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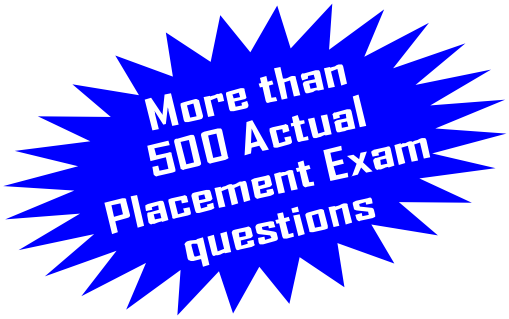

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INDEX

FACTORIALS & LAST DIGIT

Ref. No.: A1/P1/P2

1. Find the highest power of 2 in the product 1005 × 1006 × 1007 × …….. × 2009
   (a) 993 (b) 995 (c) 1004 (d) 1008

2. The highest power of 9 dividing 99! completely is:
   (a) 20 (b) 24 (c) 22 (d) 11

3. Find the number of zeroes at the end of 1090!
   (a) 270 (b) 268 (c) 269 (d) None of these

4. Given N is a positive integer less than 31, how many values can n take if (n + 1) is a factor of n!?
   (a) 18 (b) 16 (c) 12 (d) 20

5. The digit at the tens place in the sum of the expression :
   $(1!) + (2!)^2 + (3!)^3 + (4!)^4 + (5!)^5 + \ldots (111!)^{111}$ is:
   (a) 0 (b) 1 (c) 8 (d) 9

6. A number n! is written in base 6 and base 8 notation. Its base 6 representation ends with 10 zeroes. Its base 8 representation ends with 7 zeroes. Find the smallest n that satisfies these conditions. Also find the number of values of n that will satisfy these conditions.
   (a) 22 and 4 (b) 32 and 2 (c) 24 and 3 (d) 25 and 4

7. The number of digits in the product of $5^{72} \times 8^{27}$ is :
   (a) 77 (b) 75 (c) 99 (d) none of (a), (b), (c)

8. What is the value of the unit's digit in $1^8+2^8+3^8+$ .....+..... 99^8.
   (a) 0 (b) 1 (c) 2 (d) None of these

9. What is the highest power of 12 that divides 54!?
   (a) 25 (b)26 (c) 30 (d) 4

10. When 40! is expressed in base 8 form, what is the last non–zero digit in the base 8 expansion?
    (a) 2 (b) 6 (c) 4 (d) 2 or 6

11. Let K be the largest number with exactly 3 factors that divide 25! How many factors does (k – 1) have?
    (a) 16 (b) 12 (c) 9 (d) 14

12. What are the last two digits of the number 745?
    (a) 07 (b) 23 (c) 49 (d) 43

13. N is an 80-digit positive integer (in the decimal scale). All digits except the 44th digit (from the left) are 2. If N is divisible by 13, find the 26th digit?
    (a) 5 (b) 6 (c) 1 (d) 2

14. How many pairs of integers (x, y) exist such that the product of x, y and HCF (x, y) = 1080?
    (a) 8 (b) 7 (c) 9 (d) 12

15. Find the smallest number that leaves a remainder of 4 on division by 5, 5 on division by 6, 6 on division by 7, 7 on division by 8 and 8 on division by 9?
    (a) 2519 (b) 5039 (c) 1079 (d) 979

16. How many pairs of positive integers x, y exist such that HCF (x, y) + LCM (x, y) = 91?
    (a) 10 (b) 8 (c) 6 (d) 7

17. Find the G.C.D of $12x^2y^3z^2$, $18x^3y^2z^4$, and $24xy^4z^3$
    (a) $6xy^2z^2$ (b) $6x^3y^4z^3$ (c) $24xy^2z^2$ (d) $24xy^3z^2$ (e) $18x^2y^2z^3$

18. What is the highest power of 7 that will divide 5000! without leaving a remainder? (5000! means factorial 5000)
    (a) 4998 (b) 714 (c) 832 (d) 816

19. The highest power of 99 that divides 99! completely is
(a) 1 (b) 2 (c) 9 (d) None of these

20. There are 35 steps in a temple. By the time Chithra comes down two steps, Madhu goes up one step. If they start simultaneously and keep their speed uniform, then at which step from the bottom will they meet?
(a) 9th step (b)12th step (c)13th step (d) 8th step (e) None of the above

21. How many zeroes will be there at the end of the product $2!^{2!} \times 3!^{3!} \times 7!^{7!} \times 9!^{9!} \times 10!^{10!}$?
(a) 2(10!) + 9! + 7! (b) 7! + 9! 10! (c) 2! (10!) (d) 10 + 9 + 7

22. $K = 1272^{239} \times 976^{511} - 279^{10241}$ what will be the last digit of K?
(a) 7 (b) 6 (c) 2 (d) None of these

23. How many zeroes will be there at the end of the product $2!^{2!} \times 3!^{3!} \times 7!^{7!} \times 9!^{9!} \times 10!^{10!}$?
(a) 2(10!) + 9! + 7! (b) 7! + 9! 10!
(c) 2! (10!) (d) 10 + 9 + 7

24. What is the total no of factors of 16!?
(a) 5376 (b) 6048 (c) 4320 (d) none of these

25. If 146! Is divisible by 5^n, and then find the maximum value of n.
(a) 34 (b) 35 (c) 36 (d) 37

26. The highest power of 990 that will exactly divide 1090! is
(a) 101 (b) 100 (c) 108 (d) 109

27. Find the number of zeroes in the product: $1^1 \times 2^2 \times 3^3 \times 4^4 \times \ldots \times 98^{98} \times 99^{99} \times 100^{100}$
(a) 1200 (b) 1300 (c) 1050 (d) None of these

28. The sum of the last 10 digits of the sum of the expression:
$(1^1x2^2x3^3x4^4x5^5) + (1^6x2^7x3^8x4^9x5^{10}) + (1^{11}x2^{12}x3^{13}x4^{14}x5^{15}) + \ldots + (1^{96}x2^{97}x3^{98}x4^{99}x5^{100})$ is:
(a) 16 (b) 18 (c) 20 (d) none of these

29. Sum of two numbers x, y = 1050. What is the maximum value of the HCF between x and y?
(a) 350 (b) 700 (c) 1050 (d) 525

30. The sum of two non co–prime numbers added to their HCF gives us 91. How many such pairs are possible?
(a) 2 (b) 4 (c) 3 (d) 6

REMAINDER & FACTORS

Ref. No.: A2/P1/P2

1. What is the remainder when 135^{77} is divided by 7?
   (a) 4 (b) 6 (c) 8 (d) none of a,b,c

2. $(392)^n - (392)^{n-1}$ is not divisible by :
   (a) 49 (b) 23 (c) 13 (d) 17

3. What is the total number of divisors of 600?
   (a) 32 (b) 21 (c) 24 (d) 40

4. What is the remainder left after dividing (1! + 2!+ 3!+ ..... + 100!) by 7 ?
   (a) 0 (b) 5 (c) 21 (d) 14

5. A number is divided by a divisor, which is 18 times the quotient. If the remainder is 42, then find the dividend, it being given that the divisor is 9 times the remainder.
   (a) 7980 (b) 7880 (c) 42 (d) None of these

6. When two different numbers are divided by a certain divisor the remainders are 147 and 192. When the sum of the two numbers is divided by the same divisor the 'remainder is 38: Find the divisor.
   (a) 311 (b) 301 (c) 291 (d) 201

7. The number 3p725q8 leaves respective remainders of 4 and zero when divided by 16 and 11. What is the value of p?
   (a) 6 (b) 4 (c) 8 (d) 3

8. If n is a natural number, then $3^{(2n+2)} - 8n - 9$ is always divisible by_____ .
   (a) 72 (b) 64 but not 128 (c) 32 but not by 64 (d) 128

9. If p is a prime number greater than 3, then $(p^2 - 1)$ is always divisible by:
   (a) 6 but not 12 (b) 24 (c) 12 but not 24 (d) None of these

10. The sum of the digits of a number N is 23. The remainder when N is divided by 11 is 7. What is the remainder when N is divided by 33?
    (a) 7 (b) 29 (c) 16 (d) 13

11. A number when divided by 18 leaves a remainder 7. The same number when divided by 12 leaves a remainder n. How many values can n take?
    (a) 2 (b) 0 (c) 1 (d) 3

12. N leaves a remainder of 4 when divided by 33, which of the following can be a possible remainder when N is divided by 55?
    (a) 3 (b) 15 (c) 24 (d) 27

13. What is the remainder when we divide $3^{90} + 5^{90}$ by 34?
    (a) 0 (b) 17 (c) 33 (d) 1

14. N^2 leaves a remainder of 1 when divided by 24. What are the possible remainders we can get if we divide N by 12?
    (a) 1, 5, 7 and 11 (b) 1 and 5 (c) 5, 9, and 11 (d) 1 and 11

15. A prime number p greater than 100 leaves a remainder q on division by 28. How many values can q take?
    (a) 8 (b) 12 (c) 9 (d) 15

16. How many positive integers are there from 0 to 1000 that leave a remainder of 3 on division by 7 and a remainder of 2 on division by 4?
    (a) 32 (b) 36 (c) 24 (d) 19

17. Three numbers leave remainders of 43, 47 and 49 on division by N. The sum of the three numbers leaves a remainder 9 on division by N. What are the values N can take?
    (a) 65 (b) 96 (c) 125 (d)More than one value is possible

18. A number leaves a remainder 3 on division by 14, and leaves a remainder k on division by 35. How many possible values can k take?
    (a) 3 (b) 2 (c) 5 (d) 4

19. How many factors of the number $2^8 * 3^6 * 5^4 * 10^5$ are multiples of 120?
(a) 540 (b) 660 (c) 594 (d) 792

20. How many factors of 1080 are perfect squares?
(a) 4 (b) 6 (c) 8 (d) 5

21. The sum of the factors of a number is 124. What is the number?
(a) Number lies between 40 and 50 (b) Number lies between 50 and 60
(c) Number lies between 60 and 80 (d) More than one such number exists

22. Find the smallest number that has exactly 18 factors.
(a) 180 (b) 216 (c) 240 (d) None of these

23. A number N^2 has 15 factors. How many factors can N have?
(a)5 or 7 factors (b) 6 or 8 factors (c) 4 or 6 factors (d) 9 or 8 factors

24. If a three digit number 'abc' has 2 factors (where a, b, c are digits), how many factors does the 6- digit number 'abcabc' have?
(a) 16 (b) 24 (c) 18 (d) 30

25. Find the largest five digit number that is divisible by 7, 10, 15, 21 and 28.
(a) 99,840 (b) 99,900 (c) 99,960 (d) 99,990

26. Anita had to multiply two positive integers. Instead of taking 35 as one of the multipliers, she incorrectly took 53. As a result, the product went up by 540. What is the new product?
(a) 1050 (b) 540 (c) 1590 (d) 1520

27. Let x, y and z be distinct integers. x and y are odd and positive, and z is even and positive. Which one of the following statements cannot be true?
(a) $(x - z)^2$ y is even (b) $(x - z)$ y^2 is odd
(c)$(x - z)$ y is odd (d) $(x - y)^2$ z is even

28. When a number is divided by 36, it leaves a remainder of 19. What will be the remainder when the number is divided by 12?
(a) 10 (b) 7 (c) 19 (d) 192

29. The sum of the first 100 natural numbers, 1 to 100 is divisible by ____
(a)2, 4 and 8 (b) 2 and 4 (c) 100 (d) 2

30. How many different factors does 48 have, excluding 1 and 48?
(a) 12 (b) 4 (c) 8 (d) 10

ANSWER KEY

1 A	2 C	3 C	4 B	5 A	6 B	7 A	8 B	9 B	10 B	11 A	12 B	13 A
14 A	15 B	16 B	17 D	18 C	19 C	20 A	21 D	22 A	23 B	24 A	25 C	26 C
27 A	28 B	29 D	30 C									

PERCENTAGE

Ref. No.: A3/P1/P1

1. If the price of petrol increases by 25% and Raj intends to spend only an additional 15% on petrol, by how much % will he reduce the quantity of petrol purchased?
   (a) 10% (b) 12% (c) 8% (d) 6.67%
2. A shepherd has 1 million sheeps at the beginning of Year 2000. The numbers grow by x% (x > 0) during the year. A famine hits his village in the next year and many of his sheeps die. The sheep population decreases by y% during 2001 and at the beginning of 2002 the shepherd finds that he is left with 1 million sheeps. Which of the following is correct?
   (a) x > y (b) y > x (c) x = y (d) Cannot be determined
3. In an election contested by two parties, Party D secured 12% of the total votes more than Party R. If party R got 132,000 votes and there are no invalid votes, by how many votes did it lose the election?
   (a) 300,000 (b) 168,000 (c) 36,000 (d) 24,000
4. A candidate who gets 20% marks fails by 10 marks but another candidate who gets 42% marks gets 12% more than the passing marks. Find the maximum marks.
   (a) 50 (b) 100 (c) 150 (d) 200
5. When processing flower - nectar into honeybees' extract, a considerable amount of water gets reduced. How much flower - nectar must be processed to yield 1kg of honey, if nectar contains 50% water, and the honey obtained from this nectar contains 15% water?
   (a) 1.5 kgs (b) 1.7 kgs (c) 3.33 kgs (d) None of these
6. A vendor sells 60 percent of apples he had and throws away 15 percent of the remainder. Next day he sells 50 percent of the remainder and throws away the rest. What percent of his apples does the vendor throw?
   (a) 17 (b) 23 (c) 77 (d) None of these
7. If the cost price of 20 articles is equal to the selling price of 16 articles, what is the percentage profit or loss made by the merchant?
   (a) 20% Profit (b) 25% Loss (c) 25% Profit (d) 33.33% Loss
8. 30% of the men are more than 25 years old and 80% of the men are less than or equal to 50 years old. 20% of all men play football. If 20% of the men above the age of 50 play football, what percentage of the football players are less than or equal to 50 years?
   (a) 15% (b) 20% (c) 80% (d) 70%
9. If the price of petrol increases by 25%, by how much must a user cut down on his petrol consumption so that his expenditure on petrol remains unchanged?
   (a) 25% (b) 16.67% (c) 20% (d) 33.33%
10. Peter got 30% of the maximum marks in an examination and failed by 10 marks. However, Paul who took the same examination got 40% of the total marks and got 15 marks more than the passing marks. What was the passing marks in the examination?
    (a) 35 (b) 250 (c) 75 (d) 85
11. 40% of 70 is x% more than 30% of 80. Find x.
    (a) 33.33% (b) 40% (c) 16.67% (d) 25%
12. John weighs twice as much as Maria. Marcia's weight is 60% of Bob's weight. Dave weighs 50% of Lee's weight. Lee weighs 190% of John's weight. Which of these 5 persons weighs the least?
    (a) Bob (b) Dave (c) John (d) Lee
13. Tina, Mina, Gina, Lina and Bina are 5 sisters, aged in that order, with Tina being the eldest. Each of them had to carry a bucket of water from a well to their house. Their buckets' capacities were proportional to their ages. While returning, equal amount of water got splashed out of their buckets. Who lost maximum amount of water as a percentage of the bucket capacity?
    (a) Tina (b) Mina (c) Gina (d) Bina
14. Joan started work 2 years ago. Her starting salary was half of Mike's salary at that time. Each year since then Joan and Mike have received a rise of 10% in their respective salary. What percentage (to the nearest percent) of Mike's current salary is Joan's current salary?
    (a) 45 (b) 46 (c) 48 (d) 50
15. If S is 150 percent of T, then T is what percent of S + T?
    (a) 33.33% (b) 40% (c) 75% (d) 80%
16. An alloy of copper and aluminum has 40% copper. An alloy of Copper and Zinc has Copper and Zinc in the ratio 2: 7. These two alloys are mixed in such a way that in the overall alloy, there is more aluminum than Zinc, and copper constitutes x% of this alloy. What is the range of values x can take?
    (a) $30\% \le x \le 40\%$ (b) $32.5\% \le x \le 42\%$ (c) $33.33\% \le x \le 40\%$ (d) $32.5\% \le x \le 40\%$
17. A earns 25% more than B. C earns 25% more than A. A earns 20% more than D. E earns 20% more than A. A, B, C, D, and E earn integer amounts less than Rs. 100. What is the total amount earned by all five of them put together?
    (a) Rs. 300 (b) Rs. 245 (c) Rs. 305 (d) Rs. 480
18. A, B, C and D share a loot. A gets a% of the total. B gets b% of the remaining (after A has taken his share). C gets c% of the remaining and D gets the rest. D gets a% less than what A gets, B and C get equal amounts. b = 2a.
    1. What percentage of what A got did C get?
    2. If the total amount is equal to Rs. 1000, what is the difference between what A got and what D got?
    (a) 160% (b) 80% (c) 175% (d) 150%
19. A is x% less than B, A is y% less than C. C is k% more than B. Express k in terms of x and y.
    (a) $\frac{(y-x)100}{100-y}$ (b) $\frac{(y+x)100}{100-y}$ (c) $\frac{(y-x)100}{100-x}$ (d) $\frac{(y-x)100}{100+y}$
20. In a class, if 50% of the boys were girls, then there would be 50% more girls than boys. What percentage of the overall class is girls?
    (a) 25% (b) 33.33% (c) 40% (d) 20%

PROFIT & LOSS

Ref. No.: A4/P1/P2

1. On selling an article for Rs. 240, a trader loses 4%. In order to gain 10%, he must sell that article for:
   (a) Rs. 264 (b) Rs. 273.20 (c) Rs. 275 (d) Rs. 280
2. A man loses Rs. 20 by selling some toys at the rate of Rs. 3 per piece and gains Rs. 30, if he sells them at Rs. 3.25 per piece. The number of pieces sold by him are:
   (a) 100 (b) 120 (c) 200 (d) 300
3. The per cent profit made when an article is sold for Rs. 78 is twice as when it is sold for Rs. 69. The cost price of the article is:
   (a) Rs. 51 (b) Rs. 60 (c) Rs. 57 (d) Rs. 49
4. A vendor buys oranges at Rs. 2 for 3 oranges "and sells them at a rupee each. To make a profit of Rs. 10, he must sell:
   (a) 10 oranges (b) 20 oranges (c) 30 oranges (d) 40 oranges
5. Two-third of a consignment was sold at a profit of 5% and the remainder at a loss of 2%. If the total profit was Rs. 400, the value of the consignment (in rupees) was:
   (a) 20000 (b) 15000 (c) 12000 (d) 10000
6. The manufacturer of a certain item can sell all he can produce at the selling price of Rs. 60 each. If costs him Rs. 40 in materials and labour to produce each item and he has overhead expenses of Rs. 3000 per week in order to operate the plant. The number of units he should produce and sell in order to make a profit of at least Rs. 1000 per week is:
   (a) 400 (b) 300 (c) 250 (d) 200
7. A trader sells goods to a customer at a profit of k% over the cost price; besides it he cheats his customer by giving 880 g only instead of 1 kg. Thus his overall profit percentage is 25%. Find the value of k?
   (a) 8.33% (b) 8.25% (c) 10% (d) 12.5%
8. Kamal bought a house in Sushant city, whose sale price was Rs. 8 lakh. He availed 20% discount as an early bird offer and then 10% discount due to cash payment. After that he spent 10% of the cost price in interior decoration and lawn of the house. At what price should he sell the house to earn a profit of 5%?
   (a). Rs. 9 lakh (b) Rs. 7.99 lakh (c). Rs. 7.92 lakh (d). none of these
9. A car mechanic purchased four old cars for Rs. 1 lakh. He spent total 2 lakh in the maintenance and repairing of these four cars. What is the average sale price of the rest three cars to get 50% total profit if he has already sold one of the four cars at Rs. 1.2 lakh?
   (a). 1.5 lakh (b) 1.1 lakh (c). 1.2 lakh (d). 1.65 lakh
10. Akram Miaya has two types of grapes. One is the fresh grapes containing 80% water and dry grapes containing 25% water. he sells 20 kg dry grapes, by adding eater to the dry grapes, at cost price. What is the total profit percentage when after adding water the weight of 20 kg dry grapes increased in the proportion of water in fresh grapes?
    (a). 275% (b) 200% (c). 80% (d). 125%
11. Anjuli, Bhoomika and Chawla went to market to purchase the rings whose costs were same. But each ring was available with two successive discount. Anjuli availed two successive discounts of 5% and 20%. Bhoomika availed two successive discounts 10% and 15% while Chawla availed two successive discounts of 12% and 13%. Who gets the maximum possible discount?
    (a). Anjuli (b) Bhoomika (c). Chawla (d). all of these
12. A merchant earns 25% profit in general. Once his 25% consignment was abducted forever by some goondas. Trying to compensate his loss he sold the rest amount by increasing his selling price by 20%. What is the new percentage profit or loss?
    (a). 10% loss (b) 12.5% loss (c). 12.5% profit (d). 11.11% loss
13. Profit on selling 10 candles equals selling price of 3 bulbs. While loss on selling 10 bulbs equals selling price of 4 candles. Also profit percentage equals to the loss percentage and cost of a candle is half of the cost of a bulb. What is the ratio of selling price of candle to the selling price of a bulb?
    (a). 5: 4 (b) 3: 2 (c). 4: 5 (d). 3: 4
14. Cost price of two motorcycles is same. One is sold at a profit of 15% and the other for Rs. 4800 more than the first. If the net profit is 20%. Find the cost price of each motorcycle:
    (a). Rs. 48000 (b) Rs. 52000 (c). Rs. 36000 (d). Rs. 4250
15. 125 toffees cost Rs. 75. Find the cost of one million toffees if there is a discount of 40% on the selling price for this quantity.
    (a). Rs. 3, 00,000 (b) Rs. 3, 20,000 (c). Rs. 3, 60,000 (d). Rs. 4, 00,000
16. A dozen pairs of gloves quoted at Rs. 80 are available at a discount of 10%. Find how many pairs of gloves can be bought for Rs. 24.
    (a). 4 (b) 5 (c). 6 (d). 8
17. Find a single discount equivalent to the discount series of 20%, 10%, and 5%.
    (a). 30% (b) 31.6% (c). 68.4% (d). 35%
18. A dishonest trader marks up his goods by 80% and gives discount of 25%. Besides it he gets 20% more amount per kg from wholesaler and sells 10% less per kg to customer. What is the overall profit percentage?
    (a). 80% (b) 60% (c) 70% (d) none of these
19. A man buys two cycles for a total cost of Rs. 900. By selling one for 4/5 of its cost and other for 5/4 of its cost, he makes a profit of Rs. 90 on the whole transaction. Find the cost price of lower priced cycle.
    (a). Rs. 360 (b) Rs. 250 (c) Rs. 300 (d) Rs. 420
20. A manufacturer makes a profit of 15% by selling a colour TV for Rs. 5750. If the cost of manufacturing increases by 30% and the price paid by the retailer is increased by 20%, find the profit percent made by the manufacturer.
    (a) 6(2/13) % (b) 4(8/13) % (c) 6(1/13) % (d) 7(4/13) %

21. Two dealers X and Y selling the same model of refrigerator mark them under the same selling price. X gives successive discounts of 25% and 5 % and Y gives successive discounts of 16% and 12%. From whom is it more profitable to purchase the refrigerator?
    (a) From Y (b) From X (c) Indifferent between the two
    (d) Cannot be determined
22. An article costs Rs. 700 to a manufacturer who lists its price at Rs. 800. He sells it to a trader at a discount of 5%. The trader gets a further discount of 5% on his net payment for paying in cash. Calculate the amount the trader pays to the manufacturer
    (a) Rs. 722 (b) Rs. 720 (c) Rs. 725 (d) None of these
23. A shopkeeper allows a discount of 12.5% on the marked price of a certain article and makes a profit of 20%. If the article cost the shopkeeper Rs. 210, what price must be marked on the article?
    (a) Rs. 280 (b) Rs. 288 (c) Rs. 300 (d) None of these
24. A shopkeeper buys an article for Rs. 400 and marks it for sale at a price that gives him 80% profit on his cost. He, however, gives a 15% discount on the marked price to his customer. Calculate the actual percentage profit made by the shopkeeper.
    (a) 62% (b) 64% (c) 53% (d) 54%
25. A trader purchases apples at Rs. 60 per hundred. He spends 15% on the transportation. What should be the selling price per 100 to earn a profit of 20%?
    (a) Rs. 72 (b) Rs. 81.8 (c) Rs. 82.8 (d) Rs. 83.8
26. A merchant can buy goods at the rate of Rs. 20 per good. The particular good is part of an overall collection and the value is linked to the number of items that are already on the market. So, the merchant sells the first good for Rs. 2, second one for Rs. 4, third for Rs. 6…and so on. If he wants to make an overall profit of at least 40%, what is the minimum number of goods he should sell?
    (a) 24 (b) 18 (c) 27 (d) 32
27. Traders A and B buy two goods for Rs. 1000 and Rs. 2000 respectively. Trader A marks his goods up by x%, while trader B marks his goods up by 2x% and offers a discount of x%. If both make the same non-zero profit, find x.
    (a) 25% (b) 12.5% (c) 37.5% (d) 40%
28. A trader professes to sell his goods at a loss of 8% but uses a weight of 900 grams in place of a 1 kg weight. What is his real loss or gain per cent?
    (a) 2% loss (b) 2.22% gain (c) 2% gain (d) None of these
29. A merchant buys two articles for Rs.600. He sells one of them at a profit of 22% and the other at a loss of 8% and makes no profit or loss in the end. What is the selling price of the article that he sold at a loss?
    (a) Rs.404.80 (b) Rs.440 (c) Rs.536.80 (d) Rs.160
30. A trader makes a profit equal to the selling price of 75 articles when he sold 100 of the articles. What % profit did he make in the transaction?
    (a) 33.33% (b) 75% (c) 300% (d) 150%
31. If a merchant makes a profit of 20% after giving a 20% discount, what should be his mark-up?
    (a) 20% (b) 40% (c) 50% (d) 60% (e) 48%
32. The Maximum Retail Price (MRP) of a product is 55% above its manufacturing cost. The product is sold through a retailer, who earns 23% profit on his purchase price. What is the profit percentage (expressed in nearest integer) for the manufacturer who sells his product to the retailer? The retailer gives 10% discount on MRP.
    (a) 31% (b) 22% (c) 15% (d) 13% (e) 11%

AVERAGES -MIXTURES - ALLIGATIONS

Ref. No.: A5/P1/P2

Directions for questions 1 to 35: Select the correct alternative from the given choices.

