



STUDY MATERIALS

Topics	Subtopics	Expected Questions
Aptitude Module (45 min)	<ul style="list-style-type: none"> English Usage <p>15 Questions</p>	<ul style="list-style-type: none"> Reading Comprehension Grammar including Articles, Prepositions, Sentence Correction, Speech Tenses - Verbal Ability including Synonyms, Antonym, Spellings, Idioms and Phrases
	Analytical <ul style="list-style-type: none"> Reasoning 	<ul style="list-style-type: none"> Visual Reasoning Statement & Conclusions Relationships Logical Reasoning Attention to Details and Flowcharts
	Numerical <ul style="list-style-type: none"> Reasoning 	Code Commit <ul style="list-style-type: none"> Time & Work Speed & Distance Algebra Equations Progressions Profit & Loss Ratios Averages

		<ul style="list-style-type: none"> • Geometry and Data Interpretation
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Computer Fundamentals (15 min)

Topics	Subtopics
Computer Fundamentals (15 min)	<ul style="list-style-type: none"> • Basics of C/C++/OOPS • Basics of Data Structures • Basics of Computer Architecture <ul style="list-style-type: none"> • Digital Logic • Networking Concepts • Common Applications such as MS Office • General Awareness about input/output devices

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<https://www.instamojo.com/wishkaushik/cocubes-computer-fundamentals-questions-from/> Coding Module (30 min)

Topics	Expected Questions
Vocabulary	Writing codes to solve a set of problems in language of choice : C, C++, C#, Java

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QUESTIONS

1. The cost price of 10 articles is equal to the selling price of 9 articles. find the profit percent.

- a. $101/9\%$ b. $100/9\%$ c. $102/9\%$ d. $103/9\%$

Ans: $100/9\%$

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Let Cost Price be x and selling price be y

Then given that cost price of 10 articles is equal to the selling price of 9 articles

That means $10x=9y$

$$Y=10x/9$$

$$\text{Profit percent} = ((\text{selling price} - \text{cost price}) / \text{cost price}) * 100$$

$$= 100/9 \%$$

2. The ratio of radii of two right circular cylinders is 6:7 and their heights are in the ratio 5:9.

The ratio of their respective curved surface areas is

- a. 14:15 b. 17:19 c. 23:29 d. 10:21

Ans: 10 : 21

Curved surface area of a cylinder = $2 * \pi * r * h$

$$\text{Ratio} = (6/7) * (5/9) = 10:21$$

3. In how many ways can the 7 letters A,B,C,D,E,F and G be arranged so that C and E never together.

- a. 5040 b. 6480 c. 3600 d. 1440

Ans: 3600

C and E never together = Total arrangements – C and E together
Total arrangements are $7!$

C and E together = pack c and e into one unit + 5 other alphabets = $6! 2!$ ($2!$ is two arrange c and e internally)

$$\text{C and E never together} = \text{Total arrangements} - \text{C and E together} = 7! - 6! 2! = 3600$$

4. How many numbers are there in all from 4000 to 4999 (both 4000 and 4999 included) having at least one of their digits repeated?

- a. 356 b. 216 c. 496 d. 504

Ans: 496

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Atleast one of their digits repeated = Total numbers – None of the digits repeated

Total numbers from 4000 to 4999 = 1000

None of the digits repeated = _ _ _ _

There are total 4 places

1st place is filled with 4 only. So only one choice

2nd place is filled with any 9 digits except 4 as we have used 4 in 1st place.
 So 9 choices Similarly 3rd place is filled with any 8 digits. So we have 8 choices
 4th place is filled with any 7 digits. So we have 7 choices.

So total arrangements = $1 * 9 * 8 * 7 = 504$

Ans = $1000 - 504 = 496$

5. if $\frac{1}{2}x + \frac{1}{4}x + \frac{1}{8}x = 14$ Then the value of x is:

a. 8 b. 12 c. 4 d. 16

Ans: $x = 16$

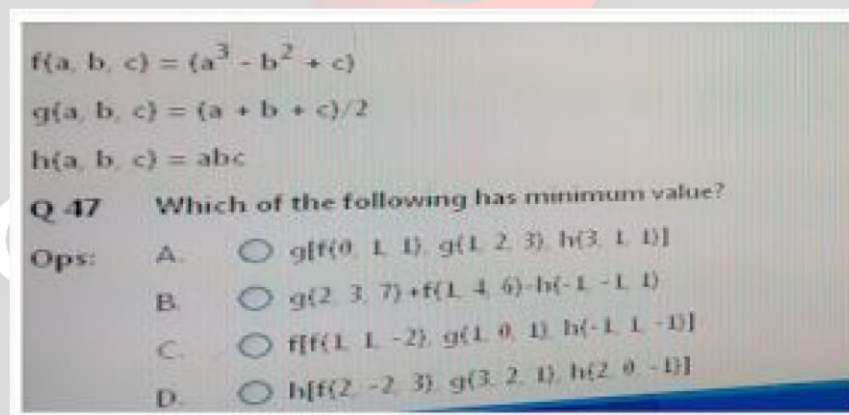
6. Which of the following expressions will always be true?



(Image taken while taking Cocubes Test)

Ans: D

Verify from options



(Image taken while taking Cocubes Test)

Ans(C)

8. Find the value of $h[f(1,2,3), g(2,1,-2), h(1,-1,-1)]$.

- a. 0.5 b. none c. 1 d.
0

Ans(D)

9. A trapezium with an area of 5100 cm^2 has the perpendicular distance between the two parallel sides of 60m . if one of the parallel sides be 40m . find the length of the other side. a. 130 m b. 110 m c. 120 m
d. 145 m

Ans: 130 m

Area of a trapezium = $(1/2) (a+b) h$

10. Find the simple interest on Rs. 306.25 from March 3rd to July 27th(In the same year) at 3.75 percent.

- a. Rs. 4.57 b. Rs. 4.59 c. Rs. 4.53 d. Rs 4.58

Ans: 4.59

from March 3rd to July 27th(In the same year) = 146 days

$$(306.25 * 146 * 3.75) / (365 * 100) = 4.59$$

11. Dhruv and Naksh drive at the speeds of 36 Kmph and 54 kmph respectively. If Naksh takes 3 hours lesser than what Dhruv takes for the same distance. Then distance is : a. 324 km b. 524 km c. 320 km d. 420 km

Ans: 324 km

Let dhruv takes t hours then naksh takes $t-3$ hours

Because distance is same in both cases So $36 * t = 54 (t-3)$

$$t=9$$

$$\text{ans: } 36 * 9 = 324 \text{ km}$$

12. The radius of wheel of axis's car is 50 cm . What is the distance that the car would cover in 14 revolutions?

- a. 11 m b. 22 m c. 33 m d. 44 m
 Ans: 44 m

Distance covered in one revolution is equal to wheel surface area = $2 * \pi * r$
 Distance covered in 14 revolutions = $14 (2 * (22/7) * 50) = 44000 \text{ cm} = 44 \text{ m}$

13. P can do a piece of work in 5 days of 8 hours each and Q can do in 4 days of 6 hours each.

How long will they take do it working 5 hours a day?

- a. 2 days b. 3 days c. 4 days d. 5 days

Ans: 3 days

P can do in $5 * 8 \text{ hours} = 40 \text{ hours}$

Q can do in = 24 hours

Working together in one hour = $(1/40) + (1/24) = 1/15$

Total work can be finished in 15 hours

They 5 hours a day so total number of days = $15/5 = 3 \text{ days}$

14. Libra had three diamond weighing equal. One of the diamond fell and broke into 4 equal pieces weighing 20gm each. what was the total weight of three diamonds. a. 200 gm b. 280 gm c. 320 gm d. 240 gm

Ans: $20 * 4 * 3 = 240 \text{ gm}$

16. if the antecedent and consequent of a ratio are increased by 5 and 6 respectively then the

ratio is 5:6. find the original ratio. a. 5:6 b. 1:2
 2:3 d. 3:4

Ans: let's say original ratio is x:y

$$(x+5)/(y+6) = 5/6$$

$$\text{Then } x/y = 5/6$$

17. Rohit and Rahul start from the same point and move away from each other at right angle. After 4 hours they are 80 km apart. if the speed of Rohit is 4 kmph more than Rahul. what is the speed of Rohit?

- a. 16 kmph b. 20 kmph c. 12 kmph d. none

Ans: x is the speed of rahul then (x+4) will be rohit speed

$$80^2 = (4x)^2 + ((x+4)4)^2$$

$$X=12$$

$$\text{Rohit speed} = 12 + 4 = 16\text{kmph}$$

18. Abhimanyu and supreet can together finish a work in 50 days. They worked together for 35 days and then supreet left. After another 21 days, Abhimanyu finished the remaining work. In how many days Abhimanyu alone can finish the work?

- a. 70 days b. 75 days c. 80 days d. 60 days

Ans: 35 days worked together + 21 days abhimayu worked = finished the work

$$35(1/50) + 21(x) = 1$$

$$X=70 \text{ days}$$

19. if two fair dice are thrown simultaneously. then what is the probability that sum of the numbers appearing on the top faces of the dice is less than 4? a. 6/14 b. none c. 1/12 d. 3/18

Ans: possible cases are (1,1) (1,2) and (2,1) = 3

$$3/36 = 1/12$$

20.

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(Image taken while taking Cocubes Test)

1. 3 individuals John Wright, Greg Chappell and Gary Kristen are in the race for the appointment of new coach of Team India. The probabilities of their appointment are 0.5, 0.3 and 0.2 respectively. If John Wright is appointed then probability of Ganguly appointed as a captain will be 0.7 and corresponding probability if Greg Chappell or Gary Kristen is appointed are 0.6 and 0.5 respectively. Find the overall probability that Ganguly will be appointed as a captain.

