Y on X is:
(a) 0.7 (b) ±0.5
(c) 1.25 (d) None

Property Based

13. If u = 2x + 5 and v = -3y – 6 and regression coefficient of y on x is 2.4, what is the regression coefficient of v on u?
(a)3.6 (b) 2.4
(c)-3.6 (d) -2.4

14. 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) 0.6
(c) 0.9375 (d) none

15. If y = 3x + 4 is the regression line of y on x and the arithmetic mean of x is -1, what is the arithmetic mean of y?
(a)1 (b) 7
(c)-1 (d) none

16. If the regression line of y on x and of x on y are given by 2x + 3y = -1 and 5x + 6y = -1 then the arithmetic means of x and y are given by
(a) (1, -1) (b) (-1, -1)
(c) (-1, 1) (d) (2, 3)

Additional Question Bank

1. The two regression lines are $7x - 3y - 18 = 0$ and $4x - y - 11 = 0$. Find the values of b_{yx} and b_{xy}
(a) 7/3, 1/4 (b) -7/3,-1/4
(c) -3/7, -1/4 (d) None

2. _____of the regression Coefficients is greater than the correlation coefficient
(a) Combined mean (b) Harmonic mean
(c) Geometric mean (d) Arithmetic mean

3. Given: $\overline{x} = 16$, $\sigma_x = 4.8$, $\overline{y} = 20$, $\sigma_y = 9.6$ The coefficient of correlation between x and y is 0.6. What will be the regression coefficient of 'x' on 'y'?
(a) 0.03 (b) 0.3
(c) 0.2 (d) 0.05

4. For a bivariate data, the lines of regression of Y on X, and of X on Y are respectively $2.5Y - X = 35$ and $10X - Y = 70$, then the Correlation coefficient "r" is equal to:
(a) 0.2 (b) -0.2
(c) 0.5 (d) - 0.5

5. If 2 variables are uncorrelated, their regression lines are:
(a) Parallel (b) Perpendicular
(c) Coincident (d) Inclined at 45 degrees

6. If the regression equations are $8x - 3y + 50 = 0$ and $14x - 7y - 60 = 0$ and standard deviation of y is 1. The coefficient of correlation is = _____
(a) 2 (b) 1
(c) 0.87 (d) -0.87

7. If mean of x and y variables is 20 and 40 respectively and the regression coefficient of y on x is 1.608, then the regression line of y on x is
(a) $y = 1.608x + 7.84$ (b) $y = 1.5x + 4.84$
(c) $y = 1.608x + 4.84$ (d) $y = 1.56x + 7.84$

8. If the value of correlation coefficient between x & y is 1, then the value of correlation coefficient between $x - 2$ and $\frac{-y}{2} + 1$ is:
(a) 1 (b) -1
(c) -1/2 (d) 1/2

9. Two regression lines are
$16x - 20y + 132 = 0$
$80x - 36y - 428 = 0$
The value of the correlation coefficient is
(a) 0.6 (b) -0.6
(c) 0.54 (d) 0.45

10. In case of "Insurance Companies" profits and the number of claims they have to pay there is _____ correlation.
(a) Positive (b) Negative
(c) No correlation (d) None

11. If the two regression lines are $3X = Y$ and $8Y = 6X$, then the value of correlation coefficient is
(a) 0.5 (b) -0.5
(c) 0.75 (d) -0.80

12. Find the probable error if $r = \frac{2}{\sqrt{10}}$ and $n = 36$
(a) 0.6745 (b) 0.067
(c) 0.5287 (d) None

13. If the regression line of y on x is given by $y = x + 2$ and Karl Pearson's coefficient of correlation is 0.5 then $\frac{\sigma y^2}{\sigma x^2}$ = _____.
(a) 3 (b) 2
(c) 4 (d) None

14. If $y = 9x$ and $x = 0.01\ y$ then r is equal to:
(a) -0.1 (b) 0.1
(c) +0.3 (d) -0.3

15. The straight -line graph of the linear equation $y = a + b\ x$, slope is horizontal if:
(a) $b = 1$ (b) $b \neq 0$
(c) $b = 0$ (d) $a = b \neq 0$

16. If the slope of the regression line is calculated to be 5.5 and the intercept 15 then the value of Y and X is 6 is:
(a) 88 (b) 48
(c) 18 (d) 78

Chapter 12 Probability

Single Event

1. A bag contains 12 balls which are numbered from 1 to 12. If a ball is selected at random, what is the probability that the number of the ball will be a multiple of 5 or 6 ?
(a)0.30 (b) 0.25
(c) 0.20 (d) 1/3

2. If two unbiased dice are rolled, what is the probability of getting points neither 6 nor 9?
(a)0.25 (b) 0.50
(c).075 (d) 0.80

3. A number is selected at random from the first 1000 natural numbers. What is the probability that the number so selected would be a multiple of 7 or 11?
(a)0.25 (b) 0.32
(c)0.22 (d) 0.33

4. Two dice are thrown together. What is the probability that the sum of the numbers on the two faces is neither divisible by 3 nor by 4?
(a) 5/10 (b) 4/9
(c) 4/7 (d) None

5. One number is chosen from numbers 1 to 200. Find the probability that it is divisible by 4 or 6?
(a) 67/200 (b) 89/200
(c) 56/200 (d) None

6. Two balls are drawn from a bag containing 5 white and 7 black balls at random. What is the probability that they would be of different colors?
(a) 35/66 (b) 30/66
(c) 12/66 (d) None

7. What is the chance of throwing at least 7 in a single cast with 2 dice?
(a) 5/12 (b) 7/12
(c) 1/4 (d) 17/36

8. If two unbiased dice are rolled together, what is the probability of getting no difference of points?
(a) 1/2 (b) 1/3
(c) 1/5 (d) 1/6

9. A packet of 10 electronic components is known to include 2 defectives. If a sample of 4 components is selected at random from the packet, what is the probability that the sample does not contain more than 1 defective?
(a)1/3 (b) 2/3
(c) 13/15 (d) 3/15

10. Two cards are drawn from a pack of 52 cards. What is the probability that either both are red or both are kings?
(a) 55/120 (b) 55/221
(c) 45/78 (d) None

11. The probability that a person will get an electric contract is $\frac{2}{5}$ and the probability that he will not get plumbing contract is $\frac{4}{7}$. If the probability of getting at least one contract is $\frac{2}{3}$ what is the probability that he will get both?
(a) 19/105 (b) 17/105
(c) 21/105 (d) None

12. Probability that Hameed passes in mathematics is $\frac{2}{3}$ and the probability that he passes in English is $\frac{4}{9}$. If the probability of passing both courses is $\frac{1}{4}$ what is the probability that Hameed will pass in at least one of these subjects
(a) 31/36 (b) 17/36
(c) 6/15 (d) None

At least One event (independent Event)

