

1-Equations, Ratio, Proportion & Variation

1) A student ask to find $\frac{3}{7}$ th of a number and he instead multiplied it by $\frac{7}{3}$ th. As a result, he got an answer, which was more than the correct answer by 1680. What was the number?

- a) 882 b) 273 c) 840 d) 1684

e) None of the these

2) A rope of 77 meters is cut into 2 pieces such that one piece is $\frac{4}{7}$ th of the other piece. What is the length of $\frac{3}{14}$ th of the longer piece in meters?

- a) 22.5 b) 245 c) 17.5 d) 10.5

e) None of these

3) Father is aged three times more than his son Sunil. After 8 years, he would be two and a half times of Sunil's age. After further 8 years, how many times would he be of Sunil's age?

- a) 4 times b) 5 times c) 2 times d) 3 times

e) None of these

4) In a regular week, there are 5 working days and for each day, working hours are 8. A man gets Rs. 2.40 per hour for regular work and Rs. 3.20 per hours for overtime. If he earns Rs. 432 in 4 weeks, then how many hours does he work for?

- A) 160 b) 175 c) 180 d) 195

e) None of these

5) A and B each has some money. If A gives Rs.30 to B then B will have twice the money left with A. But if B gives Rs.10 to A, then A will have thrice as much as is left with B. How much money does B have?

- a) Rs.20 b) Rs.28 c) Rs.24 d) Rs.34

e) None of these

6) X says to Y, "I am twice as old as you were when I was as old as you are". The sum of their present age is 63 years. Find the present age of X.

- a) 43 years b) 39 years c) 36 years d) 42 years

e) None of these

7) A question paper consists of 50 questions. Each correct answer fetches 3 marks and 1 mark is deducted for each wrong answer. A student who attempted all the questions, scored 90 marks. Find the number of questions answered by him correctly

- a) 35 b) 25 c) 15 d) 30 e) None of these

8) The sum of 3 single digit numbers is 15 less than their product. If we subtract 2 from first given number then sum of these numbers will become 7 more than their product. The product of given 3 numbers will be?

- a) 6 b) 8 c) 12 d) 24 e) 30

9) If a carton containing a dozen mirrors is dropped, which of the following cannot be the ratio of broken mirrors to unbroken mirrors?

- a) 2:1 b) 3:1 c) 3:2 d) 1:1 e) 7:5

10) The total cost of producing a certain number of units of an article is partly fixed and partly varies directly with the number of units of that articles produced. The average cost of producing 15000 units of that article is Rs.2 while that of producing 25000 units of that article is Rs.1.5. Find the variable cost of each unit of that article produced

- a) Rs.1.25 b) Rs.0.75 c) Rs.1.50

d) Rs.2.50 e) None of these

11) i) $\frac{a-3}{b-7}$, Find the value of $\frac{5a+b}{4a+5b}$

- a) 15:44 b) 22:35 c) 15:49

d) 22:47 e) Can't be determine

ii) $\frac{a-3}{b-2}$, Find the value of $\frac{5a^2+b}{5a-b}$

- a) 13:47 b) 47:13 c) 22:47 d) 15:49

e) Can't be determine

iii) $\frac{a-3}{b-2}$, Find the value of $\frac{2a-3b}{4a^3-b}$

- a) 13:47 b) 0 c) 22:47

d) 15:49

e) Can't be determine

12) An amount of Rs.1560 was divided among A, B and C in the ratio $\frac{1}{2}:\frac{1}{3}:\frac{1}{4}$. Find the share of C in this amount.

- a) Rs.300 b) Rs.320 c) Rs.280

d) Rs.360 e) None of these

13) The ratio of present age of A and B is $\frac{11}{4}$. 15 years ago, the ratio of their ages was $\frac{8}{1}$. Five years ago, the ratio of the ages of B and C was $\frac{3}{2}$. What is C's present age?

- a) 15 years b) 10 years c) 22 years

d) 25 years e) None of these

14) A varies directly with B when C is constant and inversely with C when B is constant. Given that A is 16, when B is 28 and C is 7. Find the value A, when B is 9 and C is 6.

- a) 6 b) 7 c) 8 d) 9 e) None of these

15) Two men Ashok and Baban have the ratio of their monthly incomes as $\frac{6}{5}$. the ratio of their monthly expenditure is $\frac{3}{2}$, find the ratio of their monthly savings.

- a) 1:1 b) 3:5 c) 3:10 d) 3:8 e) Can't be determine

Directions for questions 16 and 17:

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 number of Science, Humanities and Commerce student 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.

16) How many students are there in college A?

- a) 2000 b) 2500 c) 3000 d) 3500 e) None of these

17) How many girls are there in two colleges together?

- a) 1400 b) 1600 c) 1700 d) 2000 e) None of these

18) Weight of the solid right circular cone of a certain material varies directly as the square of its radius when its height is constant and varies directly as its height when its radius is constant. The weight of one such cone 12kg, its radius is 2 cm and its height is 4 cm. Find the weight of another such cone whose radius is 4 cm and whose height is 3 cm.

- a) 24kg b) 30kg c) 36kg d) 39kg e) None of these

19) The distance travelled by freely falling body is directly proportional to the square of the time for which it falls. A body fell 95 m in the 10th second. Find the distance it fell in the 14th second.

- a) 54m b) 116.5m c) 108m

d) 135m e) None of these

20) Cost of precious stone varies directly as the square root of its weight. A certain precious stone broke into 3 pieces whose weights are in the ratio 1:4:4. As a result its value went up by Rs.12000. Find its initial value.

- a) Rs.9000 b) Rs.15000 c) Rs.12000

d) Rs.18000 e) None of these

2-Percentage, Profit & Loss

1) Dipin's score is 15% more than that of Rafi. Rafi's score is 10% less than that of Chandar. If the difference between the scores of Dipin and Chandar is 14, what is the score of Rafi?