- a. 0.63 b. 0.35 c. 0.18 d. 0.89

Ans: 0.63

22. A man spends Rs 660 on tables and chairs. The price of each table is Rs. 150 and the price of each chair is Rs. 20. If he buys the maximum number of tables, what is the ratio of chairs to tables purchased?

- a. 2:5 b. 3:5 c. 2:3 d. 3:4

4 tables + 3 chairs = 660

Chairs to tables ratio is 3:4

23. Two packets are available for sale.

Packet A: Peanuts 100 gms for Rs 48

only Packet B: Peanuts 150 gms for

Rs 72 only which is a better buy?

- a. both have the same value b. Packet B c. data insufficient d. Packet A

Ans: a. both have the same value

Packet-A : 1 gm cost = $48/100$

Packet-B : 1 gm cost = $72/150$

24. find the surface area of a piece of metal which is in the form of a parallelogram whose base is 10 cm and height is 6.4 cm
 a. 64 cm² b. 65 cm² c. 45 cm² d. 56 cm² Ans:

25. Sridevi is younger than Rajeev by 4 years. if their ages are in the ratio of 7:9. how old is Sridevi? Ans: if Sridevi is x then Rajeev will be (x+4) $\frac{x}{x+4} = \frac{7}{9}$ x=14

26. A sum of Rs. 900 amounts to Rs. 950 in 3 years at simple interest. If the interest rate is increased by 4%, it would amount to how much?

27. two trains for Palwal leave Kanpur at 10a.m and 10:30 am and travel at the speeds of 60 kmph and 75 kmph respectively. After how many kilometres from Kanpur will the two trains be together?

Ans: 150 km

28. $(x + 1/x) = 6$ the value of $(x^5 + 1/x^5) = ?$

Ans: 6726

29. In how many ways can 44 people be divided into 22 couples?

Ans: Short cut how many ways n people be divided into n/2 couples $\frac{(n!)}{\{(2!)^{n/2} (n/2)! \}}$ so ans is b. $\frac{(44!)}{\{(2!)^{22} (22)! \}}$

30. Find the remainder when $(x^3 + 4x^2 + 6x - 2)$ is divided $(x+5)$

Ans: -57

31. a solid cylinder has total surface area of 462 cm² . If total surface area of the cylinder is thrice of its curved surface area. then the volume of the cylinder is:

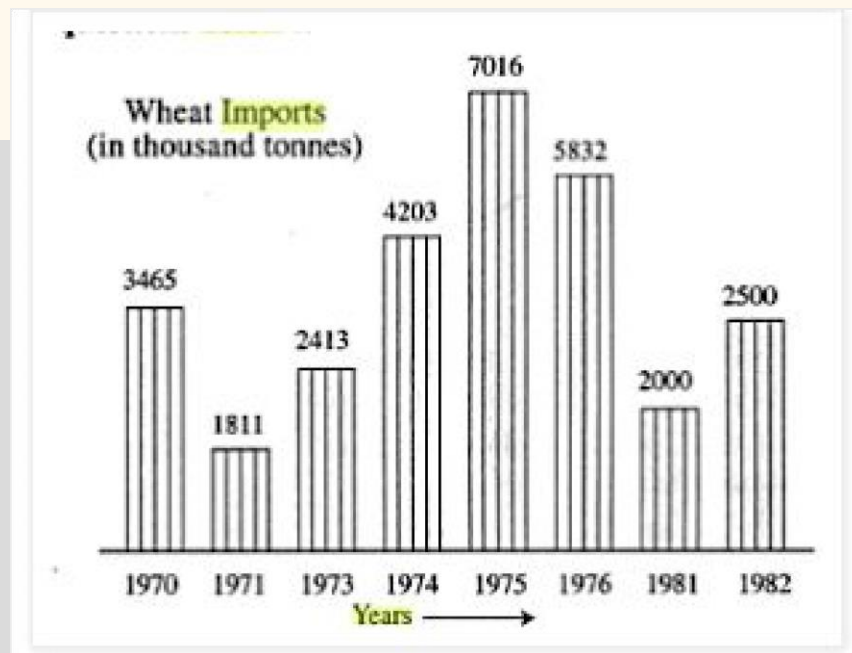
a. 539 cm³ b. 545 cm³ c. 531 cm³ d. 562 cm³

Ans: 539

32.

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In which year was there lowest wheat import?

- a. 1973 b. 1974 c. 1975 d. 1982

Ans: a

33. What is the ratio of number of years which have imports above the average imports to those which have imports below the average imports?

- a. 5:3 b. 2: 6 c. 3: 8 d. none

Ans: d

34. The increase in imports in 1982 was what percent of the imports in 1981?

- a. 25% b. 5% c. 125% d. 80%

Ans: a

35. The section of a solid right circular cone by a plane containing vertex and perpendicular to base is an equilateral triangle of side 10 cm. find the volume of the cone?

- a. 221.73 cm³ b. 223.73 cm³ c. 228.73 cm³ d. 226.61 cm³

36. A sum of Rs 468.75 was lent out at simple interest and at the end of 1 year and 8 months, the total amount of Rs 500 is recieved. find the rate of interest.

- a. 2%
b. 4% c. 1% d. 3%

Ans: 4%

37. Consider the following two curves in the X-Y plane

$$y = (x^3 + x^2 + 5) \quad y = (x^2 + x + 5)$$

Which of the following statements is true for $-2 \leq x \leq 2$?

- a. The two curves do not intersect. b. The two curves intersect thrice.
c. The two curves intersect twice. d. The two curves intersect once.

Ans: b

38. Give a model for maximising the profit in a company or minimising the loss in a conflict with optimisation techniques where quantity $f(x)$ is referred to as the object function while the vector 'x' consists of decision variables.

- A. None of the mentioned options. B. $x^* = \arg \min f(x)$ C. $x^* = \arg \max f(x)$ D. $x^* = \arg \min f(x)$

39. A positive integer is selected at random and is divided by 7, what is the probability that the remainder is 1?

- A. $3/7$ B. $4/7$ C. $1/7$ D. $2/7$

Ans: $1/7$

40. A mixture of 40 litres of salt and water contains 70% of salt. How much water must be added to decrease the salt percentage to 40%? A. 40 litres B. 30 litres C. 20 litres D. 2 litres

Ans: $x=30$

41. Anirudh, Harish and Sahil invested a total of Rs. 1,35,000 in the ratio 5:6:4. Anirudh invested his capital for 8 months. Harish invested for 6 months and Sahil invested for 4 months. If they earn a profit of

Rs. 75,900, then what is the share of Sahil in the profit? A. Rs. 12,400 B. Rs. 14,700 C. Rs. 15,800 D. Rs. 13,200

Ans: 13,200

42. A man sets out to cycle from Delhi to Rohtak and at the same time another man starts from Rohtak to cycle to Delhi. After passing each other they completed their journey in $(10/3)$ hours and $(16/3)$ hours respectively. At what rate does the second man cycle if the first cycle at 8 kmph?

- A. 6.12 kmph B. 6.42 kmph C. 6.22 kmph D. 6.32 kmph

Ans: 6.32

43. Two trains are travelling in opposite directions at uniform speeds of 60 kmph and 50 kmph. They take 5 seconds to cross each other. If the two trains travelled in the same

directions. then a passenger sitting in the faster moving train would have overtaken the other than in 18 seconds. what are the lengths of the trains?

A. 87.78 m and 55 m B. 112 m and 78 m C. 102.78 m and 50 m D. 102.78 m and 55 m
Ans: C

44. A cube is given with an edge of 12 units. it is painted on all faces and then cut into smaller cubes of edge of

4 units. How many cubes will have 2 faces painted? A. 2 B. 12 C. 8 D. 0

45. Two numbers are in the ratio $x:y$, when 2 is added to both the numbers, the ratio becomes $1:2$. when 3 is subtracted from both the numbers, the ratio becomes $1:3$. Find the sum of x and y .

A. 27 B. 24 C. 28 D. 26

Ans: 26

46. To earn extra profit, a shopkeeper mixes 30 kg of dal purchased at Rs. 36/kg and 26 kg of dal purchased at Rs. 20/kg. What will be the profit that he will make if he sells the mixture at Rs. 30/kg?

A. Rs. 60 B. Rs. 80 C. Rs. 50 D. Rs. 100

Ans: 80

47. There are 4 boys and 3 girls. they sit in a row randomly. what is the probability that all girls are together?

A. $\frac{1}{14}$ B. $\frac{2}{14}$ C. $\frac{5}{14}$ D. $\frac{3}{14}$

Ans: $\frac{2}{14}$

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48. An oblong piece of ground measures 19m 2.5 dm by 12m 5dm. From centre of each side of the ground, a path 2 m wide goes across to the center of the opposite side. What is the area of the path?

A. 59.5 m² B. 54 m² C. 43 m² D. 34 m²

Ans: 78.54

49. The circumference of the wheel of a truck is 1 meter. To cover a distance of 1.5 km, the number of revolutions made by the wheel are: A. 3000 B. 37
C. 1500 D. 750 Ans: 1500 revolutions

50. If $(x + (1/x)) = 4$, the value of $(x^5 + (1/x^5))$ is: A. 724 B. 500 C. 752 D. 525
Ans: 724

Read the information given below in the table and answer the question that follow.

