100 Quantitative Aptitude Questions With Solutions for SSC CGL Tier 2 Exam

1. The ages of A and B are in the ratio 5:7. Five years ago, their ages were in the ratio 5:8. The respective present ages (in years) are:
(a) 20,28 (b) 15,21
(c) 25,40 (d) 10,14

2. Four years ago, the ratio of ages of A and B was 3 : 5. Ten years from now, the ratio of the ages of A and B will be 5 : 6. Find the sum of present ages?
(a) 32 years (b) 24 years
(c) 26 years (d) 22 years

3. The ratio of present ages of A and B is 1: 2 and 5 years back the ratio was 1: 3. What will be the ratio of their ages after 7 years?
(a) 7: 12 (b) 3: 4
(c) 17: 27 (d) 2: 1

4. Ram's present age is thrice his son's present age and $2/5^{th}$ of the present age of his father. The average present age of all of them is 46 years. What is the difference of ages of Ram's father and Ram's son at present?
(a) 68 years
(b) 88 years
(c) 78 years
(d) Cannot be determined

5. At present Ranveer is 15 years older than Deepika. 5 years later Deepika will be 10 years old. What is the Present age of Ranveer (in years)?
(a) 15 (b) 20
(c) 25 (d) 30

6. A person was asked to state his age. His reply was— "Take my age 3 years hence, multiply it by 3, subtract the triple of my age 3 years ago and you will know how old I am." What is the present age of the person (in years)?
(a) 24 (b) 20
(c) 32 (d) 18

7. If $a^3 - b^3 = 208$ and $a - b = 4$, then $(a + b)^2 - ab$ is equal to
(a) 52 (b) 38
(c) 32 (d) 42

8. If $x + \frac{1}{x} = 5$, then $x^3 + \frac{1}{x^3}$ is equal to
(a) 110 (b) 130
(c) 145 (d)125

9. If $(x - 5)^3 + (x - 6)^3 + (x - 7)^3 = 3(x - 5)(x - 6)(x - 7)$, then what is the value of x ?
(a) 6 (b) 7
(c) 5 (d) 18

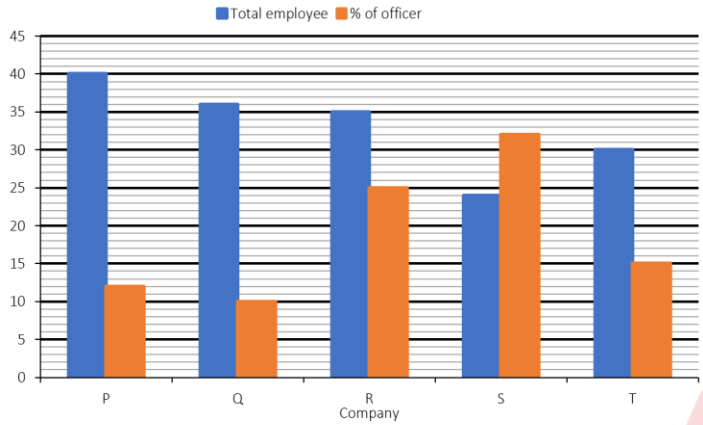
10. If $(2x + 3)^3 + (x - 8)^3 + (x + 13)^3 = (2x + 3)(3x - 24)(x + 13)$, then what is the value of x?
(a) -1.5 (b) -2.5
(c) -2 (d) -1

11. If $a^3 + b^3 = 5824$ and $a + b = 28$, then $(a - b)^2 + ab$ is equal to
(a) 208 (b) 152
(c) 180 (d) 236

12. If $x - \frac{1}{x} = 6$, then $x^3 - \frac{1}{x^3}$ is equal to
(a) 216 (b) 176
(c) 234 (d) 198

Directions (13-17): Bar graph given below shows number of employees (in thousand) in five different companies in a year and percentage of officer in total employees. Study the following graph carefully and answer the questions below it.

Note – Total employees in each company = officer + workers



13. If ratio of male workers to female worker in company P and company R is 15:7 and 13:12 respectively, then find the difference between no. of female workers in company P and that of in company R.

