

Ratio , Praportion,Indices and Logarithms

1. Two numbers are in the ratio 2 : 3 and the difference of their squares is 320. The numbers are :
 (a) 12, 18 (b) 16, 24
 (c) 14, 21 (d) None

2. An alloy is to contain copper and zinc in the ratio 9 : 4. The zinc required to melt with 24 kg of copper is:
 (a) $10\frac{2}{3}$ kg (b) $10\frac{1}{3}$ kg
 (c) $9\frac{2}{3}$ kg (d) 9 kg

3. A bag contains Rs. 187 in the form of 1 rupee, 50 paise and 10 paise coins in the ratio 3 : 4 : 5. Find the number of each type of coins :
 (a) 102, 136, 170 (b) 136, 102, 170
 (c) 170, 102, 136 (d) None

4. Two numbers are in the ratio 7 : 8. If 3 is added to each of them, their ratio becomes 8 : 9. The numbers are :
 (a) 14, 16 (b) 24, 27
 (c) 21, 24 (d) 16, 18

5. A box contains Rs.56 in the form of coins of one rupee, 50 paise and 25 paise. The number of 50 paise coin is double the number of 25 paise coins and four times the numbers of one rupee coins. The numbers of 50 paise coins in the box is :
 (a) 64 (b) 32 (c) 16 (d) 14

6. Ratio of earnings of A and B is 4 : 7. If the earnings of A increase by 50% and those of B decrease by 25%, the new ratio of their earning becomes 8 : 7. What is A's earning?
 (a) Rs. 21,000 (b) Rs. 26,000
 (c) Rs. 28,000 (d) Data inadequate

7. 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

8. In 40 litres mixture of glycerine and water, the ratio of glycerine and water is 3 : 1. The quantity of water added in the mixture in order to make this ratio 2 : 1 is:
 (a) 15 litres (b) 10 litres
 (c) 8 litres (d) 5 litres

9. Rs. 407 are to be divided among A, B and C so that their shares are in the ratio $\frac{1}{4} : \frac{1}{5} : \frac{1}{6}$. The respective shares of A, B, C are:
 (a) Rs. 165, Rs. 132, Rs. 110
 (b) Rs. 165, Rs. 110, Rs. 132
 (c) Rs. 132, Rs. 110, Rs. 165
 (d) Rs. 110, Rs. 132, Rs. 165

10. The incomes of A and B are in the ratio 3 : 2 and their expenditures in the ratio 5 : 3. If each saves Rs.1,500, then B's income is :
 (a) Rs. 6,000 (b) Rs. 4,500
 (c) Rs. 3,000 (d) Rs. 7,500

11. In what ratio should tea worth Rs.10 per kg be mixed with tea worth Rs.14 per kg, so that the average price of the mixture may be Rs.11 per kg?
 (a) 2 : 1 (b) 3 : 1 (c) 3 : 2 (d) 4 : 3

12. The ages of two persons are in the ratio 5 : 7. Eighteen years ago their ages were in the ratio of 8 : 13, their present ages (in years) are :
 (a) 50, 70 (b) 70, 50
 (c) 40, 56 (d) None

13. If p : q is the sub-duplicate ratio of $p - x^2 : q - x^2$, then x^2 is :
 (a) $\frac{p}{p+q}$ (b) $\frac{q}{p+q}$
 (c) $\frac{qp}{p-q}$ (d) None