- a) 180 b) 360 c) 120 d) 480

2) Anil spent 16.66% of his income on rent. 25% of the remaining on food, 60% of the remaining on education. If he saves ₹4500 per month, find his income

- a) Rs.16,000 b) Rs.17,000 c) Rs.18,000 d) Rs.19,000

3) Two students Sharan and Karan took the test. Sharan got 65% of the maximum marks and Karan got 55% percent of the maximum marks in the test. The difference between marks obtain

- by Sharan and Karan is 48. What are the maximum marks of the test?
- a) 360 b) 400 c) 440 d) 480
- 4) Pravin purchased the articles for Rs 123684. He sold 60% of those at a profit of 16.66% and rest at a loss. Find the loss percentage on the remaining if the overall loss is 14%?
- a) 20% b) 60% c) 33.33% d) 66.66%
- 5) Numerator of the fraction increase by 418% and denominator increase by 117% then the value of the fraction is $\frac{3}{31}$. what is the original fraction?
- a) $\frac{11}{88}$ b) $\frac{3}{74}$ c) $\frac{5}{76}$ d) $\frac{2}{83}$
- 6) A dealer gives as much discount (in percent) as the markup (in percent) above the cost price. What is the profit or loss percent?
- a) 10% b) 1% c) 4% d) can't be determined
- 7) Two articles are sold at the same price. One at a profit of 20% and another one at a loss of 20%. What is the overall profit or loss percentage?
- a) 4% loss b) 4% profit c) No profit, No loss d) 2% loss
- 8) There are five equal glasses containing milk in the ratio 3:4:5:6:7. How many glasses are at least 50% full of milk if the total volume of milk in the glasses is 60% of the total volume of the glasses?
- a) 2 b) 3 c) 4 d) 5
- 9) There are 4 containers W, X, Y and Z, each of which can hold a maximum quantity of 200 kg of a particular item. Container W has 40% more than X, X has 40% more than Y and Y has 30% less than Z. If W has 102.9 kg of contents, then what percentage of full quantity did Z has?
- a) 37.5% b) 12.9% c) 45.8% d) 82.4%
- 10) Price of the article increase by 12%, 20% and 25% successively. What is the effective percentage increase in the price of the article?
- a) 65% b) 68% c) 72% d) 76%
- 11) The length and the breadth of the rectangle are increase by 15% and 20% respectively. What is the percentage increase in the area of rectangle?
- a) 38% b) 42% c) 46% d) 50%
- 12) The length and the breadth of rectangle are increase by 12% and x% respectively, thereby area of rectangle increase by 40%. What is the value of x?
- a) 25 b) 28 c) 31 d) 34
- 13) A sugar trader declares that he sells sugar at the cost price. However, he uses a weight of 450g instead of 500g. His percentage profit is:
- a) 10% b) $11\frac{1}{9}\%$ c) $12\frac{2}{9}\%$ d) 12%
- 14) The difference between CP and SP of a table fan is Rs 175 where it gives the profit of 14%. What is SP of that fan (in Rs.)?
- a) 1225 b) 1450 c) 1425 d) 1275
- 15) The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:
- a) 15 b) 16 c) 18 d) 25
- 16) Marked price of the article is Rs. 100. It sold with first discount of 10% and second discount was half of the previous discount then find the selling price after the two successive discounts.
- a) Rs.87.5 b) Rs.90 c) Rs.85.5 d) Rs.85
- 17) An article was sold at a profit of 20%. If both the cost price and selling price decreases by Rs.3000, then the profit would be 25%. Find the original cost price.
- a) Rs.15000 b) Rs.30000 c) Rs.45000 d) Rs.60000
- 18) The loss incurred by selling 16m of a cloth equals the selling price of 4m of that cloth. Find the loss percentage.
- a) 15% b) 20% c) 33.33% d) 25%
- 19) A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?
- a) 3 b) 4 c) 5 d) 6
- 20) A trader mixes 25% kerosene to his petrol and then he sells the whole mixture at the price of petrol. If the cost price of kerosene be 50% of the cost price of petrol, what is the net profit percent?
- a) $11\frac{1}{9}\%$ b) $12\frac{1}{9}\%$ c) $9\frac{1}{11}\%$ d) 20%
- 21) A shopkeeper sells his goods at the same price as what he pays his supplier. But when he buys from his supplier, he takes 10% more than the indicated weight and when he sells to his customers he gives 10% less than the indicated weight. Find his profit percentage.
- a) $18\frac{2}{11}\%$ b) $22\frac{2}{9}\%$ c) $20\frac{2}{9}\%$ d) 20%

3-Partnership, SI & CI

- 1) A and B invest in a business in the ratio 3:2 for the same time period. If 5% of the total profit goes to charity and A's share is Rs. 855, the total profit is.
- a) Rs. 1425 b) Rs. 1500 c) Rs. 1537.50
d) Rs. 1576 e) None of these
- 2) A, B and C jointly thought of engaging themselves in a business venture. It was agreed that A would invest Rs. 6500 for 6 months, B, Rs. 8400 for 5 months and C, Rs. 10,000 for 3 months. A wants to be the working member for which, he was to receive 5% of the profits. The profit earned was Rs. 7400. Calculate the share of B in the profit.
- a) Rs. 1900 b) Rs. 2660 c) Rs. 2800
d) Rs. 2840 e) None of these
- 3) Amol started a business with Rs.2000 and after 5 months, Ashok joined him with Rs.4500. Amol received Rs.45250 including 10% of the profits as commission for managing the business at the end of one year. What amount did Ashok receive?
- a) Rs.47250 b) Rs.47500 c) Rs.47750
d) Rs.48000 e) None of these
- 4) A, B and C enter into a partnership in the ratio 7/2:4/3:6/5. After 4 months, A increases his share 50%. If the total profit at the end of one year be Rs. 21,600, then B's share in the profit is.
- a) Rs. 2100 b) Rs. 2400 c) Rs. 3600
d) Rs. 4000 e) None of these
- 5) A starts business with Rs. 3500 and after 5 months, B joins with A as his partner. After a year, the profit is divided in the ratio 2 : 3. What is B's contribution in the capital?
- a) Rs. 7500 b) Rs. 8000 c) Rs. 8500
d) Rs. 9000 e) None of these
- 6) The simple interest on a certain sum for 3 years is Rs.8178. The rate of interest are 7%, 10% and 12% per annum for the first, second and third year respectively. Find the sum.
- a) Rs. 28200 b) Rs. 29200 c) Rs. 22800
d) Rs. 22900 e) None of these
- 7) In how many years does a sum amount to four times itself at 25% p.a. simple interest?
- a) 15 years b) 12 years c) 10 years
d) 17 years e) None of these
- 8) A certain sum yields Rs.840 more simple interest if it is invested for two years at 18% p.a. than at 12% p.a.
Find the principal
- a) Rs. 7500 b) Rs. 8500 c) Rs. 8000
d) Rs. 7000 e) None of these
- 9) If Rs.8000 has been lent at 10% p.a. the interest being compounded annually, what is the interest for the fifth year?
- a) Rs.1171.28 b) Rs.1161.28 c) Rs.1141.28
d) Rs.1151.28 e) None of these
- 10) Amit borrowed a sum of money from Yogesh at simple interest. The rate of interest is 10% per annum for the first 2 years and 12% per annum for the next 3 years and 15% per annum thereafter. If Amit paid Rs.5332 as interest after 7 years, then find the sum that he borrowed.