(a) 1120 (b) 2400
(c) 1365 (d) 1400

14. No. of worker in company R are approximately what percent more than no. of worker in company S.

(a) 61% (b) 59%
(c) 57% (d) 55%

15. If ratio of male officer to female officer in company T is 23:27. Then find difference between female officer in company T and no. of worker in company Q.

(a) 29070 (b) 28970
(c) 29970 (d)28070

16. If female workers are 7140 in company S and no. of female worker in company S are 78.5% more Than male officer in the same company, then find female officers in company S.

(a) 3680 (b) 3280
(c) 3480 (d) 3880

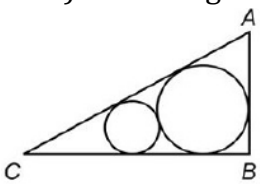
17. Find the average number of officers in company P, Q and T are approximately what percent of total workers in company S.

(a) 20% (b) 22%
(c) 18% (d) 26%

18. AB and AC are the two tangents to a circle whose radius is 6 cm. If ∠BAC = 60°, then what is the value (in cm) of $\sqrt{(AB)^2 + (AC)^2}$?

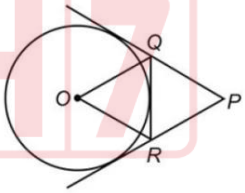
(a) $6\sqrt{6}$ (b) $4\sqrt{6}$
(c) $9\sqrt{3}$ (d) $8\sqrt{3}$

19. In the given figure, ABC is a right angled triangle. $\angle ABC = 90°$ and $\angle ACB = 60°$. If the radius of the smaller circle is 2 cm, then what is the radius (in cm) of the larger circle?



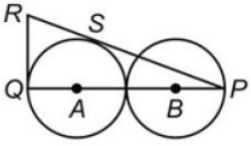
(a) 4 (b) 6
(c) 4.5 (d) 7.5

20. In the given figure, O is centre of the circle. Circle has 3 tangents. If $\angle QPR = 45°$, then what is the value (in degrees) of $\angle QOR$?



(a) 67.5 (b) 72
(c) 78.5 (d) 65

21. In the given, two identical circles of radius 4 cm touch each other. A and B are the centres of the two circles. If RQ is a tangent to the circle, then what is the length (in cm) of RQ?



(a) $3\sqrt{3}$ (b) $2\sqrt{6}$
(c) $4\sqrt{2}$ (d) $6\sqrt{2}$

22. The radius of two circles is 3 cm and 4 cm. The distance between the centres of the circles is 10 cm. What is the ratio of the length of direct common tangent to the length of the transverse common tangent?
(a) $\sqrt{51} : \sqrt{68}$ (b) $\sqrt{33} : \sqrt{17}$
(c) $\sqrt{66} : \sqrt{51}$ (d) $\sqrt{28} : \sqrt{17}$

23. A line cuts two concentric circles. The lengths of chords formed by that line on the two circles are 4 cm and 16 cm. What is the difference (in cm^2) in square of radii of two circles?
(a) 240 (b) 120
(c) 60 (d) 90

24. Two numbers are in the ratio 4 : 5. If their HCF is 16, then the sum of these two numbers is
(a) 144 (b) 124
(c) 160 (d) 150

25. Two numbers are in the ratio 4 : 7. If their HCF is 26, then the sum of these two numbers will be
(a) 312 (b) 364
(c) 338 (d) 286

26. Two numbers are in the ratio 5 : 11. If their HCF is 24, then the sum of two these numbers is:
(a) 384 (b) 408
(c) 120 (d) 264

27. Two numbers are in the ratio 6 : 11. If their HCF is 28, then the sum of these two numbers is:
(a) 476 (b) 448
(c) 392 (d) 420

28. Which of the following statement is true?
(a) HCF+LCM of two numbers=Product of two numbers
(b) LCM of two natural numbers is divisible by their HCF.
(c) Two prime numbers are co-prime numbers if their LCM is 1.
(d) HCF of two numbers is the smallest common divisor of both numbers.