14. The third proportional between $(a^2 - b^2)$ and $(a + b)^2$ is:

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

20. If $\frac{p}{q} = -\frac{2}{3}$ then the value of $\frac{2p + q}{2p - q}$ is :

- (a) 1 (b) $-1/7$ (c) $1/7$ (d) 7

21. Fourth proportional to $x, 2x, (x + 1)$ is :

- (a) $(x + 2)$ (b) $(x - 2)$
 (c) $(2x + 2)$ (d) $(2x - 2)$

22. If $19 - x, 26 - x, 35 - x$ and $50 - x$ are in proportion, then $x =$

- (a) 4 (b) 5 (c) 2 (d) None

23. Value of

$$(a^{1/8} + a^{-1/8})(a^{1/8} - a^{-1/8})$$

$$(a^{1/4} + a^{-1/4})(a^{1/2} + a^{-1/2}) \text{ is :}$$

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

24. Simplification of $\frac{x^{m+3n} \cdot x^{4m-9n}}{x^{6m-6n}}$ is :

- (a) x^m (b) x^{-m} (c) x^n (d) x^{-n}

25. If $2^x - 2^{x-1} = 4$, then the value of x^x is:

- (a) 2 (b) 1 (c) 64 (d) 27

26. If $4^x = 5^y = 20^z$ then z is equal to:

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

27. $\left(\frac{\sqrt{3}}{9}\right)^{5/2} \left(\frac{9}{3\sqrt{3}}\right)^{7/2} \times 9$ is equal to:

- (a) 1 (b) $\sqrt{3}$
 (c) $3\sqrt{3}$ (d) $\frac{3}{9\sqrt{3}}$

28. If $x = y^a, y = z^b$ and $z = x^c$ then abc is:

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

29. $\frac{2^n + 2^{n-1}}{2^{n+1} - 2^n}$

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

30. If $2^x \times 3^y \times 5^z = 360$. Then what is the value of x, y, z ?

- (a) 3, 2, 1 (b) 1, 2, 3
 (c) 2, 3, 1 (d) 1, 3, 2

31. On simplification

$$\frac{1}{1 + z^{a-b} + z^{a-c}}$$

$$+ \frac{1}{1 + z^{b-c} + z^{b-a}} + \frac{1}{1 + z^{c-a} + z^{c-b}}$$

reduces

to :

- (a) $\frac{1}{z^{2(a+b+c)}}$ (b) $\frac{1}{z^{(a+b+c)}}$
 (c) 1 (d) 0

32. If $\frac{1 - \sqrt{1-x}}{1 + \sqrt{1-x}} = \frac{1}{3}$, then $x =$

- (a) $\frac{1}{2}$ (b) $\frac{2}{3}$
 (c) $\frac{3}{4}$ (d) none of these

33. If b is the mean proportional of a and c , then

$$(a + b + c)(a - b + c) =$$

- (a) $a^2 + b^2 - c^2$ (b) $a^2 - b^2 + c^2$
 (c) $a^2 + b^2 + c^2$ (d) $a^2 - b^2 - c^2$

34. Mean proportional of a and b is 14. If $a + b = 53$, then $(a, b) \equiv$

- (a) 44, 9 (b) 4, 49
 (c) 42:11 (d) none of these

35. If $\log_{10} t + \log_{10} (t - 3) = 1$ then the value of t is equal to

- (a) 2 (b) 3
 (c) 0 (d) 5

36. $(a + b) \log \left(\frac{x^a}{x^b} \right) + (b + c) \log \left(\frac{x^b}{x^c} \right)$