- a) Rs. 6800 b) Rs. 6600 c) Rs. 6200
 d) Rs. 6400 e) None of these
- 11) A sum of money doubles in 3 years at compound interest. In how many years does it amount to 16 times itself?
 a) 25 b) 18 c) 30 d) 12 e) None of these
- 12) The compound interest, interest being compounded annually, on a certain sum for the second and the third year are Rs.2880 and Rs.3398.40 respectively. Find the rate of interest per annum.
 a) 18% b) 14% c) 20% d) 16%
 e) None of these
- 13) The simple interest and compound interest at a certain rate on a certain sum for 2 years are Rs.800 and Rs.960 respectively. Find the rate of interest as well as sum
 a) 30% p.a.; Rs.2000 b) 40% p.a.; Rs.2000
 c) 40% p.a.; Rs.1000 d) 45% p.a.; Rs.1000 e) None of these
- 14) What is the compound interest on Rs.8000 at 20% p.a. for 9-month, interest being compounded quarterly?
 a) Rs. 1281 b) Rs. 1261 c) Rs. 1241
 d) Rs. 1221 e) None of these
- 15) What is the difference between compound interest on Rs.12000 at 20% p.a. for one year when compounded yearly and half yearly?
 a) Rs. 140 b) Rs. 120 c) Rs. 130
 d) Rs. 110 e) None of these
- 16) Palak borrows money on compound interest and return it in two equal half - yearly instalments of Rs 4410 each. Find the interest charged if the rate of interest is 10% p.a. compounded half yearly.
 a) Rs 600 b) Rs 820 c) Rs 620
 d) Rs 660 e) None of these
- 17) A sum of Rs 7500 is to be paid back in three equal quarterly instalments. How much is each instalment if the interest is compounded quarterly at 8% p.a.?
 a) Rs. 2600.66 b) Rs. 2700.06 c) Rs. 2701.58
 d) Rs. 2706.08 e) None of these

4-Average, Mixture & Alligation

- 1) The average of 11 consecutive natural numbers is 'x'. If 6th number is 12, find x
 a) 9 b) 10 c) 18 d) 11 e) None of these
- 2) The average of 4 consecutive even numbers is 103. What is the product of the smallest and the largest number?
 a) 10400 b) 10504 c) 10605
 d) 10600 e) None of these
- 3) 16 men went to hotel. 15 of them paid Rs.80 each and the 16th man paid Rs.75 more than the average bill of all the sixteen men. Find the total bill
 a) Rs.1020 b) Rs.1280 c) Rs.1360
 d) Rs.1360 e) None of these
- 4) The Average age of husband, wife and their child 3 years ago was 27 years and that of wife and child 5 years ago was 20 years. The present age of husband is.
 a) 35 years b) 40 years c) 50 years
 d) 45 years e) None of these
- 5) The average age of 24 students and the principal is 15 years. When the principal's age is excluded, the average age decreases by 1 year. What is the age of the principal?
 a) 38 b) 40 c) 39 d) 37 e) None of these
- 6) Sachin Tendulkar has a certain average for 9 innings. In the 10th inning, he scores 100 runs thereby increases his average by 8 runs. His new average is
 a) 20 b) 24 c) 28 d) 32 e) None of these
- 7) The average length of any 4 fingers of my left hand is 600mm. Then the average length of all the five fingers of my left hand is.
 a) 800mm b) 750mm c) 480mm
- d) 600mm e) Cannot be determined
- 8) Vessel A contains 5 litres of milk and vessel B contains 5 litres of water. One litre of milk is taken from A and is poured into B. One litre of the mixture in B is then poured into A. If the present quantity of milk in B and water in A are X and Y respectively, then which of the following holds true?
 a) X>Y b) X=Y c) X<Y d) Cannot be determined
- 9) Fresh grapes contain 84% water while raisins contain 20% water. How many kg of raisins can be made from 80 kg of fresh grapes?
 a) 16 kg b) 18 kg c) 20 kg
 d) 22 kg e) None of these
- 10) 8 litres are drawn from a cask full of wine and is then filled with water. The operation is performed three more times. The ratio of quantity of wine now left in the cask to that of water is 16:65. How much wine the cask holds originally?
 a) 18 litres b) 24 litres c) 42 litres
 d) 32 litres e) None of these
- 11) A can contains 200 litres of pure milk. 20 litre was taken out and replaced with water. How many times should this procedure be followed for the can to contain 145.8 litres of pure milk?
 a) 2 b) 3 c) 4 d) 5 e) None of these
- 12) A cup of milk contains 3 parts of pure milk and 1 part of water. How much the mixture must be withdrawn and water substituted in order that resulting mixture may be half milk and half water.
 a) $\frac{3}{4}$ th mixture b) $\frac{1}{4}$ th mixture c) $\frac{2}{3}$ rd mixture
 d) $\frac{1}{3}$ rd mixture e) None of these
- 13) In what ratio, a liquid A of cost Rs.31 per litre should be mixed with liquid B of cost Rs.36 per litre, so that cost of liquid of mixture is Rs.32.25 per litre?
 a) 2:1 b) 3:1 c) 3:2 d) 4:3 e) None of these
- 14) In what ratio must a grocer mix two varieties of pulses costing Rs.15 and Rs.20 per kg respectively so as to get a mixture worth Rs.16.50 per kg?
 a) 3:7 b) 5:7 c) 7:3 d) 7:5 e) None of these
- 15) Two cans A and B contains milk worth Rs.7 per litre and Rs.9 per litre respectively. If the contents of A and B are transferred to another can C in the ratio 3 : 7 then the cost per litre of the mixture in can C is:
 a) Rs.9.40 b) Rs.10.10 c) Rs.7.40
 d) Rs.8.40 e) None of these
- 16) A milk vendor has 2 cans of milk. The first contains 25% water and the rest milk. The second contains 50% water. How much milk should he mix from each of the containers so as to get 12 litres of milk such that the ratio of water to milk is 3 : 5?
 a) 4 litres, 8 litres b) 6 litres, 6 litres
 c) 5 litres, 7 litres d) 7 litres, 5 litres e) None of these
- 17) A shopkeeper sells wheat partly at 4% profit & at 16% profit. How much quantity should be sold at 4% profit if he has 600kg of wheat and wants to make an overall profit of 11%?
 a) 250 kg b) 120 kg c) 350 kg
 d) 520 kg e) None of these
- 18) The quantity of sugar costing Rs.6.10 per kg must be mixed with 126 kg of sugar priced at Rs.2.85 per kg, so that 20% may be gained by setting the mixture at Rs.4.80 per kg.
 a) 126 kg b) 89 kg c) 69 kg
 d) 84 kg e) None of these
- 19) Two qualities of rice at Rs.63 per kg and Rs.67.50 per kg are mixed with another quality of rice in the ratio 2:2:3. The final mixture sold at Rs.76.50 per kg then the rate of third quality rice per kg was:
 a) Rs.87.50 b) Rs.91.50 c) Rs.81.50 d) Rs.99.50