13. A problem in probability was given to three CA students A, B and C whose chances of solving it are 1/3, 1/5 and 1/2 respectively. What is the probability that the problem would be solved?
(a) 4/15 (b) 7/8
(c)8/15 (d) 11/15

14. There are three persons aged 60, 65 and 70 years old. The survival probabilities for these three persons for another 5 years are 0.7, 0.4 and 0.2 respectively. What is the probability that at least two of them would survive another five years?
(a)0.425 (b) 0.456
(c)0.392 (d) 0.388

15. A bag contains 5 white, 7 red and 8 black balls. Four balls are drawn one by one with replacement, what is the probability that at least one is white?
(a) $1-(\frac{3}{4})^5$ (b) $1-(\frac{3}{4})^4$
(c) $1-(\frac{5}{4})^4$ (d) none

16. A can solve 90% of the problems given in a book and B can solve 70%. What is the probability that at least one of them will solve the problem, selected at random from the book?
(a) 0.97 (b) 0.89
(c) 0.56 (d) None of These

17. A machine operates if all of its three components function. The probability that the first component fails during the year is 0.14, the second component fails is 0.10 and the third component fails is 0.05. What is the probability that the machine will fail during the year?
(a) 0.2647 (b) 0.8954
(c) 0.5623 (d) None of These

More than One Event

18. There are two boxes containing 5 white and 6 blue balls and 3 white and 7 blue balls respectively. If one of the boxes is selected at random and a ball is drawn from it, then the probability that the ball is blue is
(a)115/227 (b) 83/250
(c)137/220 (d) 127/250

19. A bag contains 8 red and 5 white balls. Two successive draws of 3 balls are made without replacement. The probability that the first draw will produce 3 white balls and the second 3 red balls is
(a) 5/223 (b) 6/257
(c)7/429 (d) 3/548

20. A class consists of 80 students; 25 of them are girls and 55 boys; 10 of them are rich and the remaining poor; 20 of them are fair complexioned. What is the probability of selecting a fair complexioned rich girl?
(a) 5/512 (b) 6/512
(c) 7/512 (d) 3/548

21. A police-man fires four bullets on a dacoit. The probability that the dacoit will be killed by one bullet is 0.6. What is the probability that the dacoit is still alive?
(a) 0.0256 (b) 0.8954
(c) 0.5623 (d) None

22. A bag contains 10 white and 15 black balls. Two balls are drawn in succession without replacement. What is the probability that first is white and second is black?
(a) 5/7 (b) 1/4
(c) 7/9 (d) 3/5

23. Find the probability of drawing a diamond card in each of the two consecutive draws from a well shuffled pack of cards, if the card drawn is not replaced after the first draw.
(a) 5/17 (b) 1/16
(c) 1/17 (d) 3/17

24. A bag contains 5 white, 7 red and 8 black balls. If four balls are drawn one by one without replacement, find the probability of getting all white balls.
(a) 5/969 (b) 6/969
(c) 7/969 (d) 1/969

25. A bag contains 19 tickets, numbered from 1 to 19. A ticket is drawn and then another ticket is drawn without replacement. Find the probability that both tickets will show even numbers.
(a) 5/17 (b) 1/16
(c) 4/19 (d) 3/17

26. From 6 positive and 8 negative numbers, 4 numbers are chosen at random (without replacement) and are then multiplied. The probability that the product of the chosen numbers will be positive number is

(a) $\frac{409}{1001}$

(b) $\frac{70}{1001}$

(c) $\frac{505}{1001}$

(d) $\frac{420}{1001}$

Total Probability

27. There are two urns. The first urn contains 3 red and 5 white balls whereas the second urn contains 4 red and 6 white balls. A ball is taken at random from the first urn and is transferred to the second urn. Now another ball is selected at random from the second arm. The probability that the second ball would be red is
(a) 7/20 (b) 35/88
(c)17/52 (d) 3/20

28. There are two boxes containing 5 white and 6 blue balls and 3 white and 7 blue balls respectively. If one of the the boxes is selected at random and a ball is drawn from it, then the probability that the ball is blue is
(a)115/227 (b) 83/250
(c)137/220 (d) 127/250

Conditional Probability

29. For a group of students, 30 %, 40% and 50% failed in Physics, Chemistry and at least one of the two subjects respectively. If an examinee is selected at random, what is the probability that he passed in Physics if it is known that he failed in Chemistry?
(a)1/2 (b) 1/3
(c)1/4 (d) 1/6

30. In a school, there are 1000 students, out of which 430 are girls. It is known that out of 430, 10% of the girl's study in class XII. What is the probability that a student chosen randomly studies in class XII given that the chosen student is a girl?
(a)1/10 (b)1/13
(c)1/5 (d) 1/6

31. Ten cards numbered 1 through 10 are placed in a box, mixed up thoroughly and then one card is drawn randomly. If it is known that the number on the drawn card is more than 3, what is the probability that it is an even number?
(a)3/10 (b)6/13
(c)4/7 (d) 1/6

Expected Value

32. If a random variable x assumes the values 0, 1 and 2 with probabilities 0.30, 0.50 and 0.20, then its expected value is
(a)1.50 (b) 3
(c)0.90 (d) 1

33. A packet of 10 electronic component is known to include 3 defectives. If 4 components are selected from the packet at random, what is the expected value of the number of defective?
(a)1.20 (b) 1.21
(c)1.69 (d) 1.72

Odds in Favour | Against

34. The odds in favor of A solving a problem is 5:7 and odds against B solving the same problem is 9:6. What is the probability that if both of them try, the problem will be solved?
(a) 117/180 (b) 181/200
(c) 147/180 (d) 119/180

35. If an unbiased die is rolled once, the odds in favor of getting a point which is multiple of 3 is:
(a) 1:2 (b) 2:1
(c) 1:3 (d) 3:1

36. If p: q are the odds in favor of an event, then the probability of that event is –
(a) $\frac{p}{q}$ (b) $\frac{p}{p+q}$
(c) $\frac{q}{p+q}$ (d) $\frac{q}{p}$

Additional Question Bank

1. A bag contains 12 balls of which 3 are red 5 balls are drawn at random. Find the probability that in 5 balls 3 are red.
(a) 3/132 (b) 5/396
(c) 1/36 (d) 1/22

2. In how many ways can the letters of 'REGULATION' be arranged so that the vowels come at odd places?
(a) 1/252 (b) 1/144
(c) 144/252 (d) None

3. A dice is thrown once. What is the mathematical expectation of the number on the dice?
(a) 16/6 (b) 13/2
(c) 3.5 (d) 4.5

4. A bag contains 3 white and 5 black balls and second bag contains 4 white and 2 black balls. If one ball is taken from each bag, the probability that both the balls are white is _____
(a) 1/3 (b) 1/4
(c) 1/2 (d) None

5. A bag contains 5 Red balls, 4 Blue Balls and 'm' Green Balls. If the random probability of picking two green balls is 1/7. What is the no. of green Balls (m).
(a) 5 (b) 7
(c) 6 (d) None