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Year	Gross turnover in lakh	Profit before int. and depr.	Interest in lakh	Depreciation in lakh	Net profit Lakh
1980-81	1380	380.92	300.25	69.90	10.67
1981-82	1401	404.98	315.40	71.12	18.46
1982-83	1540	520.03	390.85	80.12	49.16
1983-84	2112	599.01	444.44	88.88	65.59
1984-85	2520	811	505.42	91.91	212.78
1985-86	2750.99	920	600.20	99	220.80

Read the information given below in the table and answer the question that follow.

Year	Gross turnover in lakh	Profit before int. and depr.	Interest in lakh	Depreciation in lakh	Net profit Lakh
1980-81	1380	380.92	300.25	69.90	10.67
1981-82	1401	404.98	315.40	71.12	18.46
1982-83	1540	520.03	390.85	80.12	49.16
1983-84	2112	599.01	444.44	88.88	65.59
1984-85	2520	811	505.42	91.91	212.78
1985-86	2750.99	920	600.20	99	220.80

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51. During which year did the net profit exceed Rs.1 crore for the first time?

A. 1985-86 B. 1983-84 C. 1984-85 D. None of the mentioned options
Ans: C

52. During which year was the "gross turnover" closest to thrice the profit before interest and depreciation? A. 1985-86 B. 1983-84 C. 1984-85 D. None of the mentioned options.
Ans: A

53. During which of the given years did the net profit from the highest proportion of the profit before interest and depression? A. 1985-86 B. 1983-84 C. 1984-85 D. None of the mentioned options. Ans: C

54. A sum was put at simple interest at certain rate for 3 years. Had it been put at 1% higher rate it would have fetched Rs. 63 more. The sum is: A. Rs. 2,400 B. Rs. 2,100 C. Rs. 2,200 D. Rs. 2,480 Ans: 2,100

55. For what value of "k" will the equation $(2kx^2 + 5kx + 2) = 0$ have equal roots?
A. $\frac{2}{7}$ B. $\frac{9}{4}$ C. $\frac{16}{25}$ D. $\frac{7}{18}$
Ans: C

56. In triangle PQR, PQ=6 cm, PR=8 cm and QR=12 cm. Calculate the area of the triangle PQR.
A. 23.33 cm² B. 17.5 cm² C. 21.33 cm² D. 28.67 cm²
Ans: 21.33

57. A company named "Dyona Automobiles" has received an order for 5,000 widgets for a total sale price of \$5,000 and wants to determine the gross profit that will be generated by completing the order.

The other details for producing 100,000 widgets are given as follows:

1. Raw Materials Costs-\$10,000

2. Direct Labor Costs-\$50,000

A. \$5,000 B. \$4,000 C. \$3,000 D. \$2,000

58. If $m = (2 - \sqrt{3})$, then the value of $(m^6 + m^4 + m^2 + 1) / m^3$ is:

A. 64 B. 56 C. 69 D. 52

59. 28 children can do a piece of work in 50 days. How many children are needed to complete the work in 30 days?

A. 49 B. 40 C. 35 D. 45

Ans: 49

60. A certain sum of money becomes Rs.750 in 2 years and becomes Rs.873 in 3.5 years. Find the sum and rate of interest. A. Rs.400, 13% p.a B. Rs.500, 11% p.a C. Rs.630, 12% p.a D. Rs.600, 13% p.a

Ans: 586, 14%

61. Henna invested Rs.5000 at 12% simple interest p.a. the interest she will receive after 2 years is:
A. Rs.800 B. Rs.1000 C. Rs.600 D. Rs.1200

Ans: $(5000 \times 12 \times 2) / 100 = 1200$

62. A bag contains 3 red, 5 yellow and 4 green balls. 3 balls are drawn randomly, what is the probability that the ball drawn contains no yellow ball? A. $9/44$ B. $37/44$ C. $43/44$ D. $7/44$ Ans:

Probability = $35/12C3 = 7/44$

63. If $a^2 + b^2 - 4(a+b) = -8$, then the value of $(a-b)$ is: A. 4 B. 0 C. 2 D. 8
64. A lent Rs.600 to b for 2 years and Rs.150 to C for 4 years and receive all together Rs.90 as both as interest. Find the rate of interest. A. 4% p.a B. 2% p.a C. 5% p.a D. 3% p.a Ans: 5%

65. If the perimeter and the diagonal of a rectangle is 18 cm and $\sqrt{41}$ cm respectively. Calculate the area of the rectangular field. A. 25 cm² B. 29 cm² C. 18 cm² D. 20 cm² Ans:

$$2(a+b) = 18$$

$$(a+b) = 9$$

$$\sqrt{a^2 + b^2} = \sqrt{41} \quad (a+b)^2 =$$

$$a^2 + b^2 + 2ab \quad ab = 20$$

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66. A, B, and C enter into a partnership and their shares are in the ratio $1/2 : 1/3 : 1/4$. After 2 months, A withdraws half of his capital and after 10 months, a profit of RS. 378 is divided among them. What is B's share? A. Rs.144 B. Rs.156 C. Rs.166 D. Rs.129

67. If $a:b = 4:1$, then $\sqrt{a/b} + \sqrt{b/a}$ is :

A. 1 B. $4/5$ C. None of the mentioned options D. $5/4$

Ans: $5/2$

68. A cube is given with an edge of 12 units. It is painted on all faces and then cut into smaller cubes of edge of 4 units. How many cubes will have 2 faces painted?

A. 8 B. 12 C. 0 D. 2

69. Find the area of Rhombus one of whose diagonals measures 8 cm and the other 10 cm. A. 47 cm^2 B. 34 cm^2 C. 40 cm^2 D. 64 cm^2

70. Rs 5000 was divided among 5 men, 6 women and 5 boys, such that the ratio of the shares of men, women and boys is $5:3:2$ what is the share of the boy? a. 200 b. 100 c. 250 d. 150

Ans: 200

The ratio of shares of groups of men, women and boys = $5 : 3 : 2$

So share of boys is = $(2/10) * 5000 = 1000$

Share of a boy = $1000/5 = 200$

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71. If 28 Men working 6 hours a day can finish a work in 15 days. In how many days can 21 men working 8 hours per day will finish the same work?

a. 24 days b. 21 days c. 18 days d. 15 days

Ans: 15 days

Work = $28 * 6 * 15$ --- (1)

Work = $21 * 8 * x$ --- (2)

Equating (1) and (2)

$28 * 6 * 15 = 21 * 8 * x$

X= 15

72. A train is running at the rate of 60 kmph. A man is also going in the same direction on a track parallel to the rails at a speed of 45 kmph. If the train crosses man in 48 seconds, the length of the train is? a. 50m b. 150m c. 100m d. 200m

Ans: 200 m

Speed = distance/time;

Distance= speed * time

= (60-45) * 48 * (5/18) (relative speed in same direction is $s_1 - s_2$ and kmph to m/sec $\times 5/18$)
= 200m

73. Find the last two digits of the expansion $(212n - 64n)$ when n is a positive integer?
a. 5 b. 11 c. 10 d. 00

Ans: 00

Assume $n=1$

Then answer is 00

74. Read the information given below and answer the questions that follow

$(a\$b) = (a+b)/2$

$(a\&b) = (a^2 - b^2)$

$(a?b) = (a-b)/2$

What is the value of

$[(22\$4)\&(25?15)]$? a. 154 b. 144

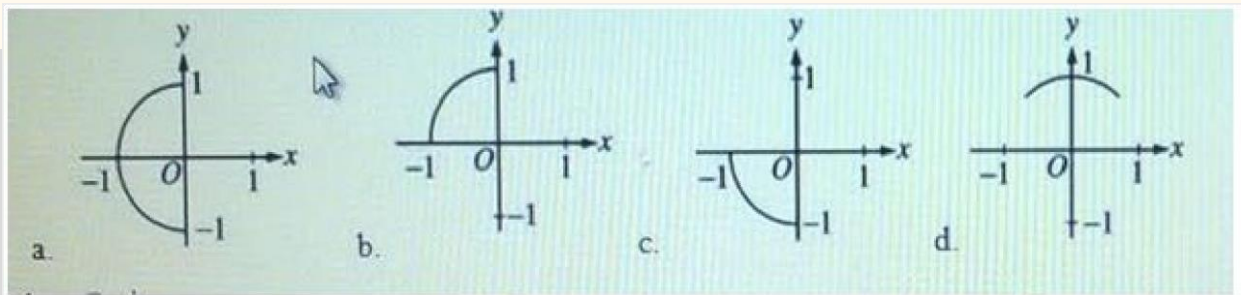
c. 112 d. 125

Ans: 144

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75. Which of the following graph indicates the graph of $\{(\sin t, \cos t) : -\pi/2 \leq t \leq 0\}$ in xy-plane?



a. D b. C c. B d. A

Ans: B

When $t = -90$ then $(\sin t, \cos t) = (-1, 0)$

When $t=0$ then $(\sin t, \cos t) = (0, 1)$

Plot above two points in x-y plane.

Answer: Option (C)

Ans: B

When $t = -90$ then $(\sin t, \cos t) = (-1, 0)$

When $t=0$ then $(\sin t, \cos t) = (0, 1)$

Plot above two points in x-y plane.

Answer: Option (C)

76. There are 4 boys and 3 girls. They sit in a row randomly, what is the probability that all the girls are together?

a. $1/14$ b. $3/14$ c. $2/14$ d. $5/14$

Ans: $2/14$

Probability = (favourable cases / total cases)

Favourable cases = girls together.