1. The average weight of the students of two classes A and B with 20 and 30 students respectively are 40 kg and 50 kg respectively. Find the average weight of the students in both the classes put together
   (a) 50kg (b) 55kg (c) 35kg
   (d) 46 kg (e) 48 kg

2. There are 5 consecutive integers in ascending . order. The average of the first and twice the last is equal to the average of the other three. Find the first integer.
   (a) -5 (b) -4 (c) -3
   (d) -2 (e) -6

3. The average weight of a group of boys is 30 kg. After 1 more boy, weighing 62 kg, joins the group, the average weight of the group goes up by 2 kg. Find the original number of boys in the group.
   (a) 11 (b) 12 (c) 15
   (d) 19 (e) 14

4. The average monthly expenditure of Arun in the first 10 months of a year is Rs.4500. What should be his average monthly expenditure over the next two months so that his average -monthly expenditure over the year is Rs.5000?
   (a) Rs.6000 (b) Rs.6500 (c) Rs.7000
   (d) Rs.8500 (e) Rs.7500

5. Raju went to the market to purchase three pens. The cost of the first pen was more than that of the second by 25%, which was more than that of the third by 20%. If the average cost of the first two pens was Rs.15 more than that of the last two pens, find the cost of the costliest pen.
   (a) Rs.60 (b) Rs.45 (c) Rs.50
   (d) Rs.90 (e) Rs.75

6. There are 11 numbers written, in increasing order. The average of the first 6 numbers is 40. The average of the last 6 numbers is 50. Find the average of the 11 numbers if the 6^{th} number is 45.
   (a) 41 (b) 42 (c) 46
   (d) 44 (e) 45

7. The average age of a group of children increases by 1 year if a 9 year old child joins the group. The average age of the group decreases by 2 years, if a 11 year old child leaves the group. Find the number of children in the group.
   (a) 8 (b) 6 (c) 5
   (d) 7 (e) 4

8. An educational institution runs six branches. The number of students in each of the branches and the average scale of the students in each branch an tabulated below. What is the approximate weighted average scale of the students of the institution?'

Branch number	Number of students	Average mark
1.		225 60
2.		205 56
3.		180 55
4.		195 70
5.		220 65
6.		250 80

   (a) 55.2 (b) 56.1 (c) 64.96
   (d) 70.1 (e) 60.1

9. The total number of runs given by a bowler in a certain number of innings was 900. In the next match, he took 4 wickets and gave 256 runs. As a result, his average (runs conceded/number of wickets taken) went up by 4. How many wickets did the bowler totally take before the last match?
   (a) 30 (b) 60 (c) 45
   (d) 50 (e) 40

10. The average age of the 25 students of a class is 20 years. If the teacher's age is also included, the average goes up by 0.5 years. Find the age of the teacher.
    (a) 30 years (b) 31 years (c) 33 years
    (d) 35 years (e) 36 years

11. Two varieties of rice costing Rs.20 per kg and Rs.25 per kg are mixed. If the mixture costs Rs.23 per kg and the quantity of the cheaper variety used for mixing is 12 kg, find the quantity of the dearer variety used for mixing.
    (a) 19kg (b) 20kg (c) 21kg
    (d) 24kg (e) 18kg

12. The average age of a couple when they got married was 30 years. Three years after their marriage, a child was born to them. The present average age of the couple and the child is 34 years. Find the present age of the child
    (a) 16 years (b) 15 years (c) 12 years
    (d) 10 years (e)14 years

13. A group of 20 friends went to a hotel. 16 of them paid Rs.50 each and the remaining four paid Rs.10, Rs.15, Rs.25 and Rs.30 more than the average amount paid by all. Find the total bill.
(a) Rs.1040 (b) Rs.1180 (c) Rs.1100
(d) Rs.1200 (e) Rs.1300

14. There are two metals A and B weighing 1600 kg per cubic meter and 2400 kg per cubic meter respectively. Find the weight of 6 cubic meters of an alloy formed by mixing 30% by volume of metal A and 70% by volume of metal B.
(a) 4656kg (b) 12720kg (c) 12960kg
(d) 13200kg (e) 14400kg

15. The average marks obtained by 45 students in a class is 80. The difference between the marks of the student who got the highest mark and the student who got the least mark is 99. If both these students are not considered, the average of the class falls by 1 mark. Find the highest mark.
(a) 203 (b) 151 (c) 125
(d) 108 (e) 161

16. Ravi lent two sums of money (both at simple interest), one at 10% p.a. and the other at 24% p.a. to Ajay and Bhuvan respectively. The total amount lent was Rs.7000 and the total interest he received from them at the end of the year was Rs.1260. Find the amount Ravi lent at 24% p.a.
(a) Rs.3500 (b) Rs.3000 (c) Rs.5000
(d) Rs.4500 (e) Rs.4000

17. By diluting 20 lts of milk and selling it at its cost price, a milk man makes 25% profit. Find the quantity of water added.
(a) 2 lts (b) 3 lts (c) 4 lts
(d) 5 lts (e) 6 lts

18. There are three sections A, B and C in class X of a school. The average weight of all the students in classes A and B together is 26 kg. The average weight of all the students in classes B and C together is 24 kg. What is the average weight of the students in all the three classes put together. (The average weight of the students in the classes A, B and C are 24 kg, 27 kg and 21 kg respectively)
(a) 24.10kg (b) 24.90kg (c) 24kg
(d) 26.10kg (e) 26kg

19. A temple had raised 80% of the amount it required for its renovation by receiving an average donation of Rs.800 from 75% of the residents of that locality, whom it had approached for donations. If it manages to raise, in total 10% more than the required amount, what should be the average contribution of the remaining residents it had approached for donations?
(a) Rs.900 (b) Rs.810 (c) Rs.750
(d) Rs.1080 (e) Rs.720

20. Raju went to the market to buy 1.5 kg of dried peas having 20% water content. He went home and soaked them for some time and the water content in the peas becomes 60%. Find the final weight of soaped peas.
(a) 1.5kg (b) 0.5kg (c) 0.75kg
(d) 3kg (e) 2kg

21. Two vessels contain milk and water in the ratio 5 : 2 and 4 : 1. Find the quantity of the mixture from the first vessel to be mixed with 20 lts of the mixture from the second vessel, so that the mixture formed has milk and water in the ratio 3:1.
(a) 48 lts (b) 15 lts (c) 10 lts
(d) 28 lts (e) 14 lts

22. A shop keeper mixes three varieties of wheat costing Rs.12, Rs.14 and Rs.17 per kg. Which of the following represents the ratio of mixing of the varieties if the mixture is sold at Rs.15 per kg and he gains 20% profit?
(a) 23 : 7 : 2 (b) 27 : 6 : 1 (c)25 : 6 : 4
(d) 24 : 3 : 18 (e) 30 : 2 : 3

23. Two varieties of wheat are mixed together in the ratio 2:3. The cost price of each kg of the first variety of wheat is Rs.5 more than the cost price of each kg of the second variety of wheat. The mixture is sold at 20% profit at Rs.30 per kg. Find the cost price of the first variety, in Rs/kg.
(a) 24 (b) 23 (c) 22
(d) 28 (e) 27

24. A shop keeper mixes two varieties of wheat in the ratio 3 : 7, which cost Rs.10 per kg and Rs.15 per kg respectively. Find the ratio in which the twc varieties of wheat should be mixed when the cost price of the second variety of wheat drops by Rs.0.50 per kg and the cost price of the mixture is maintained the same?
(a) 7 : 2 (b) 4 : 5 (c) 2 : 7
(d) 1 : 8 (e) 3 : 7

25. The average of n numbers is 41. If two-third of the numbers are increased by 9 and the remaining are decreased by 6, find the new average.
(a) 36 (b) 39 (c) 42
(d) 45 (e) 48

HCF & LCM

Ref. No.: A6/P1/P1

1. Find the number of pairs of two numbers whose HCF is 5 and their sum is 50.
   (a) 1 (b) 2 (c) 4 (d) 5
2. The largest possible length of a tape which can measure 525 cm, 1050 cm and 1155 cm length of cloths in a minimum number of attempts without measuring the length of a cloth in a fraction of the tape's length
   (a) 25 (b) 105 (c) 75 (d) none of these
3. In the above question, minimum how many attempts are required to measure whole length of cloths?
   (a) 22 (b) 25 (c) 26 (d) 28
4. Minimum how many similar tiles of square shape are required to furnish the floor of a room with the length of 462 cm and breadth of 360 cm?
   (a) 4600 (b) 4624 (c) 4620 (d) 4652
5. Mr. Baghwan wants to plant 36 mango trees, 144 orange trees and 234 apple trees in his garden. If he wants to plant the equal no. of trees in every row, but the rows of mango, orange and apple trees will be separate, then the minimum number of rows in his garden is :
   (a) 18 (b) 23 (c) 32 (d) can't be determined
6. Find the least possible 5 digit number which when divided by 2, 4, 6 and 8, it leaves the remainders 1, 3, 5 and 7 respectively.
   (a) 10005 (b) 10006 (c) 10007 (d) 10008
7. What is the least possible number which when divided by 18, 35 or 42 it leaves the 2, 19, 26 as the remainders respectively?
   (a) 614 (b) 624 (c) 610 (d) 616
8. What is the least number which when divided by 8, 12 and 16 leaves 3 as the remainder in each case, but when divided by 7 leaves no any remainder?
   (a) 140 (b) 147 (c) 154 (d) 161
9. The HCF and LCM of the two numbers is 12 and 600 respectively. If one of the number is 24, then the order number will be
   (a) 300 (b) 400 (c) 1500 (d) none of these
10. The least possible number of 3 digits when successively divided by 2, 5, 4, 3 gives respective remainders of 1, 1, 3, 1 is :
    (a) 372 (b) 275 (c) 273 (d) 193
11. A number when successively divided by 6, 7, 8 it leaves the respective remainders 3, 5 and 4. What will be the last remainder when such a least possible number is divided successively by 8, 7 and 6? ?
    (a) 2 (b) 3 (c) 4 (d) 5
12. The number of possible pairs of numbers, whose product is 5400 and HCF is 30 :
    (a) 1 (b) 2 (c) 3 (d) 4
13. Two cyclists begin training on an oval racecourse at the same time. The profesional cyclist completes each lap in 4 minutes;the novice takes 6 minutes to complete each lap. how many minutes after the start will both cyclists pass at exactly the same spot where they began to cycle?
    (a) 10 (b) 8 (c) 14 (d) 12
14. Three bells, toll at interval of 36 sec, 40 sec and 48 sec respectively. They start ringing together at particular time. They next toll together after:
    (a) 6 minutes (b) 12 minutes (c) 18 minutes (d) 24 minutes
15. A rectangular floor in my office has its area equal to 56 m^2. The minimum number of tiles required, if all the tiles are in square shape is :
    (a) 15 (b) 9 (c) 14 (d) can't be determined
16. How many pairs of integers (x, y) exist such that the product of x, y and HCF (x, y) = 1080?
    (a) 8 (b) 7 (c) 9 (d) 12
17. Find the smallest number that leaves a remainder of 4 on division by 5, 5 on division by 6, 6 on division by 7, 7 on division by 8 and 8 on division by 9?
    (a) 2519 (b) 5039 (c) 1079 (d) 979
18. There are three numbers a,b, c such that HCF (a, b) = l, HCF (b, c) = m and HCF (c, a) = n. HCF (l, m) = HCF (l, n) = HCF (n, m) = 1. Find LCM of a, b, c. (The answer can be "This cannot be determined").
19. How many pairs of positive integers x, y exist such that HCF of x, y = 35 and sum of x and y = 1085?
    (a) 12 (b) 8 (c) 15 (d) 30
20. How many pairs of positive integers x, y exist such that HCF (x, y) + LCM (x, y) = 91?
    (a) 10 (b) 8 (c) 6 (d) 7
21. Sum of two numbers x, y = 1050. What is the maximum value of the HCF between x and y?
    (a) 350 (b) 700 (c) 1050 (d) 525
22. The sum of two non co–prime numbers added to their HCF gives us 91. How many such pairs are possible?
    (a) 2 (b) 4 (c) 3 (d) 6

RATIO & PROPORTION

Ref. No.: A7/P1/P2

Directions for questions 1 to 28: Select the correct alternative from the given choices.

1. If a : b = 3 1 7, and the value of (5a + b) + (4a + 5b).
   (a) 15:44 (b) 22:35
   (c) 15:49 (d) 22:47

2. A bag contains one rupee, 50 paise and 25 paise coins in the ratio 1 : 2 : 4. If the total amount is Rs.75, then and the number of 50 paise coins in the bag.
   (a) 25 (b) 50
   (c). 75 (d) 100

3. If(x + 4) : (3x + 15) is the triplicate ratio of 2 : 3. Find the value of x.
   (a) 1 (b) 3
   (c) 4 (d) None of these

4. Find x : y from the equation $8x^2 - 18xy + 9y^2 = 0$ given that x/y is a proper fraction.
   (a) 2:3 (b) 3:4
   (c) 3:5 (d) 2:5

5. The present ages of two persons are in the ratio 7 : 8. Twenty years ago the ratio of their ages was 9 : 11. Find the present age of the older person.
   (a) 64 years (b) 72 years
   (c) 576 years (d) 40 years

6. Find x : y : z, if 2x + y - 5z = 0 and 3x - 2y - 4z = 0.
   (a) 1 : 2 : 1 (b) 1 : 1 : 1
   (c) 1 : 1 : 2 (d) 2 : 1 : 1

7. A certain sum is divided among A, B and C in a manner that for every rupee that A gets, B gets 75 paise and for every rupee that B gets, C gets 50 paise. lf C's share in the total sum is Rs.420, then and the share of A,
   (a) Rs.2380 (b) Rs.2240
   (c) Rs.1750 (d) Rs.1120

8. Seventy eight is divided into two parts such that five times the first part and tour times the second part are in the ratio 15 : 14. Find the first part.
   (a) 32 (b) 36
   (c) 42 (d) 46

9. A certain sum of money is divided among A, B and C such that A gets half of what B and C together get. B gets one-third of what A and C together get. if A got Rs. 500 more than B, then how much money was divided?
   (a) Rs.4500 (2) Rs. 6000
   (c) Rs.8000 (4) None of these

10. In a school there are 650 students. The ratio of theboys to that of the girls is 8 : 5. How many more girls should join the school so that the ratio becomes 4 : 3?
    (a) 25 (b) 50
    (c) 100 (d) 200

11. A variable x varies directly as the cube of another variable y. When x = 4, y = 2. Find y, when x = 32.
    (a) 4 (b) 8
    (c) 16 (d) 32

12. What must be added to both the terms a and b so that their ratio becomes equal to p : q?
    (a) $\frac{aq + bq}{p + q}$ (b) $\frac{ap + bq}{p + q}$
    (c) $\frac{aq - bp}{p - q}$ (d) $\frac{ap - bq}{p - q}$

13. If a : b is the duplicate ratio of (a + x) : (b + x), then find the value of x.
    (a) ab (b) $\sqrt{ab}$
    (c) a+b (d) $\sqrt{a + b}$

14. If (x + y) varies directly (x - y), then $(x^2 + y^2)$ will directly vary as
    (a) $x^2 - y^2$ (b) xy
    (c) Either (1) or (2) (d) None of these

15. A varies directly as the sum of the two quantities B and C. B in turn varies directly as x and C varies inversely as x. When x = 2, A = 6 and when x = 4,A = 9. Find the value of A when the value of x = 16.
    (a) $2^1/_2$ (b) 1
    (c) $8^1/_2$ (d) $32^1/_4$

16. Intensity of light varies inversely as the square of the distance between the lamp shade and the object. What should the distance between the lamp shade and the object be such that the intensity, becomes one-fourth of the present intensity given that the distance between the lamp shade and the object is 125 cm?
    (a) 175 cm (b) 250 cm
    (c) 375 cm (d) 500 cm

17. The consumption of petrol per hour of my car varies directly as the square of its speed. When the car is travelling at 50 kmph its consumption is 2 ltrs. If each litre costs Rs. 30 and other expenses per hour is Rs. 500 then what would be the minimum expenditure required to cover a distance of 500 km?
    (a) Rs. 500 (b) Rs.1200
    (c) Rs.1500 (d) Cannot be determined.

18. A quantity p equals the sum of three other quantities, the first of which is a constant, the second varies directly as x and the third varies directly as X^2. When x = 1; p = 13, when x = 2,p = 36 and when x = 3, p = 79. Find the constant quality.
    (a) 2 (b) 5
    (c) 7 (d) 10

19. A varies jointly as x' and as $\frac{1}{\sqrt[3]{y}}$ When x=2,y=8, A=40.

Find the percentage change in the value of A when x = 3 and y = 729.

(a) 25% increase (b) 25% decrease
(c) 50% increase (d) 50% decrease

20. The distance travelled by a freely falling body is directly proportional to the square of the time taken. if a body falls 144 m in 6 seconds, then and the distance that the body fell in the 7^{th} second.

(a) 10m (b) 17 m
(c) 52m (d) 196m

21. The area of a triangle varies directly as the attitude when the corresponding base is constant and as the base when the corresponding altitude is constant.The area is 64 sq.cm when the base is 16 cm and the altitude is 8 cm. Find the area of the triangle whose base is 12 cm and the altitude is $6\sqrt{3}$ cm.

(a) $8\sqrt{3}$ cm^2 (b) $36\sqrt{3}$ cm
(c) $14\sqrt{3}$ cm^2 (d) None of these

22. The volume of a cylinder varies directly as the square of the radius of its base when the height is constant unit varies directly as the height when the radius of the base is constant. Find the volume of a cylinder whose radius is 75 cm and height B cm, if it is given that the radius is 15 cm when the height is 20 cm and the volume 300 cu.cm.

(a) 3000 cu.cm (b) 4500 cu.cm
(c) 3750 cu.cm (d) 4250 cu.cm

23. The cost of digging a mine d ft deep has two parts. one of the parts varies directly as d and the other as d^2. lf the cost of digging two mines.10 ft and 15 ft deep are Rs. 2050 and Rs. 2050 respectively, then and the cost of digging a mine 20 ft deep.

(a) Rs. 2050 (b) Rs. 2050
(c) Rs. 2050 (d) Rs.10100

24. lf it takes 16 days for 24 men to plough 15 acres of land, then how many days would be required by 32 men to plough 30 acres of land?

(a) 18 (b) 24
(c) 32 (d) 40

25. A writer gets a fixed amount for his book apart from the royalty that he gets per book sold. He gets Rs.30000 and Rs.50000 for 1000 and. 2000 books sold respectively. What is his income per book, if 5000 books are sold?

(a) Rs.17 (b) Rs.20
(c) Rs.21 (d) Rs.22

26. The cost of a precious stone varies as the cube of its weight. A stone broke into three pieces whose weights are in the ratio 1 : 2 : 3, as a result of which its cost reduces by Rs. 80280. What was the cost of the unbroken stone?

(a) Rs. 88840. (b) Rs. 96336.
(c) Rs.102400 (d) Rs.112880

27. The time period T of a pendulum varies as the square root of lg, where l is the length of the pendulum and g is the acceleration due to gravity when l =3 and g = 9, T=2. Find T when l = 24 and g = 18.

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

28. For which of the following values of a : b is $(10a^2 + ab) : (3ab - b^2)=10 : 1$?

(a) 1 : 2 (b) 3 : 5
(c) 5 : 2 (d) 5 : 3

Directions for questions 29 and 30: These questions are based on the information given below.

There are two colleges in the town — college A and college B. There are 500 students more in college A than in college B. The ratio of the boys to that of the girls in college A is 3 : 2 and that in college B is 4 : 1. The ratio of the number of Science, Humanities and Commerce students in college A and college B are respectively 2 : 5 : 3 and 2 : 3 : 3. The number of commerce students in both the colleges is the same.

29. How many students are there in college A?

(a) 2000 (b) 2500
(c) 3000 (d) 3500

30. How many girls are there in two colleges together'?

(a) 1400 (b) 1600
(c) 1700 (d) 2000

SET THEORY

Ref. No.: A8/P1/P1

Q1. 25 person are in a room. 15 of them play hockey, 17 of them play football and 10 of them play both hockey and football. Then the number of persons playing neither hockey nor football is
(a) 2 (b) 17 (c) 13 (d) 3

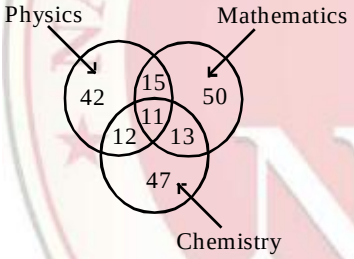
Directions (Q.2-Q4) : A TV survey gives this data for TV viewing. 60% see programme A, 50% see programme B, 30% see programme C. 30% see programme A and B, 20% see programmes B and C and 10% see programmes A and C. 10% see all programmes A, B, C. Then answer the following questions.