6. The probability of Girl getting scholarship is 0.6 and the same probability for Boy is 0.8. Find the probability that at least one of the categories getting scholarship.
(a) 0.32 (b) 0.44
(c) 0.92 (d) None

7. A coin is tossed 5 times, what is the probability that exactly 3 heads will occur.
(a) $\frac{5}{16}$ (b) $\frac{1}{32}$
(c) $\frac{5}{36}$ (d) $\frac{3}{32}$

8. Two unbiased dice are thrown. The Expected value of the sum of numbers on the upper side is;
(a) 3.5 (b) 7
(c) 12 (d) 6

9. Four married couples have gathered in a room. Two persons are selected at random amongst them, find the probability that selected persons are a gentleman and a lady but not a couple.
(a) 1/7 (b) 3/7
(c) 1/8 (d) 3/8

10. One Card is drawn from pack of 52, what is the probability that it is a king or a queen?
(a) 11/13 (b) 2/13
(c) 1/13 (d) None

11. Let A and B two events in a sample space S such that P(A) $= \frac{1}{2}$; P(B)$= \frac{5}{8}$, P(AUB) $= \frac{3}{4}$; Find P $(\overline{A} \cap \overline{B})$
(a) 3/4 (b) 1/4
(c) 3/16 (d) None

12. Which of the following pair of events E and F are mutually exclusive?
(a) E = {Ram's age is 13} and F = {Ram is studying in a college}
(b) E = {Sita studies in a school} and F = {Sita is a play back singer}
(c) E = {Raju is an elder brother in a family} and F = {Raju's father has more than one son}
(d) E = {Banu studied B.A. English literature and} F = (Banu can read English novels}

13. Assume that the probability for rain on a day is 0.4. An umbrella salesman can earn Rs. 400 per day in case of rain on that day and will lose Rs. 100 per day if there is no rain The expected earnings in (in Rs.) per day of the salesman is
(a) 400 (b) 200
(c) 100 (d) 0

14. A machine is made of two parts A and B. The manufacturing process of each part is such that probability of defective in part A is 0.08 and that B is 0.05. What is the probability that the assembled part will not have any defect?
(a) 0.934 (b) 0.864
(c) 0.85 (d) .874

Let's Discuss Most Important Question Student's Usually Get Confused

There are three persons aged 60, 65 and 70 years old. The survival probabilities for these three persons for another 5 years are 0.7, 0.4 and 0.2 respectively. What is the probability that at least two of them would survive another five years?

(a) 0.425 (b) 0.456 (c) 0.392 (d) 0.388

What is the probability that at **least one** will survive another five years?

What is the probability that **at least two** of them would survive another five years?

What is the probability that **all three** will survive another five years?

Your Math's Buddy
Aman Khedia

Chapter 16 Theoretical Distribution

Binominal Distribution

1. What is the probability of making 3 correct guesses in 5 True- False answer type questions?
(a)0.3125 (c) 0.6875
(b)0.5676 (d) 0.4325

2. X is binomial variable with n = 20. What is the mean of X if it is known that x is symmetric?
(a)5 (c) 2
(b)10 (d) 8

3. If the overall percentage of success in an exam is 60, what is the probability that out of a group of 4 students, at least one has passed?
(a)0.6525 (c) 0.8704
(b)0.9744 (d) 0.0256

4. If x is binomial variate with parameter 15 and 1/3, what is the value of mode of the distribution?
(a)5 and 6 (c) 5.50
(b)5 (d) 6

5. What is the number of trials of a binomial distribution having mean and SD as 3 and 1.5 respectively?
(a)2 (c) 8
(b)4 (d) 12

6. For a Binomial distribution
B (6, p), P(x = 2) = 9p(x = 4), then P is
(a) 1/2 (b) 1/3
(c) 10/13 (d) 1/4

Poisson Distribution

7. If 1 percent of an airline's flight suffer a minor equipment failure in an aircraft, what is the probability that there will be exactly two such failures in the next 100 such flights?
(a)0.50 (c) 0.265
(b)0.184 (d) 0.256

8. If for a Poisson variable X,
f(2) = 3 f(4), what is the variance of X?
(a)2 (c) $\sqrt{2}$
(b)4 (d) 3

9. If X ~ P (m) and its coefficient of variation is 50, what is the probability that X would assume only non-zero values?
(a)0.018 (c) 0.989
(b)0.982 (d) 0.976

10. If 1.5 per cent of items produced by a manufacturing unit are known to be defective, what is the probability that a sample of 200 items would contain no defective item?
(a)0.05 (c) 0.20
(b)0.15 (d) 0.22

11. A Company has two cars which it hires out during the day. The number of Cars demanded in a day has poison distribution with mean 1.5. Then percentage of days on which only one car was in demand is equal to
(a) 23.26 (b) 33.47
(c) 44.62 (d) 46.40

Normal Distribution

12. If the two quartiles of N (μ, σ^2) are 14.6 and 25.4 respectively, what is the standard deviation of the distribution?
(a) 9 (c) 10
(b) 6 (d) 8

13. If the mean deviation of a normal variable is 16, what is its quartile deviation?
(a)10.00 (c) 15.00
(b)13.50 (d) 12.05

14. If the points of inflexion of a normal curve are 40 and 60 respectively, then its mean deviation is
(a)40 (c) 50
(b)45 (d) 60

15. If the quartile deviation of a normal curve is 4.05, then its mean deviation is
(a)5.26 (c) 4.24
(b)6.24 (d) 4.80

16. If the Ist quartile and mean deviation about median of a normal distribution are 13.25 and 8 respectively, then the mode of the distribution is
(a)20 (c) 15
(b)10 (d) 12

17. The area under the Normal curve is
(a) 1 (b) 0
(c) 0.5 (d) – 1

18. If x ~ N (3,36) and y ~ N (5,64) are two independent Normal variate with their standard parameters of distribution, then if (x + y) ~ N (8,A) also follows normal distribution. The value of A will be _____.
(a) 100 (b) 10
(c) 64 (d) 36

19. What is the first quartile of x having the following probability density function?
$f(x) = \frac{1}{\sqrt{72\pi}} e^{-(x-10)^2/72}$ for $-\infty < x < \infty$
(a) 4 (b) 5
(c) 5.95 (d) 6.75

20. If the area of standard normal curve between z = 0 to z = 1 is 0.3412, then the value of ϕ (1) is.
(a) 0.5000 (b) 0.8413
(c) -0.5000 (d) 1

21. Area between = 1.96 to + 1.96 in a normal distribution is:
(a) 95.45% (b) 95%
(c) 96% (d) 99%

22. Area under U ± 3σ
(a) 99.73% (b) 99%
(c) 100% (d) 99.37%

23. For a certain type of mobile, the length of time between charges of the battery is normally distributed with a mean of 50 hours and a standard deviation of 15 hours. A person owns one of these mobiles and want to know the probability that the length of time will be between 50 and 70 hours is
(Given φ (1.33)) = 0.9082, φ (0) = 0.5)?
(a) -0.4082 (b) 0.5
(c) 0.4082 (d) -0.5