= 4 boys + 1 (assume 3 girls as 1) = $5! \cdot 3!$ (girls can be arranged in $3!$)

Ways) Total cases = $7!$

So probability = $(5! * 3!)/7! = 1/7$

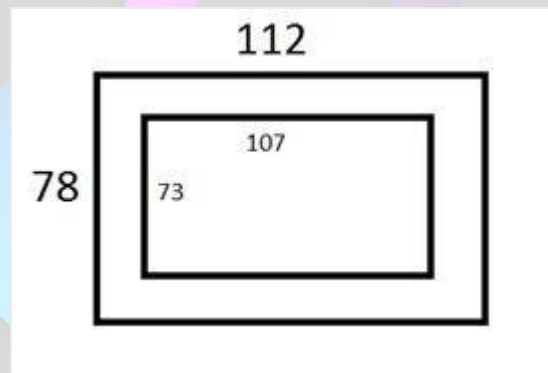
77. The simple interest on Rs. 4,500 for 4 years at 15% p.a is:

a. Rs. 2700 b. Rs. 2500 c. Rs. 2300 d. Rs. 3000

Ans: 2700

Simple interest = $(P * T * R) / 100$

Ans: 2700



78. A rectangular grassy plot is 112 m by 78 m. It has a gravel path 2.5 m wide all around it on the inside.

Find the area of the path

a. 952 m² b. 926 m² c. 912 m² d. 950 m²

Ans: 925 m²

This question is very very important

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Area of the path = $(112 * 78) - (73 * 107) = 925 \text{ m}^2$

79. A cone of height 21 cm has a volume of 2200 cm³. Determine the base

radius of the cone a. 2.5 cm b. 10 cm c. 7.5 cm d. 5 cm

Ans: 10 cm

Volume of cone = $(1/3) \pi r^2 h = 2200$

$r=10$ cm

80. what is the radius of the circular plate of thickness 1cm made by melting a sphere of radius 3cm?

A. 6 cm B. 5 cm C. 4 cm D. 7 cm

Ans: 6 cm

Volume of a sphere = $(4/3) \pi r^3$ --(1) (here $r=3$ cm)

Volume of circular plate of thickness 1 cm is $= \pi r^2 h$ -- (2) (here $h=1$ cm that is thickness) Equating (1) and (2) $r=6$ cm

81. what is the ratio of the surface area formed by placing 3 cubes adjacent to the sum of the individual surface area of these 3 cubes?

A. 7:9 B. 27:23 C. 49:81 D. 9:7

ANS: Volume of a cube = $6a^2$

Volume of 3 cubes = $18a^2$

Volume of three cubes placing adjacent each other = $6a^2+5a^2+5a^2= 16a^2$

Ratio = $16/18 = 8:9$

82. At what rate percent CI does a sum of money become nine fold in 2 years?

a. 100% p.a b. 300% p.a c. 400% p.a
d. 200% p.a Ans: $P(1+(r/100))^2 = 9P$ $r=200\%$

83. x, y, z rent an area for Rs. 10,000 per annum. X puts 312 horses in the area for 4 months, y puts 124 horses in the area for 2 months and puts 520 horses for 6 months. what % of the total question should y pay? a. 27.03% b. 67.59% c. 5.37% d. 16.7%
Solution: rent for an year = 10,000 rent for a month = $10,000/12=833$ for 2 months = $(1665/10,000)*100=16.7\%$

84. the SI on a sum of Rs. 12,000 at a rate of 15% p.a is Rs. 5,400. determine the time for which the sum is borrowed,

a. 2 years b. 3 years c. 1.5 years d. 2.5 years

Solution: $SI = PTR/100$

$5400 = (1200 * 15 * T)/100$

$T=3$

85. In a single throw of a fair dice, what is the probability that the no appearing on the top face of the dice is more than 2?

a. $1/3$ b. $3/4$ c. $2/3$ d. $1/2$

Ans: here, probability more than that the no is more than 2 is 4.
 so, we know that the formula.. $p(x) = \frac{\text{no. of favourable cases}}{\text{no. of outcomes}}$ so, it is $\frac{4}{6} = \frac{2}{3}$ option C.

86. if $x=12$, $y=4$, then find the values of $(x+y)^{x/y}$

a. 8009 b. 4096 c. none d. 1024

Ans: Here, $12+4$ is 16 and it is written as 2^4 , then $12/4$ is 3, so now it is $2^{\text{power } 12}$ so ans is 4096.

87. The salary of ramu is 3 times the salary of raju's salary increases by 20% every month & ramu's salary decreases by 10% every month, what is the ratio of salary of raju to ramu after 2 months? a. 15:24 b. 17:28 c. 14:23 d. 16:27

Ans: let salary of raju is P

Then ramu's salary is 3P

After 2 months raju's salary becomes $P(1+20/100)^2$ -- (1)

After 2 months ramu's salary becomes $3P(1+20/100)^2$ -- (2)

Ratio = (1)/(2) = 16:27

88. There are 2 vessels which are filled with milk of 2 qualities worth Rs.10 per litre and Rs.11 per litre. In what approximation ratio these two be mixed to get a new quality of milk of worth Rs.10.67 per litre? a. 12:3 b. 1:3 c. 1:2 d. 2:1 ans: 1:2

$(10*1+11*2)/1+2 = 10.66666$ (approx 10.67) by option verification.

89. A sum of Rs.5000 was divided among P, Q and R in the ratio of 2:3:5. If the amount of Rs 500 was added to each, what will be their new ratio?

Options: a) 3:4:6 b) 3:5:4 c) 3:4:5 d) 2:3:4

Divide 5000 in the ratio of 2:3:5 then 1000, 1500, 2500

Add 500 to 1000, 1500 and 2500 then 1500: 2000: 3000

3:4:6

90. There are two vessels which are filled with milk of two qualities worth Rs10 per liter and Rs 11 per liter. In what approximate ratio, these two be mixed to get a new quality of milk of worth Rs 10.67 per liter?

Options: a) 1:3 b) 1:2 c) 2:3 d) 2:1

Ans: $10 * x + 11 * y = (x+y) * 10.67$ (Assume x & y quantity in vessels 1 & 2 respectively)

Solve for $x/y = 1:2$

91. The retail price of a toothpaste of 140 grams is Rs 40, the shopkeeper gives a toothbrush whose actual price is Rs 10, free with it and still gains 25%. The cost price of the toothpaste is :

Options: a) Rs.36 b) Rs.24 c) Rs. 30 d) none of the mentioned options.

Ans: Selling price = 40 – 10 = 30 Rupees.

Let cost price = x ;

Selling price = cost price + profit on cost price

$$30 = x + 25\% \text{ of } x;$$

$$X = 24$$

92. The section of a solid right circular cone by a plane containing vertex and perpendicular to base is an equilateral triangle of side 10 cm. Find the volume of the cone? Options: a) 226.61 cm^3 b) 223.73 cm^3 c) 228.73 cm^3

Answer is 326.61 cm^3

93. 5 boys and 5 girls were made to sit around a round table alternatively. How many of such arrangements are possible?

Options: a) 14400 b) 7200 c) 28800 d) 1152

Ans: In general, the number of ways of arranging n objects around a round table is $(n-1)!$ Arranging girls is $4!$ Then arranging boys is $5!$ So total is 2880

94. Determine the speed of a train of length 240 meters if it crosses a pole in 15 seconds. Options: a) 44.4 kmph b) 57.6 kmph c) 33.3 kmph d) 22.2 kmph speed = distance/time

Ans: 57.6

95. For $p = 5$ and $q = -5$, the value of $(9p^2 + 36pq + 36q^2)$ is:

Options: a) 900 b) 15 c) 30 d) 225

Ans: $(3p + 6q)^2$

Ans: 225

96. For all integral values of n , the expression $((7^{2n}) - (3^{2n}))$ is a multiple of:

Options: a) 10 b) 31 c) 12 d) 22

Ans: take $n=1$ then verify options

Ans: 10

97. A sum of money at CI amounts to thrice itself in three years. In how many years will it be 9 times itself? Options: a) 6 years b) 2 years c) 5 years d) 3 years

Ans: $P(1+r/100)^3 = 3P$

So $(1+r/100)^3 = 3$

To become 9 times squaring on both sides

$(1+r/100)^6 = 9$

So 6 years

98. A 3 digit number is formed with the digits 1,3,6,4 and 5 at random with no digits being repeated in the same number. What is the chance that the number formed is divisible by 2?

Options: a) $4/5$ b) $3/5$ c) $2/5$ d) $1/5$

Ans: Total cases = $5 \times 4 \times 3 = 60$

— — —

3rd digit should be filled either by 6 or 4 so two ways

First place is filled with 4 ways as we have used one digit in 3rd place
Second digit is filled with 3 ways.

So favourable cases = $2 \times 4 \times 3 = 24$

Probability = $24/60$

99.

C4 PROJECTS

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TOTAL SALES IN 2013 = Rs. 500 lakhs
TOTAL SALES IN 2014 = Rs. 600 lakhs.