29. The HCF and LCM of two numbers is 6 and 5040 respectively. If one of the numbers is 210, then the other number is :
(a) 630 (b) 144
(c) 256 (d) 30

30. From the top of a 10 m high building, the angle of elevation of the top of a tower is 60° and the angle of depression of the foot of the tower is ϕ, such that $\tan\phi = \frac{2}{3}$. What is the height of the tower to nearest metres?
(a) 34 m (b) 35 m
(c) 36 m (d) 33 m

31. A ladder leaning against a wall makes an angle α with the horizontal ground such that $\tan = \frac{3}{4}$. If the foot of the ladder is 5 m away from the wall, what is the length of the ladder?
(a) 5.25 m (b) 3.75 m
(c) 6.25 m (d) 4.5m

32. From the top of a 12 m high building, the angle of elevation of the top of a tower is 60° and the angle of depression of the foot of the tower is θ, such that $\tan\theta = \frac{3}{4}$. What is the height of the tower $(\sqrt{3} = 1.73)$?
(a) 41.41m (b) 36.22 m
(c) 39.68 m (d) 37.95 m

33. A ladder leaning against a wall makes an angle θ with the horizontal ground such that $\text{Sin}\theta = \frac{12}{13}$. If the foot of the ladder is 7.5 m from the wall, then what is the height of the point where the top of the ladder touches the wall?
(a) 15 m (b) 8 m
(c) 18 m (d) 12 m

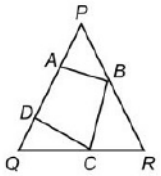
34. From the top of 75 m high tower, the angle of depression of two points P and Q on opposite side of the base of the tower on level ground is θ and ϕ, such that $\tan\theta = \frac{3}{4}$ and $\tan\phi = \frac{5}{8}$. What is the distance between the points P and Q?
(a) 190 m (b) 200 m
(c) 180 m (d) 220 m

35. The angle of elevation of top of a tower from a point P, on the ground is θ such that $\tan\theta = \frac{12}{5}$. If distance of the point P, from the base of the tower is 75m, what is the height of the tower?
(a) 160 m (b) 200 m
(c) 190 m (d) 180 m

36. ABC is a triangle. AB = 5 cm, AC = $\sqrt{41}$ cm and BC = 8 cm. AD is perpendicular to BC. What is the area (in cm^2) of triangle ABD?

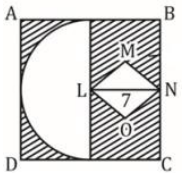
(a) 12 (b) 6
(c) 1 0 (d) 20

37. In the given figure, PQR is a triangle and quadrilateral ABCD is inscribed in it. QD = 2 cm, QC = 5 cm, CR = 3 cm, BR = 4 cm, PB = 6 cm, PA = 5 cm and AD = 3 cm. What is the area ($in\ cm^2$) of the quadrilateral ABCD?



(a) $\frac{(23\sqrt{21})}{4}$ (b) $\frac{15\sqrt{21}}{4}$
(c) $(17\sqrt{21})/5$ (d) $(23\sqrt{21})/5$

38. IN the given figures, ABCD is a square of side 14 cm. E and F are mid points of sides AB and DC respectively. EPF is a semicircle whose diameter is EF. LMNO is a square. What is the area (in cm^2) of the shaded region?



(a) 108.5 (b) 94.5
(c) 70 (d) 120

39. In the given figure, AB, AE, EF, FG and GB are semicircles. AB = 56 cm and AE = EF = FG = GB. What is the area (in cm^2) of the shaded region?

(a) 414.46 (b) 382.82
(c) 406.48 (d) 394.24

40. Radius of base of a hollow cone is 8 cm and its height is 15 cm. A sphere of largest radius is put inside the cone. What is the ratio of radius of base of cone to the radius of sphere?

(a) 5 : 3 (b) 4 : 1
(c) 2 : 1 (d) 7 : 3

41. The area of a regular hexagon is equal to the area of the square. What is the ratio of the perimeter of the regular hexagon to the perimeter of square?

(a) $\sqrt{6\sqrt{3}} : \sqrt{3\sqrt{6}}$ (b) $2\sqrt{3} : \sqrt{6\sqrt{2}}$
(c) $\sqrt{6\sqrt{3}} : 2$ (d) $\sqrt{6\sqrt{3}} : 2\sqrt{3}$

42. An alloys contains 32% copper, 24% nickel and rest zinc. How much zinc is present in 12 kg of the alloy?

(a) 672 gm (b) 6.72 kg
(c) 5.28 kg (d) 528 gm

43. In what ratio should coffee costing Rs. 2800/kg be mixed with coffee costing Rs. 1750/kg so that the cost of the mixture is Rs. 2150/kg.