Additional Question Bank

1. For a Poisson distribution P (x = 3) = 5 P (x = 5), then S.D. is

(a) 4 (b) 2

(c) 16 (d) $\sqrt{2}$

2. For a Poisson distribution P (x = 3) = 5 P (x = 5), then S.D. is

(a) 4 (b) 2

(c) 16 (d) $\sqrt{2}$

3. If the inflexion points of a Normal Distribution are 6 and 14. Find its Standard Deviation?

(a) 4 (b) 6

(c) 10 (d) 12

4. In a Binomial Distribution, if mean is k-times the variance, then the value of 'k' will be _____.

(a) p (b) $\frac{1}{p}$

(c) 1 – p (d) $\frac{1}{1-p}$

5. The binomial distribution with mean 3 & variance 2 is:

(a) $\left(\frac{2}{4}+\frac{1}{4}\right)^{2\to9}$ (b) $\left(\frac{2}{6}+\frac{1}{6}\right)^{2\to9}$

(c) $\left(\frac{2}{3}+\frac{1}{3}\right)^{2\to9}$ (d) $\left(\frac{2}{5}+\frac{1}{5}\right)^{2\to9}$

6. If parameters of a binomial distribution are n and p then, this distribution tends to a Poisson distribution when

(a) $n \to \infty$. $p \to 0$ (b) $p \to 0$, $np = \lambda$

(c) $n \to \infty$, $np = \lambda$ (d) $n \to \infty$, $p \to 0$, $np = \lambda$

7. In a binomial Distribution with 5 independent trials, probability of 2 and 3 successes are 0.4362 and 0.2181 respectively. Parameter 'p' of the binomial distribution is:

(a) 3/4 (b) 1/3

(c) 2/3 (d) 1/4

8. In a certain Poisson frequency distribution, the probability corresponding to two successes is half the probability corresponding to three successes. The mean of the distribution is

(a) 6 (b) 12

(c) 3 (d) 2.45

9. Mean and Variance of a binomial variance are 4 and $\frac{4}{3}$ respectively then P (x >1) will be _____.

(a) $\frac{728}{729}$ (b) $\frac{1}{729}$

(c) $\frac{723}{729}$ (d) None

10. 5,000 students were appeared in an examination. The mean of marks was 39.5 with a Standard Deviation 12.5 marks. Assuming the distribution to be normal, find the number of students recorded more than 60% marks.

Given: When Z = 1.64, Area of normal curve = 0.4495

(a) 1,000 (b) 505

(c) 252 (d) 2,227

11. If six coins are tossed simultaneously. The probability of obtaining exactly two heads are:

(a) 1/64 (b) 63/64

(c) 15/64 (d) None

12. If for a normal distribution $Q_1 = 54.52$ and $Q_3 = 78.86$, then the median of the distribution is

(a) 12.17 (b) 39.43

(c) 66.69 (d) None

13. If for a normal distribution $Q_1 = 54.52$ and $Q_3 = 78.86$, then the median of the distribution is

(a) 12.17 (b) 39.43

(c) 66.69 (d) None

14. The speeds of a number of bikes follow a normal distribution model with a mean of 83 km/hr and a standard deviation of 9.4 km/hr. Find the probability that a bike picked at random is travelling at more than 95 km/hr?

(a) 0.1003 (b) 0.38

(c) 0.49 (d) 0.278

Your Math's Buddy
Aman Khedia

Chapter 17 Index Number

Basic Problems

1. The index number in whole sale prices is 152 for August 1999 compared to August 1998. During the year there is net increase in prices of whole sale commodities to the extent of
(a) 45% (b) 35%
(c) 52% (d) 48%

2. The price level of a country in a certain year has increased 25% over the base period. The index number is
(a) 25 (b) 125
(c) 225 (d) 250

3. If the price of all commodities in a place have increased 1.25 times in comparison to the base period prices, then the index number of prices for the place is now
(a) 100 (b) 125
(c) 225 (d) None

4. The wholesale price index number or agricultural commodities in a given region at a given date is 280. The percentage increase in prices of agricultural commodities over the base year is:
(a) 380 (b) 280
(c)180 (d) 80

5. If now the prices of all the commodities in a place have been decreased by 35% over the base period prices, then the index number of prices for the place is now
(a) 100 (b) 135
(c) 65 (d) None

6. If the index number of prices at a place in 1994 is 250 with 1984 as base year, then the prices have increased on average by
(a) 250% (b) 150%
(c) 350% (d) None

Unweighted Index. No

7. From the following data

Commodity	Base Price	Current Price
Rice	35	42
Wheat	30	35
Pulse	40	38
Fish	107	120

The simple Aggregative Index is
(a)115.8 (b) 110.8
(c)112.5 (d) 113.4

8. From the following data

Commodities	Base Year 1922 Price	Current Year 1934 Price
A	6	10
B	2	2
C	4	6
D	11	12
E	8	12

The price index number for the year 1934 is:
(a)140 (b) 145
(c) 147 (d) None

9. From the following data

Commodities	Base year	Current year
A	25	55
B	30	45

Then index numbers from G. M Method is:
(a)181.66 (b) 185.25
(c) 181.75 (d) None

Chain Based Index No.

10. In 1976 the average price of a commodity was 20% more than that in 1975 but 20% less than that in 1974 and more over it was 50% more than that in 1977. The price relatives using 1975 as base year (1975 price relative = 100) then the reduce date is:
(a)8.75 (b) 150,100,120,80
(c)75.125 (d) None of these

Weighted Index. No

11. From the following data base year: -

Commodity	Base Year		Current Year	
Quantity	Price	Quantity	Price	Quantity
A	4	3	6	2
B	5	4	6	4
C	7	2	9	2
D	2	3	1	5

Fisher's Ideal Index is
(a)117.3 (b) 115.43
(c)118.35 (d) 116.48

12. If $\Sigma P_0Q_0 = 1360$, $\Sigma P_nQ_0 = 1900$, $\Sigma P_0Q_n = 1344$, $\Sigma P_nQ_n = 1880$ then the Laspeyres's Index number is
(a)0.71 (b) 1.39
(c)1.75 (d) None

13. If the ratio between Laspeyres's index number and Paasche's Index number is 28: 27. Then the missing figure in the following table p is:

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
X	L	10	2	5
Y	L	5	P	2

(a)7 (b) 4
(c)3 (d) 9

Deflation

14. Consumer Price index number for the year 1957 was 313 with 1940 as the base year 96 the Average Monthly wages in 1957 of the workers into factory be Rs. 160/- their real wages is
(a)Rs.48.40 (b) Rs.51.12
(c)Rs.40.30 (d) None of these

Value Index Number

15. The total value of retained imports into India in 1960 was Rs.71.5 million per month. The corresponding total for 1967 was Rs.87.6 million per month. The index of volume of retained imports in 1967 composed with 1960 (= 100) was 62.0. The price index for retained inputs for 1967 our 1960 as base is
(a)198.61 (b)197.61
(c)198.25 (d) None of these.