Q2. What percent view A and B but not C?
(a) 20 (b) 10 (c) 30 (d) 7

Q3. What percent do not view any of the three programmes?
(a) 30 (b) 10 (c) 15 (d) 17

Q4. What percent view exactly two programmes ?
(a) 20 (b) 30 (c) 50 (d) 24

Directions (Q.5-Q9) : The diagram given below shows the number of students who got distinction in 3 subjects out of 500 students. Study the diagram and answer the following:



Q5. What is the percentage of the student who got distinction is exactly two subjects?
(a) 8% (b) 9% (c) 10% (d) 12%

Q6. What is the percentage of students who got distinction?
(a) 28% (b) 30% (c) 38% (d) 40%

Q7. The percentage of students will distinctions in Mathematics is
(a) 17.8% (b) 18.6% (c) 19.2% (d) 20.6%

Q8. In a certain school 30 students play football, 15 play hockey and 25 take part in athletics. 8 play both football and hockey, 6 play hockey and athletics, 12 play football and athletics. 4 take part in all three games. How many students in all are involved in any of the three games?
(a) 50 (b) 48 (c) 46 (d) 66

Q.9 In a certain locality of Delhi, there are 1000 families. A survey indicated of 300 subscribe to the Hindustan Times Daily News Paper and 250 subscribe to Statesman Daily News Paper and of these two categories 100 subscribe both. Find the number of families which do not subscribe to any of these New Papers.
(a) 550 (b) 450 (c) 600 (d) 650

Directions (Q.10-Q13) : In an organization 500 employees are working. Among them 200 are Technicians, 220 are Managers and 120 are Supervisors. 100 employees are Manager who are also Technicians but not Supervisors. There are 10 employees who are Supervisors, Technicians and also Managers. There are 50 employees who are only Technicians. 40 employees are only Supervisors. Then answer the following questions.

Q10. How many employees are only managers ?
(a) 80 (b) 120 (c) 140 (d) 160

Q11. How many employees do exactly one type of job ?
(a) 160 (b) 150 (c) 170 (d) 180

Q12. How many employees are neither technicians nor managers nor supervisors ?
(a) 100 (b) 250 (c) 150 (d) 200

Q13. How many employees are managers and supervisors but not technicians?
(a) 30 (b) 70 (c) 10 (d) 80

SIMPLE INTEREST AND COMPOUND INTEREST

Ref. No.: A9/P1/P1

Q1. Find the simple interest for Rs. 22,000 for 5 years at 8% per annum.
(a) Rs. 8000 (b) Rs. 8200
(c) Rs. 8800 (d) Rs. 8400

Q2. The simple interest on a sum of money is $1/25^{th}$ of the principal. If the rate of interest is 8% p.a. What is the time period ?
(a) 3 months (b) 2 months
(c) 8 months (d) 6 months

Q3. A certain sum of money amounts to Rs. 3080 in 3 years and Rs. 3400 in 5 years at S.I. What is the sum ?
(a) Rs. 2600 (b) Rs. 3600
(c) Rs. 4600 (d) Rs. 1700

Q4. In how many years will a sum of money become 5 times at 8% p.a. simple interest ?
(a) 10 years (b) 20 years
(c) 30 years (d) 50 years

Q5. A sum of money Rs. 15000 is lent in two parts one at 7% p.a. and other at 4% p.a. If the annual interest received is Rs. 900. What is the amount lent at 4% p.a.?
(a) Rs. 4000 (b) Rs. 6000
(c) Rs. 5000 (d) Rs. 8000

Q6. What principal will amount to Rs. 570 at 4% p.a. in 3.5 years ?
(a) Rs. 800 (b) Rs. 500
(c) Rs. 400 (d) Rs. 1000

Q7. Find the S.I. on Rs. 500 for 8 months at 3 paise per rupee per month?
(a) Rs. 118.50 (b) Rs. 120
(c) Rs. 118.75 (d) Rs. 125.40

Q8. Rs. 1080 is divided into two parts such that if the first is lent at 6% for 5 years and second is lent at 10% for 4 years, the interest will be in the ratio 3 : 5. Find the first part.
(a) Rs. 500 (b) Rs. 480
(c) Rs. 780 (d) Rs. 680

Q9. Anil invested Rs. 8000 for 3 years at 5% compound interest in a post office. If the interest is compounded once in a year. What sum will be get after 3 years.
(a) Rs. 10, 200 (b) Rs. 11, 261
(c) Rs. 9261 (d) Rs. 12, 261

Q10. Find the amount in 2 years for a principal of Rs. 25,000. If the rate of interest being 5% for the first year and 10% for the second year.
(a) Rs. 28, 475 (b) Rs. 28, 875
(c) Rs. 18, 875 (d) Rs. 19, 875

Q11. Find the compound interest on Rs. 2000 for 9 months at 40% p.a. compounded quarterly
(a) Rs. 662 (b) Rs. 362
(c) Rs. 862 (d) Rs. 962

Q12. Find the difference between C.I. and S.I. on Rs. 6400 for 2 years at 12.5% p.a.
(a) Rs. 400 (b) Rs. 300
(c) Rs. 100 (d) Rs. 200

Q13. The C.I. on a certain sum for 2 years at 10% p.a. is Rs. 1260. What is the S.I. on the same sume at the same rate for 2 years.
(a) Rs. 1100 (b) Rs. 1200
(c) Rs. 600 (d) Rs. 1400

Q14. The value of a building is Rs. 2,66, 200 and that of a land is Rs. 1,45,800. After how many years will the values of both will be same. Given that the value of the building decreases at 10% p.a. and that of land increases at 10% p.a.
(a) 2 (b) 3 (c) 4 (d) 6

Q15. A sum of money amounts to Rs. 4840 in 2 years and Rs. 5324 in 3 years at C.I. What is the rate percent ?
(a) 9% (b) 8% (c) 4% (d) 10%

Q16. The S.I. on a certain sum of money for 2 years at 5% p.a. is Rs. 600. What is the C.I. on the same sum at the same rate and for the same time?
(a) Rs. 415 (b) Rs. 615
(c) Rs. 815 (d) Rs. 960

Q17. At C.I. a certain sum becomes twice itself in 7 years. In how many years will it become 32 times?
(a) 45 (b) 40 (c) 35 (d) 30

Q18. Find the difference between C.I. and S.I. on Rs. 32,000 for 3 years at rate 5% p.a.
(a) Rs. 244 (b) Rs. 304
(c) Rs. 444 (d) Rs. 344

TIME & WORK

Ref. No.: A10/P1/P2

1. If 10 lions can kill 10 deers in 10 minutes how long will it take 100 lions to kill 100 deers
   (a) 1 minutes (b) 10 minute (c) 100 minutes (d) 10000 minutes

2. There are two tanks A and B. A drains water at 6L/m and B drains water at 8L/m. A starts to drain water at 9:00am and after 2 minutes, B starts draining water. At what time, both with have same level of water?
   (a) 9:12 (b) 9:10 (c) 9:08 (d) 9:04

3. A tank fills in the sequence of 10, 20, 40, 80.... (Means 10 litres in 1 hr, 20 litres in 2nd so on.). If at the end of 4th hour the tank is 1/4 full .When will it be completely full?
   (a) 6 hours (b) 4 hours (c) 8 hours (d) 40 hours

4. A man, a woman and a boy can finish a work together in 6 days. Man alone takes 10 days; woman alone takes 24 days, then how many days boy alone will take to do that work?
   (a) 40 days (b) 4 days (c) 48 days (d) 24 days

5. A can complete a project in 20 days while B can complete same project in 30 days. If A and B start working together and A leaves the work 10 days before completion of project, then in how many days the project will be completed?
   (a) 18 days (b) 8 days (c) 40 days (d) 20 days

6. Mr.P, Mr.Q and Mr.R takes a project and they can complete it in 36 hours, 54 hours and 72 hours respectively. Unfortunately Mr.P met an accident and left from the project 8 hours before the completion while Mr.Q left 12 hours before the completion. Then for how many hours did Mr.R worked?
   (a) 24 b) 18 c) 42 d) 36

7. Roja and Edward were working in a courier company. Roja takes 6 hours to pack 32 parcels while Edward takes 5 hours to pack 40 parcels. How long they will take to pack 330 parcels working together?
   (a) 24 hours 45 minutes b) 23 hours c) 25 hours 15 minutes d) none of these.

8. There are 4 machines namely P, Q, R and S in a factory. P and Q running together can finish an order in 10 days. If R works twice as P and S works 1/3 as much as Q then the same order of work can be finished in 6 days. Find the time taken by P alone to complete the same order.
   (a) 11.5 days b) 12.5 days c) 13.5 days d) 14.5 days

9. George can do a piece of work in 8 hours; Paul can do the same work in 10 hours; Hari can do the same work in 12 hours. George, Paul and Hari start the same work at 9 am, while george stops at 11 am, the remaining two complete the work. What time(approx) will the work complete?
   (a) 1:06pm (b) 12:55pm (c) 1:10pm (d) 1pm

10. A and B can together complete a piece of work in 4 days. If A alone can complete the same work in 12 days, in how many days can B alone complete that work ?
    (a) 4 days (b) 5 days (c) 6 days (d) 7 days

11. Machine P can print one lack books in 8 hours. Machine Q can print the same number of books in 10 hours while machine R can print the same in 12 hours. All the machines started printing at 9 A.M. Machine P is stopped at 11 A.M. and the remaining two machines complete work. Approximately at what time will the printing of one lack books be completed?
    (a) 3 pm (b) 2 pm (c) 1:00 pm (d) 11am

12. A can do a particular work in 6 days . B can do the same work in 8 days. A and B signed to do it for Rs. 3200. They completed the work in 3 days with the help of C. How much is to be paid to C?
    (a) Rs. 380 (b) Rs. 600 (c) Rs. 420 (d) Rs. 400

13. P is able to do a piece of work in 15 days and Q can do the same work in 20 days. If they can work together for 4 days, what is the fraction of work left?
    (a) 8/15 (b) 7/15 (c) 11/15 (d) 2/11

14. A,B,C can do some work in 36 days. A and B together can do twice as much work as C alone, and A and C together cand do thrice as much work as B alone. Find the time taken by C to do whole work?
    (a) 96 days (b) 108 day (c) 120 days (d) 72 days

15. George and Mark work for a comapny. George can finish a certain job in 30 days. Mark can finish the same job in 45 days. A project was taken by the company and George was made superior to Mark. This move from the company was not liked by mark. So Mark did not work for 15 days. Find the total number of days the entire work was completed if Mark works at his normal speed after 15 days from the date of commencement?
(a) 15 (b) 20 (c) 35 (d) 24

16. An army camp has provision for 52 days.17 days later, 300 new recruits join the camp and the remaining provisions will last only for 21 days. How many recruits are there in camp?
(a) 150 (b) 450 (c) 300 (d) 100

17. A and B can complete a piece of work in 12 days while B and C in 15 days. A did the work for 3 days, B for 8 days and C for 10 days to complete the work. In how many days C alone can complete the work?
(a) 6 days (b) 9 days (c) 10 days (d) 12days

18. Two taps are running continuously to fill a tank. The first tap could have filled it in 5 hours by itself and the second one by itself could have filled it in 20 hours. But the operator failed to realize that there was a leak in the tank from the beginning which caused a delay of one hour in the filling of the tank. Find the time in which the leak would empty a filled tank? option
(a) 15 (b) 20 (c) 25 (d) 40

19. A gas station need 80 people to fill air in 20,000 tyres in 84 days. How many people does the gas station need to fill air in 30,000 tyres in 63 days?
(a) 160 (b) 120 (c) 90 (d) 180

20. Three pipes, X, Y and Z. through which water flows at the same rate are fitted to a tank. If any two pipes work as filling pipes and the third pipe works as an emptying pipe, the tank would be full in 6 hours. Find the time taken, in hours, to fill the tank if all the three pipes are used as filling pipes.
(a) 1 (b) 2 (c) 3 (d) 4 (e) 5

21. Raman and Rajan together complete half the work in 18 days. Rajan and Rajiv complete the remaining half in 12 days. If Rajiv alone can complete the work in 36 days, how many days will it take for Raman alone to complete the work?
(a) 144 (b) 84 (c) 72 (d) 90

22. A man builds $1/8^{th}$ part of the wall every day. Out of the length of the wall built per day, 20 % falls off each day (including last day's work. In how many days-can he complete the wall?
(a) 8 (b) 10 (c) 46/5 (d) 49/5

23. P and Q can complete a piece of work in 20 days, Q and R in 15 days and P and R in 12 days. In how many days respectively can P, Q and R complete the work if they work individually?
(a) 30,60, 20 (b) 45,60,180 (c) 30,45,90 (d) 45,60,20

24. The efficiency of a man is reduced by half every two hours. At maximum efficiency, he could have completed the job in 150 hours. How many hours does it take him to complete the job, if his efficiency becomes maximum after every 8 hours, and then reduces as mention above?
(a) 300 (b) 320 (c) 600 (d) 620

25. If there is one man less to do work, then the number of days required to do a piece of work would be one more. If the initial number of man-days required to complete the work is 56, how many worked initially?
(a) 6 (b) 8 (c) 9 (d) 14

26. L, *M* and N started a piece of work. They worked on it for 5 days, after which L left. The other two continued to work for 5 more days after which M left and the remaining work was completed by N in 5 more days. If M alone can complete the work in 30 days and N alone takes more than 45 days to complete the work. Which of the following is true?
(a) L did the least part of the work. (b) M did the least part of the work.
(c) M did the greatest part of the work. (d) L did the greatest part of the work.
(e) L, M and N did the same amount of work.

TIME DISTANCE & SPEED

Ref. No.: A11/P1/P2

1. Tim and Elan are 90 km from each other. They start to move towards each other simultaneously Tim at speed 10 kmph and Elan 5 kmph. If every hour they double their speed what is the distance that Tim will pass until he meet Elan.
   (a) 60km (b) 30km (c) 40km (d) 50

2. A thief is noticed by a policeman from a distance of 200m. The thief starts running and the policeman chases him. The thief and the policeman run at the rate of 10 km & 11 km per hour respectively. What is the distance bet ween them after 6 minutes?
   (a) 50 meter (b) 100 meter (c) 110 meter (d) None of above

3. How long does a train 110 meters long running at the speed of 72 km/hour take to cross a bridge 132 meters in length ?
   (a) 15 seconds (b) 12.1 seconds (c) 10 seconds (d) 8.1 second

4. For a car there are 5 tyres including one spare tyre(4+1). All tyres are equally used. If the total distance travelled by the car is 40000km then what is the average distance travelled by the each tyre?
   (a) 10000 (b) 40000 (c) 32000 (d) 8000

5. 2 workers- one young and one old, live together and work at the same office. It takes 20 minutes for the young man to walk to office. The old man takes 30 minutes for the same distance. When will the young man catch up with the old man, if the old man starts at 10:00 a.m. and the young man start 10:05 a.m.?
   (a) 10:15am (b) 10:10am (c) 10:20am (d) 10:30am

6. Scott starts jogging from point X to point Y. A half-hour later his friend Garrett who jogs 1 mile per hour slower than twice Scott's rate starts from the same point and follows the same path. If Garrett overtakes Scott in 2 hours, how many miles will Garrett have covered?
   (a) 11/5 (b) 10/3 (c) 4 (d) 6 (e) 20/3

7. Ashish and his girlfriend started from a point on a river and began to row upstream. After rowing for two hours, Ahish paused. He wanted to hand over a flower to his girlfriend but it slipped from his hand into the river and started floating downstream. They rowed upstream for two more hours and then turned back. They caught up with the flower, at a point 6 km downstream of the point where it fell in to the river. Find the speed (in km/hr) of the stream.
   (a) 1.5 (b) 3 (c) 2 (d) Cannot be determined

8. Ankita and Bhoomika start running simultaneously on a circular track. Ankita finishes one lap in 14 minutes and Bhoomika finishes one lap In 10 minutes. After how many minutes from the start will Bhoomika have covered exactly 2 laps more than of Ankita?
   (a) 140 minutes (b) 70 minutes (c) 60 minutes (d) 40 minutes

9. Boat R started from a point A on a river and began to travel towards the point B, 24 km upstream. One hour later, boat S, which has the same speed in still water, started from B and began to travel towards A. The boats met at the midpoint of AB, two hours after S started. If R has to travel the distance AB in still water, how many hours would it take?
   (a) 3 (b) 3.2 (c) 6 (d) 4.8 (e) 9.6

10. A train starts form station X at the rate of 60 kmph and reaches station Y in 45 minutes. If the speed is reduced by 6 kmph, how much more time will the train take to return from station Y to station X?
    (a) 5 min (b) $7\frac{1}{2}$ min (c) 6 min (d) 4 min

11. A motorist covers a distance of 39 km in 45 minutes by moving at a speed of x kmph for the first 15 minutes, then moving at double the speed for the next 20 minutes and then again moving at his original speed for the rest of the journey. Then, x is equal to :
    (a) 31.2 (b) 36 (c) 40 (d) 52

12. A man drives 150 km from A to B in 3 hours 20 minutes and returns to A in 4 hours 10 minute. Then, average speed from A to B exceeds the average speed for the entire trip by :
    (a) 5 km/h (b) 4.5 km/h (c) 4 km/h (d) 2.5 km/h

13. Two trains start from stations A and B and travel towards each other at speeds of 50 kmph and 60 kmph respectively. At the time of their meeting the second train has travelled 120 km more than the first. The distance between A and B is :
    (a) 990 km (b) 1200 km (c) 1320 km (d) 1440 km

14. During the shooting of a certain movie, Salman is separated from Madhuri by 500m and is supposed to take Madhuri up in his arms. Madhuri starts running away from Salman at 1.5 m/s, as soon as Salman starts off. If Salman has to catch up with her in 50 s, what is the speed of Salman?
(a)10 m/s (b) 11 m/s (c) 11.5 m/s (d) 10.5 m/s

15. A motor car does a journey in 10 hrs, the first half at 21 km/hr and the second half at 24 km/hr. Find the distance.
(a) 225 km (b) 224 km (c) 230 km (d) 220 km

16 A man rode out a certain distance by train at the rate of 25 km an hour and walked back at the rate of 4 km per hour. The whole journey took 5 hours and 48 minutes. What distance did he ride?
(a) 15 km (b) 24 km (c) 8 km (d) 20 km

17. A man covers a certain distance between his house and office on scooter. Having an average speed of 30 km/hr, he is late by 10 min. However, with a speed of 40 km/hr, he reaches his office 5 min earlier. Find the distance between his house and office.
(a) 60 km (b) 45 km (c) 30 km (d) 40 km

18. A boy walking at a speed of 10 km/hr reaches his school 15 minutes late. Next time he increases his speed by 2 km/hr, but still he is late by 5 minutes. Find the distance of his school from his house.
(a) 8 km (b) 10 km (c) 12 km (d) 15 km

19. Two runners cover the same distance at the rate of 15 km and 16 km per hour respectively. Find the distance traveled when one takes 16 minutes longer than the other
(a) 64 km (b) 80 km (c) 60 km (d) 75 km

20. Two men A and B walk from P to Q, a distance of 21 km at 3 and 4 km an hour respectively. B reaches Q, returns immediately and meets A at R. Find the distance from P to R.
(a) 18 km (b) 15 km (c) 16 km (d) 17 km

21. A man travels first 50 km at 25 kmph, next 40 km at 20 kmph and then 90 km at 15 kmph. His average speed for the whole journey (in kmph) is:
(a) 25 (b) 20 (c) 18 (d) 40

22. A man goes uphill with an average speed of 24 kmph and comes down with an average speed of 36 kmph. The distance travelled in both the cases being the same, the average speed for the entire journey is :
(a) 30 kmph (b) 24 kmph (c) 28.8 kmph (d) 32.6 kmph

23. An airplane flies along the four sides of a square field at speeds of 200, 400, 600 and 800 km/hr. The average speed of the plane in the flight around the field in km/hr is :
(a) 384 (b) 400 (c) 600 (d) 284

24. Two stations Bombay and Goa are 465 km apart. A train leaves from Bombay for Goa at 11 a.m. at a speed of 60 kmph. Another train leaves from Goa for Bombay on a parallel track at 12 noon at a speed.of 75 kmph. They will cross each other at
(a) 3:00p.m. (b) 4p.m. (c) 5p.m. (d) 4:30 p.m. (e) 2:00 p.m.

25. A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:
(a)100 kmph (b) 110 kmph (c) 120 kmph (d) 130 kmph

PERMUTATION & COMBINATION

Ref. No.: A12/P1/P2

1. A college has 10 basketball players. A 5-member team and a captain will be selected out of these 10 players. How many different selections can be made?
   (a) 1260 (b) 210 (c) 10C6 * 6! (d) 10C5 * 6

2. Badri has 9 pairs of dark Blue socks and 9 pairs of Black socks. He keeps them all in a same bag. If he picks out three socks at random what is the probability he will get a matching pair?
   (a) $(2*{}^{9}C_2 * {}^{9}C_1) / {}^{18}C_3$ (b) $({}^{9}C_2 * {}^{9}C_1) / {}^{18}C_3$ (b) 1 (d) None of these

3. How many words of 4 consonants and 3 vowels can be made from 12 consonants and 4 vowels, if all the letters are different?
   (a) ${}^{16}C_7 * 7!$ (b) ${}^{12}C_4 * {}^{4}C_3 * 7!$ (c) ${}^{12}C_3 * {}^{4}C_4$ (d) ${}^{12}C_4 * {}^{4}C_3$

4. If the letters of the word CHASM are rearranged to form 5 letter words such that none of the word repeat and the results arranged in ascending order as in a dictionary what is the rank of the word CHASM?
   (a) 24 (b) 31 (c) 32 (d) 30

5. How many four letter distinct initials can be formed using the alphabets of English language such that the last of the four words is always a consonant?
   (a) (26^3)*(21) (b) 26*25*24*21 (c) 25*24*23*21 (d) None of these.

6. When four fair dice are rolled simultaneously, in how many outcomes will at least one of the dice show 3?
   (a) 155 (b) 620 (c) 671 (d) 625

7. In how many ways can the letters of the word EDUCATION be rearranged so that the relative position of the vowels and consonants remain the same as in the word EDUCATION?
   (a) 9!/4 (b) 9!/(4!*5!) (c) 4!*5! (d) None of these

8. How many ways can 10 letters be posted in 5 post boxes, if each of the post boxes can take more than 10 letters?
   (a) 5^10 (b) 10^5 (c) 10P5 (d) 10C5

9. A team of 8 students goes on an excursion, in two cars, of which one can seat 5 and the other only 4. In how many ways can they travel?
   (a) 9 (b) 26 (c) 126 (d) 3920

10. How many ways can 4 prizes be given away to 3 boys, if each boy is eligible for all the prizes?
    (a) 256 (b) 12 (c) 81 (d) None of these

11. There are 12 yes or no questions. How many ways can these be answered?
    (a) 1024 (b) 2048 (c) 4096 (d) 144

12. How many words can be formed by re-arranging the letters of the word ASCENT such that A and T occupy the first and last position respectively?
    (a) 5! (b) 4! (c) 6! - 2! (d) 6! / 2!