5-Time and Work

1) A can do a work in 12 days and B can do the same work in 36 days, in how many days can they complete the work, working together?

- a) 15 b) 9 c) 24 d) 18 e) 12

2) P and Q can do a work in 15 days and 21 days respectively. P joins Q after some days and the total work is completed in 14 days. After how many days did P join Q?

- a) 8 b) 7 c) 6 d) 9 e) 12

3) A, B and C can do a work in 10 days, 15 days and 20 days respectively. They work together and completed the work, earning ₹312. What is the share of C?

- a) Rs.138 b) Rs.98 c) Rs.72
d) Rs.112 e) Rs.108

4) A is twice as good a workman as B and working together they finish a work in 14 days. In how many days can A alone finish the work?

- a) 19 b) 17 c) 43 d) 21 e) 42

5) Mr. P and Mr. Q can build a wall in 10 days; Mr. Q & Mr. R can take 14 days to build the same wall and Mr. P and Mr. R can do it in 8 days. Who among them will take more time when they work alone?

- a) P b) Q c) R d) data inadequate

6) M and N together finish a work in 30 days. If they work together for 20 days and then N left. The remaining work was done by M alone in the next 20 days. N alone can finish the work in

- a) 48 days b) 70 days c) 40 days
d) 50 days e) 60 days

7) Arun and Vinay can do a work in 12 days and 36 days respectively. If they work on alternate days, beginning with Arun, then in how many days will the work get completed?

- a) 24 b) 22 c) 18 d) 20 e) 25

8) Lalit and Bipin can do a work in 3 days and 7 days respectively. If they work on alternate days, then find the minimum number of days required to complete the work?

- a) $4\frac{1}{3}$ b) $4\frac{1}{7}$ c) 7 d) 3 e) None of These

9) 33 binders can bind 2200 books in 24 days. Find the number of binders required to bind 1800 books in 18 days.

- a) 33 b) 30 c) 40 d) 36 e) None of these

10) Thirty-six men can do a work in 20 days. In how many days can 24 men do the same work, given that the time spent per day is decreased by $1/3^{\text{rd}}$ of the previous time?

- a) 42 b) 39 c) 48 d) 45 e) 52

11) 12 men or 16 women can do a work in 18 days, in how many days can 9 men and 24 women do the work?

- a) 12 b) 8 c) 10 d) 18 e) 14

12) 10 men and 8 women can do a work in 10 days, 8 men and 19 women can do the same work in 8 days. In how many days can 4 men and 6 women do the same work?

- a) 20 b) 5 c) 15 d) 10 e) 25

13) Two men and four women can complete a piece of work in four days. One man and two women take the same time as five women to complete the work. Find the time by one woman to complete the work

- a) 20 days b) 25 days c) 30 days
d) 40 days e) 45 days

14) A contractor employs 280 men to complete a work in 10 days. But after 3 days it was found that only $1/4^{\text{th}}$ of the work was done. How many additional men are required to finish the work on time?

- a) 360 b) 120 c) 140 d) 80 e) 120

15) Three pipes, of which two are filling and the third is draining, are fitted to a tank. The two pipes can fill an empty tank in 30 minutes and 40 minutes and the draining pipe empties the full tank in 60 minutes. In how many minutes is the empty tank completely full when all the three pipes are opened simultaneously?

- a) 36 b) 60 c) 30 d) 48 e) 24

16) Pipes A and B can fill an empty tank in 20 minutes and 30 minutes respectively, whereas C can empty the full tank in x minutes. When pipes A, B and C are opened simultaneously the tank will be filled in 15 minutes. What is the value of x?

- a) 50 b) 55 c) 45 d) 60 e) 30

17) Pipe A can fill a tank in 3 hours. A can fill the tank in 5 hours if it works along with the outlet pipe B. If B can empty the tank at 6 litres per minute, then what is the capacity of the tank?

- a) 2850 litres b) 3450 litres c) 3200 litres

- d) 3600 litres e) 2700 litres

6-Time, Speed and Distance

1) Had a person travelled 3 kmph faster he would have taken 2 hours less to cover a certain distance. Had he travelled 4 kmph slower he would have taken 5 hours more to cover the same distance. Find the distance.

- a) 180 km b) 120 km c) 140 km

- d) 160 km e) None of these

2) A car covers a distance from town A to town B at a speed of 70 kmph and covers the distance from town B to town A at a speed of 90 kmph. What is the approximate average speed of the car?

- a) 70 kmph b) 79 kmph c) 80 kmph

- d) 90 kmph e) None of these

3) Without stoppages a train travels a certain distance with an average speed of 60 km/h and with stoppages with an average speed of 40 km/h. How many minutes per hour does the train stops?

- a) 30 minutes b) 20 minutes c) 10 minutes

- d) 15 minutes e) None of these

4) A car starts from a city X at 9 am and travels towards another city Y at 70 km/hr. Another car starts from the city Y at 10 am and travels towards the city X at 85 km/hr. If the distance between the cities X & Y is 690 km then at what time do they meet?

- a) 1 pm b) 1.30 pm c) 2 pm

- d) 2.15 pm e) None of these

5) Two cyclists simultaneously start from city A to city B and city B to city A respectively. After crossing each other first cyclist reaches city B in 4 hours while the second cyclist reaches city A in 9 hours. Find the ratio of the speed of two cyclists.

- a) $\frac{2}{3}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{3}{4}$ e) None of these

6) A police van travelling at 60 kmph crosses an escaping thief travelling in opposite direction at 48 kmph. The police van has to travel for a further 5 minutes before it can find a gap in the median where it can take a U turn and start chasing the thief. After how much time police van catch the thief?