16. From the following data with 1966 as base year

Commodity	Quantity Units	Values (Rs)
A	100	500
B	80	320
C	60	150
D	30	360

The price per unit of commodity A in 1966 is
(a)Rs.5 (b) Rs.6
(c)Rs.4 (d) Rs.12

Consumer Price Index

17. During a certain period, the cost-of-living index number goes up from 110 to 200 and the salary of a worker is also raised from Rs. 325 to Rs. 500. The worker does not get really gain. Then the real wages decreased by:
(a)Rs.45.45 (b) Rs. 43.25
(c)Rs.100 (d) None of these

18. With the base year 1960 the C. L. I. in 1972 stood at 250. x was getting a monthly Salary of Rs.500 in 1960 and Rs. 750 in 1972. In 1972 to maintain his standard of living in 1960 he has to receive as extra allowances of
(a)Rs.600/- (b) Rs. 500/-
(c)Rs.300/- (d) None of these

Students are requested to Note Down the questions along with reference Book That are required to be revised along with the AK-47 Multiple time Specially One Day Before Examination

Reference Book	Question Number	Remark

Chapter 15 Number Series, Coding Decoding Odd Man Out

Number Series

1. 6, 11, 21, ? , 56, 81
(a) 42 (b) 36
(c) 91 (d) 51

2. 10, 18, 28, 40, 54, ?, 88
(a) 70 (b) 86
(c) 87 (d) 9

3. 120, 99, ?, 63, 48, 35
(a) 80 (b) 36
(c) 45 (d) 40

4. 22, 24, 28, 36, ? , 84
(a) 44 (b) 52
(c) 38 (d) 54

5. 48, 24, 96 , ?192
(a) 48 (b) 47
(c) 44 (d) 54

6. 165, 195, 255, 285, ?, 435
(a) 345 (b) 390
(c) 335 (d) 395

7. 6, 13, 28, 59, ?
(a) 122 (b) 114
(c) 113 (d) 112

8. 2, 7, 27, 107, 427, ?
(a) 1707 (b) 4027
(c) 4207 (d) 1207

Coding Decoding

9. In a certain language, MADRAS is coded NBESBT, how DELHI is coded in that code?
(a) EMMJI (b) EFMIJ
(c) EMFIJ (d) JIFEM

10. If RAMAN is written as 12325 and DINESH as 675489 how HAMAM is written?
(a) 92323 (b) 92233
(c) 93233 (d) 93292

11. If MEKLF is coded as 91782 and LLLJK as 88867, how can IHJED is coded as?
(a) 97854 (b) 64512
(c) 54310 (d) 75632

12. If DELHI is coded 73541 and CALCUTTA as 82589662, How can CALICUT be coded?
(a) 5279431 (b) 5978213
(c) 8251896 (d) 8543962

13. In a certain code, RIPPLE is written as 613382 and LIFE is written as 8192. How is PILLER written in that code?
(a) 318826 (b) 318286
(c) 618826 (d) 338816

14. In certain language, PEAR is coded as 7519, and TOIL is coded as 2693, then hoe DOCTOR be written in that code?
(a) 463293 (b) 463239
(c) 463269 (d) 463296

15. In a certain system of coding the word "STATEMENT" is written as "TNEMETATS". In the same system of coding the word "POLITICAL" written as:
(a) LACITILOP (b) LACTILIOP
(c) OPILITACL (d) LACATILOP

Odd Man Out

16. 3, 5, 7, 15, 17, 19
(a) 15 (b) 17
(c) 19 (d) 7

17. 10, 14, 16, 18, 23, 24, 26
(a) 26 (b) 23
(c) 24 (d) 18

18. 1, 4, 9, 16, 24, 25, 36
(a) 9 (b) 24
(c) 25 (d) 36

19. 1, 5, 14, 30, 49, 55, 91
(a) 49 (b) 30
(c) 55 (d) 91

20. 835, 734, 642, 751, 853, 981, 532
(a) 751 (b) 853
(c) 981 (d) 532

21. Choose out the odd one of the following:
(a) December (b)February
(c) March (d) July

22. Choose out the odd one of the following:
(a) June (b) July
(c) Aug (d) Oct

23. Choose out the odd one of the following:
(a) Month (b) Week
(c) Fortnight (d) Season

24. Choose out the odd one of the following:
(a) Calendar (b) Year
(c) Date (d) Month

Students are requested to Note Down the questions along with reference Book That are required to be revised along with the AK-47 Multiple time Specially One Day Before Examination

Reference Book	Question Number	Remark

Chapter 16 Direction Test

In Which Direction Moving Now

1. A start from a point and walks 5 kms north, then turns left and walks 3 kms. Then again turns left and walks 5 km. Point out the direction in which he is going now.
(a) North (b) South
(c) East (d) West

2. A rat run 20 towards East and turns to right runs 10 and turns to right runs 9 and again turns to left runs 5 and then turns to left runs 12 and finally turns to left and runs 6. Now what direction is the rat facing?
(a) East (b) North
(c) West (d) South

3. A driver left his village and drove North for 20 km, after which he stopped for breakfast. Then he turned left and drove another 30 km, when he stopped for lunch. After some rest, he again turned left and drove 20 kms before stopping for evening tea. Once more he turned left and drove 30 kms to reach the town where he had supper. After evening tea in which direction did, he drive?
(a) West (b) East
(c) North (d) South

4. 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

5. One evening, Raja started to walk toward the Sun. After walking a while, he turned to his right and again to his right. After walking a while, he again turned right. In which direction is he facing?
(a) South (b) East
(c) West (d) North

Direction With Respect to Starting Point

6. Ashok went 8 km South and turned West and walked 3 km again he turned North and walked 5 kms. He took a final turn to East and walked 3 kms. In which direction was Ashok from the starting point?
(a) East (b) North (c) West (d) South

7. A walk southwards, then turns right, then left and then right. In which direction is he from the starting point?
(a) South (b) East (c) West (d) North

8. Laxman went 15 km to North then he turned West and covered 10 kms. Then he turned south and covered 5 kms. Finally turning to East, he covered 10 kms. In which direction he is from his house?
(a) East (b) West (c) North (d) South

9. Roy walks 2 km to East, then turns North-West and walks 3 km. Then he turns South and walks 5 km. Then again, he turns West and walks 2 km. Finally, he turns North and walks 6 km. In which direction, is he from the starting point?
(a) South-West (b) South-East
(c) North-West (d) North-East