13. Four dice are rolled simultaneously. What is the number of possible outcomes in which at least one of the die shows 6?
    (a) 6! / 4! (b) 625 (c) 671 (d) 1296

14. How many alphabets need to be there in a language if one were to make 1 million distinct 3 digit initials using the alphabets of the language?
    (a) 26 (b) 50 (c) 100 (d) 1000

15. There are 5 Rock songs, 6 Carnatic songs and 3 Indi pop songs. How many different albums can be formed using the above repertoire if the albums should contain at least 1 Rock song and 1 Carnatic song?
    (a) 15624 (b) 16384 (c) 6144 (d) 240

16. What is the value of 1*1! + 2*2! + 3!*3! + ... n*n!, where n! means n factorial or n(n-1)(n-2)...1
    (a) n(n-1)(n-1)! (b) (n+1)!/(n(n-1)) (c) (n+1)! - n! (d) (n + 1)! - 1!

17. How many number of times will the digit '7' be written when listing the integers from 1 to 1000?
    (a) 271 (b) 300 (c) 252 (d) 304

18. 36 identical chairs must be arranged in rows with the same number of chairs in each row. Each row must contain at least three chairs and there must be at least three rows. A row is parallel to the front of the room. How many different arrangements are possible?
(a) 2 (b) 4 (c) 5 (d) 6

19. Find the number of 6-digit numbers that can be formed using the digits 1,2,3,4,5,6 once, such that the 6-digit numbers are divisible by its unit digit?
(a) (5*5! + 2*4!) (b) (2*4!) (c) (5*5!) (d) (5! + 4!)

20. A person has 7 paise with him and 1 water melon is for 1paisa, 2chickoos for 1paisa, 3 grapes for 1paisa. He has three sons. How can he share the fruits equally?
(a) 1 watermelon, 2 chickoos and 3 grapes each (b) 2 watermelon, 1 chickoos and 3 grapes each
(c) 3 watermelon, 1 chickoos and 2 grapes each (d) 3 watermelon, 2 chickoos and 1 grapes each

21. If a traveller was offered 5 city in asia and 11 city in europe and asked to chose atleast 3 city in asia and overall 11 cities. How many ways can he travel?
(a) C(5,3)*C(11,8) + C(5,4)*C(11,7) + C(5,5)*C(11,6) (b) C(16,11)
(c) C(5,3)*C(11,8) * C(5,4)*C(11,7) (d) C(5,3)*C(11,8) * C(5,5)*C(11,6)

22. There are 3 men, 8 women, they are standing in a row for a photoshoot. In how many ways they can be arranged if no 2 men can stand together.
(a) 8!*P(9,3) (b) 6!*C(9,3) (c) 6!*P(9,3) (d) 8!*C(9,3)

23. Form the 8 digit number using 1,2,3,4,5 repetition is allowed and it must be divisible by 4?
(a) 62500 (b) 12500 (c) 2500 (d) 12000

24. 3 persons A, B and C are standing in a queue. There are 5 persons between A and B and 8 persons between B and C. If there are 3 persons ahead of C and 21 persons behind A, what could be the minimum number of persons in the queue ? Option
(a) 41 (b) 40 (c) 28 (d) 27

25. Two question booklets for an aptitude test are to be given to students. In how many ways can the students be placed in two rows of six each so that there should be no identical series side by side and that, the students sitting one behind the other should have the same series ?
(a) $2 \times {}^{12}C_6 \times (6!)^2$ (b) $6! \times 6!$
(c) $7! \times 7!$ (d) None of these

26. An organisation has 3 committees, only 2 persons are members of all 3 committee but every pair of committee has 3 members in common. what is the least possible number of members on any one committee?
(a) 4 (b) 5 (c) 6 (d) 1

27. There are 20 persons sitting in a circle. In that, there are 18 men and 2 sisters. How many arrangements are possible, in which the two sisters are always separated by a man?
(a) 18!*2 (b) 17! (c) 17!*2 (d) 12

28. Mr and Mrs smith have invited 9 of their friends and their spouses for a party at the waikki beach report.they stand for a group hotograph.if Mr smith never stand next to the Mrs smith(as he says there are always together otherwise),how many ways the group csn be arranged in a row for the photograph.
(a) 2x19! (b) 20! (c) 18x19! (d) 19!+18!

29. How many six digit even numbers can be formed from the digits 1, 2, 3, 4, 5, 6 and 7 so that the numbers should not repeat and the second last digit is even?
(a) 5!*6 (b) 5!*2 (c) 5!*3 (d) 5!*4

30. In G-20 meeting there were 20 people representing their own country.All the representative sat around a circular table.Find the number of ways in which we can arrange them around a circular table so that there is exactly one person between two representatives namely Manmohan and Musharraf. option
(a) 2x(17!) (b) 2x(18!) (c) (3!)X(18!) (d) (17!)

PROBABILITY

Ref. No.: A13/P1/P2

1. 1024 people live in a village. 720 speak tamil,562 speak english while 346 speak both the languages. If a person who does not speack english or tamil, he speaks hindi. What is probibility that a person speak hindi?
(a) 11/ 128 (b) 88/ 1023 (c) 11/ 1024 (d) 127/ 1024

2. There are two bags. One bag contains 4 white and 2 black balls. Second bad contains 5 white and 4 black balls. 2 balls are transferred from first bag to the second bag. Then one ball is taken out from the second bag. The probability that the ball is white is
(a) 42/ 165 (b) 5/ 165 (c) 48/ 165 (d) 19/ 33

3. A Bag contains P white and Q black balls. Two players A and B alternately draw a ball from the bag, replacing the balls each time after the draw till one of them draws a white and wins the games. If A begins the game and the probability of A winning the game is 3 times that of B, then what is the ratio of P : Q?
(a) 3:4 (b) 4:3 (c) 2:1 (d) 1:2

4. 2/3rd of the balls in a bag are blue, the rest are pink. if 5/9th of the blue balls and 7/8th of the pink balls are defective, find the total number of balls in the bag given that the number of non defective balls is 146.
(a) 216 (b) 649 (c) 432 (d) 578

5. A letter is chosen at random from the word 'ASSASSINATION'. What is the probability that it is a vowel?
(a) 4/ 13 (b) 8/ 13 (c) 7/ 13 (d) 6/ 13

6. Probability that a leap year chosen at random will have 53 sundays
(a) 2/ 7 (b) 8/ 49 (c) 1/ 7 (d) 3/ 49

7. 3 dices are thrown. What is the probability that sum ten appears?
(a) 1/ 8 (b) 7/ 216 (c) 3/ 8 (d) 9/ 216

8. In a chess tournament of 4 games among Anand and Karsproviz, the probability of Anand wining the game is 2/5. Probability of individual game draw is zero. What is the probability of the series draw?
(a) 432/ 625 (b) 400/ 625 (c) 32/ 125 (d) 301/ 625

9. Two friends decided to meet at some time between 3 p.m. to 4 p.m. on a certain day at a gym. They didn't fix the exact time but they agreed that the one who arrived first at the gym, would wait up to 20 minutes (but no more)for the other person. Assuming that each of them went to the gym at some time between 3 p.m. and 4 p.m, find the probability that they-did not meet that day.
(a) 1/ 3 (b) 2/ 3 (c) 5/ 9 (d) 4/ 9

10. If A speaks the truth 60% of the times, B speaks the truth 50% of the times. What is the probability that at least one will tell the truth?
(a) 80% (b) 60% (c) 50% (d) 40%

11. There are 20 balls which are red,blue,or green.If 7 balls are green and the sum of red balls and green balls is less than 13, at most how many red balls are there?
(a) 5 (b) 6 (c) 7 (d) 4

12. If the probability of rain on any given day in pune city is 50% then what is the probability that it rains on exactly 3 days in a 5 day period?
(a) 5/ 16 (b) 25/ 64 (c) 15/ 64 (d) 3/ 16

13. The probability of rain on Day 1 is 0.2 and on Day 2 is 0.3. What is the probability of raining on both the days?
(a) 0.2 (b) 0.1 (c) 0.6 (d) 0.25

14. The letters B, G, I, N and R are rearranged to form the word 'BRING'. Find its probability.
(a) 1/120 (b) $1/5^4$ (c) 1/24 (d) $5/5 \times 4^2$

15. A six-sided die with faces numbered 1through 6 is rolled three times. What is the probability that the face with the number 6 on it will not face upward on all the three rolls?
(a) 1/216 (b) 1/6 (c) 2/3 (d) 216/216

16. A man bets on number 16 on roulette wheel 14 times and loses each time. On the 15th spin, he does a quick calculation and finds out that the number 12 had appeared twice in the 14 spans and is therefore unable to decide whether to bet on 16 or 12 in the 15th spin. Which will give him the best chance and what are the odds of winning on the bet that he takes? (Roulette has numbers 1 to 36).
(a) 16; 22 : 14 (b) 12; 72 : 1 (c) 12; 7 : 1 (d) Either; 35 : 1

17. Badri has 9 pairs of dark blue socks and 9 pairs of black socks. He keep s them all in the same bag. If he picks out three socks at random, then what is the probability that he will get a matching pair?
(a) $(2\ {}^9C_2\ {}^9C_1) / {}^{18}C_3$ (b) $({}^9C_2\ {}^9C_1)/{}^{18}C_3$
(c) 1 (d) None of these

18. In his wardrobe, Timothy has 3 trousers. One of them is black, the second blue, and the third brown. In his wardrobe, he also has 4 shirts. One of them is black and the other 3 are white. He opens his wardrobe in the dark and picks out one shirt-trouser pair, without examining the colour. What is the likelihood that neither the shirt nor the trouser is black?
(a) 1/12 (b) 1/6 (c) 1/4 (c) ½

19. A mail-sorting clerk is given 4 envelopes addressed to different people and 4 letters. She has to carefully put the letters in the correct envelopes and then mail them. However, she carelessly puts any letter in any envelope. Making sure that each envelope has precisely one of those 4 letters. What is the likelibood that all the letters are in the correct envelope?
(a) 1/24 (b) 1/12 (c) 1/6 (d) 1/4

20. The probability of raining on day 1 is 0.2 and on day 2 is 0.3. What is the probability of raining on both the days?
(a) 0.2 (b) 0.1 (c) 0.6 (d) 0.25

21. There are 10 pairs of socks in a drawer. What is the minimum number of socks that a person should pull out from the drawer to ensure that he gets at least two matching pairs of socks?
(a) 12 (b) 11 (c) 5 (d) 10

22. If the probability that A will live 15 years is $\frac{7}{8}$ and that B will live 15 years is $\frac{9}{10}$, then what is the pro bribability that both will live after 15 years ?

(a) $\frac{1}{20}$ (b) $\frac{63}{80}$ (c) $\frac{1}{5}$ (d) None of these

23. A bag contains 2 red, 3 green and 2 blue balls. 2 balls are to b drawn randomly. What is probability that the balls drawn contain no blue ball?

(a) $\frac{5}{7}$ (b) $\frac{10}{21}$ (c) $\frac{2}{7}$ (d) $\frac{11}{21}$

24. I forgot the digit of a 7-digit telephone number. If I randomly dial the final 3 digits after correctly dialing the first four, then what is the chance of dialing the correct number?

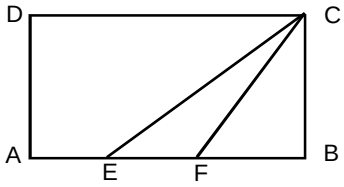
(a) $\frac{1}{1001}$ (b) $\frac{1}{990}$ (c) $\frac{1}{999}$ (d) $\frac{1}{1000}$

GEOMETRY

Ref. No.: A14/P1/P2

1. ABCDEF is a regular hexagon. Find the ration of areas of ACE and ABCDEF.
   (a) 1:4 (b) 2:3 (c) 1:2 (d) none of these

2. In the given diagram, ABCD is a rectangle with AE= EF = FB. What is the ratio of the area of the triangle CEF and the rectangle?

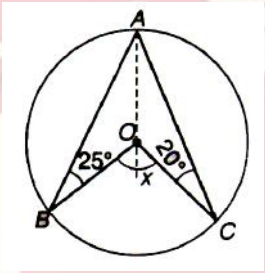


   (a) 1 : 4 (b) 1 : 6
   (c) 2 : 5 (d) 2 : 3

3. Parallel lines are drawn on a rectangular piece of paper. The paper is then cut along each of the line forming n identical strips, If the strips have the same ratio of length to width as the original paper this ratio is
   (a) $\sqrt{n} : 1$ (b) n : 1 (c) n : 2 (d) $n^2 : 1$

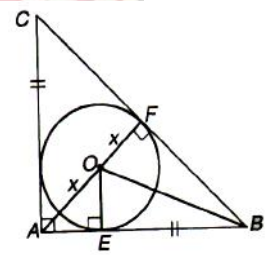
4. P, Q, R are points on a circle. PQ, QR, RP are tangents to another circle and the two circles are concentric. Area of the outer circle is 48 sq.cm. Find the area of triangle PQR.
   (a) $\frac{(36\pi)}{\sqrt{3}}$ (b) $\frac{(36\pi)}{\sqrt{2}}$ (c) $\frac{(36)}{\pi}$ (d) $\frac{(36\sqrt{3})}{\pi}$

5. If $\angle ABO = 25^0$ and $\angle ACO = 20^0$, then $\angle x$ is



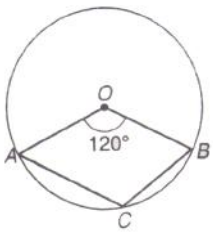
   (a) 60^0 (b) 120^0
   (c) 80^0 (d) 90^0

6. In $\triangle ABC$, BC is $6\sqrt{2}$ cm. Then, the value of x is



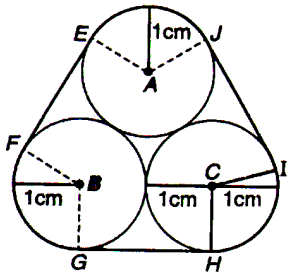
   (a) $(6 + 3\sqrt{2})$ cm (b) $(6 - 3\sqrt{2})$ cm
   (c) $(3 + \sqrt{2})$ cm (d) $(3 - \sqrt{2})$ cm

7. If O is center and $\angle AOB = 120^0$, then $\angle ACB$ is



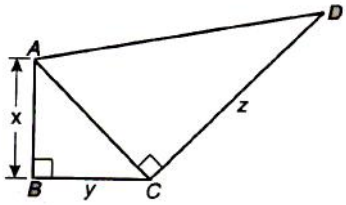
   (a) 120^0 (b) 140^0
   (c) 100^0 (d) 150^0

8. Each Circle of radius 1 cm, touchs each other. Then, the perimeter of rope in comparing the three circles is



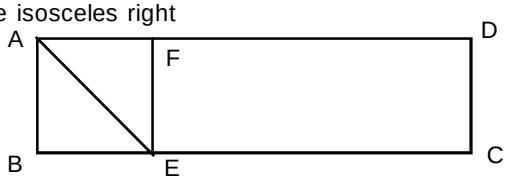
   (a) $2\pi + 6$ (b) $3\pi + 6$
   (c) $4\pi + 6$ (d) $6\pi + 6$

9. $\triangle ABC$ and $\triangle ACD$ are right angled triangle and AB = xcm, BC = y cm, CD = z cm and x **X** y = z and x, y and z has minimum integral value. Then, the area of ABCD is



   (a) $36cm^2$ (b) $64cm^2$
   (c) $24cm^2$ (d) $25cm^2$

10. In the figure given below, ABCD is a rectangle. Thr area of the isosceles right ABE = $7cm^2$; EC = 3(BE). Then, the area of ABCD (in cm^2) is



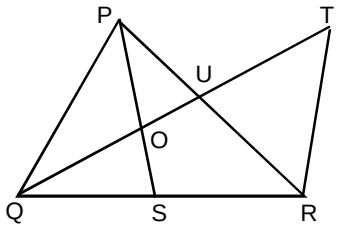
   (a) 21 (b) 28
   (c) 42 (d) 56

11. In the figure given below, PQ = 4 units, PR = 6 units, PS = 3 units, RU = 5 units, QS = SR and QU is extended till T such thet QU = UT = 4 units. O is the point of intersection of PS and SQU.

Find the measure of side RT.

(a) $\sqrt{14}$cm (b) 4 cm

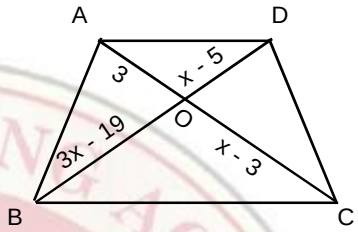
(c) 3.5 cm (d) $2\sqrt{3}$ cm



12. In the given figure, AD || BC, AO = 3 cm, OC = x - 3, BO 3x - 19, OD = x - 5. Then, the value of x is

(a) x = 8, 9 (b) x = 7, 8

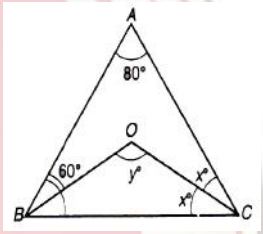
(c) x = 8, 10 (d) x = 10, 12



13. In the given figure, $\angle A = 80^0$, $\angle B = 60^0$, $\angle C = 2x^0$ and $\angle BOC = y^0$. BO and Co bisect angle B and C respectively. Then the values of x and y respectively are

(a) 15^0 and 70^0 (b) 10^0 and 160^0

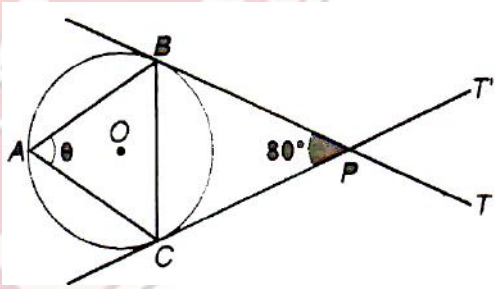
(c) 20^0 and 130^0 (d) 20^0 and 125^0



14. In the given figure, T and T' are two tangents at B and C point on the circle and $\angle BPC$ is80^0, then $\angle A$ is

(a) 80^0 (b) 60^0

(c) 50^0 (d) 40^0



15. P and Q be centers of two circle having radius 200cms. These circle intersect each other at some point A and B. Length of PQ is 250 cms. What will the angle AQP be?
(a) between 0 to 45 (b) between 0 to 30 (c) between 0 to 60 (d) between 0 to 75

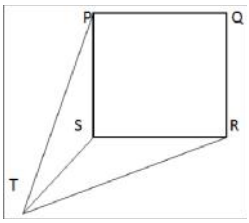
16. There are 10 points on a straight line AB and 8 on another straight line AC none of them being point A. how many triangles can be formed with these points as vertices?
Option
(a) 680 (b) 720 (c) 816 (d) 640

17. The interior angle of a regular polygon is 156 . How many diagonals does the polygon have ?
(a) 60 (b) 90 (c) 75 (d) 120

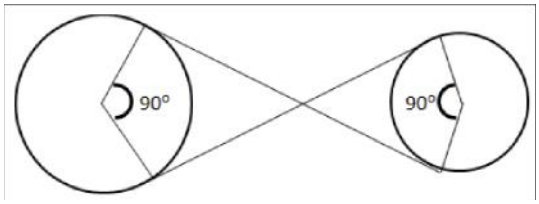
MENSURATION

Ref. No.: A15/P1/P2

1. A right circular cone has height H and radius R. A small cone is cut off at the top by a plane parallel to the base. At what height above the base the section has been made?
   Statement (I): H = 20 cm
   Statement (II): Volume of small cone: volume of large cone : 1:15
   a. If the question can be answered with statement I alone but not statement II alone, or can be answered with statement II alone but not statement I alone.
   b. If the question cannot be answered with statement I alone or with statement II alone, but can be answered if both statements are used together.
   c. If the question can be answered with either statement alone.
   d. If the question cannot be answered with the information provided.
2. A sphere of radius r is cut by a plane at a distance of h from its center, thereby breaking this sphere into two different pieces. The cumulative surface area of these two pieces is 25% more than that of the sphere. Find h.
   a. $r/\sqrt{2}$ b. $r/\sqrt{3}$
   c. $r/\sqrt{5}$ d. $r/\sqrt{6}$
3. Two mutually perpendicular chords AB and CD meet at a point P inside the circle such that AP = 6 cms, PB = 4 units and DP = 3 units. What is the area of the circle?
   a. $125\pi/4$ sq cms b. $100\pi/7$ sq cms
   c. $125\pi/8$ sq cms d. $52\pi/3$ sq cms
4. Cylindrical cans of cricket balls are to be packed in a box. Each can has a radius of 7 cm and height of 30 cm. Dimension of the box is l = 76 cm, b = 46 cm, h = 45 cm. What is the maximum number of cans that can fit in the box?
   a. 15 b. 17
   c. 22 d. 21
5. PQRS is a square of sides 2 cm & ST = 2 cm. Also, PT=RT. What is the area of ΔPST?



   a. 2 cm^2 b. $\sqrt{3}$ cm^2
   c. $\sqrt{2}$ cm^2 d. $1/\sqrt{2}$ cm^2
6. A string is wound around two circular disk as shown. If the radius of the two disk are 40 cm and 30 cm respectively. What is the total length of the string?



   a. 70 cm b. 70 + 165*π
   c. 70 + 120π d. 70 + 165*(π/2)
7.

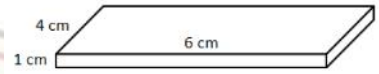
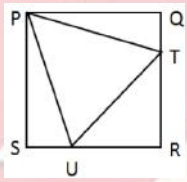
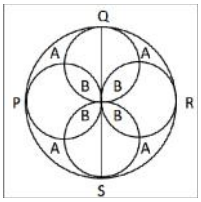


   Figure above shows a box which has to be completely wrapped with paper. However, a single Sheet of paper need to be used without any tearing. The dimension of the required paper could be
   a. 17 cm by 4 cm b. 12 cm by 6 cm
   c. 15 cm by 4 cm d. 13 cm by 4 cm
8. An inverted right circular cone has a radius of 9 cm. This cone is partly filled with oil which is dipping from a hole in the tip at a rate of $1cm^2$/hour. Currently the level of oil 3 cm from top and surface area is 36π cm^2. How long will it take the cone to be completely empty?
   a. 216π hours b. 1 hour
   c. 3 hours d. 36π hours
9.



   A square PQRS has an equilateral triangle PTO inscribed as shown:
   What is the ratio of AΔPQT to AΔTRU?
   a. 1 : 3 b. 1 : $\sqrt{3}$
   c. 1 : $\sqrt{2}$ d. 1 : 2
10. A spherical shaped sweet is placed inside a cube of side 5 cm such that the sweet just fits the cube. A fly is sitting on one of the vertices of the cube. What is the shortest distance the fly must travel to reach the sweet?
    a. 2.5 cm b. $5(\sqrt{3} - 1)$ cm
    c. $5(\sqrt{2} - 1)$ cm d. $2.5(\sqrt{3} - 1)$ cm
11. Anil grows tomatoes in his backyard which is in the shape of a square. Each tomato takes 1 cm^2 in his backyard. This year, he has been able to grow 131 more tomatoes than last year. The shape of the backyard remained a square. How many tomatoes did Anil produce this year?
    a. 4225 b. 4096
    c. 4356 d. Insufficient Data

12. PQRS is a circle and circles are drawn with PO, QO, RO and SO as diameters areas A and B are shaded A/B is equal to

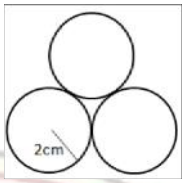


a. π b. 1
c. $\pi/4$ d. 2

13. ABCD is a square drawn inside a square PQRS of sides 4 cm by joining midpoints of the sides PQ, QR, RS, SP. Another square is drawn inside ABCD similarly. This process is repeated infinite number of times. Find the sum of all the squares.
a. 16 cm^2 b. 28 cm^2
c. 32 cm^2 d. Infinite

14. PQRST is a pentagon in which all the interior angles are unequal. A circle of radius 'r' is inscribed in each of the vertices. Find the area of portion of circles falling inside the pentagon.
a. πr^2 b. $1.5\pi r^2$
c. $2\pi r^2$ d. $1.25\pi r^2$

15. Three circles with radius 2 cm touch each other as shown :-



Find the area of the circle, circumscribing the above figure.
a. $3\pi(4+\sqrt{3})^2$ b. $\pi/2(4+2\sqrt{3})^2$
c. $\pi/4(4+2\sqrt{3})^2$ d. $12\pi-(\pi/2)(4+2\sqrt{3})^2$

CO-ORDINATE GEOMETRY

Ref. No.: A16/P1/P2

Directions for questions 1 to 25: Select the correct alternative from the given choices.