- a) 25 minutes b) 45 minutes c) 50 minutes

- d) 32 minutes e) None of these

7) A train travelling at 36 kmph completely crosses another train having half its length and travelling in the opposite direction at 54 kmph, in 12 seconds. If it also passes a railway platform in 60 seconds, the length of the platform is :

- a) 300 metres b) 350 metres c) 450 metres

- d) 500 metres e) None of these

8) A train, 350-meter-long, crosses a man, running in the same direction in 7 sec. The same train crosses a pole in 5 sec. What will be the speed of man?

- a) 14 m/s b) 36 m/s c) 25 m/s

- d) 20 m/s e) None of these

9) Two trains running in the opposite direction cross a man standing on platform in 31 sec and 23 sec respectively. Two trains cross each other in 29 sec. What is the ratio of their speeds?

- a) 3:1 b) 4:3 c) 2:1 d) 3:2 e) None of these

10) Two trains running at 45 kmph and 54 kmph cross each other in 12 seconds when they run in opposite directions. When they run

in the same direction, a person in the faster train observe that he crossed the other train in 32 seconds. Find the lengths of the two trains?

- a) 250 m, 90 m b) 260 m, 70 m c) 240 m, 90 m
 d) 250 m, 80 m e) None of these

11) Two bombs were exploded at a place P with a time interval of 40 minutes. A person moving away from P heard the first explosion at a point A and second explosion when he was at a point B. If he heard the explosions at an interval of 41 minutes and the speed of the sound is 331m/s, what is the distance between A and B?

- a) 15240 m b) 18660 m c) 19860 m d) 20356 m

12) A motorboat can cover $10\frac{1}{3}$ km in 1 hour in still water. And it takes twice as much as time to cover up than as to cover down the same distance in running water. The speed of the current is:

- a) $3\frac{4}{9}$ km/hr b) $2\frac{1}{3}$ km/hr c) 4 km/hr
 d) 3 km/hr e) None of these

13) A man can row a certain distance downstream in 2 hours while he takes 3 hours to come back. If the speed of the stream be 6 km/hr then the speed of the man in still water is:

- a) 15km/hr b) 30km/hr c) 25km/hr
 d) 29km/hr e) None of these

14) A boat takes 7 hours to cover 24 km distance and comes back. And, it can cover 2 km with the stream in the same time as 1.5 km against the stream. The speed of the stream is:

- a) 1 km/hr b) 2 km/hr c) 3 km/hr
 d) 4 km/hr e) None of these

15) In a 100 metre race. A beats B by 20 metre and C by 30 meters, then in the same race B beats C by how many metres?

- a) 10 metre b) 12.5 metre c) 15 metre
 d) 20 metre e) None of these

16) In a race Palak gives Asha a head start of 350 m and still beats her by 50 m. If palak's speed is $1\frac{1}{4}$ times Asha's speed, What is the length of race?

- a) 1 km b) 2 km c) 4 km
 d) 1.5 km e) None of these

17) Three runners A, B and C run a race, with runner A finishing 12 meters ahead of runner B and 18 meters ahead of runner C, while runner B finishes 8 meters ahead of runner C. Each runner travels the entire distance at a constant speed. What was the length of the race?

- a) 36 meters b) 72 meters c) 60 meters
 d) 48 meters e) None of these

18) Two toy trains start at same time from the same point on a circular track of circumference 1452 meters and run in opposite direction at 9 km/hr and 7.5 km/hr, respectively. They will meet in:

- a) 4.12 minutes b) 5.28 minutes c) 3.92 minutes
 d) 4.08 minutes e) None of these

19) P, Q, R run around a circular track 1200 m long with speed of 9, 18, 27 kmph. If they start at the same point and at the same time in the same direction, when will they meet again at the starting point?

- a) 480 sec b) 360 sec c) 240 sec
 d) 300 sec e) None of these

20) A can run one full round of a circular track in 6 min and B in 15 min. If both A and B start simultaneously from the same starting point then How many times would they met in the time B has completed 10 rounds when running in same direction, and in opposite direction?

- a) 15, 10 b) 25, 30 c) 15, 35
 d) 35, 10 e) None of these

1) Find unit digit

- i) 687⁵⁶⁷

- a) 7 b) 3 c) 9 d) 1 e) None of these

- ii) 763⁴⁵³⁹

- a) 3 b) 1 c) 9 d) 7 e) None of these

- iii) 568⁵⁶⁴

- a) 8 b) 4 c) 2 d) 6 e) None of these

2) i) If a number is represented by $N=84 \times 192 \times 217 \times 301$. What will be remainder when N is divided by 27?

- a) 7 b) 6 c) 5 d) 9 e) None of these

ii) What will be remainder when $568+5468+2543+65259$ is divided by 13?

- a) 10 b) 11 c) 12 d) 13 e) None of these

3) i) Which of the following number is divisible by 11, 42, 72?

- a) 8736 b) 6240 c) 10032

- d) 7392 e) None of these

ii) Which number we have to add in 2456210 to make it divisible by 11?

- a) 9 b) 7 c) 3 d) 5 e) None of these

iii) Which number we have to subtract from 468951 to make it divisible by 9?

- a) 14 b) 15 c) 17 d) 18 e) None of these

iv) What is the smallest number by which the number 222264 is to be divided such that the quotient becomes a perfect cube?

- a) 3 b) 4 c) 7 d) 8 e) None of these

4) i) The remainder when 6^{100} is divided by 7, is:

- a) 3 b) 0 c) 1 d) 2 e) None of these

ii) The remainder when 54^{457} is divided by 63 is,

- a) 19 b) 17 c) 13 d) 18 e) None of these

5) Three numbers are in the ratio of 3 : 4 : 5 and their L.C.M. is 2400. Their H.C.F. is:

- a) 40 b) 80 c) 120 d) 200 e) None of these

6) The H.C.F and L.C.M of two numbers are 13 and 455 respectively. If one number lies between 85 and 125, then that number is :

- a) 99 b) 88 c) 91 d) 110 e) None of these

7) LCM and HCF of 2/7, 3/14 and 5/3 is

- a) $45\frac{1}{14}$ b) $35\frac{30}{42}$ c) $30\frac{1}{42}$ d) $25\frac{30}{1}$ e) None of these

8) The greatest possible length which can be used to measure exactly the lengths 7 m, 3 m 85 cm, 12 m 95 cm is:

- a) 15 cm b) 35cm c) 27cm

- d) 52cm e) None of these

9) A rectangular courtyard 3.78 meters long 5.25 meters wide is to be paved exactly with square tiles, all of the same size. what is the minimum number of the tile which could be used for the purpose?