$$+ (c + a) \log \left(\frac{x^c}{x^a} \right) =$$

- (a) 0 (b) 1
 (c) $\log x$ (d) None

37. If a, b, c are in geometric progression then the value of $\log_b a + \log_b c$ is equal to
 (a) \sqrt{ab} (b) $b^2 = ac$
 (c) 2 (d) ac
38. The sum of n terms $\log_a b + \log_{a^2} b^2 + \log_{a^3} b^3 + \dots + \log_{a^n} b^n$ is given by
 (a) $\log_a b^n$ (b) $\log_a b$
 (c) $\log_{a^n} b^n$ (d) none of these
39. If $\log(2x - 3y) = \log x - \log y$ then x is equal to
 (a) $\frac{3y}{2x-1}$ (b) $\frac{y^2}{2y-1}$
 (c) $\frac{3y^2}{2y-1}$ (d) $\frac{-3y^2}{2y-1}$
40. If $\log_2 x + \log_4 x + \log_{16} x = \frac{21}{4}$ then the value of x is
 (a) 23 (b) 20
 (c) 1 (d) 8
41. $\log_4(x^2 + x) - \log_4(x + 1) = 2$. Find x :
 (a) 16 (b) 0 (c) -1
 (d) None of these
42. If $\log_2[\log_3(\log_2 x)] = 1$, then x equals :
 (a) 128 (b) 256
 (c) 512 (d) None
43. $7\log\left(\frac{16}{15}\right) + 5\log\left(\frac{25}{24}\right) + 3\log\left(\frac{81}{80}\right)$ is equal to
 (a) 0 (b) 1 (c) $\log 2$ (d) $\log 3$
44. If $\left(\frac{21}{10}\right)^x = 2$, then $x =$
 (a) $\frac{\log 2}{\log 3 + \log 7 - 1}$ (b) $\frac{\log 2}{\log 3 - \log 7 - 1}$
 (c) $\frac{\log 2}{1 + \log 2 + \log 3}$ (d) None of these

Equations

1. The area of a triangle with vertices (1,3), (5, 6) and (-3, 4) in terms of square units is
 (a) 5 (b) 3 (c) 8 (d) 13
2. In a fraction, if the denominator is increased by 1, it becomes $\frac{1}{2}$. If the numerator is increased by 9, it becomes 1. Find the denominator.
 (a) 3 (b) 8 (c) 13 (d) 19
3. If sum of three consecutive even numbers is 66, then find the difference of the squares of the extremes.
 (a) 176 (b) 100 (c) 78 (d) 125
4. If sum of three consecutive even numbers is 66, then find the difference of the squares of the extremes.
 (a) 176 (b) 100 (c) 78 (d) 125
5. If thirty years ago my age was $\frac{1}{6}$ th of what it is now, then what is my present age in years?
 (a) 42 years (b) 40 years
 (c) 36 years (d) 30 years
6. A man went to the Reserve Bank of India with Rs.1,000. He asked the cashier to give him Rs.5 and Rs.10 notes only in return. The man got 175 notes in all. Find how many notes of Rs.5 and Rs.10 did he receive?
 (a) (25, 150) (b) (40, 110)
 (c) (150, 25) (d) None
7. If area and perimeter of a rectangle is 6000 cm^2 and 340 cm respectively, then the length of rectangle is
 (a) 140 (b) 120 (c) 170 (d) 200
8. Given a quadratic equation $\frac{x+1}{x} - \frac{x}{x+1} = \frac{3}{2}$. Its roots are
 (a) 1 and $\frac{-2}{3}$ (b) -1 and $\frac{2}{3}$