1. The distance between (6, 8) and the centre of the circle $x^2 + y^2 = a^2$ is
   (a) 6 units (b) 8 units (c) 10 units
   (d) 9 units (e) Cannot be determined

2. The slope of the line joining (a + b, a - b) and (a, -b) is
   (a) b/a (b) b- a / a + b (c) -b/a
   (d) -a/b (e) a/b

3. The equation of the line parallel to y-axis and passing through (3/2, 3) is
   (a) x = 0 (b) 2x - 3 = 0 (c) 2x + 3 = 0
   (d) 3y - 2 = 0 (e) 3x + 2 = 0

4. The line passing through (2, 3) and (3, 2) is
   (a) x + y - 5 = 0 (b) x -y - 1 = 0
   (c) x + y + 1 = 0 (d) x - y + 1 = 0
   (e) x = 2y -7 = 0

5. The lines 2x + 3y + 5 = 0 arid x + y + 2 = 0 intersect in the
   (a) 1st quadrant. (b) 2nd quadrant.
   (c) 3rd quadrant (d) 4th quadrant.
   (e) x-axis.

6. Which of the following line is perpendicular to $\sqrt{3}x + y + 2 = 0$?
   (a) $\sqrt{3}x - y + 1 = 0$ (b) $x - y + \sqrt{3} = 0$
   (c) $\sqrt{3}x - 6y + 5 = 0$ (d) $\sqrt{3}x + 3y + \sqrt{3} = 0$
   (e) $\sqrt{3}x - 3y + 5 = 0$

7. The slope of the line $x + \sqrt{3}y + 8 = 0$ is
   (a) 150° (b) 1/V3 (c) 60°
   (d) $\sqrt{3}$ (e) $-1/\sqrt{3}$

8. The ratio in which the x-axis divides the line joining (2, 3) and (-4, 1) is
   (a) 1 : 2 internally (b) 3 : 4 internally
   (c) 2 : 1 internally (d) 1 : 3 externally
   (e) 3 :1 externally

9. If the points (2, 3), (3, 1) and (-1, k) are collinear, then k =
   (a) 3/2 (b) -1/2 (c) 9
   (d) -2/3 (e) 1/2

10. The area of the triangle formed by the points (1, 1), (3, -4) and (-2, 3) in sq.units is
    (a) 11/2 (b) 11/4 (c) 11
    (d) 15/2 (e) 15

11. The area of the triangle formed by the line 3x + 4y = 24 with co-ordinate axes in sq.units is
    (a) 6 sq.units (b) 11 sq.units (c) 48 sq.units
    (d) 24 sq.units (e) 22 sq.units

12. If the lines x - 2y - 3 = 0, x + 3y - 3 = 0 and 2x + y - 1 = 0 form a right angled triangle, then the vertex containing the right angle is
    (a) (3,0) (b) (0,1) (c) (1.-1)
    (d) (1,1) (e) (1,3)

13. If the roots of the quadratic equation $x^2 - 3x + 2 = 0$ are the intercepts of a line, the line can be
    (a) x + y = 2 (b) 2x + y = 1
    (c) 2x + y = 2 (d) x + 2y = 1
    (e) x + y = 1

14. If (1, 1) and (-1, -1) are the two vertices of an equilateral triangle, then the third vertex could be
    (a) $(\sqrt{3}, -\sqrt{3})$ (b) (-3,3)
    (c) (0, 0) (d) Both (1) and (3)
    (e) Both (2) (3)

15. If (1, 3), (-2,1) and (4, -2) are the three consecutive vertices of a parallelogram, then the fourth vertex is
    (a) (-1,0) (b) (-1.2) (c) (7,0)
    (d) (0,7) (e) (2.-1)

16. The angle made by the line x - y + 5 = 0 with y-axis is
    (a) 30° (b) 45° (c) 60°
    (d) 150° (e) 75°

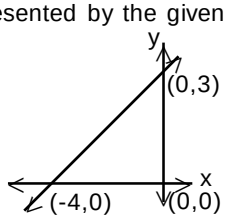
17. The equation of the line passing through (2, 3) and sum of whose intercepts is zero is
    (a) x - y - 1 = 0 (b) x - y + 1 = 0
    (c) x + y + 1 = 0 (d) x + y - 5 = 0
    (e) x - y - 5 = 0

18. The distance of (1, 4) from the line 3x - 4y + 3 = 0 is
    (a) 1/5 units (b) 2/5 units (c)8/5 units
    (d) 2 units (e) 9/5 units

19. If the lines $\sqrt{3}x + \sqrt{2}y = 6$ and $\sqrt{2}x + ky = 2$ are parallel, then k =
    (a) $\sqrt{6}$ (b) $2 / \sqrt{3}$ (c) $\sqrt{3} / 2$
    (d) $\sqrt{3}$ (e) $2\sqrt{3}$

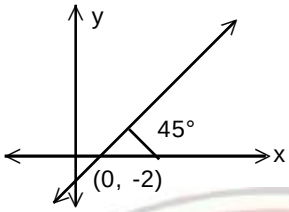
20. If x - 2y + 1 = 0 and 2x - 4y + 6 = 0 are two opposite sides of a square, then area of the square in sq.units is
    (a) 2/5 (b) 4/5 (c) 5
    (d) 5/4 (e) Cannot be determined

21. The equation of the line represented by the given graph _____ is.



(a) 3x - 2y + 12 = 0
(b) 3x + 4y + 12 = 0
(c) 4x - 3y + 12 = 0
(d) 3x - 4y - 12 = 0
(e) 3x - 4y + 12 = 0

22. The equation of the line represented by the given graph.



(a) 2x - 4y + 12 = 0
(b) x - y - 2 = 0
(c) x + y - 2 = 0
(d) x + y + 2 = 0
(e) 2x + y - 2 = 0

23. The equation of the line making an angle of 30° with x-axis and having y-intercept 6 is

(a) $x - \sqrt{3}y + 6\sqrt{3}=0$ (b) $x - \sqrt{3}y + 6 = 0$
(c) $x + \sqrt{3}y + 6 = 0$ (d) $\sqrt{3}x - y + 6 = 0$
(e) $x - \sqrt{3}y - 6\sqrt{3} = 0$

24. The angle between the lines x - y - 1 =0 and $\sqrt{3}x - y - 2 = 0$ is

(a) 45° (b) 30° (c) 60°
(d)90° (e) 15°

25. If the line x - 2y - k = 0 passes through the point of intersection of 2x + y = 2 and x - 3y = 1, then k =

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

ALGEBRA

Ref. No.: A17/P1/P1

1. IN base 7,a number is written using the digit 0,1,.....,6, the number 21 in base 7 is equal to 2*7+1=15 in base 10. Similarly the number 135 in base 7 is $1x7^2+3x7+5=75$ in base 10. What is the sum (in base 7) numbers 1234 and 6543 in base 7?
   a) 10111 b) 11101 c) 11110 d) 11011

2. How many different sums of money can be formed with the coins of denominations- a 5 rupee coin, a 1 rupee coin, a 50 paisa coin , a 25 paisa coin, a 10 paisa coin and a 1 paisa coin?
   a) 32 b) 31 c) 30 d) 33

3. If N is an integers and N>2. At most, how many integers among (N+2), (N+4), (N+5), (N+6) and (N+7) are prime integers?
   a) 1 b) 3 c) 2 d) 4

4. X+Y+Z = 20; How many non-negative integral solution-sets are there for X, Y & Z?
   a) 231 b) 5313 c) 180 d) 295

5. X+Y+Z = 20; How many non-negative integral solution-sets are there for X, Y & Z, if X is not less than 2, Y is not less 3 & Z is not less than 4?
   a) 78 b) 87 c) 162 d) 126

6. Given Series is
   $\frac{2}{1!}+\frac{3}{2!}+\frac{6}{3!}+\frac{11}{4!}+\frac{18}{5!}+\ldots$
   a) 3(e-1) b) 3(e + 1) c) 3e + 1 d) 3(e-2)

7. Given that $a_1=1$ and $a_{n+1}=2a_n+5$, where n=1, 2, 3,....., what is the value of a_{100}?
   a) $5 \times 2^{99}-6$ 2) $5 \times 2^{99}+6$ c) $6 \times 2^{99}+5$ d) $6 \times 2^{99}-5$

8. $\sqrt{[1+(1/1^2)+(1/2^2)]} + \sqrt{(1+1/2^2+1/3^2)} + \ldots\ldots \sqrt{[1+(1/2007^2)+(1/2008^2)]}$
   a) 2008-(1/2008) b) 2007-(1/2008) c) 2008-(1/2009) d) 2008-(1/2007)

9. K & $2K^2$ are the two roots of the equation x^2-px+q. find $q+4q^2+6pq$ =
   a) q^2 b) p^3 c) 0 d) $2p^3$

10. For what value of x,
    $\text{Log}_3(2^x-5)$, $\text{Log}_3[(2^x+1)/2]$ and $\text{Log}_3(2^x-5/4)$ are in arithmetic progression?
    a) 2 b) 3 c) 4 d) 5

11. A four digit number is made by repetition of a two-digit number. This number is always divisible by:
    a) 89 b) 11 c) 9 d) 101

12. Find two consecutive even numbers such that 73 times their difference is equal to their sum.
    a) 72, 74 b) 50, 52 c) 46, 48 d) 36, 38

13. If $x+y+z=0$, find $\frac{x^2}{yz}+\frac{y^2}{zx}+\frac{z^2}{xy}$.
    a) 0 b) 1 c) 2 d) 3

14. If $2x^{-1/3}+2x^{1/3}=5$, then x =
    a) 8 or 1/8 b) 2 or 1/2 c) 3 or 1/3 d) None of these

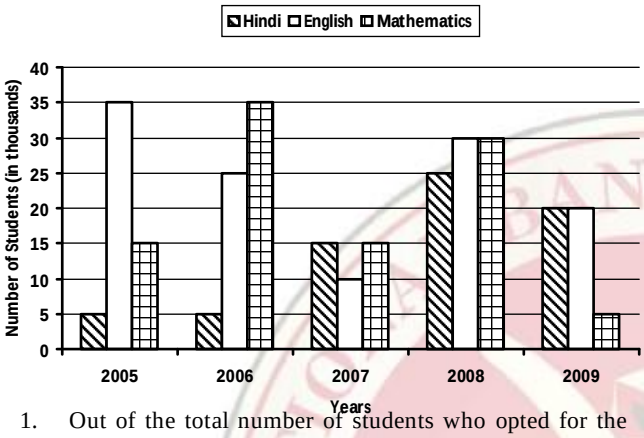
15. If xy + yx = 17, and x + y = 5 when $0<x<5$ and $0<y<5$, x and y are whole numbers, then find the value (x-y).
    a) 1 b) -1 c) 1 or -1 d) None of these

DATA ANALYSIS

Ref. No.: A18/P1/P2

Directions : Study the following graph and answer the questions given below :

Number of students (in thousands) who opted for three different specializations during the given five years in a University



1. Out of the total number of students who opted for the given three subjects, in the year 2009, 38% were girls. How many boys opted for Mathematics in the same year?
   (a) 1322 (b) 1332
   (c) 1312 (d) Cannot be determined
   (e) None of these

2. If the total number of students in the University in the year 2007 was 455030, then the total number of students who opted for the given three subjects were approximately what percent to the total students?
   (a) 19% (b) 9%
   (c) 12% (d) 5%
   (e) 23%

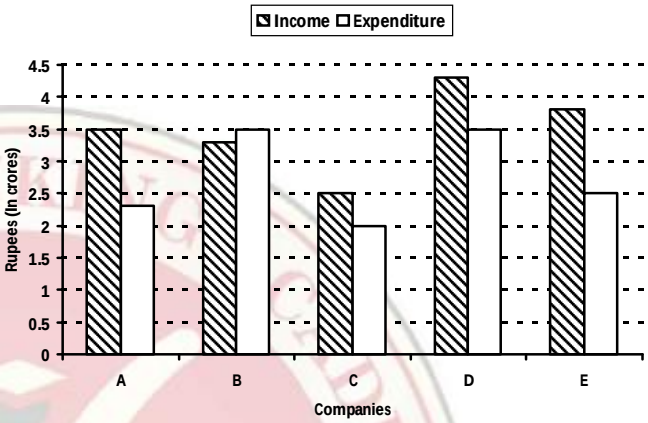
3. What is the total number of students who opted for Hindi and who opted for Mathematics in the Years 2006, 2007 and 2009 together?
   (a) 97000 (b) 93000
   (c) 85000 (d) 96000
   (e) None of these

4. The total number of students who opted for Mathematics in the Years 2005 and 2008 together are approximately what percent to the total number of students who opted for all three subjects in the same years?
   (a) 38% (b) 28%
   (c) 42% (d) 32%
   (e) 48%

5. What is the respective ratio between the number of students who opted for english in the year 2006 and 2008 together and the number of students who opted for Hindi in the year 2005 and 2009 together?
   (a) 11 : 5 (b) 12 : 7
   (c) 11 : 7 (d) 12 : 5
   (e) None of these

Directions : Study the following graph carefully and answer the questions and answer the questions given below :

Income and Expenditure of Various Comapnies during a year (Profit = Income - Expenditure)



6. What is the average income earned by all the companies together?
   (a) Rs. 34,50,00,000 (b) Rs. 33,50,00,000/-
   (c) Rs. 33,50,000 (d) Rs. 3,45,00,000
   (e) None of these

7. Expenditure incurred by Comapny C is approximately what percent to the expenditure incurred by company B?
   (a) 41% (b) 57%
   (c) 62% (d) 51%
   (e) 65%

8. What is approximately difference between the percent profit earned by Comapny A and that by Comapny D?
   (a) 5% (b) 20%
   (c) 35% (d) 15%
   (e) 25%

9. What is the total expenditure incurred by all the companies together?
   (a) Rs. 1,37,50,000
   (b) Rs. 1,37,50,00,000
   (c) Rs. 13,75,00,00,000
   (d) Rs. 13,75,000
   (e) None of these

Directions : Study the following table carefully and answer the questions given answer below :

Monthly Expenditure (in thousands) by five people on Rent, Food, Children's Educations, Clothes and Travelling

Expenditure → People ↓	Rent	Food	Childern's Education	Clothes	Travelling
A	12.5	7.5	6.52	3.3	4.72
B	16	8.55	8.38	2.75	5.86
C	13.8	11.4	12.6	6.3	9.3
D	9.65	17.8	9.95	8.4	7.85
E	14.5	9	10.25	3.9	5.42

10. What is the total monthly expenditure made by D on rent, B on clothes and E on travelling together?
(a) Rs. 18,720 (b) Rs. 1,78,200
(c) Rs. 17,800 (c) Rs. 1,84,720
(e) None of these

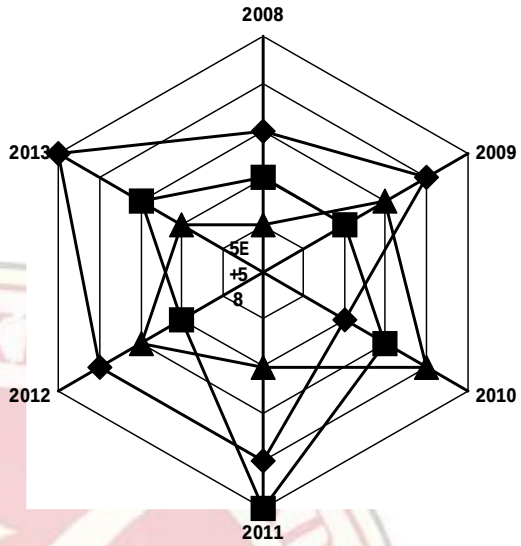
11. What is the average monthly expenditure on food by all the people together?
(a) Rs. 1,08,500 (b) Rs. 10,850
(c) Rs. 54,250 (d) Rs. 52,450
(e) None of these

12. Whose monthly expenditure on all the heads together is the lowest among them?
(a) A (b) B
(c) C (d) D
(e) F

13. If the monthly expenditure of C on childern's education is increased by 5%, then what will be his yearly expenditure on childern's educations?
(a) Rs. 1,58,760 (b) Rs. 15,87,600
(c) Rs. 13,230 (d) 1,32,300
(e) None of these

Directions : Study the radar graph carefully and answer the questions that follow :

Number of Employees (In thousands) in three different comapnies in Six years



14. In which years the difference between TCS and Infosys employees the least ?
(a) 2008 (b) 2010
(c) 2011 (d) 2012
(e) All except (d)

15. What is the difference between the number of employees in Wipro in 2013 and the number of employees in Infosys in 2010?
(a) 25,000 (b) 20,000
(c) 22,000 (d) 0
(e) None of these

16. In which years the difference between the number of employees in Infosys and the number of employees in TCS the highest?
(a) 2011 (b) 2012
(c) 2013 (d) 2009
(e) All except the year

17. In 75 % of employees in TCS in the year 2011 were experienced, then find fresher's employee ?
(a) 37,500 (b) 11,500
(c) 12,500 (d) 16,000
(e) None of these

18. In Wipro in 2012, 60 % employees are male, then find the female employee in the same year ?
(a) 15,000 (b) 18,000
(c) 12,000 (d) 14,500
(e) None of these

19. What is the total number of employees together in Infosys in 2009 and in Wipro 2011, and in TCS in 2010 ?
(a) 70,000 (b) 90,000
(c) 85,000 (d) 75,000
(e) None of these

Answer Key

1. d
2. b
3. e
4. d
5. a
6. d
7. b
8. c
9. e
10. e
11. b
12. a
13. a
14. e
15. d
16. e
17. c
18. c
19. b

BLOOD RELATIONSHIP

Ref. No.: A19/P1/P2

1. Kamal says, “Ravi’s mother is the only daughter of my mother”. How is kamal related to ravi?
   (a) Uncle (b) Cousin
   (c) Brother (d) Can’t be determine

2. Anil, introducing a girl in a party, said she is the wife of the grandson of my mother. How is Anil related to the gilr?
   (a) Father (b) Grandfather
   (c) Husband (d) Father’s in law

3. Introducing Rajesh, Neha said,”His brother’s father is the only son of my grand father.” How Neha is related to Rajesh?
   (a) Sister (b) Daughter
   (c) Mother (d) Niece

4. A man said to a woman, “Your mother’s husband’s sister is my aunt.” How is the woman related to the man?
   (a) Grand father (b) Daughter
   (c) Sister (d) Aunt

5. Pointing to a photograph A said, “She is the daughter of my brother’s only sister.” If A is female than How is the girl is the photograph related to A?
   (a) Daughter (b) Sister
   (c) Mother (d) Aunt

6. Pointing to a man in photograph, a woman said, “His bother’s father is the only son of my grand father.” How is the woman related to the man in the photograph?
   (a) Sister (b) Daughter
   (c) Wife (d) Cousi

7. Pointing to a man, awoman said, “His mother is the only daughter of my mother.” How is the woman related to the man?
   (a) mother (b) Daughter
   (c) Sister (d) Grandmother

8. Pointing to photograph, a man said, I have no brother or sister but that man’s father is my father’s son Whose Photograph was it.
   (a) His own (b) His Son
   (c) His father (d) His Grand father

9. Pointing to a lady in a photograph, Dev Said “This woman is my sister fathers son-in-LAW’s wife”. How is woman related to the Dev?
   (a) Mother (b) Wife
   (c) Sister (d) Can’t be determind

10. A man pointing to a photograph says, “The lady in the photograph is my nephew’s meternal grandfather.” How is the lady in the photograph related to the man’s sister. Who has no other sister.
    (a) Cousin (b) Sister In Law
    (c) Mother (d) Mother in Law

11 X, Y are brother and sister, C, D are wife and Husband X is son of C. F is sister of D. How is Y related to F?
   (a) Sister (b) Niece
   (c) Aunt (d) Can’t be determined

12. Q’s Mother of is the sister of R and daughter of S, N is the daughter of R and sister of M. How M is related to S?
    (a) Grand Mother (b) Grand Father
    (c) Grand daughter (d) Can’t be determined

13. Pointing to Ketan, Namrata said, “His is the son of my father’s only son”. How is Ketan’s mother related to Namrata?
    (a) Sister (b) Wife
    (c) brother-in-Law (d) Sister-in-law

14. Pointing to the woman in the Picture, Rajiv said, “Her mother has only one grandchild whose mother is my wife.” How is the woman in the picture related to Rajiv?
    (a) Wife (b) Mother
    (c) Sister (d) Sister-in-law

15. Pointing to aphotograph, A lady tells pramod. “I am the only daughter of this lady and her son is your maternal uncle.” How is the speaker related to Pramod’s father?
    (a) father (b) mother
    (c) sister (d) brother

16. Deepak said to Nitin, “That boy playing football is the younger of the two brother of the daughter of my father’s wife.” How is the boy playing football related to Deepak?
    (a) Father (b) Bother in law
    (c) Brother (d) Mother

17. Pointing to a photograph, a woman said, “This man’s son’s sister is my mother in law.” How is the womn’s husband related to the man in the photograph?
    (a) Grand mother (b) Grand Father
    (c) Grand Son (d) Grand Daughter

Direction : These Questions are based on the following information study it carefully and answer the questions.