Upside Down

10. If X stands on his head with his face towards south, to which direction will his left-hand point?
(a) East (b) West
(c) North (d) South

11. If A stands on his head with his face towards north. In which direction will his left-hand point?
(a) North-East (b) North
(c) East (d) North-West

Clockwise Anticlockwise

12. A man is facing west. He turns 45 degrees in clockwise direction and then another 180 degrees in the same direction and then 270 degrees in anticlockwise direction. In which direction is he facing now?
(a) South-East (b) West
(c) South (d) South-West

Position of One WRT Another

13. Babu is Rahim's neighbor and his house is 200 meters away in the north-west direction. Joseph is Rahim's neighbor and his house is located 200 meters away in the south-west direction. Gopal is Joseph's neighbor and he stays 200 meters away in the south-east direction. Roy is Gopal's neighbor and his house is located 200 meters away in the north-east direction. Then where is the position of Roy's house in relation to Babu's?
(a) South-east (b) south-west
(c) North (d) North-east

Clock Concept

14. The hour hand of a clock is in west direction when time is 3'0 clock What is the direction of minutes hand when time is 6:45?
(a) East (b) West
(c) North (d) South

15. Daily in the morning the shadow of a Clock Tower installed on Railway Station falls on high rise Mall and in the evening the shadow of the same mall falls on the Clock Tower installed on Railway Station exactly. So in which direction is Clock Tower to Mall?
(a) Eastern side (b) Western side
(c) Northern Side (d) Southern side

Shadow Concept

16. One morning after Sunrise, Vikram and Shailesh were standing in a down with their back towards each other. Vikram's shadow fell exactly towards left hand side. Which direction was Shailesh facing?
(a) South-West (b) West
(c) South (d) East-South

17. Sun rises behind the tower and sets behind the railway station. In which direction is the tower from railway station?
(a) North (b)South (c) East (d) West

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Reference Book	Question Number	Remark

Chapter 17 Seating Arrangement

Linear Arrangement

1. There are five different houses, A to E, in a row. A is to the right of B and E is to the left of C and right of A, B is to the right of D. Which of the houses is in the middle? IB CA (IO) 2013)
(a) A **(b)** B
(c) C **(d)** D

2. Five friends P, Q, R, S and T are sitting in a row facing North. Here, S is between T and Q and Q is to the immediate left of R. P is to the immediate left of T. Who is in the middle? (SSC (Multi Task)2014)
(a) S **(b)** T
(c) Q **(d)** R

3. Five boys are standing in a row facing East. Pavan is left of Tavan, Vipin and Chavan to the left of Nakul. Chavan is between Tavan and Vipin. Vipin is fourth from the left, then how far is Tavan to the right? (CLAT 2014)
(a) First **(b)** Second
(c) Third **(d)** Fourth

4. In a gathering seven members are sitting in a row. 'C' is sitting left to 'B' but on the right to 'D'. 'A' is sitting right to 'B', 'F; is sitting right to 'E' but left to 'D'. 'H' is sitting left to 'E'. Find the person sitting in the middle
(a) C **(b)** D
(c) E **(d)** F

Circular Arrangement

5. Siva, Satish, Amar and Praveen are playing cards. Amar is to the right of Satish who is to the right of Siva. Who is to the right of Amar?
(a) Satish **(b)** Amar
(c) Praveen **(d)** Shiva

Directions (Q. No. 6- 9): Study the following information carefully to answer the given questions.
(a) P, Q, R, S, T, U, V and w are sitting round the circle and are facing the Centre.
(b) P is second to the right of T who is the neighbor of R and V
(c) S is not the neighbor of P
(d) V is the neighbor of U
(e) Q is not between S and W. W is not between U and S

6. Which two of the following are not neighbor?
(a) RV **(b)** UV
(c) RP **(d)** QW

7. Who is immediate right to the V?
(a) P **(b)** U
(c) R **(d)** T

8. Which of the following is correct?
(a) P is not the immediate right of Q.
(b) R is between U and V
(c) Q is to the immediate left of W
(d) U is between W and S

9. What is the position of S?
(a) Between U and V
(b) Second to right of P
(c) To the immediate right of W
(d) Data inadequate

Double Line Arrangement

Directions (Q. No. 10- 13): Study the following information carefully to answer the given questions.
Eight persons P to W are sitting in front of one another in two rows. Each row has four persons. P is between U and V and facing North. Q, who is to the immediate left of M is facing W. R is between T and M and W is to the immediate right of V.

10. Who is sitting in front of R?
(a) U **(b)** Q
(c) V **(d)** P

11. Who is to the immediate right of R?
(a) M **(b)** U
(c) M or W **(d)** None

12. In which of the following pairs, persons are sitting in front of each other?
(a) MV **(b)** RV
(c) TV **(d)** UR

13. Four girls A, B, C, D are sitting around a circle facing the centre. B and C infront of each other, which of the following is definitely true? (MAT 2009)
(a) A and D Infront of each other
(b) A is not between B and C
(c) D is left of C
(d) A is left of C

Students are requested to Note Down the questions along with reference Book That are required to be revised along with the AK-47 Multiple time Specially One Day Before Examination

Reference Book	Question Number	Remark

Chapter 18 Blood Relations

Based on Tree Diagram

1. A is the father of B. C is the daughter of B. D is the brother of B. E is the son of A. What is the relationship between C and E?
(a) Brother and sister (b) Cousins
(c) Niece and uncle (d) Uncle and aunt

2. If P is the husband of Q and R is the mother of S and Q. What is R to P?
(a) Mother (b) Sister
(c) Aunt (d) Mother-in-law

3. P and Q are brothers. R and S are sister. P's son is S's brother. How is Q related to R?
(a) Uncle (b) Brother
(c) Father (d) Grandfather

4. X is the husband of Y. W is the daughter of X. Z is husband of W. N is the daughter of Z. What is the relationship of N to Y?
(a) Cousin (b) Niece
(c) Daughter (d) Grand-daughter

5. If A is the mother of D. B is not the son of C. C is the father of D, D is the sister of B, then how is A related to B?
(a) Mother (b) Brother
(c) Step son (d) Sister

6. A and B are brother and sister respectively. C is A's father. D is C's sister and E is D's mother. How is B related to E?
(a) Grand-daughter (b) Great grand-daughter
(c) Aunt (d) Daughter

7. A is the mother of D and sister of B. B has a daughter C who is married to F. G is the husband of A. How is G related to D?
(a) Uncle (b) Husband
(c) Son (d) Father

Number of Family Members

8. Six persons are seen together in a group. They are A, B, C, D, E and F. B is the brother of D, but D is not brother of B. F is the brother of B, C and A are married together. F is son of C, but C is not the mother of F. E is the brother of A. The number of female members in the group is:
(a) 1 (b) 2
(c) 3 (d) 4

9. A, B, C, D, E and F are members of a family B is the son of A but A is not the mother of B, A and C are married couple F is the brother of A. D is the sister of B, E is the son of C.