- (c) 1 and $\frac{2}{3}$ (d) -1 and $\frac{-2}{3}$
9. The three roots of the cubic equation $x^3 + 9x^2 - x - 9 = 0$ are
 (a) $-1, +1$ and 9 (b) $-1, +1$ and -9
 (c) $-1, +1$ and $1/9$ (d) $-1, +1$ and -1
10. The quadratic equation with rational coefficients, one of whose roots is $(5 + 2\sqrt{2})$ is
 (a) $x^2 - 10x + 17 = 0$
 (b) $x^2 + 10x + 17 = 0$
 (c) $x^2 + 10x - 17 = 0$
 (d) $x^2 - 10x - 17 = 0$
11. If α and β are the roots of $x^2 + 2x + 1 = 0$ then the equations whose roots are $\frac{1}{\alpha^2}$ and $\frac{1}{\beta^2}$ is
 (a) $x^2 - \frac{7}{4}x + 1 = 0$ (b) $x^2 + \frac{7}{4}x + 1 = 0$
 (c) $4x^2 + 7x + 1 = 0$ (d) None of these
12. The ages of two persons are in the ratio $5 : 7$. Eighteen years ago their ages were in the ratio of $8 : 13$, their present ages (in years) are :
 (a) $50, 70$ (b) $70, 50$
 (c) $40, 56$ (d) None
13. If the roots of the equation $x^2 - px + q = 0$ differ by unity then
 (a) $p^2 = 4p + 1$ (b) $p^2 = 4q + 1$
 (c) $p^2 = 4p - 1$ (d) $p^2 = 4q - 1$
14. The third proportional between $(a^2 - b^2)$ and $(a + b)^2$ is:
 (a) $\frac{a + b}{a - b}$ (b) $\frac{a - b}{a + b}$
 (c) $\frac{(a - b)^2}{a + b}$ (d) $\frac{(a + b)^3}{a - b}$
20. For what value of p the difference between the roots of the equation $x^2 - px + 8 = 0$ is 2 ?
 (a) 6 (b) -6 (c) ± 6 (d) ± 2
21. The centroid of a triangle with vertices $(2, -1)$, $(-5, 3)$ and $(7, 2)$ is given by
 (a) $(4, 4)$ (b) $(3, 3)$
 (c) $(4/3, 4/3)$ (d) $(3/4, 3/4)$
22. The area of a triangle with vertices $(1, 3)$, $(2, -5)$ and $(2, 3)$ is
 (a) 8 (b) 4
 (c) ± 4 (d) ± 8
23. The area of the triangle with vertices $(p, q + r)$, $(q, r + p)$ and $(r, p + q)$ is
 (a) 0 (b) 1
 (c) -1 (d) ± 1
24. The area of the quadrilateral with vertices $(1, 7)$, $(3, -5)$, $(6, -3)$ and $(-4, 2)$ is
 (a) 57 (b) 58
 (c) 57.5 (d) 58.5
25. The centroid of the triangle with vertices $(p - q, p - r)$, $(q - r, q - p)$ and $(r - p, r - q)$ is located at
 (a) $(-1, 1)$ (b) $(-1, -1)$
 (c) $(0, 0)$ (d) $(1, 1)$
26. Points $(a, 0)$, $(0, b)$ and $(1, 1)$ are collinear if
 (a) $\frac{1}{a} + \frac{1}{b} = 1$ (b) $\frac{1}{a} - \frac{1}{b} = 1$
 (c) $\frac{1}{a} + \frac{1}{b} = 0$ (d) $\frac{1}{a} - \frac{1}{b} = 0$
27. The equation of the line passing through $(3, -2)$ and having slope $\frac{3}{2}$ is
 (a) $3x - 2y = 0$ (b) $3x + 2y = 13$
 (c) $2x + 3y = 13$ (d) $3x - 2y = 13$
28. The equation of a line having slope $\frac{3}{2}$ and intercepting on Y-axis at 2 is
 (a) $3x - 2y = 4$ (b) $3x - 2y + 4 = 0$
 (c) $2x - 3y = 4$ (d) $2x - 3y + 4 = 0$

29. The equation of a line passing through (3,2) and parallel to the line $5x - 2y + 7 = 0$ is

- (a) $5x - 2y = 11$ (b) $5x - 2y + 11 = 0$
 (c) $2x - 5y = 11$ (d) $2x - 5y + 11 = 0$

30. The equation of a line having equal intercepts and passing through (3,5) is

- (a) $x + y = 8$ (b) $x + y = \pm 8$
 (c) $x - y = 8$ (d) $x - y = \pm 8$

31. The value of

$$2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \dots \infty}}}}$$

- (a) $1 \pm \sqrt{2}$ (b) $2 \pm \sqrt{5}$;
 (c) $2 \pm \sqrt{3}$ (d) None

32. The graph of straight line $x = 5$ will be :

- (a) Intersecting both the axis
 (b) Parallel to y-axis
 (c) Parallel to x-axis
 (d) None of these

33. One root of the equation :

$x^2 - 2(5 + m)x + 3(7 + m) = 0$ is reciprocal of the other. Find the value of M.