- a) 400 b) 450 c) 500

- d) 600 e) None of these

10) 6 different sweet varieties of count 32, 216, 136, 88, 184, 120 were ordered for a particular occasion. They need to be packed in such a way that each box has the same variety of sweet and the number of sweets in each box is also the same. What is the minimum number of boxes required to pack?

- a) 129 b) 64 c) 48 d) 97 e) None of these

11) i) If $p \times q = 361$, p, q are integers then the value of $p + (q-1)^2$ can be:

- a) 343 b) 111 c) 109 d) None of these

ii) If $p \times q = 289$ and p, q are integers then find the integer value of p/q .

- a) 289 b) 1 c) a & b d) None of these

12) i) Simplify: $[(1113 + 626)^2 + (1113 - 626)^2] / (1113 \times 1113 + 626 \times 626)$

- a) 1 b) 2 c) 1113^2 d) 487^2 e) None of these

ii) Simplify: $(1004 \times 1004 \times 1004 + 382 \times 382 \times 382) / (1004 \times 1004 - 1004 \times 382 + 382 \times 382)$

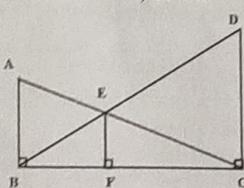
- a) 1386 b) 622 c) 1004×382

7-Numbers

- 4) 1 e) None of these
- 13) i) The sum of squares of two numbers is 80 and the square of their difference is 36. The product of the two numbers is.
 a) 44 b) 22 c) 58 d) 116 e) None of these
- ii) The sum of the squares of the three numbers is 138. While sum of their products taken two at a time is 131. Their sum is.
 a) 20 b) 30 c) 40 d) 50 e) None of these
- 14) If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, then the sum of the reciprocals of the numbers is equal to:
 a) 55/601 b) 601/55 c) 11/120
 d) 120/11 e) None of these
- 15) i) Find the number of factors of 4320.
 a) 40 b) 42 c) 36 d) 48 e) None of these
- ii) Find the sum of factors of 4320.
 a) 13172 b) 15120 c) 10890
 d) 12144 e) None of these
- 16) Find the smallest 3 digit number which when divided by 4, 7 and 11 leaves a remainder of 3 in each case.
 a) 308 b) 305 c) 311 d) 309 e) None of these
- 17) Find the smallest number which when divided by 5, 7, 11 and 13 leaves respective remainder of 2, 4, 8 and 10
 a) 5005 b) 5002 c) 5500
 d) 5020 e) None of these
- 18) Find the smallest number which when divided by 7 leaves a remainder of 6 and when divided by 11 leaves remainder of 8
 a) 37 b) 43 c) 47 d) 41 e) None of these
- 19) Find the largest number with which when 906 and 650 are divided they leave respective remainders of 3 and 5.
 a) 129 b) 127 c) 131 d) 133 e) None of these
- 20) Find the largest number with which when 437, 857 and 1557 are divided, leaves the same remainder in each case
 a) 130 b) 140 c) 150 d) 160 e) None of these
- 21) In a large school auditorium, the students are made to sit to watch the programmes. If the teachers make a row of students of 16 each, there will be 12 students left. If they make rows of 24 each, then there will be 20 students left, if they make rows of 25 each, there will be 21 students left and if they make rows of 30 each, there will be 26 students left. What is the minimum number of students present in the school?
 a) 1216 b) 1784 c) 1196
 d) 2396 e) None of these

8-Geometry & Mensuration

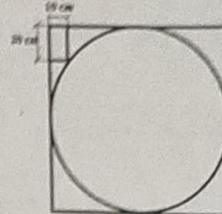
- 1) The wheel of a motorcar makes 1000 revolutions in moving 550m. Find the diameter of wheel.
 a) 18 cm b) 20 cm c) 17.5 cm d) 18.5 cm
- 2) In parallelogram ABCD, AP and BP are the angle bisectors of $\angle DAB$ and $\angle ABC$. Find $\angle APB$.
 a) 85° b) 90° c) 70° d) 80° e) 95°
- 3) In a trapezium PQRS, PQ is parallel to RS and $PQ=10\text{cm}$ and $RS=20\text{cm}$. What is the length of the line UV which is parallel to PQ and RS and divides the distance between them in the ratio 2:3 respectively?
 a) 15 cm b) 12 cm c) 14 cm
 d) 16 cm e) 10 cm



- 4) In the above figure, $AB = 10\text{ cm}$, $CD = 40\text{ cm}$, Find EF.

- a) 5 b) 6 c) 8 d) 4

- 5) Sum of the interior angles of a polygon is 1620. How many sides does polygon have?
 a) 12 b) 11 c) 10 d) 9 e) 8
- 6) In the diagram find the radius of the circle.
 a) 10 cm b) 50 cm c) 40 cm
 d) 60 cm e) 30 cm



- 7) T is an obtuse angle triangle. Two of its sides are 7 cm and 13 cm. How many possibilities exist for T such that the third side has an integral measure?

- a) 12 b) 7 c) 16 d) 9 e) 15
- 8) The area of similar triangles ABC and XYZ are 54 sq.cm and 150 sq.cm respectively. Find the perimeter of triangle XYZ, if the perimeter of the triangle ABC is 36 cm.

- a) 100 cm b) 30 cm c) 50 cm
 d) 60 cm e) 70 cm

- 9) How far from the centre of a circle of diameter 170 cm is the chord 26 cm long?

- a) 84 cm b) 85 cm c) 82 cm
 d) 83 cm e) 81 cm

- 10) A horse is put outside a fenced rectangular plot 60m x 20m and is tethered to one of the corners of the plot by rope of length 30m. Find the total area that it can graze.

- a) 600π sq.m. b) 750π sq.m. c) 700π sq.m.
 d) 500π sq.m. e) None of these

- 11) A solid sphere is cut into 8 identical pieces by three mutually perpendicular cuts. By what percentage is the sum of total surface area of the eight pieces more than the total surface area of the original sphere?