(i) ‘A X B’ means ‘A is father of B’
(ii) ‘A ÷ B’ means ‘A is daughter of B’
(iii) ‘A + B’ means ‘A is sister of B’
(iv) ‘A - B’ means ‘A is husband of B’

1. In F ÷ R X H - L How is H related to F?
   (a) Father (b) Brother
   (c) Sister (d) CMD

2. Which of the following indicate ‘N is mother of K’?
   (a) K + L ÷ N X F (b) K + L ÷ N - M
   (c) H X K ÷ N (d) N X F + K
   (e) None of these

3. In F - R + H ÷ T, How is F related to T?
   (a) Son In Law (b) Daughter in Law
   (c) Son (d) Daughter
   (e) None of these

4. In G X T + Q ÷ M. How is M releated to G?
   (a) Brother (b) Sister
   (c) Sister in Law (d) Can’t be determined
   (e) None of these

5. From Which of the following is known N is daughter of K.
(a) k + L ÷ F X N (b) N + L ÷ F - K
(c) N ÷ L + F X K (d) N X L ÷ K
(e) None of these

Directions : Read the following information carefully and answer the questions which follow:

If 'P * Q' means 'P is the mother of Q'
If 'P X Q' means 'P is the father of Q'
If 'P + Q' means 'P is the sister of Q'
If 'P - Q' means 'P is the brother of Q'
If 'P > Q' means 'P is the son of Q'
If 'P < Q' means 'P is the daughter of Q'

1. In the expression 'A X B + R > S' how is S related to A?
(a) Daughter in Law (b) Daughter
(c) Wife (d) Cannot be determined

2. Which of the following means P is the father of S?
(a) P X Q < R * S (b) R X P < Q - S
(c) R = S > Q + P (d) S + Q - R * P
(e) Cannot be determined

3. In the expression 'P + Q > A - B' how is P related to B?
(a) Daughter (b) Son
(c) Niece (d) Nephew
(e) Cannot be detremined

4. Which of the following means D is the aunt of A?
(a) D > B * A * C (d) D + B - C * A
(c) D - B - A X C (d) D + B X A X C
(e) None of these

5. In the expression 'W > X < Y * Z' how is W related to Z?
(a) Nephew (b) Uncle
(c) Son (d) Brother-in-law
(e) None of these

Direction : Read the following information carefully and answer the questions which follow:
If 'A * Z' means 'P is the wife of Z'
If 'A + Z' means 'P is the husband of Z'
If 'A ÷ Z' means 'P is the sister of Z'
If 'A - Z' means 'P is the brother of Z'
If 'A > Z' means 'P is the son of Z'
If 'A < Z' means 'P is the daughter of Z'

1. Which of the following relations will not be true. If the expression 'A < P X T ÷ F > L X M' is definitely true?
(a) A is the daughter of T
(b) F is the son of M
(c) P is the son in Law of L
(d) A is the cousin of F
(e) M is the grandmother of A

2. Which of the following means N is the daughter in law of A?
(a) M ÷ N * P > A (b) N < M X P ÷ A
(c) M - N X P < A (d) A < P ÷ N X M
(e) A < N < P * M

3. How is P related to F if Q X P < B ÷ F?
(a) Daughter (b) Niece
(c) Daughter in law (d) Grand daughter
(e) Aunt

4. Which of the following means P is the father of R?
(a) R > S < P * J (b) J ÷ R - S < P
(c) R > S * P - J (d) S ÷ J X R < P
(e) None of these

5. How is M related to B if A * B > Z X S ÷ M?
(a) Aunt (b) Grandfather
(c) Uncle (d) Cousin
(e) Cannot be detremined

Direction : Study the given information carefully and answer the given questions:

A is the monther of B, B is the sister of C, D is the son of C, E is the brother of D, F i sthe mother of E, G is the grandfather of A, H has only two childern - B and C

1. How many F is related to H?
(a) Son in law (b) Daughter in law
(c) Father in law (d) Grandfather
(e) Cannot be determined

2. How is C related to E?
(a) Father (b) Son
(c) Mother (d) Cousin brother
(e) Cannot be determined

3. Who is the mother of G?
(a) C (b) B
(c) F (d) Either B or F
(d) Either C or F

Direction : A is the father of C and D. C and E are married couple and they have two daughter H and I. C is the brother of D. G is the sister of F and daughter of P, who is the mother of R. N is Grand father of k who is not the son of D and G. B is mother is Law of F who is wife of D.

1. How many married couples in the group?
(a) four (b) Two
(c) Three (d) None
(e) None of these
2. Who is mother of H?
(a) E (b) C (c) C or E
(d) None (d) NOT
3. Who is married couple in the following?
(a) NP (b) CD (c) FG (d) GR (e) RK
4. who is cousin of I?
(a) R (b) G (c) D (d) K (e) NOT

CODING LANGUAGE

Ref. No.: A20/P1/P1

Directions : In the following questions select the right option which indicates the correct code for the word or letter given in the question.

1. In a certain language, A. 'go ju mi' stands for 'plenty of money'; B. pao ju go nei vu' for 'money creates lots of problems'; C. 'kol vu nei' for 'problems create tension'; and D. 'sol run ju haw' for 'still money is needed'. Which of the following words stand for 'money'?
   A. nei B. ju
   C. haw D. go
2. In a certain language, A. 'FOR' stands for 'old is gold'; B. 'ROT' stands for 'gold is pure'; C. 'ROM' stands for 'gold is costly'. How will 'pure old gold is costly' be written?
   A. TFROM B. FOTRM
   C. FTORM D. TOMRF
3. In a certain code '415' means 'milk is hot'; '18' means 'hot soup'; and '895' means 'soup is tasty'. What number will indicate the word 'tasty'?
   A. 9 B. 8
   C. 5 D. 4
4. In a certain code '643' means 'she is beautiful', '593' means 'he is handsome', and '567' means 'handsome meets beautiful'. What number will indicate the word 'meets'?
   A. 5 B. 3
   C. 7 D. 6
5. In a certain code language, A. 'dugo hui mul zo' stands for 'work is very hard'; B. 'hui dugo ba ki' for 'Bingo is very smark'; C. 'nano mul dugo' for 'cake is hard', and D. 'mul ki qu' for 'smart and hard'. Which of the following words stand for 'Bingo'?
   A. jalu B. dugo
   C. ki D. ba
6. In a certain code '7 8 6' means 'bring me apple', '9 5 8' means 'peel green apple' and '6 4 5' means 'bring green fruit'. Which of the following is the code for 'me'?
   A. 8 B. 6
   C. 7 D. Cannot be determined
7. If 'ish Ito inm' stands for 'neat and tidy'; 'qpr inm sen' stands for 'small but neat'; 'hsm sen rso' stands for 'good but erratic'; what would 'but' stand for?
   A. inm B. sen
   C. qpr D. hsm
8. If 'nso ptr kli chn' stands for 'Sharma gets marriage gift': 'ptr Inm wop chn' stands for 'wife gives marriage gift': 'tti wop nhi' stands for 'he gives nothing'; what would 'gives' stand for?
   A. wop B. ptr
   C. nhi D. chn
9. In a certain code language, 'col tip mot' means 'singing is appreciable', 'mot baj min' means 'dancing is good' and 'tip nop baj' means 'singing and dancing'. Which of the following means 'Good' in that code language?
   A. mot B. min
   C. baj D. Cannot be determined
10. In a certain code '7 8 6' means 'study very hard', '9 5 8' means 'hard work pays' and '6 4 5' means 'study and work', which of the following is the code for 'very'?
   A. 8 B. 6
   C. 7 D. Cannot be determined

Directions : (Qs. 11-12) : In a certain code language :
A. 'tom na rod' means 'give me sweet'.
B. 'jo ta rod' means 'you and me'.
C. 'pot ta noc' means 'you are good'.
D. 'jo mit noc' means 'good and bad'.

11. Which of the following represents 'bad' in that language?
   A. mit B. noc
   C. jo D. None of these
12. To arrive at the answer to the above question which of the following can be dispensed with?
   A. All are necessary B. A or B only
   C. A or C only D. None of these

Directions : (Qs. 13-14) : In a certain code language :
A. 'pit na som' means 'bring me water'.
B. 'na jo tod' means 'water is life'.
C. 'tub od pit' means 'give me toy'.
D. 'jo lin kot' means 'life and death'.

13. Which of the following represents 'is' in that language?
   A. jo B. na
   C. tod D. lin
14. To find out the answer to the above question, which of the following statements can be dispensed with?
   A. A only B. C only
   C. D only D. B or C only

Directions : (Qs. 15-17) : In a certain code language :
A. '1 3 4' means 'you are well'.
B. '7 5 8' means 'they go home'.
C. '8 3 9' means 'we are home'.

15. Which of the following represents 'they' in that code language?
   A. 5 B. 7
   C. 3 D. Data inadequate
16. Which of the statements can be dispensed with while answering the above question?
   A. A only B. B only
   C. A or C only D. B and C only
17. Which of the following represents 'are' in that code language?
   A. 1 B. 3
   C. 4 D. 7
18. In a certain code **nee tim see** means 'how are you'; **ble nee see** means 'where are you'. What is the code for 'where'?
   A. nee B. tim
   C. see D. None of these
19. In a certain code language, **pit nae tom** means 'apple is green'; **nae ho tap** means 'green and white' and **ho tom ka** means 'shirt is white'. Which of the following represents 'apple' in that language?
   A. nae B. tom
   C. pit D. ho
20. If in a certain language, **mxy das zci** means 'good little frock'; **jmx cos zci** means 'girl behaves good'; **nvg drs cos** means 'girl makes mischief' and **das ajp cos** means 'little girl fell'; which word in that language stands for 'frock'?
   A. zci B. das
   C. nvg D. None of these
21. In a certain code language, **Mink Yang Pe** means 'fruits are ripe'; **Pe Lao May Mink** means 'oranges are not ripe' and **May Pe Nue Mink** means 'mangoes are not ripe'. Which word in that languages means 'Mangoes'?
   A. May B. Pe
   C. Nue D. Mink

Directions (22) : In a certain code language.
A. 'pit na sa' means 'you are welcome'
B. 'na ho pa la' means 'they are very good'
C. 'ka da la' means 'who is good'.
D. 'od ho pit la' means 'they welcome good people'

22. Which of the following means 'people' in that code language?
   A. ho B. pit
   C. la D. od

Answer Sheet

1.	(b)	6.	(c)	11.	(a)	16.	(a)	21.	(c)
2.	(a)	7.	(b)	12.	(d)	17.	(b)	22.	(d)
3.	(a)	8.	(a)	13.	(c)	18.	(d)	23.	(d)
4.	(c)	9.	(b)	14.	(b)	19.	(c)	24.	(c)
5.	(d)	10.	(c)	15.	(d)	20.	(d)		

CUBES, DICE & DIRECTIONS + SEATING ARRANGEMENT

Ref. No.: A21/P1/P2

Directions (Q.1-Q.4) : Large cube after painting it from all faces was divided into 125 smaller equal cubes. Answer the following.

Q1. How many cubes are not painted at all
(a) 8 (b) 27 (c) 64 (d) 12

Q2. How many cubes are painted from 3 sides
(a) 8 (b) 12 (c) 24 (d) 4

Q3. How many cubes are painted from exactly 2 sides
(a) 48 (b) 24 (c) 12 (d) 36

Q4. How many cubes are painted from only one side.
(a) 54 (b) 64 (c) 48 (d) 36

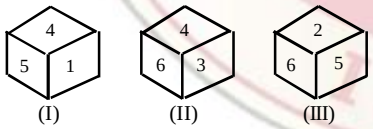
Directions (Q.5-Q.7) : A cube of side 8 cm has been painted black, red and blue on pair of opposite faces. Then it is divided into smaller equal cubes of side 2 cm each. Answer the following:

Q5. How many cubes will be having two face painted
(a) 2 (b) 4
(c) 8 (d) None of these

Q6. How many cubes will have one face painted blue and one face painted red? (The other faces many or may not be painted)
(a) 16 (b) 8
(c) 0 (d) None of these

Q7. How many cube will have exactly one face painted and that too with red colour.
(a) 8 (b) 16
(c) 12 (d) None of these

Directions (Q.8-Q.11) : A dice having face numbered from 1 to 6 is shown from three different orientations (I, II, III)



(I) (II) (III)

Q8. Which number is just opposite to 6.
(a) 1 (b) 4 (c) 2 (d) 5

Q9. Which will be number at the bottom in orientations (I)
(a) 2 (b) 3
(c) 5 (d) Can't be determined

Q10. Which number is opposite to 5
(a) 3 (b) 2 (c) 1 (d) 6

Q11. Which number is at the bottom of orientation (II)
(a) 6 (b) 5 (c) 2 (d) 1

Directions (Q.12-Q.21) : Answer the following.

Q12. Dalbir is facing south. He turns 135^0 in the anticlockwise direction and then 180^0 in the clockwise direction. Which direction is he facing now?
(a) North-east (b) North-west
(c) South-east (d) South-west

Q13. Muong a college student is facing north-west. He turns 90^0 in the clockwise direction and then 135^0 in the anticlockwise direction. Which direction is he facing now?
(a) East (b) West
(c) North (d) South

Q14. Rakesh starts walking straight towards east. After walking 75 metres, he turns to the left and walks 25 metres straight. Again he turns to the left, walks a distance of 40 metres straight, again he turns to the left and walks a distance of 25 metres. How far is he from the starting point?
(a) 25 metres (b) 50 metres
(c) 140 metres (d) None of these

Q15. I am facing South, I turn right and walk 20 m. Then I turn right again and walk 10 m. Then I turn left and walk 10 m and then turning right walk 20 m. Then I turn right again and walk 60 m. In which direction am I from the starting point?
(a) North (b) North-west
(c) East (d) North-east

Q16. A man walks 1 km towards East and then he turns to South and walks 5 km. Again he turns to East and walks 2 km, after this he turns to North and walks 9 km. Now, how far is he from his starting point?
(a) 3 km (b) 4 km
(c) 5 km (d) 7 km

Q17. From his house Sanjay went 15 kms to the North. Then he truned West and covered 10 kms. Then, he turned South and covered 5 kms. Finally, turning to East, he covered 10 kms. In which direction is he from his house?
(a) East (b) West
(c) North (d) South

Q18. Going 50 m to the South of her house, Radhika turns left and goes another 20 m. Then, turning to the North, she goes 30 m and then starts wolking to her house. In which direction is she waling now?
(a) North-west (b) North
(c) South-east (d) East

Q19. Michael walks 20 m North. Then he turns right and walks 30 m. Then he turns right and walks 35 m. Then he turns left and walks 15 m. Then he again turns left and walks 15 m. In which direction and how many metress away is he from his original position?
(a) 15 metres west (b) 30 meteres east
(c) 30 meteres west (d) 45 meteres east

Q20. A child is looking for his father. He went 90 metres is the East before turning to his right. He went 20 metres before turning to his right again to look for his father at his uncle's place 30 metres from this point. His father was not there. From here he went 100 metres to the North

before meeting his father in a street. How far did the son meet his father from the starting point?
(a) 80 metres (b) 100 metres
(c) 140 meteres (d) 260 meteres

SEATING ARRANGEMENT

Q21. There are five different houses A to E in a row. A is the right of B and E is the left of C and right of A. B is the right of D. Which of the houses is in the middle.
(a) A (b) B (c) D (d) E

Directions (Q.22-Q.23) : Six friends A, B, C, D, E, F are sitting in a close circle facing the centre. E is the left of D. C is between A and B. F is between E and A.

Q22. Who is the left of B?
(a) C (b) A (c) D (d) E

Q23. Who is the right of C?
(a) E (b) B (c) A (d) F

Directions (Q.24-Q.26): Eight boys P, Q, R, S, T, U, V, W are sitting around a circular table facing the centre. Further information as follows:
(i) W sits between T and Q, while Q sits opposite to U
(ii) P sits to the immediate right of T and opposite to R
(iii) S does not sit next to R

Q24. Who sits opposite to V?
(a) Q (b) R (c) S (d) T

Q25. Who sits two places left of S?
(a) P (b) T (c) R (d) Q

Q26. If S and Q interchange their places then who sits opposite for Q?
(a) W (b) U (c) R (d) T

Directions (Q.27-Q.28): 6 persons A, B, C, D, E, F are sitting in two rows, three in each row. E is not at the end of any row. D is the second to the left of F, C is the neighbour of E is sitting diagonally opposite to D. B is the neighbour of F.

Q27. Which of the following are in one of the two rows?
(a) FBC (b) CEB (c) DBF (d) AEF

Q28. Who is facing B ?
(a) A (b) C (c) D (d) E

Directions (Q.29-Q.30): A, B, C, D, E, F are sitting in a closed circle facing the centre D is between F and B. A is second to the left of D and second to the right of E.

Q29. Who is facing D?
(a) A (b) C
(c) F (d) Can't be determined

Q30. Who is facing A?
(a) B (b) D
(c) A (d) Can't be determined

Answer Sheet

1. (b)	7. (a)	13. (b)	19. (d)	25. (a)
2. (a)	8. (a)	14. (d)	20. (b)	26. (a)
3. (d)	9. (a)	15. (d)	21. (a)	27. (c)
4. (a)	10. (a)	16. (c)	22. (c)	28. (d)
5. (d)	11. (c)	17. (c)	23. (c)	29. (b)
6. (a)	12. (d)	18. (a)	24. (d)	30. (d)

ERROR SPOTTING - I

Ref. No.: A22/P1/P2

Directions (Q. Nos. 1-20) In the given sentences some have errors and some are correct. Find out which part of a sentence has an error and corresponding to the appropriate letter" (a), (b), (c). If a sentence is free from errors, corresponding to (d) in the Answer Sheet.

1. The vaccine (a) / when hit the Indian market (b) / is dogged by controversy (c) / No error (d)

2. His son (a) / is working (b) / very hardly (c) / No error (d)

3. Do you know that it was I (a) / who has done (b) / this piece of beautiful work? (c) / No error (d)

4. The company has ordered (a) / some (b) / new equipments. (c) / No error (d)

5. The future of food companies (a) / seems quite secure (b) / owed to ever-growing demand. (c) / No error (d)

6. When he had been (a) / walked along the road (b) / a wild and ferocious dog hit him hard knocked him down. (c) / No error (d)

7. I am grateful to you (a) / and all your friends for showing sympathy and (b) / kindness with me. (c) / No error (d)

8. The leader was so shrewd (a) / that he could not deceive (b) / by the words of the sycopant courtiers. (c) / No error (d)

9. He is the man (a) / who I know (b) / has helped my son in the final examination. (c) / No error (d)

10. I have been living in Hyderabad (a) / at my uncle (b) / since my birth. (c) / No error (d)

11. He was upset because he had (a) / never in such a (b) / peculiar situation before. (c) / No error (d)

12. He failed explaining (a) / why he could not (b) / complete the important assignment within the given time limit. (c) / No error (d)

13. His decision of quiting the present job before (a) / he well get a new job (b) / is not admirable. (c) / No error (d)

14. Had all of them (a) / gone there with the books (b) / it could have impressed the delegates. (c) / No error (d)

15. He advised me (a) / to wait with pateintly (b) / for the next opportunity and to grab it soon. (c) / No error (d)

16. It was clear from the way they were behaving (a) / that they had been (b) / lost their senses. (c) / No error (d)

17. That boy possess (a) / three beautiful pens (b) / but he would not show them to any one. (c) / No error (d)

18. A small piece (a) / of bread is better than (b) / having nothing to eat. (c) / No error (d)

19. Families are (a) / fortunate enough to own (b) / a house in the city are very few. (c) / No error (d)

20. Though I had been (a) / his freind for quite a logn time, I refused to help him (b) / because his ill nature. (c) / No error (d)

Answer Key

1.	(c)	2.	(c)	3.	(b)
4.	(d)	5.	(c)	6.	(b)
7.	(c)	8.	(b)	9.	(d)
10.	(b)	11.	(b)	12.	(a)
13.	(b)	14.	(d)	15.	(b)
16.	(b)	17.	(a)	18.	(d)
19.	(a)	20.	(c)		

Directions (Q. Nos. 21-40) In the given sentences some have errors and some are correct. Find out which part of a sentence has an error and corresponding to the appropriate letter" (a), (b), (c). If a sentence is free from errors, corresponding to (d) in the Answer Sheet.

21. I have critices (a) / the reamrkable book (b) / because I benefited from reading it. (c) / No error (d)

22. As Arundhati Roy (a) / in her foreword write (b) / John offers untold stories of people. (c) / No error (d)

23. Citizens needed (a) / to know that (b) / our leader cannot be trusted. (c) / No error (d)

24. Responsibilities includes (a) / working with the editors (b) / on all aspect of the editorial process. (c) / No error (d)

25. We build a simple model (a) / to test whether (b) / there is a place change in the Indian economy. (c) / No error (d)

26. Everyone of us know (a) / that he is not capable of (b) / remaining under water for such a long time. (c) / No error (d)

27. Your television set (a) / is superior to our television set (b) / by all respects. (c) / No error (d)

28. The boy who was guilt for (a) / having broken the window glass (b) / came out with the truth. (c) / No error (d)

29. Ramesh has been both (a) / a dishonestly person (b) / and a gambler since his childhood. (c) / No error (d)

30. The number of employees (a) / reporting sick (b) / has reduced significantly becuase of the incentive. (c) / No error (d)

31. People who are (a) / fortunate enough to own (b) / a personal library are always held in high esteem by me. (c) / No error (d)

32. A small loaf of bread (a) / given with affection is far superior to (b) / a delicious dish served with indifferently. (c) / No error (d)

33. The incentive seems to (a) / having been worked well (b) / becuase the number of employees going on leave had reduced significantly. (c) / No error (d)

34. His dishonest acts have made his parents (a) / bent their heads (b) / in shame. (c) / No error (d)

35. Everybody know (a) / that his failure can (b) / be attributed only to his lack of practice. (c) / No error (d)

36. One of the security men (a) / reshed forward and asked (b) / me whether I had anything objectionable. (c) / No error (d)

37. We could not (a) / believe that one of us was (b) / responsible with the act. (c) / No error (d)

38. We are now (a) / reliably learnt that (b) / he was involved in the bank robbery. (c) / No error (d)

39. Now a days the cost of living (a) / is so high that people find it difficult (b) / to make both ends meeting. (c) / No error (d)

40. Karnavati is (a) / one of the leading (b) / business centres in our state/ (c) / No error (d)

Answer Key

21.	(a)	22.	(b)	23.	(a)
24.	(a)	25.	(d)	26.	(a)
27.	(c)	28.	(a)	29.	(b)
30.	(d)	31.	(d)	32.	(c)
33.	(b)	34.	(b)	35.	(a)
36.	(d)	37.	(c)	38.	(a)
39.	(c)	40.	(d)		

ERROR SPOTTING - II

Ref. No.: A23/P1/P2

Directions (Q. Nos. 1-20) In the given sentences some have errors and some are correct. Find out which part of a sentence has an error and corresponding to the appropriate letter" (a), (b), (c). If a sentence is free from errors, corresponding to (d) in the Answer Sheet.

1. I am grateful to you and all your friends (a) / for they showed sympathy (b) / and kindness towards me. (c) / No error (d)

2. While he was (a) / walking along the road a speeding car (b) / knocked down to him. (c) / No error (d)

3. Though none of his (a) / so-called well-wishers forwarded to help (b) / I helped him by completing his work on time. (c) No error (b)

4. From the way he was talking (a) / it was clear (b) / that he had no control on himself. (c) / No error (d)

5. Your over-dependent on (a) / others even for (b) / trivial matters may prove disadvantageous. (c) / No error (d)

6. Our results (a) / indicate that (b) / 1991 marked the end of an era. (c) / No error (d)

7. While grouping the words (a) / care have been taken (b) / to include the role grammar plays in a language. (c) / No error (d)

8. Between the years (a) / 1952 to 1962 I worked in the field (b) / as sub-divisional officer. (c) / No error (d)

9. The Chief Minister (a) / was obliged (b) / to honour the promise made during the contest. (c) / No error (d)

10. Distrust seems (a) / to be a factor borne out of (b) / prevailing circumstances. (c) / No error (d)

11. Unless he does not return (a) / all the library books (b) / he will not be relieved from the service. (c) / No error (d)

12. You must either tell me (a) / the whole story or at least, (b) / the first half of it. (c) / No error (d)

13. The old woman has had the best medical facilites available (a) / but she will not be cured (b) / unless she does not have a strong desire to live. (c) / No error (d)

14. My book has been (a) / missing from my room (b) / till yesterday. (c) / No error (d)

15. The manager of the bank was busy; (a) / so he asked them to come and (b) / see him between two to three in the afternoon. (c) / No error (d)

16. Most of the popular tele-serials (a) / are not only illogical (b) / in their story line but also crude in their presentation. (c) / No error (d)

17. I am trying to convince him (a) / for the last two days to come (b) / and live with me till his father's anger cools down. (c) / No error (d)

18. It is a pity that a son (a) / born from very good parents (b) / should live a life of misery and deprivation of the worst order. (c) / No error (d)

19. I would have asked him to leave our house immediately (a) / if my father would not have been (b) / at home and awake. (c) / No error (d)

20. Mala's two brothers Rupesh and Bhupat (a) / are very intelligent and hardworking but I am sure (b) / I like the latter most. (c) / No error (d)

Answer Key

1.	(b)	2.	(c)	3.	(b)
4.	(d)	5.	(a)	6.	(d)
7.	(b)	8.	(c)	9.	(d)
10.	(c)	11.	(a)	12.	(d)
13.	(c)	14.	(c)	15.	(c)
16.	(d)	17.	(a)	18.	(b)
19.	(b)	20.	(c)		

Directions (Q. Nos. 21-40) In the given sentences some have errors and some are correct. Find out which part of a sentence has an error and corresponding to the appropriate letter" (a), (b), (c). If a sentence is free from errors, corresponding to (d) in the Answer Sheet.