- (a) -7 (b) 7 (c) $1/7$ (d) $-1/7$

34. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots \infty}}}$ is

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

35. The line joining $(-1, 1)$ and $(2, -2)$ and the line joining $(1, 2)$ and $(2, k)$ are perpendicular to each other for the following value of k :

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

Simple & Compound interest

1. Rs.8,000 becomes Rs.10,000 in two years at simple interest. The amount that will become Rs.6,875 in 3 years at the same rate of interest is :
 (a) Rs.4,850 (b) Rs.5,000
 (c) Rs.5,500 (d) Rs.5,275
2. A sum of Rs. 7200 amounts to Rs. 8300 in two years at simple interest. What will the sum amount to in eight years?
 (a) Rs. 14600 (b) Rs. 12600
 (c) Rs. 10600 (d) Rs. 11600
3. A certain sum of money amounts to Rs. 6300 in two years and Rs. 7875 in three years nine months at simple interest. Find the rate of interest per annum.
 (a) 20% (b) 18%
 (b) 15% (d) 10%
4. The rate of simple interest on a sum of money is 6% p.a. for first 3 years, 8% p.a. for the next five years and 10% p.a. for the period beyond 8 years. If the simple interest accrued by the sum for a period for 10 years is Rs.1,560. The sum is :
 (a) Rs. 1,500 (b) Rs. 2,000
 (c) Rs. 3,000 (d) Rs. 5,000
5. In how much time would the simple interest on a certain sum be 0.125 times the principal at 10% per annum?
 (a) $1\frac{1}{4}$ years (b) $1\frac{3}{4}$ years
 (c) $2\frac{1}{4}$ years (d) $2\frac{3}{4}$ years
6. Two equal sums of money were lent at simple interest at 11% p.a. for $3\frac{1}{2}$ years and $4\frac{1}{2}$ years respectively. If the difference in interests for two periods was Rs.412.50, then each sum is :
 (a) Rs.3,250 (b) Rs. 3,500
 (c) Rs. 3,750 (d) Rs. 4,350