(a) 8 : 13 (b) 13 : 8
(c) 7 : 5 (d) 5 : 7

44. In an alloy, Zinc and Copper are in the ratio 1 : 2. In the second alloy, the same elements are in the ratio 2 : 3. If there two alloys combined to form a new alloy in which two elements are in the ratio 5 : 8, the ratio of these two alloys in the new alloys is –

(a) 3 : 10 (b) 7 : 3
(c) 3 : 7 (d) 10 : 3

45. A jar contained a mixture for two liquids A and B in the ratio 4 : 1. When 10 L of the mixture was taken out and 10 L of liquid B was poured into the jar, this ratio becomes 2 : 3. The quantity of liquid A contained in the gas initially was –

(a) 4 L (b) 12 L
(c) 8 L (d) 16 L

46. Two vessels A and B contain mixtures of milk and water in the ratios 4 : 1 and 9 : 11 respectively. They are mixed in the ratio of 3 : 2. Find the ratio of milk and water in the resulting mixture.

(a) 12 : 25 (b) 15 : 37
(c) 17 : 19 (d) 33 : 17

47. 6 litres of milk and water mixture has 75% milk in it. How much milk should be added to the mixture to make it 90% pure?

(a) 10 litre (b) 8 litre
(c) 9 litre (d) 12 litre

48. The number 45789 is divisible by which of the single digit numbers:
(a) Only by 9 (b) Only by 3 and 9
(c) Only by 3 (d) Only by 3 nad 7

49. 210102 can be divided exactly by:
(a) 7 (b) 3
(c) 4 (d) 8

50. A gardener planted 1936 samplings in a garden such that there were as many rows of saplings as the columns. The number of rows planted is:
(a) 46 (b) 44
(c) 48 (d) 42

51. Which least number should be added to 1000 so that the number obtained is exactly divisible by 37?
(a) 1 (b) 25
(c) 36 (d) 13

52. If a nine digit number 985x3678y is divisible by 72, find the value of x + y
(a) 4 (b) 8
(c) –2 (d) 6

53. If it takes 42 days for a pond to get filled with rain water. If the level of water doubles each day. Then how long would it take to fill 1/16 of pond.
(a) 38 days (b) 39 days
(c) 32 days (d) 8 days

54. The price of sugar has decreased by 15%. By what percentage can a person increase the consumption so that there is no change in the expenditure?
(a) $\frac{300}{23}\%$ (b) $\frac{300}{17}\%$
(c) $\frac{50}{3}\%$ (d) $\frac{20}{3}\%$

55. If A's income is 40% more than the income of B, then what percentage of B's income is less than income of A?
(a) $27\frac{4}{7}\%$ (b) $28\frac{5}{7}\%$
(c) $27\frac{5}{7}\%$ (d) $28\frac{4}{7}\%$

56. In an examination, 54% of the candidates passed in science and 42% failed in mathematics. If 32% failed in both subjects, what percentage passed in both subjects?
(a) 56% (b) 48%
(c) 32% (d) 44%

57. The income of A is 24% more than the income of B. By what percent is the income of B less than the income of A ?
(a) $\frac{150}{7}\%$ (b) $\frac{600}{29}\%$
(c) $\frac{500}{31}\%$ (d) $\frac{600}{31}\%$

58. In an examination, 48% of candidates passed in science and 56% failed in mathematics. If 32% failed in both subjects, then what percent of students pass in both subjects?
(a) 24% (b) 32%
(c) 28% (d) 22%

59. The price of sugar is decreased by 10%. By what can a person increase the consumption so that there is no change in the expenditure?
(a) $\frac{100}{11}\%$ (b) $\frac{109}{11}\%$
(c) $\frac{100}{9}\%$ (d) 10%

60. A shopkeeper sold two articles for Rs 9471 each. On one, he gained 23% and on the other, he lost 23%. What is the overall percentage gain or loss?
(a) 5.29% loss (b) 6.29% gain
(c) 5.29% gain (d) 6.29% loss