21. Bharat asked him (a) / that which was the way (b) / to the post office.(c) / No error (d)

22. Unless you do not listen to his advice (a) / I am not going (b) / to help you. (c) / No error (d)

23. How do you say (a) / that neither he or (b) / Ravi has qualified in the examination? (c) / No error (d)

24. Being a strict vegetarian (a) / he depended on milk and fruit (b) / and had to cook for himself. (c) / No error (d)

25. Even though the shirt is rather expensive (a) / but I wish to (b) / purchase it with my own money. (c) / No error (d)

26. No sooner did I open the door (a) / when the rain, heavy and stormy, rushed in (b) / making us shiver from head to foot. (c) / No error (d)

27. Be smart (a) / not only in dress (b) / and also in action. (c) / No error (d)

28. Heardly had I reached the airport (a) / where I learnt (b) / about the powerful bomb explosion. (c) / No error (d)

29. It is not (a) / such a good book (b) / that I expected. (c) / No error (d)

30. The downfall of this kind (a) / is to be attributed to (b) / nothing else than pride. (c) / No error (d)

31. Ramesh is a student (a) / who we all expect (b) / to get more than 95% marks. (c) / No error (d)

32. Small farmers do not get (a) / the require support (b) / from outside the farming sector. (c) / No error (d)

33. He is one of the best novelists (a) / that has ever lived. (b) / Do you agree ? (c) / No error (d)

34. The campaign launched by the group of citizens (a) / was admirable most (b) / by all the guests. (c) / No error (d)

35. We do not know (a) / whom we should blame (b) / for all the lapses observed in the procedure. (c) / No error (d)

36. The economical condition (a) / of our country is bad (b) / and unlikely to improve in the near future. (c) / No error (d)

37. As mentioned on the form (a) / and also in the brochure (b) / please write your name only with ink. (c) / No error (d)

38. He wept bitterly (a) / on hearing the news (b) / of his failure in the examination C (c) / No error (d)

39. Come and sit down (a) / for a while, you are digging (b) / since luch time. (c) / No error (d)

40. Hari has faith in God (a) / and will do never wrong (b) / even in the most trying and unusual circumstances. (c) / No error (d)

Answer Key

21.	(b)	22.	(a)	23.	(b)
24.	(c)	25.	(b)	26.	(b)
27.	(c)	28.	(b)	29.	(c)
30.	(c)	31.	(b)	32.	(b)
33.	(b)	34.	(b)	35.	(d)
36.	(a)	37.	(c)	38.	(d)
39.	(b)	40.	(b)		

FILL IN THE BLANKS WITH APPROPRIATE PREPOSITION

Ref. No.: A24/P1/P1

1. He drove from Maharashtra _____ Karnataka without stopping to rest.
   (a) is (b) to
   (c) into (d) towards.
2. Bill's fight____ hunting put 26 professional hunting companies out of jobs.
   (a) towards (b) for
   (c) over (d) against
3. The court has absolved him _____ all the charges leveled against him.
   (a) off (b) with (c) in (d) of
4. You are welcome to partake _____ their light refreshment.
   (a) in (b) for (c) at (d) of
5. We met a lot of people _____ our holidays.
   (a) on (b) in (c) during (d) at
6. The firm has been dealing _____ luxury goods for more than two decades.
   (a) in (b) with (c) out (d) on
7. Today students should be reconciled _____ the way things are changing.
   (a) with (b) to (c) for (d) at
8. That week the dollar dropped _____ its lowest levels.
   (a) to (b) at (c) into (d) by
9. He went _____ sea alone
   (a) in (b) to (c) into (d) on
10. Everyone in this world is accountable to God _____ his actions.
    (a) actions (b) for (c) to (d) overll.
11. Speed is _____ essence in a project of this type.
    (a) in (b) for (c) about (d) of
12. A wise man profits _____ the mistakes of others.
    (a) through (b) from (c) with (d) by
13. Ram agreed _____ my proposal.
    (a) with (b) for (c) on (d) to
14. He is addicted _____ smoking.
    (a) to (b) with (c) on (d) for
15. He sat _____ the shade of a tree.
    (a) under (b) into (c) in (d) on
16. There is something wonderful _____ him
    (a) of (b) about (c) for (d) in side
17. When will you hand _____ your assignment?
    (a) in (b) back (c) down (d) into
18. A new minister has taken _____ after the election.
    (a) to (b) over (c) off (d) down
19. There is a bridge _____ the river.
    (a) over (b) on (c) down (d) across
20. Please make yourself _____ home.
    (a) with (b) at (c) in (d) on
21. The brave youth immediately jumped _____ the river to save the drowing child.
    (a) in (b) into (c) inside (d) to
22. We can make no progress if We continue working_____ these conditions.
    (a) into (b) with (c) under (d) for
23. Keep your dog ___ the flower beds. It may damage the flowers
    (a) out (b) from (c) beside (d) off
24. _____a moment she felt disappointed for no stockings hung from the the place
    (a) just (b) for (c) at (d) since
25. We werw completly taken _____ by the estate who turned out to a crook.
    (a) for (b) on (c) off (d) in
26. Dr. Sharma concluded his speech ____ explaining the importance of charity.
    (a) by (b) with (c) at (d) in
27. Shivaji Maharaj fought _____ every kind of aggression.
    (a) against (b) to (c) with (d) at
28. Don't depend _____ others; you must stand on your own feet.
    (a) at (b) on (c) to (d) for
29. Our life promises a lot _____ pleasure and we must learn to enjoy it.
    (a) with (b) for (c) of (d) at
30. He travelled all _____ the world when he was eighty years old.
    (a) in (b) over (c) with (d) of
31. My father lives _____ Delhi.
    (a) in (b) at (c) inside (d) on
32. Madhav is good _____ English
    (a) in (b) at (c) on (d) with
33. Naina did not disclose the fact _____ her husband.
    (a) to (b) before (c) from (d) on
34. The child did not approve _____ the father's plan.
    (a) to (b) by (c) of (d) with
35. The tribes lived _____ customs different from the English had ever seen.
    (a) on (b) by (c) off (d) with
36. The strike has been called_____.
    (a) of (b) at (c) off (d) by
37. We warned her _____ the danger
    (a) from (b) about (c) against (d) of
38. We laughed_____ the affair.
    (a) over (b) about (c) for (d) on
39. Put a blanket _____ the baby.
    (a) over (b) about (c) at (d) on
40. Stay _____ your limits.
    (a) within (b) in (c) at (d) on
41. She was happy to partake _____ the festivities
    (a) in (b) of (c) at (d) for
42. I can cope _____ any problem.
    (a) up with (b) with (c) up (d) from
43. His manners _____ him.
    (a) speak of (b) speak out
    (c) speak up (d) speak for
44. A thorough search of the aircraft was carried _____ in the airport
    (a) out (b) off (c) on (d) along
45. Discrimination _____ any form should be avoided
    (a) of (b) by (c) from (d) in
46. A large number of people have fallen victim _____ dengue fever
    (a) to (b) of (c) from (d) with
47. She scoffed _____ the idea of revolution.
    (a) for (b) at (c) about (d) on
48. This work of art is worthy ____ praise.
    (a) of (b) for (c) for (d) to
49. It is our duty to get _____ the truth.
    (a) to (b) over (c) into (d) at
50. For a child, a blow _____ self-esteem is a terrible thing.
    (a) of (b) with (c) to (d) on
51. He is a descendent _____ the Mughal royalty.
    (a) of (b) from (c) in (d) for
52. Fate smiled _____ him in all his ventures.
    (a) above (b) below (c) on (d) at

VOCABULARY

Ref. No.: A25/P1/P2

Synonyms

Directions (1 - 20): Choose the word that is similar in meaning to the word given in capital letters.

1. ADVISE
   (a) council (b) counsel
   (c) practice (d) proposal

2. JEALOUS
   (a) obvious (b) atrocious
   (c) envious (d) ferocious

3. RECUPERATE
   (a) recapture (b) reclaim
   (c) recover (d) regain

4. DISCOMFIT
   (a) litigate (b) ease
   (c) conflict (d) frustrate

5. ABSTINENCE
   (a) Synchronic (b) torrential
   (c) restraint (d) gluttony

6. ERUDITE
   (a) execute (b) expanse
   (c) academic (d) Settle

7. TACITURNITY
   (a) dumbness (b) changeableness
   (c) hesitation (d) reserve

8. CAPTIVATE
   (a) repel (b) subjugate
   (c) dangerous (d) fascinate

9. OBNOXIOUS
   (a) clever (b) shrewd
   (c) disagreeable (d) outdated

10. PERNICIOUS
    (a) radical (b) baneful
    (c) scientific (d) negative

11. DISCURSIVE
    (a) Rambling (b) Impolite
    (c) Neglectful (d) Methodical

12. PREJUDICE
    (a) Aversion (b) Gestation
    (c) Preliminary (d) Admiration

13. PACIFY
    (a) Placate (b) Rouse
    (c) Harass (d) Rejoice

14. REPERCUSSION
    (a) Reaction (b) Acceptance
    (c) Resistance (d) Magnificence

15. DENOUEMENT
    (a) Outcome (b) Eschew
    (c) Action (d) Character

16. OMINOUS
    (a) Threatening (b) Powerful
    (c) Ubiquitous (d) Burdensome

17. PROCRASTINATE
    (a) Multiply (b) Irregular
    (c) Postpone (d) Predict

18. TRIVIAL
    (a) Significant (b) Momentous
    (c) Unimportant (d) Critical

19. BONHOMIE
    (a) Friendliness (b) Wrath
    (c) aversion (d) Greed

20. DEFILE
    (a) Pollute (b) Disapprove
    (c) Delay (d) Reveal

Antonyms

Ref. No.: A25/P2/P2

Directions (21 - 40) : Choose the word that is most nearly opposite in meaning to the word given in capital letters.

21. ANACHRONISTIC
(a) formerly (b) present
(c) futuristic (d) non-existing

22. HOMOGENISED
(a) set type (b) multi-coloured
(c) different (d) rejected

23. PROCLAIM
(a)denounce (b) pretend
(c) attend (d) distend

24. ABOMINATE
(a) love (b) loathe
(c) abhor (d) despise

25. SACROSANCT
(a) irreligious (b) unethical
(c) irreverent (d) unholy

26. OBSOLETE
(a) rare (b) useless
(c) recent (d) conducive

27. SANGUINE
(a) bloody (b) thin
(c) happy (d) gloomy

28. SUBSERVIENT
(a) aggressive (b) straightforward
(c)dignified (d) supercilious

29. ABOLISH
(a) remove (b) reside
(c) confront (d) establish

30. REPREHENSIBLE
(a) commendable (b) fearful
(c) ignorant (d) culpable

31. OBLOQUY
(a) Praise (b) Cruel
(c) Slander (d) Dialogue

32. DOCILE
(a) unmanageable (b) Dutiful
(c) Submissive (d) Painful

33. TENACIOUS
(a) faint-hearted (b) yielding
(c) erroneous (d) praiseworthy

34. REPRIMAND
(a) Reward (b) Appreciate
(c) Encourage (d) Praise

35. AMALGAMATE
(a) Merge (b) Consecrate
(c) Impoverish (d) Split

36. PROLIFIC
(a) Barren (b) Backward
(c) Reckless (d) Profound

37. NEOPHYTE
(a) Veteran (b) Violence
(c) Desperado (d) Prodigal

38. TRANSIENT
(a) Transitory (b) Fleeting
(c) Permanent (d) Momentary

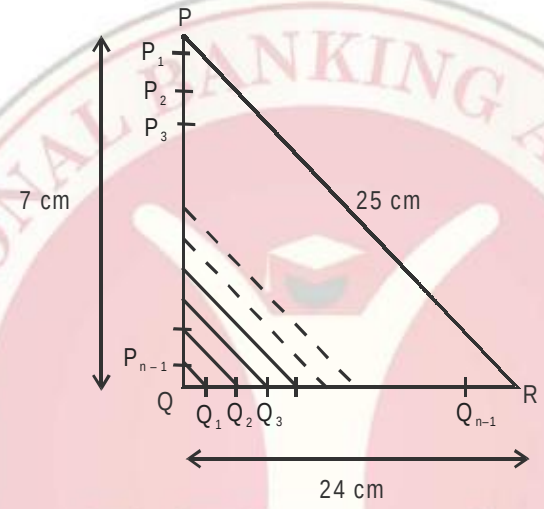
39. IGNOBLE
(a) Huge (b) Worthy
(c) Known (d) Hypocritical

40. SOLICITIOUS
(a) Concerned (b) Indifferent
(c) Eager (d) Noisy

PRACTICE TEST - 01

Ref. No.: A26/P1/P7

1. In the figure given below, PQR is a triangle where PQ = 7 cm, QR = 24 cm and PR = 25 cm. The sides PQ and QR are divided into 'n' equal parts by taking 'n – 1' equally spaced points on them as shown in the figure. P_{n-1} is joined with Q_1, P_{n-2} is joined with Q_2, and so on. For what value of 'n' will the sum of the lengths of the resulting line segments be 200 cm?



(a) 15 (b) 16 (c) 17 (d) 18

2. If $\frac{\left(x^3-5x^2+7x-3\right)\left(x^3-5x^2+8x-4\right)}{\left(x-2-x^2\right)\left(x^2-3x+2\right)\left(x^2+3x+4\right)} \geq 0$, where x is a real number, then which of the following is correct?

(a) $x \in [-\infty, 1] \cup [2, 3]$ (b) $x \in [1, 2] \cup [3, \infty)$ (c) $x \in [2, 3]$ (d) None of these

3. Ten books are arranged in a row on a bookshelf. A student has to select three out of these ten books in such a way that no two books selected by him must have been lying adjacently. In how many ways can he make the selection?

(a) 56 (b) 64 (c) 72 (d) None of these

4. If $x \Delta (y+1) = y \Delta (x+1), x \Delta x = 1$ and $(x-y) \Delta (x+y) = x \Delta y$, then what is the value of $1001 \Delta 1$?

(a) 1000 (b) 100 (c) 10 (d) 1

5. Rohan is asked to figure out the marks scored by Sunil in three different subjects with the help of certain clues. He is told that the product of the marks obtained by Sunil is 72 and the sum of the marks obtained by Sunil is equal to the Rohan's current age (in completed years). Rohan could not answer the question with this information. When he was also told that Sunil got the highest marks in Physics among the three subjects, he immediately answered the question correctly. What is the sum of the marks scored by Sunil in the two subjects other than Physics?
(a) 6 (b) 8 (c) 10 (d) Cannot be determined

6. Which of the following could be a possible value of 'x' for which each of the fractions

$\frac{[x]+2}{10}, \frac{[x]+13}{11}, \frac{[x]+26}{12}, \frac{[x]+41}{13}, \ldots, \frac{[x]+1913}{49}$ and $\frac{[x]+2002}{50}$

is in its simplest form, where [x] stands for the greatest integer less than or equal to 'x'?
(a) 45.45 (b) 49.49 (c) 51.51 (d) 53.53

7. The sequence 1, 2, 4, 5, 7, 9, 10, 12, 14, 16, 17,…. has one odd number followed by the next two even numbers, then the next three odd numbers followed by the next four even numbers and so on. What is the 2003^{rd} term of the sequence?
(a) 3953 (b) 3943 (c) 3940 (d) 3950

8. Given that $A > B > C$ and $A^{60} = B^t = C^{120}$. If logA, logB and logC are in Arithmetic Progression, then what is the value of 't'?
(a) 40 (b) 60 (c) 80 (d) 120

9. A circle with center 'O' circumscribes a quadrilateral PQRS, such that the side RS of the quadrilateral is also the diameter of the circumcircle. The diagonals of the quadrilateral intersect at point M. PO and QO are joined. Which of the following is equal to $\angle QMR$?

(a) $\angle QOR + \angle POS$ (b) $\frac{\angle QOR + \angle POS}{2}$

(c) $\angle QOR + \angle POS - 90°$ (d) None of these

10. In a Table Tennis tournament, the number of male participants was twice the number of female participants. Each player played a match with each of the rest of the players exactly once. Each match involved exactly two players. No match ended in a draw. The number of matches won by the female players was equal to the number of matches won by the male players. Which of the following can be the total number of matches in which a male player defeated a female player?
(a) 20 (b) 24 (c) 39 (d) 30

11. In how many ways can 1000 be written as a sum of 'n' consecutive natural numbers, where 'n' is greater than 1?
(a) 0 (b) 1 (c) 2 (d) 3

12. The exterior angles of a quadrilateral are in the ratio 1 : 3 : 4 : 7. What is the sum of the largest and the smallest interior angles of the quadrilateral?
(a) 72° (b) 144° (c) 168° (d) 192°

13. $x + y = 8$ and $P = 5x^2 + 11y^2$, where $x, y > 0$. What is the minimum possible value of P?
(a) 110 (b) 220 (c) 300 (d) None of these

14. A circle is drawn inside a trapezium such that it touches all the four sides of the trapezium. The line joining the midpoints of the non-parallel sides divides the trapezium in two parts with areas in the ratio 3 : 5. If the lengths of the non-parallel sides are 6 cm and 10 cm, then what is the length (in cm) of the longer parallel side of the trapezium?
(a) 8 (b) 10 (c) 12 (d) Cannot be determined

15. A and B are the two opposite ends of a swimming pool and the distance between them is 420 metres. Ankur and Manu start swimming towards each other at the same time from A and B, with speeds in the ratio 5 : 9 respectively. As soon as any of them reaches an end, he turns back and starts swimming towards the other end. At what distance (in metres) from A will they meet when Manu is in his 13^{th} round? Note: A to B is considered one round and B to A another round.
(a) 405 (b) 330 (c) 240 (d) 280

16. x and y are real numbers such that $2\log(x - 2y) = \log x + \log y$. What is the value of $\frac{x}{y}$?
(a) 1 (b) 4 (c) Either (a) or (b) (d) None of these

17. There are 140 students in a school. The number of students who play Cricket, Football and Hockey are 50, 80 and 70 respectively. The ratio of the number of students who play more than one of the three sports to the number of students who play all the three sports is 3 : 2. If each student of the school plays at least one of the three sports, then how many students play exactly two of the three sports?
(a) 12 (b) 14 (c) 16 (d) 20

18. There are three equal containers that are completely filled with different water-alcohol mixtures with water and alcohol in the ratio 2 : 3, 3 : 4 and 4 : 5 respectively. They are emptied into a bigger container. What fraction of the mixture in the bigger container should be replaced by water so that the resulting mixture has equal quantities of water and alcohol?
(a) $\frac{43}{945}$ (b) $\frac{143}{945}$ (c) $\frac{43}{544}$ (d) $\frac{143}{1088}$

19. In an increasing Arithmetic Progression, the product of the 5th term and the 6th term is 300. When the 9th term of this A.P. is divided by the 5th term, the quotient is 5 and the remainder is 4. What is the first term of the A.P.?
(a) 12 (b) –40 (c) –16 (d) –5

20. The work done by 4 men in 12 days is equal to the work done by 6 women in 10 days and is also equal to the work done by 8 children in 9 days. A man, a woman and a child working together take 10 days to complete a particular job. In how many days will the same job be completed by 2 women and 5 children working together?
(a) 5 (b) 6 (c) 4 (d) 7

Directions for questions 21 and 22: Answer the questions on the basis of the information given below.

The table given below shows some data for fifteen companies for the year 2010.

Company	Number of branches across the country	Average Number of employees/branch	Average Revenue generated/branch (in Rs. Crores)	Total Expenses across the country (in Rs. Crores)
Roca Cola	12	178	760	5,100
Critannia	15	134	345	2,990
Kestle	6	546	456	1,880
Chepsi	8	277	510	2,315
Trimul	24	160	225	2,400
Gold Diary	18	112	650	9,056
Superb Diary	22	150	360	3,500
Fresh & First	27	106	410	7,126
Gopal Jee	16	216	585	5,810
Shudh	9	360	744	4,138
Evertasty	10	245	660	4,284
Natural & Fresh	32	80	208	3,100
Jusico	25	140	376	5,430
Trifolla	15	230	500	4,800
Real Fruits	8	325	752	2,800

21. How many of the given companies had more than 3,000 employees and generated more than Rs. 7,500 Crores as the total Revenue in the year 2010?
(a) 2 (b) 3 (c) 4 (d) 5

22. For how many of the given companies are the Total Expenses less than half the total Revenue generated in the year 2010?
(a) 3 (b) 4 (c) 5 (d) 6

Directions for questions 23 to 25: Answer the questions on the basis of the information given below.

In Sun-Moon bakery, four different types of cakes – Mango Cake, Pineapple Cake, Banana Cake and Fresh Fruitcake – are sold. Each type of cake consists of five fixed ingredients – Wheat Flour, Milk, Sugar Free, Eggs and Baking Powder – and some variable ingredients. The variable ingredients used in different types of cakes are as follows:
Mango cake – Mango Cream and Mango pieces.
Pineapple cake – Pineapple Cream and Pineapple pieces.
Banana cake – Banana Cream and Banana pieces.
Fresh fruitcake – Milk Cream and equal quantities of Mango, Pineapple and Banana pieces.

The Cost Price of Eggs is Rs. 48/dozen and the Cost Price of Milk is Rs. 30/litre. The table given below shows the Cost Price/100 g of the rest of the ingredients.

Ingredient	Cost (in Rs.)/100 g
Wheat Flour	50
Sugar Free	200
Baking Powder	350
Mango pieces	30
Pineapple pieces	20
Banana pieces	40
Mango Cream	60
Pineapple Cream	90
Banana Cream	50
Milk Cream	70

The table given below shows the Selling Price of the different types of cakes.

Cake	Selling Price(in Rs.)
Mango Cake	515
Pineapple Cake	500
Banana Cake	600
Fresh Fruitcake	690

The statements given below are true for a cake of any of the four types made in Sun-Moon bakery.

(i) The ratio of the quantity of Sugar Free used to the quantity of Wheat Flour used is same as the ratio of the quantity of Cream used to the quantity of Fruit pieces used.

(ii) The quantity of Cream used is three times the quantity of Sugar Free used.

(iii) The total cost of the fixed ingredients is equal to the total cost of the variable ingredients.

(iv) In each cake, 10 g Baking Powder, 3 Eggs (equivalent to 120 g) and 100 ml Milk (equivalent to 70 g) are used.

(v) The net weight of each cake is 1 kg.