100. What is the difference in revenue earned by stamps in two years?

Options: a) 16 lakhs b) 10 lakhs c) 14 lakhs d) 12 lakhs

Ans: 14 lakhs

101. The revenue earned by pads in the year 2013 is what percent of the revenue earned by gloves in the year

2014? Options: a) 83.3% b) 58.5% c) 43.3% d) 72.5%

Ans: 83.3%

102. What is difference between the revenue earned by pads in 2014 and revenue earned by balls in 2013?

Ans: 7 lakhs

103. W and Z throw one dice for a stake of Rs.40, which is to be won by the player who first throws a one. The game ends when the stake is won by W or Z if W has the first throw, what are the chances that the stake is won by Z?

a.5/11 b.1/2 c.1/3 d.5/12

Adminstrator-signed Rules by Regulatory Stages,2005-2010

104. What is the average of NPRM, Direct Final, and Final rules in 2008? a.52.33 b.45.33 c.54.33 d.40.33

Ans: 45.33

105. What is the ratio of 2006 NPRM to 2005 Final Rules?

a.none of the mentioned options b.79:41 c.71:49 d.49:71

Ans: 71.49

106. what is the average of 2005,2008 and 2010 for all stages? a.38.33 b.39.46 c.52.57 d.none of the mentioned options

107. Six different objects were divided among 4 people. In how many ways it can be done, if there is no restriction on minimum number of objects that each person can get? a.23 b.72 c.64 d.84

Ans: $(6+4-1)C(4-1) = 9C3 = 84$

108. A Rectangular hall 12m long and 10m broad is surrounded by a verandah, 2m wide. Find the area of the verandah. a. 105m² b. 104m² c. 89m² d. 123m²

Ans: Similar to Q.no 78 : $(16*14) - (10*12) = 104$

109. Two circular cylinders of equal volume have heights in the ratio of 1:2. Ratio of their radii is: a. 1.414:1 b. None of the mentioned Options c. 1.69:1 d. 1.732:1 Ans: 1.414 : 1

110. If $s(s+s_1+s_2)=9$, $s_1(s+s_1+s_2)=16$ and $s_2(s+s_1+s_2)=144$, then the what is the value of "s"? a. 7/11 b. 1/11 c. 11/13 d. 9/13

Ans: Let $s+s_1+s_2 = x$;

Then $s(x)=9$ --(1)

$s_1(x)=16$ -- (2)

$s_2(x)=144$ --(3)

Add above three equations

$s(x)+s_1(x)+s_2(x)=9+16+144$ $x(s+s_1+s_2) = 169$ $x^2=169$

$x=13$

substitute x value in equation(1) so $s=9/13$

111. Atul sold two mobiles for Rs.9900 each. At one mobile, he gained 10% and on other he lost 10%. Find his gain or loss in transaction. a. Loss 1% b. Neither loss Nor gain c. Gain 1% d. none of the mentioned options

Ans: When a person sells two similar items, one at a gain of say x%, and the other at a loss of x%, then the seller always incurs a loss given by:

Loss % = $X^2/100$

Ans: Loss 1%

112. three pipes can fill the tank in 18 hours. One of the pipes can fill it in 18 hrs and the other pipe can empty in 9 hours. At what rate does the third pipe work?

a. Waste pipe emptying the tank in 18 hours b. Filling the tank in 9 hours

c. Filling the tank in 18 hours d. Waste pipe emptying the tank in 9 hours

$1/18 = 1/18 - 1/9 + x$

$x=1/9$

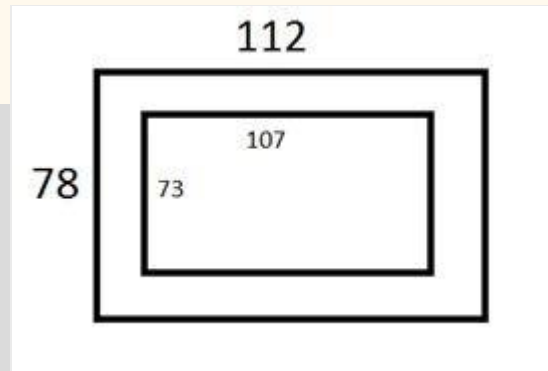
Ans: Filling the tank in 9 hours

113. A rectangular grassy plot is 112m by 78m. It has a gravel path 2.5m wide all around it on the inside. Find the cost of constructing it at Rs. 2 per m².

a. Rs. 2,300 b. Rs. 1,567 c. Rs. 1,850 d. Rs. 2,355

Similar Q.no 78.

This question is very very important



Area of the path = $(112 \times 78) - (73 \times 107) = 925 \text{ m}^2$

Cost = $925 \times 2 = 1850$

114. A man spend Rs. 660 on tablets and chairs, the price of each table being Rs.150, and the price of each chair being Rs.20. If he buys the maximum number of tables, what is the ratio of chairs to tables purchased? a. 3:4 b. 2:3 c. 2:5 d. 3:5

4 tables + 3 chairs = 660

Chairs to tables ratio is 3:4

115. A Shopkeeper allow a discount of 20% on the marked price but charges 5% sales tax on the marked price and 5% service tax on the discounted price. If the customer pays Rs. 2670 as price including tax, then what is marked price of the item? a. 3245 let x be the marked price $x - 20\% \text{ of } x + 5\% \text{ of sales tax} + 5\% \text{ of } (x - 20\% \text{ of } x) = 2670$ $x = 3000$

116. There are 4 boys and 3 girls. They sit in a row randomly what is the probability that all girls are together?

A. $1/14$ B. $3/14$ C. $2/14$ D. $5/14$ see

solution for Q.no 76 (ans : $2/14$)

117. The simple interest on Rs.4,500 for 4 years at 15% p.a. is:

A. Rs. 2700 B. Rs. 2500 C. Rs. 2300 D. 3000

Ans: 2700

118. A rectangular grassy plot is 112 m by 78 m. It has a gravel path 2.5m wide all round it on the inside.

Find the area of the path A. 925 m² B. 926 m² C. 912 m² D. 950

m² Ans: Q.no 78 (Ans: 925)

119. A cone of height 21cm has a volume of 2200 cm³. Determine the base radius of the cone. A. 2.5 cm B. 10 cm C. 7.5 cm D. 5 cm $\frac{1}{3} \pi r^2 h = 2200$ $r=10$

120. 3 individuals John Wright, Greg Chappell and Gary Kristen are in the race for the appointment of new coach of team India. The probabilities of their appointment are 0.5, 0.3, 0.2 respectively. If John Wright is appointed then probability of Ganguly appointed as a captain will be 0.7 and the corresponding probability if

Greg Chappell or Gary Kristen is appointed are 0.6 or 0.5 respectively. Find the overall probability that

Ganguly will be appointed as a captain? A. 0.18 B. 0.35 C. 0.63 D. 0.89

Ans: $0.5 * 0.7 + 0.3 * 0.6 + 0.2 * 0.5 = 0.63$

121. Study the following data carefully and answer the question that follows.

$$A \% B = (A+B)^2$$

$$A \# B = (A^2 - B^2)$$

$$A ? B = (A-B)^2$$

Question: Find the value of $5 ? (6 \% 2)$

A. -3481 B. 59 C. 3481 D. -59

123. what is the difference in revenue earned by stumps in two years? A. 12 lakhs B. 14 lakhs C. 16 lakhs D. 10 lakhs

124. the revenue earned by pads in the year 2013 is what percent of the revenue earned by gloves in the year 2014?

A. 58% B. 83% C. 43.3% D. 72.2%

125. what is the difference between the revenue earned by pads in 2014 and revenue earned by balls in 2013? A. 3 lakhs B. 7 lakhs C. 5 lakhs D. 1 lakh

126. what will be unit's digit in the result of the expression $365 * 653 * 95$?

A. 6 B. 2 C. 3 D. 7

Ans: 2

127. if x and y throw a pair of dice alternately .x wins if the throws 4 before y throws 5 and y wins. If she throws 5 before x throws 4. Find y's chance of winning if x makes the first throw
A. $\frac{1}{3}$ B. $\frac{1}{2}$ C. $\frac{5}{11}$ D. $\frac{5}{12}$

128. A train 1200m long crosses a platform in 1.5 min at a speed of 54 kmph . what is the length of the platform?

A. 150m B. 120m C. 175m D. 100m

Ans: A

129. a cow gives 4 liters of milk daily ,but this is only $\frac{1}{3}$ rd of what a herd of cows gives daily. if 24 liters of milk is collected in 2 days ,the number of cows in the herd is

A. 6 B. none of the mentioned options C. 3 D. 2

Ans: 3

130. if $(x + \frac{1}{x}) = 6$, the value of $(x^5 + \frac{1}{x^5})$ is

A. 7302 B. 5473 C. 6726

Ans: . Shortcut : let $(x + \frac{1}{x}) = a$

Then $(x^5 + \frac{1}{x^5}) = a^5 - 5a^3 + 5a$

So answer : 6726

131. two trains of the same length but with different speeds pass a static pole in 4 sec and 5 sec respectively.

In what time will they cross each other .when they are moving in the same direction?

A. 3.22 sec B. 4.98 sec C. 4.44 sec D. 4.22 sec

Ans: Same direction : relative speed is $s_1 - s_2$

Opposite Direction: relative speed is : $s_1 + s_2$

$S_1 = \frac{l}{4}$

$S_2 = \frac{l}{5}$

Same direction: time = distance/speed

$= \frac{2l}{s_1 - s_2}$;

Substitute s_1 and s_2 values in above equation, we get 40 seconds But no option contains this answer.

Assuming that given question is for opposite direction then we get answer as 4.44 sec. So choose 4.44 seconds as answer

132. A person covers a distance in 40 min .if he runs at a speed 45 kmph on a average . find the speed at which he must run to reduce the time of journey to 30 min

A. 40 kmph B. 30 kmph C. 50 kmph D. 60

kmph Ans: $40 * 45 = 30 * x$; Find x value .

Ans: 60

133. a sum of RS. 5000 was divided among P,Q and R in the ratio 2:3:5. If the amount of RS.500 was added to each ,what will be their new ratio ?