- a) 125% b) 150% c) 175% d) 200%

- 12) Find the perimeter of the semicircle whose radius is 35 cm.
 a) 110 cm b) 150 cm c) 180 cm
 d) 220 cm e) None of these

- 13) If the distance between the tops of two poles with lengths 13.42 m and 8.484 m both standing erect, is 6.17 m. Find the distance between their bases.

- a) 1.234 m b) 3.702 m c) 4.936 m
 d) 2.468 m e) None of these

- 14) A swimming pool 100 m long and 40 m wide is 1 m deep at the shallow end and 5m at deep end. Find the volume of water contain in the pool?

- a) 10000 cu.m. b) 12000 cu.m c) 15000 cu.m
 d) 12500 cu.m e) 13500 cu.m

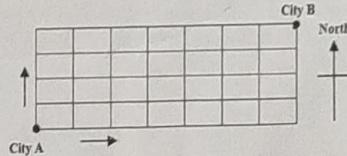
- 15) Radius and height of a right cylinder are each increase by 10%. Find the percentage increase in its volume.

- a) 30% b) 33.33% c) 33.1%
 d) 300% e) None of these

- 16) A conical cup when filled with ice-cream forms a hemispherical shape on its open end. Find the approximate volume of ice-cream. If the radius of the base of the cone is 3.5 cm and the vertical height of cone is 7 cm.

- a) 165 cm^3 b) 185 cm^3 c) 170 cm^3
 d) 175 cm^3 e) 180 cm^3

- 17) The minute hand of a clock is 24.5 cm long. Find the area swept by it between 10:10 am and 10:40 am of the same day.
 a) 900 sq.cm b) 948.75 sq.cm
 c) 943.25 sq.cm d) 953.25 sq.cm
- 18) Four points P, Q, R and S lie on a straight line in the XY plane, such that PQ=QR=RS and the length of PQ is 5 meters. A man wants to go from P to S, but there are dogs tethered with 5 metre chains at point Q and R. The man would not go within the reach of any dog. Minimum distance in meters the man must travel to reach the point S is.
 a) $5(\pi+1)$ b) $\frac{20\pi}{3}$ c) $\frac{40\pi}{3}$ d) $15\sqrt{2}$
- 19) A mosquito is flying in a room having dimensions 8 ft \times 6 ft \times 10 ft. It has to fly from one corner to the farthest opposite corner of a room to collect food. It collects the food and returns to its original spot. Find the minimum possible distance covered by the mosquito?
 a) $20\sqrt{2}ft$ b) 20 ft. c) $4\sqrt{47}ft$ d) None of these
- 20) A cylindrical vessel of radius 21 m and height 5 m is 60% filled with water. How many pebbles of diameter 2 m are approximately required to fill the vessel?
 a) 540 b) 340 c) 662 d) 750
- 21) A peacock is sitting on a 19 m long pole, a snake is approaching the hole which is at bottom of the pole, the snake is 27 m away from the hole, if their speeds are same, find the distance from the hole at which the peacock pounces over the snake.
 a) 3.4 m b) 6.8 m c) 5.9 m d) 7.3 m
- d) 30240 e) None of these
- 8) A letter lock consists of three rings each marked with six different letters. The number of distinct unsuccessful attempts to open the lock is at the most?
 a) 120 b) 216 c) 360 d) 215 e) None of these
- 9) How many 7 lettered words without repetition can be formed using the letters of the word "MISTAKE" so that no two vowels are together?
 a) 1240 b) 1220 c) 1420
 d) 1440 e) None of these
- 10) A committee of 6 members is to be formed out of 10 members. How many ways can a selection of six members made so that,
 i) A particular person is always included?
 a) 126 b) 84 c) 210 d) 96 e) None of these
 ii) A particular person is always excluded?
 a) 210 b) 120 c) 84 d) 126 e) None of these
- 11) In how many ways you can arrange the letters of the word i) BINOCULARS
 a) $\frac{10!}{5!}$ b) 9! c) ${}^{10}C_{10}$ d) 10! e) None of these
- ii) ASSISTANTS
 a) $\frac{10!}{2! \times 4! \times 2!}$ b) $\frac{10!}{6!}$ c) $\frac{10!}{8!}$ d) ${}^{10}P_{10}$ e) None of these
- iii) MISSISSIPPI
 a) $\frac{10!}{2! \times 2! \times 4!}$ b) ${}^{11}P_{10}$ c) $\frac{11!}{10!}$ d) $\frac{11!}{2! \times 4! \times 4!}$ e) None of these
- 12) In the figure given below, the lines represent the one-way roads allowing cars to travel only eastwards or northwards. In how many ways car travel from the City A to the City B?



9-Permutation & Combination

- 1) If Naresh has 5 different shirts and 7 different pairs of pants, how many different combinations could he wear?
 a) 35 b) 30 c) 40 d) 45 e) None of these
- 2) There are 8 stations between Ermakulum and Chennai. How many second-class tickets have to be printed, so that a passenger can travel from one station to any other station?
 a) 70 b) 80 c) 90 d) 100 e) None of these
- 3) How many 4-digit numbers can be formed using digits 1, 2, 3, 4 and 5?
 i) Without repetition of digits
 a) 240 b) 420 c) 625 d) 120 e) None of these
 ii) With repetition of digits
 a) 420 b) 625 c) 120 d) 240 e) None of these
- 4) How many 4-digit numbers can be formed using digits 0, 1, 2, 3, 4 and 5?
 i) Without repetition of digits
 a) 60 b) 120 c) 360 d) 300 e) None of these
 ii) With repetition of digits
 a) 625 b) 1080 c) 750 d) 36 e) None of these
- 5) How many 4 digit numbers can be formed using digits 0, 5, 6, 7, 8 and 9 which are divisible by 4?
 i) Without repetition of digits
 a) 36 b) 72 c) 96 d) 108 e) None of these
 ii) With repetition of digits
 a) 240 b) 360 c) 270 d) 72 e) None of these
- 6) In how many ways 4 girls and 4 boys can seat in a row facing north such that no 2 boys and no 2 girls are together?
 a) 20240 b) 1152 c) 576
 d) 40320 e) None of these
- 7) How many ways 8 persons can seat around a circular table facing the centre such that 3 particular persons are always together?
 a) 5040 b) 40320 c) 241920
- d) 4095 e) None of these
- 13) Rohit attempted a multiple-choice question paper consisting of 10 questions and each question having 4 choices. The number of ways in which he can attempt the entire paper if he is making the answers at random is
 a) ${}^{10}P_4$ b) 4^{10} c) ${}^{10}C_4$ d) 10^4 e) None of these
- 14) There are 15 points in a plane of which 8 of them on a straight line. Then by how many ways,
 i) Straight lines can be formed?
 a) 105 b) 21 c) 78 d) 84 e) None of these
 ii) Triangles can be formed?
 a) 399 b) 400 c) 434 d) 235 e) None of these
- 15) The total number of selections of 5 fruits which can be made from 4 oranges, 3 apples and 2 bananas taking at least one of each kind is:
 a) 44 b) 55 c) 98 d) 56 e) None of these
- 16) In how many ways selection of at least 1 ball be made from 6 distinct balls?
 a) 2^6 b) 96 c) 63 d) 120 e) None of these
- 17) There are 4 identical books on Maths, 5 identical books on Science, and 3 identical books on English. In how many ways one or more books can be selected?
 a) 120 b) 119 c) 4096
 d) 4095 e) None of these
- 18) Five persons A, B, C, D and E are standing in a row facing north. Find the number of possible arrangements in which A is to the left of B?
 a) 48 b) 64 c) 24 d) 60 e) None of these
- 19) In how many ways can Anil uncle distribute 10 identical chocolates in three children A, B and C?
 a) 4^{10} b) 3^{10} c) 66 d) 63 e) None of these