23. For which type of cake is the profit percentage made by the bakery the highest?
(a) Mango Cake (b) Pineapple Cake (c) Banana Cake (d) Fresh Fruitcake

24. What are the two types of cake that require the same quantity of Sugar Free in their preparation?
(a) Mango Cake and Pineapple Cake (b) Banana Cake and Pineapple Cake
(c) Banana Cake and Fresh Fruitcake (d) Mango Cake and Fresh Fruitcake

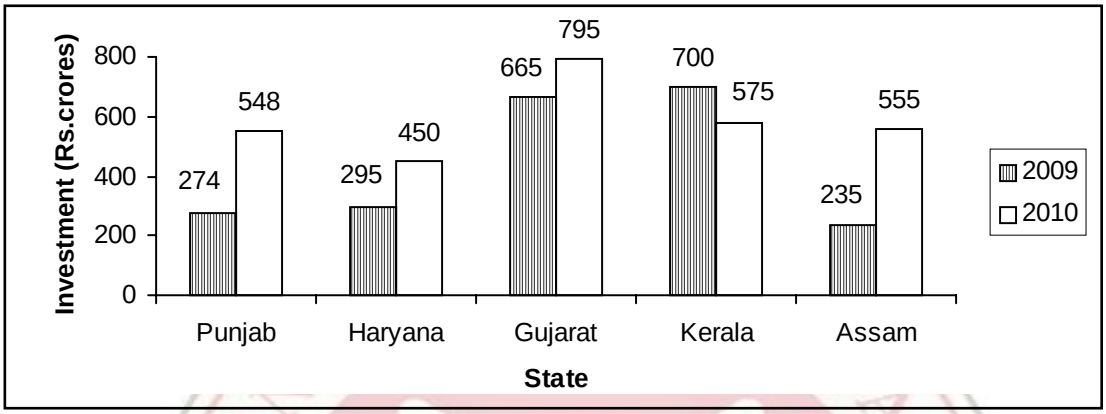
25. How much Wheat Flour is used in preparing four cakes – one of each type?
(a) 475 g (b) 500 g (c) 525 g (d) 550 g

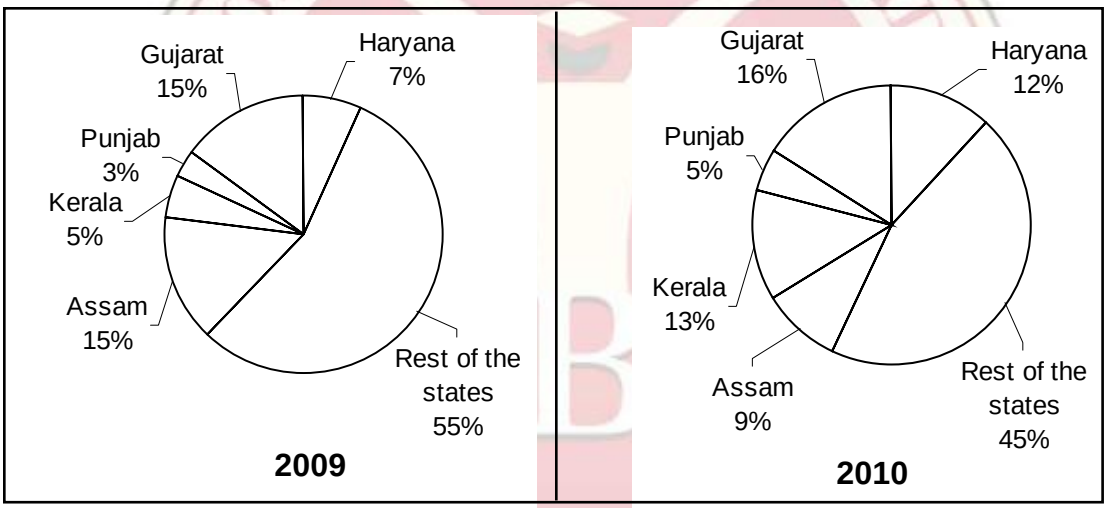
26. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:
Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.
Mark (b) if the question can be answered by using either statement alone.
Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
Mark (d) if the question cannot be answered even by using both the statements together.

Q. N is a natural number that has exactly 24 factors. What is the number of factors of N^3?
A. When N is multiplied by 3, the resultant number has 32 factors.
B. When N is multiplied by 5, the resultant number has 30 factors.

Directions for questions 27 to 29: Answer the questions on the basis of the information given below.

The bar graph given below shows the total amount (in Rs. Crores) invested by five states of India – Punjab, Haryana, Gujarat, Kerala and Assam – in three fields – R&D, Education and Sports – in 2009 and 2010. The pie charts given below show the percentage break-up of the total investment (which also includes the three fields mentioned earlier) made by different states of India in 2009 and 2010.





27. In 2009, Kerala's investment in R&D, Education and Sports was 56% of its total investments. In 2010, Haryana's investment in R&D, Education and Sports was 15% of its total investments. What was the percentage change in the total investment made by the "Rest of the states" from 2009 to 2010?
(a) 9.09% (b) 11.11% (c) 18.18% (d) 22.22%

28. In both 2009 and 2010, one-third of the total amount invested by Gujarat and Assam together in R&D, Education and Sports was done in R&D. The investment in R&D by Gujarat and Assam together as a fraction of the total investment made by Gujarat and Assam together increases by 20% from 2009 to 2010. Find the ratio of the total investment made by all the states across the country in 2009 to that in 2010?
(a) 2 : 3 (b) 3 : 4 (c) 4 : 5 (d) None of these

29. The investment made by Punjab in fields other than R&D, Education and Sports in 2010 was double of that made in 2009. What was the percentage change in the total investment made by all the states across the country from 2009 to 2010?
(a) 20% (b) 33.33% (c) 45% (d) 66.67%

30. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:
Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.
Mark (b) if the question can be answered by using either statement alone.
Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
Mark (d) if the question cannot be answered even by using both the statements together.

Q. Five girls – Komal, Dhara, Jyoti, Sarla and Neha – are of different ages. Sarla is younger than both Jyoti and Komal. Jyoti is younger than Dhara but older than Neha. Who among the five is the oldest?
A. The average age of Komal and Dhara is less than the average age of Jyoti and Neha.
B. The average age of Dhara and Jyoti is less than the average age of Komal and Neha.

PRACTICE TEST - 02

Ref. No.: A27/P1/P7

1. How many positive integer values of 'a' are possible such that $\frac{a+220}{a+4}$ is an integer?

(a) 12 (b) 13 (c) 15 (d) 16

2. In ΔABC, D is the midpoint of BC. E is a point on AC such that AE : EC = 2 : 1 and F is a point on AB such that AF : FB = 3 : 1. Line segments AD and FE intersect at point O. What is the ratio of the area of ΔDOF to the area of ΔDOE?

(a) 8 : 9 (b) 9 : 8 (c) 3 : 4 (d) 4 : 3

3. Pia and Ria start running simultaneously from the same point on a circular track of length 4200 m. If they run in opposite directions, they meet for the first time exactly after 2 minutes from the start and they meet at seven distinct points on the track. If they run in the same direction, they meet at three distinct points on the track. How much time (in minutes) does Ria take to complete one round, if she is the slower runner?

(a) 3.5 (b) 7 (c) 10.5 (d) None of these

4. In a test consisting of 15 questions, 3 marks are awarded for a correct answer, 1 mark is deducted for an incorrect answer and no mark is awarded for an unattempted question. If a student attempts at least one question in the paper, what is the number of distinct scores that he can get?

(a) 57 (b) 58 (c) 59 (d) None of these

5. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using either statement alone.
Mark (b) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.
Mark (c) if the question cannot be answered even by using both the statements together.
Mark (d) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Q. Each student in a class opts for one of the two foreign languages – French and Spanish. Six boys opt for French and eight girls opt for Spanish. What is the maximum possible number of girls who opt for French?
A. The total number of students in the class is 35.
B. The students who opt for Spanish are fewer than the students who opt for French.

6. A man, starting from a point P, takes exactly six equal steps. Each step is in one of the four directions – East, West, North and South. What is the total number of ways in which the man ends up at point P after the six steps?

(a) 200 (b) 256 (c) 400 (d) 512

7. What is the remainder obtained when the sum of the squares of any thirty consecutive natural numbers is divided by 12?
(a) 0 (b) 3 (c) 11 (d) Cannot be determined

8. What is the area (in square units) of the quadrilateral ABCD formed by the points A(0, 0), B(6, 0), C(8, 4) and D(2, 8) in the x-y plane?
(a) 40 (b) 32 (c) 56 (d) 48

9. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using either statement alone.
Mark (b) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.
Mark (c) if the question cannot be answered even by using both the statements together.
Mark (d) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

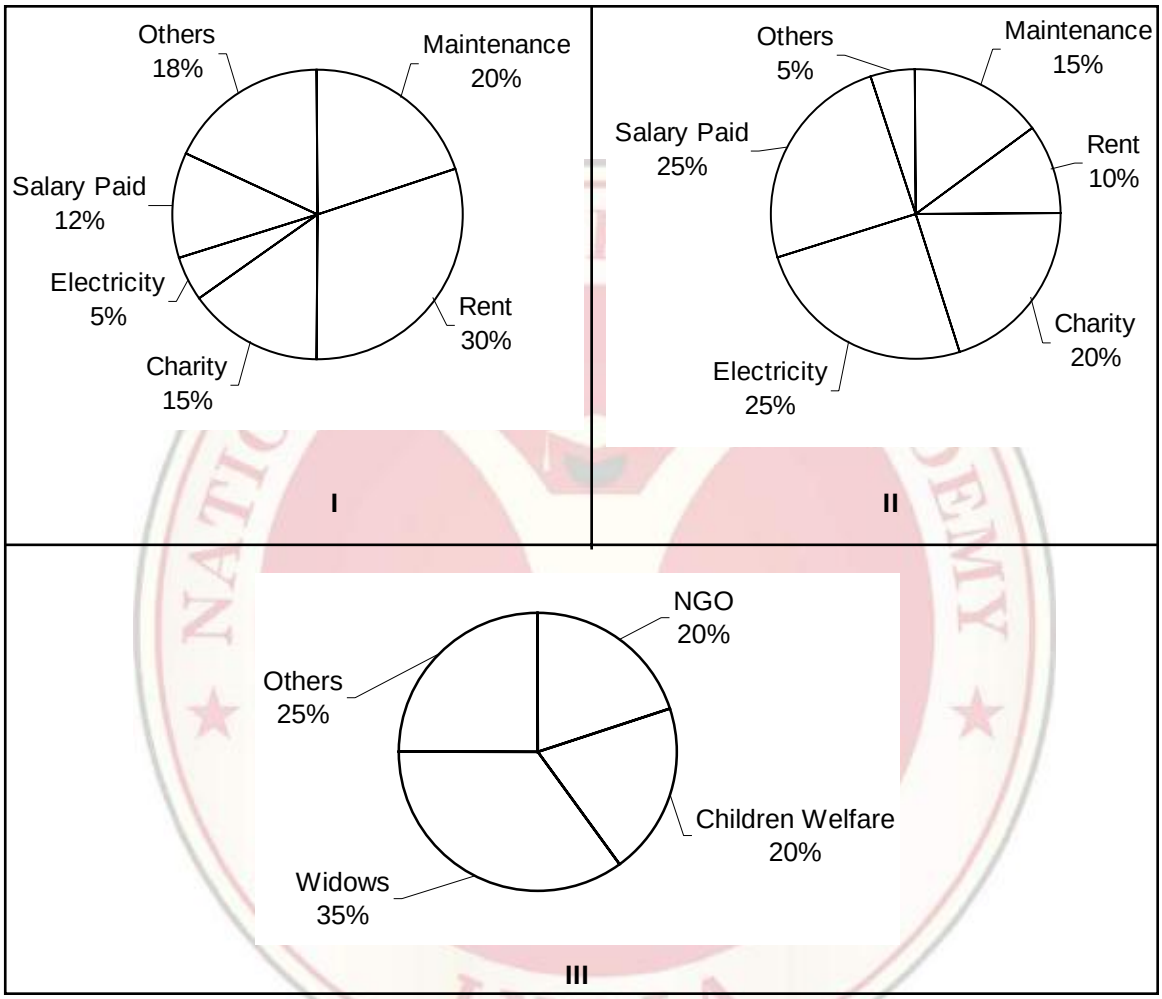
Q. If $(347)^x \times (467)^y = N$, where x and y are positive integers, then what is the unit digit of N?
A. $x + y = 9$
B. $x = 5$

10. If $a^2 + b^2 = 1$, $c^2 + d^2 = 1$ and $ac + bd = 0$, where a, b, c and d are real numbers, then what is the value of $a^2 + c^2$?
(a) 2 (b) 1 (c) 0 (d) Cannot be determined

11. A container is filled up to half of its total volume with liquids L_1 and L_2 in the ratio 3 : 7. L_1 and L_2 evaporate at the rate of 25 litre/hr and 20 litre/hr respectively. After an hour the container is filled completely by adding another mixture which contains L_1 and L_2 in the ratio 2 : 3. The final ratio of L_1 and L_2 in the container becomes 1 : 2. What is the volume (in litres) of the container?
(a) 300 (b) 360 (c) 420 (d) 480

Directions for questions 12 and 13: Answer the questions on the basis of the information given below.

Pie Chart I and Pie Chart II show the percentage break-up of the "Total Expenditure" of Vidyapeeth and Christ College respectively in the year 2010. Pie Chart III shows the percentage break-up of the combined expenditure on "Charity" by the two colleges in 2010.



12. If Vidyapeeth's expenditure on "Charity" was double the combined expenditure of the two colleges on "Children Welfare", then what was the ratio of the "Total Expenditure" of Vidyapeeth to that of Christ College in 2010?
(a) 8 : 9 (b) 9 : 8 (c) 7 : 8 (d) None of these

13. If Vidyapeeth's expenditure on "Electricity" was one-fifth that of Christ College, then find the combined expenditure of the two colleges on "NGO" as a percentage of the "Total Expenditure" of Vidyapeeth in 2010.
(a) 10% (b) 14% (c) 12% (d) None of these

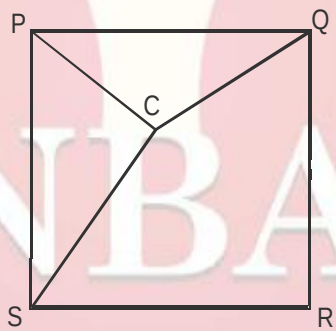
Directions for questions 14 and 15: Answer the questions on the basis of the information given below.
In a class of 96 students, each student opts for at least one of the three subjects – Physics, Chemistry and Mathematics. It is also known that:

(i) The number of students who opt for Physics only is equal to the number of students who opt for Mathematics only and is also equal to twice the number of students who opt for both Mathematics and Physics but not Chemistry.
(ii) The number of students who opt for exactly two subjects is 25.
(iii) The number of students who opt for Chemistry is 31.
(iv) Among those who opt for Chemistry, 13 students opt for at least two subjects.

14. If the number of students who opt for Mathematics is the maximum among the three subjects, then what is the maximum possible number of students who opt for both Physics and Chemistry but not Mathematics?
(a) 5 (b) 6 (c) 7 (d) Cannot be determined

15. Which additional piece of information is required to find the exact number of students who opt for both Chemistry and Mathematics but not Physics?
(a) The number of students who opt for exactly one of the three subjects is 70.
(b) Only one student opts for all the three subjects.
(c) The number of students who opt for Mathematics is 50.
(d) The number of students who opt for Mathematics only is 26.

16. In the figure given below, C is a point inside the square PQRS. If PC = 6 m, QC = 8 m and SC = 10 m, then find the length of RC.



(a) $9\sqrt{2}$ m (b) $8\sqrt{3}$ m (c) $8\sqrt{2}$ m (d) $9\sqrt{3}$ m

17. A company took a loan for three years at 20% p.a. C.I. with annual compounding. It repaid the entire loan amount in three equal annual installments of Rs. 21.60 crores each. What was the amount of the loan (in Rs.) taken by the company?
(a) 45.50 crores (b) 45.50 lakhs (c) 37.50 crores (d) 37.50 lakhs

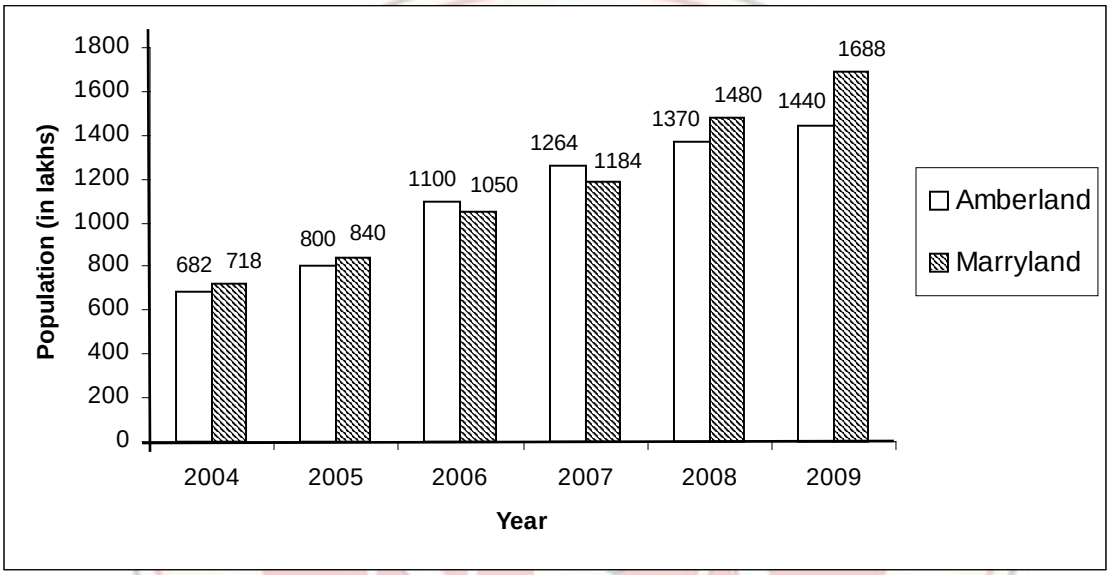
18. The sum of the digits of a four-digit number is 31. What fraction of such numbers are divisible by 11?
(a) $\frac{1}{4}$ (b) $\frac{1}{5}$ (c) $\frac{1}{6}$ (d) None of these

19. Aman, Baman and Chaman can finish a job working alone in 15, 20 and 25 days respectively. However, while working with somebody the efficiency of Aman, Baman and Chaman reduces by 30%, 20% and 50% respectively. If none of them is allowed to work for three consecutive days, then what is the maximum possible fraction of the job that they can complete in four days?

(a) $\frac{21}{50}$ (b) $\frac{17}{50}$ (c) $\frac{8}{25}$ (d) $\frac{1}{3}$

Directions for questions 20 and 21: Answer the questions on the basis of the information given below.

The bar graph given below shows the population (in lakhs) of two countries - Amberland and Marryland - in each year from 2004 to 2009.



20. For which two years was the percentage increase in the population of Marryland over the previous year the same?
(a) 2006 and 2008 (b) 2007 and 2009
(c) 2004 and 2007 (d) None of these

21. If the percentage increase in the population of Amberland in 2010 over 2009 was the same as that in 2006 over 2005, then what was the population (in lakhs) of Amberland in the year 2010?
(a) 2040 (b) 1980 (c) 1800 (d) None of these

22. The function f(x) is defined for all positive values of x and y as f(xy) = f(x) + f(y). Also, f(2) = 2 and f(3) = 3. What is the value of $f\left(\frac{32}{27}\right)$?

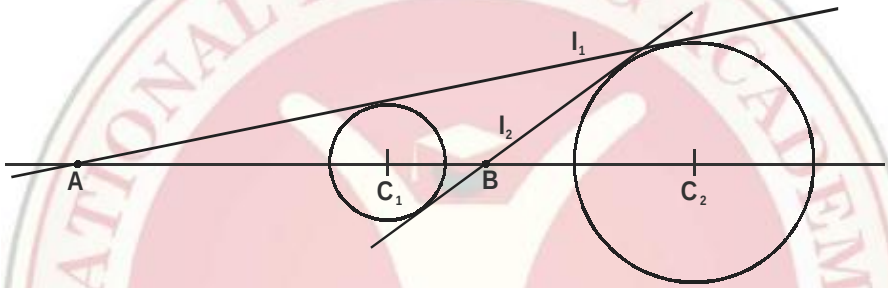
(a) 1 (b) $\frac{5}{3}$ (c) 10 (d) None of these

23. a and b are natural numbers such that $a > b > 1$. If 8! is divisible by $a^2 \times b^2$, then how many such sets (a, b) are possible?
(a) 5 (b) 6 (c) 7 (d) 8

24. Appurv and Vikram play a game in which they roll a 6-faced die alternately starting with Appurv. Each of them keeps on adding the numbers rolled by him and the first one to get to a sum of at least 3 wins the game. What is the probability of Vikram winning the game?

(a) $\frac{2}{9}$ (b) $\frac{293}{6^4}$ (c) $\frac{299}{6^4}$ (d) None of these

25. The figure given below shows two circles with centers C_1 and C_2 and radii 2 cm and 4 cm respectively such that $C_1C_2 = 9$ cm. Two common tangents, l_1 and l_2, are drawn to the circles and they intersect the line passing through C_1 and C_2 at points A and B respectively. What is the length (in cm) of AB?



(a) 27 (b) 21 (c) 18 (d) 12

26. The density of milk at 25°C is 1000 g/litre and it varies with temperature according to the following relation:
$d_t = 2500 - kt$, where d_t = density of milk (at temperature t) in g/litre, t = temperature in °C and k is a constant.
A milkman buys milk from a place where the temperature is 25°C and sells it at a place where the temperature is 30°C. If he claims to buy and sell milk at the same price (in Rs./litre), then what is the profit made by him?

(a) $\frac{80}{3}\%$ (b) $\frac{200}{7}\%$ (c) $\frac{100}{3}\%$ (d) $\frac{300}{7}\%$

27. w, x, y and z are natural numbers such that:

(i) $\log_y x = \frac{3}{2}$

(ii) $\log_z w = \frac{5}{4}$

(iii) $y - z = 9$

What is the value of 'x – w'?
(a) 81 (b) 117 (c) 93 (d) 109

Directions for questions 28 and 29: Answer the questions on the basis of the information given below.
Fifteen countries participated in a competition organized by International Math Organization in the year 2010. There were three rounds in the competition and the countries were awarded non-negative integer points in all the rounds. Round–1 had two stages – Stage–X and Stage–Y – and the points scored in Round–1 were the sum of the points scored in the two stages. The Final Score was the sum of the points scored in Round–1, Round–2 and Round–3. The country with the highest, the second highest and the third highest Final Scores received the Gold, the Silver and the Bronze medals respectively. Also, the Final Scores of no two countries were found to be equal.
The table given below has partial information about the points scored by different countries.

Country	Stage–X	Stage–Y	Round–1 (X + Y)	Round–2	Round–3	Final Score
Argentina	1072	1337	2409	405	1019	3833
Brazil	864	2155	3019	424	885	4328
Canada	865	2128	2993	410	890	4293
Denmark	3612	3978		1083	2239	10912
Egypt	2374	5294	7668	1465	3165	
France	3918			1083	3950	
Germany	4852	6371	11223	1181	4916	17320
Hungary	5853	7766	13619		4963	
India	6658	9642		1652	5649	
Japan	6081	9747		2398	5987	
Kenya	795	2327	3122	439	1096	
Libya	919	3292	4211	549	1284	
Malaysia	1371	3000	4371	672	1528	
Netherlands	1555	3362	4917	769	1595	
Oman	2128	3135	5263	806	1719	

28. Hungary won the Silver medal and France got the fourth highest Final Score. What is the least number of points that Hungary must have scored in Round–2?
(a) 5020 (b) 4438 (c) 5010 (d) None of these

29. France won the Bronze medal and Hungary got the fourth highest Final Score. What is the least number of points that France must have scored in Stage–Y of Round–1?
(a) 8361 (b) 8371 (c) 7861 (d) None of these

30. What is value of 10.11.12.13 + 11.12.13.14 + … + 96.97.98.99?
(a) 1806869592 (b) 1806869594 (c) 1806869596 (d) 1806869598

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