9A. How many male members are there in the family.
(a) 1 (b) 2
(c) 3 (d) 4

9B. How is F related to B?
(a) Uncle (b) Daughter
(c) Son (d) Niece

9C. How many children does A have?
(a) 3 (b) 2
(c) 4 (d) 1

Relations in Coded Language

10. If P + Q means P is the mother of Q P ÷ Q means P is the father of Q, P - Q means P is the sister of Q then which of the following relationship shows that M is the daughter of R?
(a) R ÷ M + N (b) R + N ÷ M
(c) R - M ÷ N (d) None

11. If A $ B means A is father of B. A # B means A is daughter of B. A @ B means A is sister of B. Then how is K related to M in "H @ K $ L # M"
(a) Husband
(b) Uncle
(c) Father
(d) Grandson

Pointing towards a Photograph

12. Pointing to a lady, Suresh said "She is the mother of my son's wife's daughter." How is Suresh related to lady?
(a) Uncle (b) Cousin
(c) Daughter-in-law (d) Father-in-law

13. Pointing to lady, a man said "the son of her only brother is brother of my wife." How is the lady related to man?
(a) Mother-in-law (b) Sister of father-in-law
(c) Mother of Father-in-law (d) Cousin

14. Showing the man playing the cricket, Ms. P said, "He is the brother of my uncle's daughter." Who is the man to Ms. P?
(a) Son (b) Cousin
(c) Uncle (d) Brother – in -law

15. Introducing a boy, Akshat said, "His mother is the only daughter of my mother – in – law." How is Akshat related to the boy?
(a) Uncle (b) Father
(c) Brother (d) Husband

16. Pointing to a photographer, a woman says" This man's son's sister is my mother-in-law". How is the women's husband related to the man is the photographer?
(a) Son (b) Son-in-law
(c) Grandson (d) Nephew

17. Pointing to a man in the photograph. Khushi says, "This man's son's sister is my mother-in-law." How is the Khushi's husband related to the man in the photograph?
(a) Grandson (b) Son
(c) Son in law (d) Cousin

18. When Rani saw Vinit, she recollected that "He is the brother of my grandfather's son". How is Rani related to Vinit?
(a) Aunt (b) Daughter
(c) Sister (d) Niece

Students are requested to Note Down the questions along with reference Book That are required to be revised along with the AK-47 Multiple time Specially One Day Before Examination

Reference Book	Question Number	Remark

Answer Sheet

Ratio & Proportion

1.	b	5.	c	9.	d	13.	d	17.	a	21.	a	25.	a
2.	b	6.	d	10.	a	14.	b	18.	b	22.	c	26.	b
3.	c	7.	a	11.	c	15.	c	19.	c	23.	b	27.	a
4.	a	8.	c	12.	d	16.	c	20.	d	24.	b	28.	a

Indices

1.	c	5.	c	9.	b	13.	b	17.	c	21.	b
2.	c	6.	b	10.	a	14.	b	18.	a		
3.	d	7.	a	11.	c	15.	a	19.	a		
4.	b	8.	a	12.	b	16.	c	20.	b		

Additional Question Bank

1.	d	2.	a	3.	d	4.	a	5.	d	6.	a	7.	b	8.	a	9.	b	10.	a
11.	b	12.	b	13.	c	14.	a	15.	a	16.	b								

Logarithm

1.	c	5.	a	9.	a	13.	c	17.	d	21.	b	25.	d	29.	c
2.	c	6.	c	10.	b	14.	a	18.	c	22.	b	26.	b		
3.	b	7.	b	11.	c	15.	b	19.	c	23.	a	27.	d		
4.	c	8.	d	12.	b	16.	c	20.	b	24.	a	28.	a		

Additional Question Bank

1.	a	3.	a	5.	a	7.	b	9.	b	11.	d
2.	b	4.	c	6.	d	8.	b	10.	c		

Equations

1.	d	5.	b	9.	d	13.	a	17.	b	21.	b
2.	d	6.	a	10.	d	14. `	c	18.	b	22.	a
3.	a	7.	c	11.	b	15.	a	19.	b	23.	b
4.	d	8.	b	12.	d	16.	d	20.	d		

Additional Question Bank

1.	d	4.	c	7.	d	10.	d	13.	c	16.	b
2.	a	5.	c	8.	d	11.	b	14.	b	17.	b
3.	a	6.	b	9.	b	12.	c	15.	d		

Inequalities

1.	c	2.	c	3.	a	4.	a	5.	d	6.	a	7.	b	8.	c	9.	b	10.	b
11.	a	12.	a														

Additional Question Bank

1.	d	2.	a	3.	a	4.	d	5.	b	6.	c	7.	c	8.	c
9.	b														

Mathematics of Finance

1.	b	6.	c	11.	b	16.	a	21.	a	26.	c	31.	b	36.	a
2.	a	7.	a	12.	c	17.	a	22.	c	27.	a	32.	d	37.	
3.	a	8.	c	13.	c	18.	a	23.	b	28.	a	33.	b	38.	a
4.	a	9.	a	14.	d	19.	c	24.	c	29.	a	34.	d	39.	b
5.	c	10.	d	15.	b	20.	d	25.	a	30.	c	35.	b		

Additional Question Bank

1.	b	3.	a	5.	b	7.	c	9.	b	11.	b
2.	a	4.	c	6.	c	8.	c	10.	c	12.	a

Permutation & Combination

1.	c	5.	a	9.	a	13.	d	17.	b	21.	b	25.	b
2.		6.	c	10.	a	14.	a	18.	b	22.	c		
3.	c	7.	c	11.	c	15.	c	19.	b	23.	a		
4.	c	8.	a	12.	a	16.	c	20.	b	24.	a		

Additional Question Bank

1.	C	5.	C	9.	C	13.	a	17.	c	21.	a
2.	A	6.	C	10.	a	14.	a	18.	d		
3.	B	7.	a	11.	a	15.	c	19.	b		
4.	B	8.	b	12.	a	16.	c	20.	a		

Sequence & Series

1.	B	5.	B	9.	b	13.	C	17.	a	21.	A	25.	A	29.	B
2.	C	6.	B	10.	A	14.	B	18.	B	22.	C	26.	B	30.	A
3.	B	7.	C	11.	b	15.	A	19.	A	23.	C	27.	C	31.	d
4.	C	8.	A	12.	c	16.	B	20.	A	24.	A	28.	C		

Additional Question Bank

1.	b	4.	b	7.	a	10.	a	13.	d	16.	d
2.	d	5.	c	8.	b	11.	b	14.	c	17.	a
3.	c	6.	b	9.	b	12.	b	15.	c		