61. A shopkeeper marks his goods at a price such that after giving a discount of 25%, he gains 20%. If the cost price of the article is Rs 460, what is its marked price?
(a) Rs 736 (b) Rs 748
(c) Rs 725 (d) Rs 752

62. The successive discounts of 20%, 10% and 15% is equivalent to a single discount of
(a) 43.5% (b) 42.2%
(c) 38.8% (d) 44.5%

63. A shopkeeper sold two articles for Rs 9831 each. On one he gained 13% and on the other, he lost 13%. What is the overall percentage gain or loss?
(a) 6.5% loss (b) 6.5% gain
(c) 1.69% gain (d) 1.69% loss

64. The successive discount of 25%, 20% and 10% is equivalent to a single discount of
(a) 46% (b) 48%
(c) 54% (d) 44%

65. A shopkeeper marks his good at a price such that after giving a discount of 25%, the gain is 20%. If the marked price of the article is Rs 736. What is the cost price of the article?
(a) Rs 450 (b) Rs 455
(c) Rs 460 (d) Rs 440

66. What is the sum of the mean proportional between 10.8 and 4.8 and the third proportional of 2 and 4 ?
(a) 15.2 (b) 11.2
(c) 8.2 (d)10.2

67. What is the ratio of the mean proportional between 8.1 and 3.6 and the third proportional of 2 and 3?
(a) 5 : 6 (b) 5 : 4
(c) 4 : 5 (d) 6 : 5

68. What is the ratio of mean proportional between 1.8 and 3.2 and the third proportional of 5 and 3 ?
(a) 3 : 5 (b) 4 : 3
(c) 3 : 4 (d) 5 : 3

69. What is the ratio of mean proportional between 3.6 and 12.1 and third proportional between 2 and 11?
(a) 36 : 5 (b) 6: 5
(c) 11: 36 (d) 6: 55

70. Rs. 7,80,516 is divided among A, B, C and D in the proportion of 2 : 3 : 4 : 3. The share of C is:
(a) Rs. 2,60,172 (b) Rs. 1,95,129
(c) Rs. 1,30,086 (d) Rs. 2,24,562

71. There are 50 paisa, 25 paisa and Rs. 1 coins in a bag in the ratio 5 : 8 : 1. If the total value of all the coins is Rs. 55, how many 25 paisa coins are there in the bag?
(a) 10 (b) 80
(c) 50 (d) 25

72. A sum of Rs 15000 is invested partly at 12% per annum and the remaining at 10% per annum simple interest. If the total interest at the end of 2 yrs is Rs 3344 how much money was invested at 10% per annum?
(a) Rs 6,200 (b) Rs 6600
(c) Rs 6400 (d) Rs 6500

73. A sum of Rs 12800 is invested partly at 15% per annum and the remaining at 12% per annum simple interest. If the total interest at the end of 3 yrs is Rs 5085, then how much money was invested at 15% per annum.
(a) Rs 5,200 (b) Rs 7,500
(c) Rs 5,800 (d) Rs 5,300

74. A sum of Rs 15,600 is invested party at 7% per annum and the remaining at 9% per annum simple interest. If the total interest at the end of 3 years is Rs 3,738, how much money was invested at 7% per annum?
(a) Rs 7,800 (b) Rs 7,900
(c) Rs 7,600 (d) Rs 7,700

75. A sum of Rs. 10,200 is invested partly at 8% per annum and remaining at 6% per annum for 3 years at simple interest. If the total interest is Rs. 2124, how much money was invested at 6% per annum?
(a) Rs. 4,900 (b) Rs. 5,200
(c) Rs. 4,800 (d) Rs. 5,400

76. A borrowed a loan from B at 8% simple interest for 2 years and repaid the loan with interest totaling Rs 191864. The amount of loan taken A is :
(a) Rs 166540 (b) Rs 168920
(c) Rs 165400 (d) Rs 164492

77. Rs. 2,64,000 is invested for 3 years at 8.25% p.a. simple interest. The interest is:
(a) Rs. 87,120 (b) Rs. 43,560
(c) Rs. 21,780 (d) Rs. 65,340