A. 3:4:6 B. 3:5:4 C. 3:4:5 D. 2:3:4

Ans: Divide 5000 in the ratio of 2:3:5 then 1000, 1500, 2500

Add 500 to 1000, 1500 and 2500 then 1500: 2000: 3000

3:4:6

134. there are two vessels which are filled with milk of two quantities worth RS.10 per litre and RS. 11 per litre .in what approximate ratio these two be mixed to get a new quality of milk of worth RS.10.6 litre?

A. 1:3 B. 1:2 C. 2:3 D. 2:1

Ans: $10 * x + 11 * y = (x+y) * 10.6$ (Assume x & y quantity in vessels 1 & 2 respectively)

Solve for $x/y = 2:3$

135. A man walking with a speed of 5kmph reaches his target 5min late. If he walks at a speed of 6kmph, he reaches on time. Find the distance of the target from this house.

2.5km 3km 1.5km 4km

Ans: distance= $5 * (t+5/60)$

Distance = $6 * t$

Equate above two

equations $t=5/12$ distance

= $6 * (5/12) = 2.5$ km

136. If $m=3-2$, then the value of $-(1/)$ is:

1 2 2 -1

Ans: $-(1/)$ = x

Squaring on both sides

$m+1/m-2=x^2$ so

$x=2$

137. If radius of circle is increased by 5% then the percentage increase in its area is:

8.25% 10.25% 25% 9.32%

Ans: let's original radius is 100

Then new radius is 105

Original area= $\pi \times 100 \times 100 = x$

New area is = $\pi \times 105 \times 105 = y$

%increase= $\frac{(y-x)}{x} \times 100$

Ans= 10.25

138. What is the total number of ways of selecting at least one object from 2 sets of 10 distinctly different objects?

220-1 100 (210-1)2 120

139. Read the info given below and answer the question that follow:

$(a \& b) = (a+b)/2$

$(a \& b) = (a^2 - b^2)$

$(a ? b) = (a-b)/2$

What will be the value of $((a \& b) / (a \& b))^2 - (a \& b) (a ? b)$ at $a = 4$ and $b = 6$?

95/16 65/16 31/16 81/16

Ans: 81/16

140. Determine the speed of train of length 180cm if it crosses a pole in 5 sec.

190kmph 135.8kmph 129.6kmph 150.5kmph

Ans: 129.6 kmph

141. A certain number of men can do a work in 75 days. If there were 6 more men, it could be completed in 15 days less. How many men were there in the beginning?

30 men 27 men 24 men 21

men Ans: $x * 75 = (x+6) * 60$

Find x.

Ans= 24

142. The break up of energy consumption in various parts of a building, for the years 1990 and 2000, is given in the pie charts below. Study the pie-charts carefully and answer the following questions :

143. Between 1990 and 2000, what was the increase in energy use for the PC Room, Meeting Rooms space combined?

188 kWh 50 kWh Cant be determined 184 kWh

Ans: 50 KWH

144. If the total energy usage today is 6% lower than it was in 2000, by how much has today's usage reduced when compared to 1990? 0.178 0.171 Cant be determined 0.829

Ans: 0.171

145. Which space experienced the smallest change in energy use between 1990 and 2000?

Meeting Rooms PC Room Print Room Kitchen

Ans: Meeting rooms

146. 3 individuals John Wright, Greg Chappell and Gary Kristen are in the race for the appointment of new coach of team India. The probabilities of their appointment are 0.5, 0.3 and 0.2 respectively. If John Wright is appointed then probability of Ganguly appointed as a captain will be 0.7 and corresponding probability if Greg Chappell or Gary Kristen is appointed are 0.6 and 0.5 respectively. Find the overall probability that Ganguly will be appointed as a captain.

a. 0.63 b. 0.35 c. 0.18 d. 0.89

Ans: 0.63

147. We know that $p/q = r/s$ multiplies $p/r = q/s$. This property is known as: a. Componendo b. Dividendo c. Alterendo d. None of these

148. A polygon has 77 diagonals. Determine the number of sides.

a. 15 b. 12 c. 17 d. 14 Ans:

149. If $(m^4 + m^{-4}) = 47$, then determine the value of $(m + m^{-1})$.

a. 3 b. 1 c. -1 d. 0

Ans: 3

150. P lends Rs 3000 to Q and certain sum to R at 5% P.a Simple Interest. If after 4 years P altogether receives Rs 1200 as interest from Q and R then what was the sum lent to R?
a. 750 b. 1000 c. 500 d. 240 Ans:

151. The direct distance between City A and City B is 300 miles. The direct distance between City B and City C is 400 miles. What could be the direct distance between City C and City A?

a. Between 100 and 700 b. Less than 100 c. More than 900 d. More than 700 Ans: . There are two possibilities with the given data.

So answer is : a. Between 100 and 700

152. If the curved surface area of a cone is twice that of another cone and slant height of the second cone is twice that of the first. Find the ratio of the area of their bases. a. 2:3 b. 1:4 c. 4:1 d. 16:1

Ans: Curved surface area of a cone = $\pi * r * l$;

$$2l = (r_1 * l) / (r_2 * 2) \text{ so } r_1 / r_2 = 4/1$$

Answer: 4:1

153. What is the least number which when divided by 3,8,11,21 and 27 leaves a remainder of 5 in each case a. 149688 b. 16637 c. 125466 d. 1253

Lcm of (3,8,11,21,27) = 16632

Add 5 to 16632 = 16637

154. $(x+1/x)^4 = 14$ then $(x-1/x)^2$ is a. -2 b. 2 c. 4 d. -4

Ans: 2

155. A cone of slant height 20 cm has a curved surface area of 880 cm². Determine the base radius of the cone.

Curved surface area of a cone = $\pi * r * l$;

$$880 = (22/7) * r * 20$$

So r = 14

156. The ratio of three numbers is 4:5:6 and sum of their squares is 7700. What is the sum of the numbers. a. 100 b. 90 c. 120 d. 150 let the numbers be 4k,5k,6k Sum of their squares is 7700

$$16k^2 + 25k^2 + 36k^2 = 7700$$

K=10

Sum of their numbers = 4k+5k+6k = 15k = 150

Ans: 150

157. Two cone have their heights in the ratio 2:1 and their base radius in the ratio 1:4 . what will be their volumes ratio?

a. 2:1 b. 3:2 c. 2:3 d. 1:2 cone

$$\text{volume} = (1/3) * \pi * r * r * h$$

So volumes ratio = 1:8

158. if $m=2-\sqrt{3}$ then $(m^6+m^4+m^2+1)/m^3$ is

Apply denominator to individual terms then give equation becomes

$$m^3+m+1/m+1/m^3$$

$$1/m=2+\sqrt{3}$$

Ans: 56

159. Anitha has 3 novels and 4 dictionaries. Determine the number of ways in which all 7 books can be arranged on the shelf so that the books of the same kind must be kept together. a. 2120 b. 288 c. 144 d. 5040

Assume 3 novels as object-A and 4 dictionaries as object-B

Now keeping together means...

We can arrange A and B in two ways

A contains 3 novels, we can arrange 3! Ways internally

B contains 4 Dictionaries, we can arrange 4! Ways internally

So total = $2 \times 3! \times 4! = 288$ ways

160. A container contains a mixture having orange juice, pine apple juice and water in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{5}$. What is the approximate percentage of pine apple in the container? a. 20% b. 32% c. 30% d. 36%

Ans: lcm of (2,3,5) = 30

Multiply ratios with 30

15: 10: 6

Pineapple percentage = $(6/31) \times 100 = 20\%$

161. Read the information given below and answer the questions that follow.

$$X\%y = (y^2 - x^3) \quad X\&y = (x^2 - y^3) + (x\%y)$$

$$f(a) = (a^2 + a^3)$$

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what is the value of $((x\%y) - (x\&y)) / (x\%y) - 1$ where $x=2, y=1$?

(a) $11/7$ (b) $-3/7$ (c) $3/7$ (d) $-11/7$

Solution: $3/7$

162. The sum of three numbers is 98. If the ratio of first to second is 2:3 and that of the second to the third is 5:8 then the second number is : Solution:
 $a+b+c=98 \rightarrow (1) \ a/b=2/3 \rightarrow a=(2/3)b \rightarrow (2) \ b/c=5/8 \rightarrow c=(8/5)b \rightarrow (3)$

Substitute equations (2) and (3) in Equation(1) $b=30$

The basic fuel expenditure of a country is dominated by four major uses - Domestic, Transport, Industry and Electricity. In 2014, the total amount of energy used was equivalent to 600 million tonnes of coal. Directions:

Study the following graph carefully & answer the questions given below it.

163. The central angle for the energy consumed for others is a. 12 b. 15 c. 18 d. 9

Ans: 100 % it is 360

Then 5% is = $(360/100)*5 = 18$

164. What is difference between energy used for domestic and others in the country in 2014? a. 18 million b. 54 million c. 48 million d. 32 million

Ans: $13\% - 5\% = 8\%$ of 600 Million tonnes
 48 million

165. If the energy requirement of transport in 2014 were 220 million tonnes, the approximate amount of additional primary energy required would be

- a. 400 million tonnes of coal b. 750 million tonnes of coal
 c. 890 million tonnes of coal d. 1000 million tonnes of coal

Ans: let's say total primary energy is x

Then 22% of x = 220

$$(22/100) * x = 220$$

$$X=1000$$

$$\text{Ans: } 1000 - 600 = 400$$

166. If the simple interest on a certain sum of money for 8 months at 8%p.a exceeds the simple interest on the same sum for 12 months at 5% p.a by Rs. 20, then find the value of sum.