7. In how many years, a sum of Rs.1000 compounded annually @ 10%, will amount to Rs. 1331?
 (a) 6 years (b) 5 years
 (c) 4 years (d) 3 years
8. In how many years, a sum will become double at 5% p.a. compound interest.
 (a) 14.0 years (b) 14.1 years
 (c) 14.2 years (d) 14.3 years
9. A person borrows Rs.5,000 for 2 years at 4% p.a. simple interest. He immediately lends to another person at $6\frac{1}{4}$ % p.a. for 2 years. Find his gain in the transaction per year :
 (a) Rs. 112.50 (b) Rs. 125
 (c) Rs. 225 (d) Rs. 167.50
10. How much amount is required to be invested every year so as to accumulate Rs.3,00,000 at the end of 10 years, if interest is compounded annually at 10%?
 [Given $(1.1)^{10} = 2.5937$]
 (a) Rs. 18,823.65 (b) Rs.18,828.65
 (c) Rs.18,832.65 (d) Rs.18,882.65
11. The present value of an annuity of Rs.3,000 for 15 years at 4.5% p.a. C.I. is (Given that $(1.045)^{15} = 1.935282$)
 (a) Rs. 23,809.67 (b) Rs. 32,218.67
 (c) Rs. 32,908.67 (d) None of these
12. The difference between the simple and compound interest on a certain sum for 3 years at 5% p.a. is Rs.228.75. The compound interest on the sum for 2 years at 5% p.a. is :
 (a) Rs.3,175 (b) Rs.3,075
 (c) Rs.3,275 (d) Rs.2,975
13. Mr. X Invests Rs.10,000 every year starting from today for next 10 years suppose interest rate is 8% per annum compounded annually. Calculate future value of the annuity :
 (Given that $(1 + 0.08)^{10} = 2.15892500$)
 (a) Rs.156454.88 (b) Rs.144865.625
 (c) Rs.156554.88 (d) None of these
14. A company is considering proposal of purchasing a machine either by making full payment of Rs.4,000 or by leasing it for four years at an annual rate of Rs.1,250. Which course of action is preferable, if the company can borrow money at 14% compounded annually?
 [Given $(1.14)^4 = 1.68896$]
 (a) Leasing is preferable
 (b) Should be purchased
 (c) No difference
 (d) None of these
15. The annual birth and death rates per 1000 are 39.4 and 19.4 respectively. The number of years in which the population will be doubled assuming there is no immigration or emigration is :
 (a) 35 years (b) 30 years
 (c) 25 years (d) None of these
16. A machine worth Rs. 4,90,740 is depreciated at 15% on its opening value each year. When its value would reduce to Rs. 2,00,000 :
 (a) 5 years 6 months
 (b) 5 years 7 months
 (c) 5 years 5 months (d) None
17. A sinking fund is created for redeeming debentures worth Rs.5 lacs at the end of 25 years. How much provision needs to be made out of profits each year provided sinking fund investment can earn interest at 4% p.a.?
 (a) 12,006 (b) 12,040
 (c) 12,039 (d) 12,035
18. If the difference between simple interest and compound interest is Rs.11 at the rate of 10% for two years, then find the sum.
 (a) Rs. 1,200 (b) Rs. 1,100
 (c) Rs. 1,000 (d) None of these
19. A person deposited Rs. 5,000 in a bank. The deposit was left to accumulate at 6% compounded quarterly for the first five years and at 8% compounded semi-annually for the next eight years. The compound amount at the end of 13 years is:

- (a) Rs. 12621.50 (b) Rs.12613.10
 (c) Rs. 13613.10 (d) None

20. A person deposited Rs. 5,000 in a bank. The deposit was left to accumulate at 6% compounded quarterly for the first five years and at 8% compounded semi-annually for the next eight years. The compound amount at the end of 13 years is:
- (a) Rs. 12621.50 (b) Rs.12613.10
 (c) Rs. 13613.10 (d) None

Permutation and Combination

1. If ${}^n P_4 = 10 \times {}^n P_3$ then n is equal to
 (a) 0 (b) 1
 (c) 2 (d) 13
2. If ${}^{56} P_{n+6} : {}^{54} P_{n+3} = 30,800 : 1$, then
 (a) $n = 51$ (b) $n = 41$
 (c) $n = 31$ (d) $n = 21$
3. Given : $P(7, k) = 60 P(7, k - 3)$. Then
 (a) $k = 9$ (b) $k = 8$
 (c) $k = 5$ (d) $k = 0$
4. If $C(n, r) : C(n, r + 1) = 1 : 2$ and
 $C(n, r + 1) : C(n, r + 2) = 2 : 3$,
 determine the value of n and r :
 (a) (14, 4) (b) (12, 4) (c) (14, 6) (d) None
5. If ${}^{18} C_r = {}^{18} C_{r+2}$ Find r.
 (a) $r = 8$ (b) $r = 6$
 (c) $r = 4$ (d) $r = 2$
6. Find the value of r, if ${}^n P_r = 720$ and
 ${}^n C_r = 120$
 (a) 12 (b) 9
 (c) 6 (d) 3
7. If ${}^{n+1} C_4 = 9 \times {}^n C_2$, find the value of n.
 (a) $n = 11$ (b) $n = 10$
 (c) $n = 9$ (d) $n = -10$
8. A code word is to consist of two English alphabets followed by two distinct numbers between 1 and 9. How many such code words are there?
 (a) 6,15,800 (b) 46,800
 (c) 7,19,500 (d) 4,10,800
9. A Supreme Court Bench consists of 5 judges. In how many ways, the bench can give a majority division?
 (a) 10 (b) 5 (c) 15 (d) 16
10. How many three digit numbers are there, with distinct digits, with each digit odd?
 (a) 6 (b) 15
 (c) 60 (d) 120
11. How many five digit numbers can be formed with the digits 2, 3, 5, 7, 9 which lies between 30000 and 90000?
 (a) 12 (b) 24
 (c) 48 (d) 72
12. Determine the number of different words that can be formed with each of three letters of the word ENGLISH, if each letter is to be used not more than once.
 (a) 21 (b) 210
 (c) 201 (d) 102
13. How many permutations can be made out of the letters of the word EXAMINATION?
 (a) 698400 (b) 698400
 (c) 489600 (d) 498600
14. In how many ways can the letters of word 'ACCOUNTANT' be arranged so that vowels are always together?
 (a) 5706 (b) 5760
 (c) 7560 (d) 7506
15. A committee of 5 persons is to be formed out of 6 men and 4 ladies. In how many ways this can be done when at most two ladies are included?
 (a) 60 (b) 120
 (c) 186 (d) 196
16. An examination paper consists of 12 questions divided into two parts A and B. Part A contains 7 questions and part B contains 5 questions. A candidate is