78. $9\frac{3}{4} \div \left[2\frac{1}{6} + \left\{4\frac{1}{3} - \left(2\frac{1}{2} + \frac{3}{4}\right)\right\}\right]$ is equal to
(a) 3 (b) 15/4
(c) 4 (d)17/4

79. $4\frac{4}{5} \div \frac{3}{7}\ of\ 7 + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$ is equal to
(a) $\frac{7}{5}$ (b) $\frac{8}{5}$
(c) $\frac{34}{25}$ (d) $\frac{41}{25}$

80. $5\frac{5}{6} + \left[2\frac{2}{3} - \left\{3\frac{3}{4}\left(3\frac{4}{5} \div 9\frac{1}{2}\right)\right\}\right]$ is equal to
(a) $\frac{44}{7}$ (b) 7
(c) $\frac{43}{6}$ (d) $\frac{22}{3}$

81. The value of $3\frac{1}{5} - \left[2\frac{1}{2} - \left\{\frac{5}{6} - \left(\frac{2}{5} + \frac{3}{10} - \frac{4}{15}\right)\right\}\right]$ is
(a) $\frac{6}{5}$ (b) $\frac{9}{10}$
(c) $\frac{11}{10}$ (d) $\frac{13}{5}$

82. $\frac{6.75\times6.75\times6.75-4.25\times4.25\times4.25}{67.5\times67.5+42.5\times42.5+67.5\times42.5}$ is equal to:
(a) 2.5 (b) 0.25
(c) 0.0025 (d) 0.025

83. $5\frac{1}{5} - \left[3\frac{1}{2} - \left\{\frac{5}{6} - \left(\frac{3}{5} + \frac{1}{10} - \frac{4}{15}\right)\right\}\right]$ is equal to:
(a) $\frac{21}{10}$ (b) $\frac{7}{5}$
(c) $\frac{7}{3}$ (d) $\frac{8}{3}$

84. A train travels at a speed of 76km/h. If it crosses a pole in 36 seconds, the length of the train is:
(a) 720 m (b) 675 m
(c) 760 m (d) 630 m

85. If an airplane covers a distance of 980 km in 35 minutes, then what time it will take to cover a distance of 1470 km?
(a) $\frac{1}{2}$ hour (b) $1\frac{1}{8}$ hours
(c) $\frac{7}{8}$ hour (d) $1\frac{1}{6}$ hours

86. A boy walks 15 m in 7 seconds and then walks back in 5 seconds. His average speed (in m/s) is:
(a) 6 (b) 2.5
(c) 3.25 (d) 4

87. A part of the journey is covered in 31.5 minutes at 80 km/h and the remaining part in 16 minutes at 75 km/h. The total distance of the journey is:
(a) 45 km (b) 38 km
(c) 62 km (d) 54 km

88. A train 100 m long running at uniform speed crosses a station which is 500 m long in 25 seconds. How long will it take for the train to pass a station that is 380 m long?
(a) 21 seconds (b) 20 seconds
(c) 19 seconds (d) 22 seconds

89. A train covers a distance of 576 km at a certain speed. If the speed is decreased by 24 km/hr, it will take 2 hours more to cover the same distance. Find $33\frac{1}{3}\%$ of original speed.
(a) 32 km/hr (b) 24 km/hr
(c) 38 km/hr (d) 28 km/hr

90. A and B can finish a work together in 30 days. B and C can finish the same work together in 24 and A and C can finish the work together in 40 days. If all three work together, how long will it take them to complete the work?
(a) 15 days (b) 10 days
(c) 20 days (d) 5 days

91. A can do a work in 30 days, B can do the same work in 48 days. After working alone for 20 days A left and B started working, how long will B take to complete the work?
(a) 24 days (b) 28 days
(c) 38 days (d) 16 days

92. If 15 men can do a piece of work in 14 days, how many men will be needed to do the work in 30 days?
(a) 8 (b) 10
(c) 7 (d) 9

93. The ratio of efficiencies of A, B, C is 4 : 6 : 7. Working together, they can complete working in 39 days A and C together can complete $88\frac{2}{3}\%$ of work in how many days? (approx.)
(a) 53.4 days (b) 55.7 days
(c) 49 days (d) 61.8 days