Solution:

$$(P*8*8)/(12*100) - (p*1*5)/100 = 20$$

$$P=6000$$

167. A mixture of 66 litres contains whisky and water in the ratio 4:7 how many litres of whisky and water each must be added to the mixture to make the ratio 2:3?

Solution:

Quantity of whisky in 66 litres mixture is : $(4/11)*66 = 24$

Similarly quantity of water in 66 litres mixture is : $(7/11)*66 = 42$

Let's say adding x litres of whisky and water added to make mixture ratio as 2:3

$$\text{Then } (24+x)/(42+x) = 2:3$$

$$X=12$$

168. if $m = 3 - 2\sqrt{2}$, then the value of $\sqrt{m} - (1/\sqrt{m})$ is:

Solution:

$$\text{Let's say } \sqrt{m} - (1/\sqrt{m}) = x$$

Squaring on both sides $m + 1/m -$

$$2 = x^2 \text{ if } m = 3 - 2\sqrt{2}, \text{ then } 1/m =$$

$$3 + 2\sqrt{2} \text{ so } m + 1/m - 2 = x^2$$

$$4 = x^2$$

$$X=2$$

$$\text{Ans: } 2$$

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169. Two cities x and y are 400km apart. Q leaves x 8 hours after P. Both P and Q arrive simultaneously. Find the time the slower person spent on the trip if the speed of one of them was 15kmph higher than that of other.

Solution:

170. Train 'A' leaves a source station for destination station at 11 a.m., running at the speed of 60 kmph. Train B leaves the same source station to the same destination by the same route at 2 p.m. on the same day, running at the speed of 72 kmph. At what time will the two trains meet each other?

Solution:

With 60 kmph in 3 hours train 'A' covers 180 kms.

Train B speed is 12kmph more than train 'A'. Because train B started 3 hours later so it has to cover 180 extra with extra 12kmph speed.

Time taken is $= 180/12 = 15$ hours

So 15 hours from 2p.m is 5a.m on the next day

171. A motor cycle is moving with the speed of 47.52 kmph and the radius of the wheel of the motorcycle is 21cm. calculate the approximate number of revolutions made by the wheel in one minute.

Solution:

Ans:600

172. A wire of length 5 cm is subjected to stress that leads to the increase in its length by 25.60%. If the wire is re-shaped into a circle by joining its both ends, then what will be the radius of the circle?

Ans: 1 cm

173. If the length of a rectangle is thrice its width and it is known that length of its diagonal is $15\sqrt{10}$ cm. then determine the area of the rectangle.

Ans: 675

174. A boy buys a pen for Rs. 25 and sells it for Rs. 20. Find his loss percent. Ans: 20

175. A and B are running at 250 m/minute and 300 m/minute, in the same direction. The distance between the two, after 1 hour, will be:

Ans: 3 km

176. A number when divided by 2, 3, 4, 5 and 6 leaves a remainder 1 in each case but it is exactly divisible by 7.

a. 305 b. 606 c. 601 d. 301

Ans: 301

Solution: find lcm of (2,3,4,5 and 6) = 60

Divide given options with 60 remainder should be 1.

Option c and d satisfy above conditions.

Divide c and d options with 7 . only option(d) is divisible with 7.

177. If $(m - m^{-1}) = 1/5$, then determine the value of $(25m^2 + 25m^{-2})$. a. 2 b. 1 c. $49/25$ d. 51 Ans: 51.

Solution: $(m - m^{-1}) = 1/5$

Squaring on both sides

$$m^2 + 1/m^2 - 2 = 1/25 \quad m^2 + 1/m^2 = 51/25$$

Substitute above value

$$25(m^2 + m^{-2}) = 51.$$

178. The ratio between the speeds of two trains is 15:13. If the second train runs 260 km in 2 hours, then the speed of the first train is

a. 75 kmph b. 150 kmph c. 120 kmph d. 90 kmph

Ans: 150 kmph

Solution: $s_1/s_2 = 15/13$

$S_2 = 130$ kmph (given)

So $s_1 = 150$ kmph

179. Find the value of "x" if $10/3 : x :: 5/2 : 5/4$ a. $2/5$ b. $5/3$ c. $1/5$ d. $3/5$

Ans: $5/3$

180. Fredy drives his car on two journeys the first journey is of 8 miles and takes 35 minutes, while the second journey takes 17.5 miles and takes 55 minutes. Find the average speed of the two journeys combined. a. 17 miles per hour b. 20 miles per hour c. 15 miles per hour d. 25 miles per hour

Ans: 17 miles per hour

Solution: Average Speed = Total distance/ Total time

$= (8+17.5) / (35+55)/60 = 17$ miles per hour (convert time in minutes to hour)

181. A square field of area 31684 m² is to be enclosed with wire placed at height 1 m, 2 m, 3 m, 4 m above the ground. What length of the wire will be required if its length required for each circuit is 5% greater than the perimeter of the field?

a. 6456 m b. 27666 m c. 2990.4 m d. 4666.5 m

Ans: 2990.4 m

Solution: let a is side of square field then

$a^2 = 31684$ $a = 178$ perimeter = $4 * a = 712$

5% more than perimeter = $712 + 5\% \text{ of } 712 = 712 + 35.6 = 747.6$

Because we enclose four times so $4 * 747.6 = 2990.4$

182. The curved surface area of two spheres are in the ratio 1:4. Find ratio of their volumes. a. 1:4 b. 1:7 c. 1:8 d. 1:6

Ans: 1:8

Curved surface area : $4 * \pi r^2$

* r^2 Volume = $(4/3) * \pi * r^3$

$r_1/r_2 = \sqrt[3]{1/8} = 1/2$

183. 5 boys and 5 girls were made to sit in a row. In how many ways they can be seated so that every boy sits with his respective girl friend?

Ans: $5! \cdot 2^5$

184. A vessel is filled to its capacity with pure milk. Ten litres are withdrawn from it and replaced by water. This procedure is repeated again. The vessel now has 32 litres of milk. Find the capacity of the vessel. a. 55 litres b. 50 litres c. 40 litres d. 45 litres
Ans: 50 litres
Solution:

So $x=50$

185. A person invested Rs. 2500 on simple interest and got Rs. 200 at the end of the year as interest. What was his rate of interest?

a. 12% p.a b. 10% p.a c. 8% p.a d. 6% p.a

Ans: 8% p.a

Solution: Apply Simple interest formula ($P \cdot T \cdot R / 100$)

186. There are two queues at a super market billing counter. In the first queue, there are m_1 customers all with n_1 items in their baskets, while in the second queue there are m_2 customers all with n_2 items in their baskets. It takes " t " seconds to process each item and " p " seconds for each person to pay. A customer wishes to know which queue to join.

Which one of the following options gives the condition for the first queue to be the better queue to join?

a. $m_1(p+n_1t)=m_2(p+n_2t)$ b. $m_2(p+n_2t) \leq m_1(p+n_1t)$ c. $m_1(p+n_1t) \leq m_2(p+n_2t)$ d. $m_1(p+n_1t) < m_2(p+n_2t)$

Ans: d. $m_1(p+n_1t) < m_2(p+n_2t)$

187. Harish creates a model based on Arithmetic Progression which starts at 3 and with a spacing of 8 goes till 467 (i.e. 3, 11, ..., 467). Ravi wants to create another model through a subset of this series such that the total of no two elements of his series is 479. The maximum possible number of elements which Ravi's series has would be:

a. 24 b. 32 c. 30 d. 29

189. The diameter of the wheel of a car is 14 m. It makes 5 revolutions per 11 seconds. What is the speed of the car?

a. 48 kmph b. 72 kmph c. 64 kmph d. 56 kmph

Ans: 72 kmph

Solution: surface area of a circle = $2 * \pi * r = 44 \text{ m}$

5 revolutions in 11 seconds

1 second = 20 m

20 m/second = $20 * (18/5) = 72 \text{ kmph}$

190. If x,y,z are positive variables and the value of $(x+y+z)=18$, then what is the maximum value of xyz? a. 110 b. 100 c. 216 d. 252

191. Read the information given below and answer the question that follows:

1. A+B means A is father of B;
2. A-B means A is the sister of B;
3. A/B means A is the mother of B;
4. A*B means A is the brother of B

Which of the following expressions shows that M is the paternal uncle of N? a. $N*P$ b. $N-P+M$ c. $M-P+Q*N$ d. $M*P+Q-N$

192. if $m/(m^2-2m+1)=1/5$, then determine the value of $(m^3 + m^{-3})$ a. 323 b. 321 c. 320 d. 322

Solution: $(m^2-2m+1)/m=5$

Apply denominator to individual terms

$m^{-2}+1/m=5$ $m+1/m=7$ so $(m+1/m)^3 = m^3+3m+3/m+1/m^3$ substitute required values in above equation.