- required to attempt 8 questions selecting at least 3 from each part. In how many maximum ways can the candidate select the questions?
 (a) 35 (b) 175
 (c) 210 (d) 420
17. There are three blue balls, four red balls and five green balls. In how many ways can they be arranged in a row?
 (a) 26720 (b) 27720
 (c) 27820 (d) 26620
18. In how many ways can 17 billiard balls be arranged if 7 of them are black, 6 red and 4 white?
 (a) 4084080 (b) 1
 (c) 8048040 (d) None of these
19. A mathematics paper is divided into 3 sections A, B and C consisting of 6, 7 and 8 questions respectively. Four questions are to be answered from each section. Find the number of total ways of selecting the questions from the paper by a student.
 (a) 36750 (b) 36507
 (c) 36570 (d) 35670
20. A boat's crew consists of 8 men, 3 of whom can only row one side and 2 only on the other. Find the number of ways in which the crew can be arranged.
 (a) 576 (b) 1576
 (c) 1718 (d) 1728
21. Out of 4 gents and 6 ladies, a committee is to be formed find the number of ways the committee can be formed such that it comprises of at least 2 gents and at least number of ladies should be double of gents.
 (a) 94 (b) 132 (c) 136 (d) 104
22. In how many ways can a party of 4 men and 4 women be seated at a circular table, so that no two woman are adjacent?
 (a) 164 (b) 174 (c) 144 (d) 154
23. In how many ways a man can invite his five friends to a dinner so that two or more than two of his friends remain present?
 (a) 5 (b) 10
 (c) 15 (d) 26
24. A polygon has 44 diagonals. The no. of its sides is
 (a) 10 (b) 11
 (c) 12 (d) 13
25. Everybody in a room shakes hand with everybody else. The total no. of hand shakes is 66. The no. of persons in the room is
 (a) 14 (b) 11
 (c) 12 (d) 13

Sequence and series

1. The 8th term of progression 8, 5, 2, -1, -4, ... is
 (a) 0 (b) -16
 (c) 13 (d) -13
2. Find the A.P. whose 6th term is 5 and 13th term is -2.
 (a) 9, 8, 7, 6, (b) 10, 9, 8, 7,
 (c) 11, 10, 9, (d) 10, 8, 6, ...
3. Which term of the A.P. 11, 8, 5, 2, ..., is -10?
 (a) 6 (b) 8
 (c) 16 (d) 24
4. If 5 times the 5th term of an A.P. is equal to 8 times the 8th term of an A.P. then the 13th term of the A.P. is
 (a) -1 (b) 0
 (c) 1 (d) 2
5. Insert four arithmetic means between 3 and 18.
 (a) 12, 15, 9, 6 (b) 6, 9, 12, 15
 (c) 9, 6, 12, 15 (d) 15, 12, 60
6. Find the three numbers in A.P., where the sum of the numbers is 24 and the sum of their cubes is 1968.
 (a) 11, 8, 5 (b) 11, 5, 8
 (c) 5, 11, 8 (d) 8, 5, 11