Sets

1.	b	2.	c	3.	b	4.	a	5.	c	6.	c	7.		8.	a	9.	b	10.	b
11.	a	12.	c	13.	a	14.	b	15.	a	16.	c	17.	a	18.i.	a	18.ii.	b	19.	a
20.i.	a	20.ii.	b	20.iii.	c	21.	b	22.	b										

Relations & Functions

1.	c	2.	a	3.	d	4.	a	5.	a	6.	b	7.	c	8.	c	9.	b	10.	b
11.	a	12.	a	13.	c	14.	b	15.	a	16.	b	17.	a	18.	b	19.	b	20.	d
21.	a	22.	d	23.	a	24.	a												

Additional Question Bank

1.	a	2.	d	3.	a	4.	b	5.	a	6.	d	7.	c	8.	c	9.	c	10.	c
11.	b	12.	a	13.	a	14.	b	15.	b										

Differential Calculus

1.	a	2.	b	3.	a	4.	b	5.	c	6.	c	7.	c	8.	a	9.	b	10.	a
11.	b	12.	a	13.	b	14.	a	15.	c	16.	b	17.	a	18.	b	19.	c	20.	a
21.	b	22.	b	23.	a	24.	c	25.	c	26.	a	27.	b	28.	a				

Additional Question Bank

1.	b	2.	b	3.	b	4.	c	5.	b	6.	b	7.	b	8.	a	9.	a	10.	c
11.	a	12.	b	13.	b	14.	c	15.	c	16.		17.	b						

Integral Calculus

1.	b	2.	b	3.	b	4.	b	5.	d	6.	d	7.	c	8.	b	9.	a	10.	a
11.	b	12.	b	13.	a	14.	a	15.	a	16.	c	17.	a	18.	b	19.	b	20.	c
21.	a	22.	d	23.	c	24.	b	25.	b	26.	b	27.	a						

Additional Question Bank

1.	b	2.	a	3.	c	4.	c	5.	b	6.	b	7.	d	8.	b	9.	b	10.	d
11.	c	12.	b	13.	a														

Limits & Continuity

No Answer Sheet Available

Statistical Description of Data

1.	b	2.	d	3.	d	4.	a	5.	b	6.	b	7.	a	8.	a	9.	a	10.	d
11.	c	12.	a	13.	b	14.	c	15.	d	16.	c	17.	b	18.	d	19.	d	20.	b
21.	d	22.	c	23.	a	24.	b	25.	a	26.	b	27.	b	28.	a	29.	a	30.	a
31.	c	32.	b	33.	d	34.	d	35.	c	36.	a	37.	a	38.	a	39.	b	40.	d
41.	d	42.	c	43.	b														

Measures of Central Tendency

1.	a	2.	c	3.	a	4.	b	5.	a	6.	b	7.	c	8.	b	9.	c	10.	b
11.	b	12.	c	13.	a	14.	c	15.	b	16.	c	17.	c	18.	c	19.	c	20.	c

Additional Question Bank

1.	b	2.	c	3.	b	4.	b	5.	a	6.	c	7.	c	8.	a	9.	c	10.	d
11.	c	12.	c	13.	c	14.	c												

Measures of Dispersion

1.	d	2.	b	3.	c	4.	b	5.	c	6.	d	7.	c	8.	c	9.	a	10.	c
11.	a	12.	a	13.	a	14.	b	15.	b	16.	a	17.	a	18.	b	19.	b	20.	a
21.	b	22.	a	23.	d	24.	c												

Additional Question Bank

1.	b	2.	b	3.	c	4.	b	5.	c	6.	d	7.	a	8.	c	9.	c	10.	c
11.	d	12.	b	13.	d	14.	d	15.	b	16.	b								

Correlation Analysis

1.	a	2.	b	3.	a	4.	c	5.	b	6.	c	7.	a	8.	b	9.	a	10.	d
11.	a	12.	b	13.	b	14.	c	15.	d	16.	d	17.	a						

Additional Question Bank

1.	b	2.	a	3.	d	4.	b	5.	b	6.	b	7.	b	8.	b	9.	c	10.	b
11.	c	12.	b	13.	a	14.	b												

Regression Analysis

1.	a	2.	a	3.	b	4.	a	5.	c	6.	c	7.	c	8.	d	9.	b	10.	c
11.	b	12.	c	13.	c	14.	a	15.	a	16.	a							

Additional Question Bank

1.	a	2.	d	3.	b	4.	a	5.	b	6.	c	7.	a	8.	b	9.	a	10.	b
11.	a	12.	b	13.	c	14.	c	15.	c	16.	b							

Probability

1.	d	2.	c	3.	c	4.	b	5.	a	6.	a	7.	b	8.	d	9.	c	10.	b
11.	b	12.	a	13.	d	14.	d	15.	b	16.	a	17.	a	18.	c	19.	c	20.	a
21.	a	22.	b	23.	c	24.	d	25.	c	26.	c	27.	b	28.	c	29.	a	30.	a
31.	c	32.	c	33.	a	34.	a	35.	a	36.	b								

Additional Question Bank

1.	d	2.	a	3.	c	4.	b	5.	c	6.	c	7.	a	8.	b	9.	b	10.	b
11.	a	12.	c	13.	c	14.	d												

Theoretical Distribution

1.	a	2.	b	3.	a	4.	b	5.	d	6.	d	7.	b	8.	a	9.	c	10.	a
11.	b	12.	d	13.	b	14.	a	15.	d	16.	a	17.	a	18.	b	19.	c	20.	b
21.	b	22.	a	23.	a														

Additional Question Bank

1.	a	2.	d	3.	a	4.	d	5.	c	6.	d	7.	b	8.	a	9.	a	10.	c
11.	c	12.	d	13.	c	14.	a												

Index Number

1.	c	2.	b	3.	c	4.	c	5.	c	6.	b	7.	b	8.	d	9.	a	10.	b
11.	a	12.	b	13.	b	14.	b	15.	b	16.	a	17.	a	18.	b				

Number Series, Coding Decoding, Odd Man Out

1.	B	2.	A	3.	A	4.	B	5.	A	6.	A	7.	A	8.	A	9.	B	10.	C
11.	C	12.	C	13.	A	14.	C	15.	A	16.	A	17.	B	18.	B	19.	A	20.	A
21.	B	22.	A	23.	D	24.	a												

Direction Tests

1.	b	2.	b	3.	b	4.	a	5.	a	6.	d	7.	a	8.	c	9.	c	10.	b
11.	c	12.	d	13.	a	14.	a	15.	a	16.	c	17.	c						

Seating Arrangement

1.	a	2.	a	3.	d	4.	b	5.	c	6.	a	7.	d	8.	c	9.	c	10.	d
11.	b	12.	a	13.	a														

Blood Relation

1.	c	2.	d	3.	a	4.	d	5.	a	6.	a	7.	d	8.	b	9a.	d	9b.	a
9c.	a	10.	a	11.	a	12.	d	13.	b	14.	b	15.	b	16.	c	17.	a	18.	d