Ans: 322

193. The base of a triangular field is 880 m and its height is 550 m. Calculate the charges for supplying water to the field at the rate of Rs. 24.25 per sq.hectometer. a. Rs 44 b. Rs 24.22 c. Rs 58.68 d. 654.4

Ans: 58.68

Solution: area of a triangle = $(1/2) * \text{base} * \text{Height}$

= $242000 \text{ sq.m} = 2.42 \text{ sq.hectometer}$

Charges = $2.42 * 24.25 = 58.68$

194. How many numbers greater than a million can be formed from the digits 4,5,6,0,7,6,5? a. 540 b. 4320 c. 2160 d. 1080

195. Which of the following would not be a consideration while designing model for emergency fire exit? a. Number of evacuation doors. B. Number of people to be evacuated

c. Comfort of exit d. Number of safety personals

196. Ashif sold an article for Rs 315 at a profit of 5%. What would have been the loss incurred by him if it was sold for Rs. 275?

a. 7.625% b. 4.5 % c. 5.625% d. 6.25% e. 8.33%

197. a hemisphere, a cylinder and a cone of same height have equal base radii. Determine the ratio of their volumes (in the same order)

a. 5:2:6 b. 3:4:6 c. 1:2:3 d. 2:3:1

198. The internal and external radii of a hollow cylinder are 4 cm and 6 cm respectively. What is the ratio of its internal surface area to its external surface area? a. 4:9 b. 2:3 c. 3:4 d. 9:4

199. If $A+B+C = 450$ and $A:B:C=3:5:7$, then the value of "A" is: a. 60 b. 90 c. 120 d. 140

200. Two numbers are in the ratio of 4:9. If the first number is increased by 50% and second number is doubled then the ratio becomes 1:3 then original numbers are:

a. 36,81 b. 27,12 c. 18,36 d. 80,90

ans: 36,81

01. In how many ways can 34 people be divided into 17 couples?

a. $\frac{(34!)}{((17!)17 (2!)}}$ b. $\frac{(34!)}{((2!)17 (17!)}}$ c. $\frac{(34!)}{((2!)(17!)}}$ d. Data Inadequate

Ans: Short cut how many ways n people be divided into n/2 couples

$\frac{(n!)}{((2!)n/2 (n/2)!}}$ so ans is b. $\frac{(34!)}{((2!)17 (17!)}}$

202. The electricity bill of JMD is partly fixed and partly varies as the number of units of electricity consumed. When in a certain month 650 units consumed the bill was Rs. 2,130. In yet another month 720 units were consumed and the bill was Rs. 2,340. What would be the bill for the month 940 units consumed? a. 3,575 b. 3,000 c. 4,350 d. 2,990

Ans: 3,000

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Solution: let's say fixed cost is k and unit cost is x

Then $k+650 * x=2130$

$K+720 * x= 2340$

From above two equations $k=180$ and $x=3$

Now $180+940*3= 3000$

203. A wooden board is 7ft 9 inches long. It is divided into 3 equal parts. What is the length of each part? a. 2 ft 7 inches b. 3 ft c. 2 ft 4 inches d. 2ft 6 inches

Ans: 2 ft 7 inches

1 ft= 12 inches

So 7 ft 9 inches = 93 inches

Divide 93 inches into 3 equal parts. Then each part is 31 inches.

31 inches = 2 ft 7 inches

204. Determine the metal required to make a 21 m long pipe if its inner and outer diameter are 12 m and 10 m respectively.

a. 2904 m³ b. 2534 m³ c. 2843 m³ d. 2647 m³

volume of a hollow cylinder = $\pi \cdot h \cdot (R^2 - r^2)$

$22/7 \cdot 21 \cdot (144 - 100) \text{ m}^2$

$= 66 \cdot 44 \text{ m}^3$

$= 2904 \text{ m}^3$

205. Two trains of length 180 m and 220 m are running in opposite directions, the first one at the rate of 50 kmph and while second one at . Calculate the time they will require to pass each other. a. 20 seconds b. 16 seconds c. 18 seconds d. 17 seconds

206. 30 men can do a work in 30 days and 40 women can do the same work in 40 days. If they started working together, how many more men required completing the work in 10 days? a. 42 b. 28 c. 25 d. 38

Ans: 38

Total work has to be finished in 10 days. That means 1 day work becomes 1/10 Let's say x number of men added to complete the work in 10 days.

Then

1 day's work of (30 men + 40 women + x men) = 1/10 ---- (1)

If 30 men can do a work in 30

days Then 30 men 1 day's work = $\frac{1}{30}$

Then 1 man 1 day's work = $\frac{1}{900}$

40 women can do a work in 40 days

Then 40 women 1 day's work = $\frac{1}{40}$

Substitute above values in equation (1)

$(\frac{1}{30} + \frac{1}{40} + x (\frac{1}{900})) = \frac{1}{10}$

Simplify above equation and find x value.

$X=37.5$ but x cannot be decimal value because x represents number of men. So $x=38$

207. Read the information given below and answer the question that follows:

- I. $(x \& y) = (x^2 - y^2)$
- II. $(x ? y) = (x - y)/2$
- III. $(x \$ y) = (x + y)/2$

If $(x @ y)$ is defined as $(x^3 - y^3)$ then for integers $x, y > 2$ and $x > y$ which of the following relationships will always be true?

- a. $(x \& y) < (x @ y)$ b. $(x \$ y) > (x ? y)$ c. $(x \$ y) \geq (x ? y)$ d. Both $(x \$ y) > (x ? y)$ and $(x \& y) < (x @ y)$

208. 3 designers x, y and z can stitch 324 dresses in 6 weeks working simultaneously. During one shift, z stitches as many dresses more than y as y stitches more than x . Z 's work in 10 weeks is equivalent to x 's work in 14 weeks. How many dresses does x stitch per shift.
a. 21 b. 15 c. 27 d. 18

209. A person travels for 3 hours at the speed of 40 kmph and for 4.5 hours at the speed of 60 kmph. At the end of it, he finds that he has covered $(3/5)$ th of the total distance. At what average speed should he travel to cover the remaining distance in 4 hours?

- a. 70 kmph b. 65 kmph c. 75 kmph d. 60 kmph

Ans: 65 kmph

Distance covered in 3 hours = $3 * 40 = 120$ km

Distance covered in 4.5 hours = $60 * 4.5 = 270$ km

Let's say total distance is x kms

Then $(3/5) * x = 120 + 270$

$X = 650$ kms

Remaining distance = $650 - (120 + 270) = 260$ km

Speed = distance / time = $260 / 4 = 65$ kmph

210. If the simple interest is 7% annual and compound interest is 6% annual, find the difference between the interests after 4 years on a sum of Rs 2000. a. 33.05 b. 32.5 c. 37.5 d. 35.05

Ans: 35.05

Simple interest after 4 years = $(2000 * 7 * 4) / 100 = 560$

Compound interest after 4 years = $2000 * (1 + 6/100)^4 - 2000 = 525.95$

Difference = $560 - 525.95 = 35.05$

211. if $(p+q)=3$ then what is the value of $(p^3 + q^3)$, when it is given that $p=1/q$? a. 123 b. 143 c. 111 d. 132

Ans: 18

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212. let $M = (1, 2, 3, 4, \dots)$ be the set of natural numbers and $Q(n)$ be a mathematical statement involving the natural numbers "n" belonging to M such that

I. $Q(1)$ is true i.e., $Q(n)$ is true for $n=1$

II. $Q(n+1)$ is true whenever $Q(n)$ is true

Which of the following statements is true with regard to the given information?

a. $Q(n)$ is true for all natural numbers n b. Cannot be determined from the data given
c. Both the mentioned statements are true. D. $Q(n)$ is true implies that $Q(n+1)$ is true.

213. 132 ml of a drink contains vodka and water in 27:6. How much more water is to be added to get a new mixture

a. 24 ml b. 54 ml c. 12 ml d. 36 ml

214. if $(x + 1/x) = 3$ then find the value of $(x^8 + 1/x^8)$ a. 3037 b. 2207 c. 1000 d. 800

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215. The sum of ages of two people is 40 years. After 5 years the ratio of their ages will be 3:7 what is the ratio of their present ages?

a. 1:3 b. 1:2 c. 2:1 d. 3:1 Ans:

$a+b=40$ -- (1)

$(a+5)/(b+5) = 3/7$ -- (2)

Solve above two equations then $a=10$ and $b=30$

So ratio is 1:3

216. Two numbers are in the ratio 11:6 if the first number is increased by 200 and second by 50% then the new ratio becomes 5:3 determine the original numbers

a. 40 and 25 b. 24 and 15 c. 550 and 300 d. 32 and 20

Ans: original ratio = $11k/6k$

$(11k+200) / (6k+3k) = 5/3$

Then $k=50$

So original numbers are 550 and 300

217. A photograph is to be fitted in a photo frame of sides 18 cm by 15 cm such that there is a margin of 1.5 cm left. What should be the area of the photograph?

a. 140 cm² b. 180 cm² c. None of these d. 270 cm²

Ans: 180 (similar to q.no 78)

1.5 cm margin on both sides....then $1.5 + 1.5 = 3\text{cm}$

area of photograph(rectangle) $= (18-3) \times (15-3)$

$= 180\text{cm}^2$

218. if $m + (m-3) - 1 = 6$ then determine the value of $(m-3)^2 + (m-3) - 2$ a. 3 b. -1 c. 1 d. 0

219. 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

They both have same speed hence if snake moves 'x' then peacock also moves 'x' but diagonally down from the pole...

hence path of peacock, ground, and the pole make a triangle..... with diagonal (Hypotenuse) = x snake moves 'x' hence distance left $= (27 - x)$ which is the base of triangle and height of the pole is the height of triangle $= 19$.

now, apply pythagoras' theorem----- $x^2 = (27-x)^2 + 19^2$

solve the equation $x = 20.18\text{ m}$

And the distance from the hole at which the peacock pounces over the snake $= 27 - 20.18 = 6.8$ Answer = 6.8

220. At the bottom of the tank containing 100 gallons of water, a leak was formed of diameter "D" cm that can empty 5 gallon/minute. Due to the load of water the diameter (D) of the leak started varying every minute with respect to (t) as "Dt" cm. In what time the whole tank will become empty?

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