7. In an A.P., if $S_{10} = 550$ and $a = 100$, then find d.
 (a) 10 (b) -10
 (c) 20 (d) -20
8. Find the nth term of the series whose sum to n terms is $5n^2 + 2n$
 (a) $10n - 3$ (b) $10 - 3n$
 (c) $3n - 10$ (d) None of these
9. Find the sum of all natural numbers, between 250 and 1000 which are exactly divisible by 3.
 (a) 156375 (b) 156357
 (c) 165375 (d) 165357
10. The 8th term of the G.P. 7, 14, 28,... is
 (a) 869 (b) 876
 (c) 896 (d) None of these
11. How many terms are there in the G.P. 16, 8, 4,... $\frac{1}{16}$?
 (a) 8 (b) 9
 (c) 10 (d) 12
12. If a, b, c are in G.P. then log a, log b and log c are in
 (a) H.P. (b) G.P.
 (c) A.P. (d) H.M.
13. $1 - \frac{1}{3} + \frac{1}{3^2} - \frac{1}{3^3} + \dots \infty =$
 (a) $\frac{1}{4}$ (b) $\frac{3}{4}$
 (c) $\frac{3}{2}$ (d) $\frac{2}{3}$
14. The first, second and seventh term of A.P. are in G.P. and the common difference is 2, the 2nd term of A.P. is :
 (a) $\frac{5}{2}$ (b) 2 (c) $\frac{3}{2}$ (d) $\frac{1}{2}$
15. $(x + 1), 3x, (4x + 2)$ are in A.P. Find the value of x.
 (a) 2 (b) 3 (c) 4 (d) 5
16. The sum of terms of an infinite GP is 15. And the sum of the squares of the term is
45. Find the common ratio.
 (a) $\frac{3}{2}$ (b) 1 (c) $-\frac{2}{3}$ (d) $\frac{2}{3}$
17. Find three numbers in G.P. such that their sum is 21, and the sum of their squares is 189 :
 (a) 5, 7, 9 (b) 3, 7, 11
 (c) 3, 6, 12 (d) 4, 8, 9
18. Find two numbers whose A.M. is 10 and G.M. is 8.
 (a) [10, 10] (b) [16, 4]
 (c) [18, 2] (d) [14, 6]
19. A person pays Rs. 975 in monthly instalments, each instalment is less than former by Rs.5. The amount of first instalment is Rs.100. In what time will the entire amount be paid?
 (a) 26 months (b) 15 months
 (c) both (a) and (b) (d) 18 months
20. If the first term of a G.P exceeds the second term by 2 and the sum to infinity is 50, the series is :
 (a) 10, 8, $\frac{32}{5}, \dots$ (b) 10, 8, $\frac{5}{2}, \dots$
 (c) 10, $\frac{10}{3}, \frac{10}{9}, \dots$ (d) None
21. The sum of all natural numbers between 100 and 1000 which are multiple of 5 is :
 (a) 98,450 (b) 96,450
 (c) 97,450 (d) 95,450
22. A certain ball when dropped to the ground rebounds to $\frac{4}{5}$ th of the height from which it falls; it is dropped from a height of 100 metres find the total distance it travels before finally coming to rest :
 (a) 600m (b) 700m (c) 900m (d) 200m
23. The sum of an A.P., whose first term is -4 and last term is 146 is 7171. Find the value of n.
 (a) 99 (b) 100 (c) 101 (d) 102