10-Probability

- 1) Four fair coins are tossed simultaneously. What is the probability of getting exactly 2 tails?
 a) $\frac{3}{8}$ b) $\frac{5}{8}$ c) $\frac{7}{16}$ d) $\frac{1}{2}$ e) None of these
- 2) Four fair coins are tossed simultaneously. What is the probability of getting at least 2 heads?
 a) $\frac{9}{16}$ b) $\frac{5}{8}$ c) $\frac{11}{16}$ d) $\frac{13}{16}$ e) None of these
- 3) If a die is thrown once, what is the probability of getting a prime number?
 a) $\frac{2}{3}$ b) $\frac{1}{6}$ c) $\frac{1}{2}$ d) $\frac{1}{3}$ e) None of these
- 4) Find a probability of getting a total more than 7, when sequentially throw a pair of dice?
 a) $\frac{2}{12}$ b) $\frac{3}{12}$ c) $\frac{5}{12}$ d) $\frac{7}{12}$ e) None of these
- 5) Three dices are thrown up simultaneously. What is the probability of having all the three different faces on the top?
 a) $\frac{4}{9}$ b) $\frac{1}{3}$ c) $\frac{5}{9}$ d) $\frac{2}{3}$ e) None of these
- 6) Two cards are drawn from a standard deck of 52 playing cards. What is the probability the both the cards are honour cards?
 a) $\frac{36}{221}$ b) $\frac{16}{221}$ c) $\frac{20}{221}$ d) $\frac{18}{221}$ e) None of these
- 7) i) Two cards are drawn from a standard deck of 52 playing cards one after another with replacement. What is the probability the both the cards are face cards?
 a) $\frac{9}{169}$ b) $\frac{18}{169}$ c) $\frac{15}{169}$ d) $\frac{12}{169}$ e) None of these
 ii) Two cards are drawn from a standard deck of 52 playing cards one after another without replacement. What is the probability the both the cards are black cards?
 a) $\frac{27}{102}$ b) $\frac{25}{102}$ c) $\frac{31}{102}$ d) $\frac{21}{102}$ e) None of these
- 8) A card is drawn from a standard deck of 52 playing cards. What is the probability that the card is an ace or a king?
 a) $\frac{3}{13}$ b) $\frac{2}{13}$ c) $\frac{4}{13}$ d) $\frac{5}{13}$ e) None of these
- 9) A card is drawn from a standard deck of 52 playing cards. What is the probability that the card is a red card or a king?
 a) $\frac{6}{13}$ b) $\frac{15}{26}$ c) $\frac{8}{13}$ d) $\frac{15}{26}$ e) None of these
- 10) A box contains 12 electric bulbs, of which four are defective. Two bulbs are drawn at random from the bag. What is the probability that both are defective bulbs?
 a) $\frac{4}{11}$ b) $\frac{3}{11}$ c) $\frac{2}{11}$ d) $\frac{1}{11}$ e) None of these
- 11) The probability that it rains on a certain day is 0.6 and the probability that it rains on certain another day is 0.8. What is the probability that it will not rain on both days?
 a) 0.04 b) 0.08 c) 0.12 d) 0.16 e) None of these
- 12) Out of all the 2-digit integers between 1 and 100, a number is selected at random. What is the probability that the selected number is not divisible by 7?
 a) $\frac{13}{90}$ b) $\frac{79}{90}$ c) $\frac{80}{90}$ d) $\frac{77}{90}$ e) None of these
- 13) A seven-letter word is written at random with the letters of the word 'REPLACE'. What is the probability that it is REPLACE?
 a) $\frac{1}{630}$ b) $\frac{1}{1260}$ c) $\frac{1}{2520}$ d) $\frac{1}{5040}$ e) None of these
- 14) Six persons sit in a row randomly. What is a probability that three particular persons always appear together?
 a) $\frac{1}{5}$ b) $\frac{2}{5}$ c) $\frac{3}{5}$ d) $\frac{4}{5}$ e) None of these
- 15) Probability that a speak truth is $\frac{7}{10}$ and the probability that b speaks truth is $\frac{11}{15}$. What is the probability that both speak false while making a statement?
 a) $\frac{6}{25}$ b) $\frac{4}{25}$ c) $\frac{2}{25}$ d) $\frac{8}{25}$ e) None of these
- 16) The probability that M hits the target is 0.6, N hits the target is 0.65 and K hits the target is 0.55. What is the probability that at least of the person hits the target?
- a) 0.877 b) 0.897 c) 0.917 d) 0.937 e) None of these
 17) A bag contains four red, three green, two yellow and five blue marbles. Three marbles are drawn at random from the bag
 i) What is the probability that all the marbles are of the same colour?
 a) $\frac{15}{364}$ b) $\frac{19}{364}$ c) $\frac{23}{364}$ d) $\frac{27}{364}$ e) None of these
 ii) What is the probability that all the marbles are of different colours?
 a) $\frac{11}{36}$ b) $\frac{1}{2}$ c) $\frac{15}{36}$ d) $\frac{11}{32}$ e) None of these
 iii) What is the probability that at least one green coloured marble is drawn?
 a) $\frac{159}{264}$ b) $\frac{179}{264}$ c) $\frac{199}{264}$ d) $\frac{209}{264}$ e) None of these