94. If A had worked alone he would have taken 63 hours to do the task. What is B's share, if A and B together on a task finishing it in 36 hours and they get paid Rs. 5,950 for it?
(a) 3600 (b) 3400
(c) 2750 (d) 2550

95. 12 persons working 8 hours a day can complete a work in 10 days. In how many days 18 persons working 7 hours day will complete 70% of work?
(a) 9 days (b) $5\frac{1}{3}$ days
(c) $6\frac{1}{5}$ days (d) $4\frac{1}{2}$ days

96. If tan x = cot (45° + 2x), then what is the value of x?
(a) 45° (b) 15°
(c) $\frac{45^\circ}{2}$ (d) 20°

97. The value of $\left[\frac{sin^2 24^\circ + sin^2 66^\circ}{cos^2 24^\circ + cos^2 66^\circ} + sin^2 61^\circ + cos 61^\circ \; sin 29^\circ\right]$ is equal to
(a) 2 (b) 3
(c) 1 (d) 0

98. The value of $\frac{sin30^\circ - cos60^\circ + cot^2 45^\circ}{cos30^\circ - tan45^\circ + sin90^\circ}$ is equal to
(a) $\frac{2\sqrt{3}}{3}$ (b) $\frac{\sqrt{3}}{2}$
(c) $\frac{3}{2}$ (d) $\frac{\sqrt{3}}{4}$

99. If tan 3x = cot (30° + 2x), then what is the value of x?
(a) 18° (b) 12°
(c) 10° (d) 15°

100. The value of $sin^2 30^\circ . cos^2 45^\circ + 2\ tan^2 30^\circ - sec^2 60^\circ$ is equal to:
(a) $-\frac{13}{12}$ (b) $-\frac{77}{24}$
(c) $-\frac{25}{12}$ (d) $-\frac{1}{12}$

Solutions

1. (b): Let present age = $5x : 7x$
A. T. Q
$\frac{5x-5}{7x-5} = \frac{5}{8}$
$40x - 40 = 35x - 25$
$5x = 15$
$x = 3.$
Present age = 15, 21.

2. (b):

A	B		
3	5		
		)	7 — 14
$5_{\times 2}$	$6_{\times 2}$	)	1 — 2
10	12		

A B
Present Age's of A and B — (3 × 2) + 4 (5 × 2)+4
10 14
Sum of present ages of A & B = 24.

3. (c):

A		B	
2×1	1×2	2×2	
2	:	4	) 1 — 5
1	:	3	
10	:	20	
+7		+7	
17	:	27	

4. (c):
A.T.Q., $x + \frac{x}{3} + \frac{5x}{2} = 46 \times 3$
x = 36 year
Req. diff. = 90 – 12 = 78 year.

5. (b):
Present age of Deepika = 5 year.
Present age of Ranveer= 20 years.

6. (d):
$3(x+3)-3(x-3) \Rightarrow Present\ age = 18 \text{year}.$

7. (a): $a^3 - b^3 = (a-b)(a^2+b^2+ab)$
$\Rightarrow \frac{208}{4} = 52$

8. (a): $x + \frac{1}{x} = a \ , x^3 + \frac{1}{x^3} = (a^3 - 3a)$
$x + \frac{1}{x} = 5 x^3 + \frac{1}{x^3} = 125 - 15 = 110$

9. (a): if $x^3 + y^3 + z^3 - 3xyz = 0$
then x + y + z = 0
x-5+ x-6 + x-7=0
3x = 18
x = 6

10. (c): $(2x + 3)^3 + (x - 8)^3 + (x + 13)^3 - 3(2x + 3)(x - 8)(x + 13) = 0$
If = a + b + c = 0
2x + 3 + x – 8 + x + 13 = 0
4x + 8 = 0
$\boxed{x = -2}$

11. (a): $a^3 + b^3 = 5824$
$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$
$\frac{5824}{28} = 208 = a^2 + b^2 - ab$

12. (c): $x - \frac{1}{x} = 6$
$x^3 - \frac{1}{x^3} = ?$ $\quad x^3 - \frac{1}{x^3} = (x^3 + 3a)$
$x^3 - \frac{1}{x^3} = 216 + 18 = 234$

13. (d): no. of female worker in company P = $40000 \times \frac{88}{100} \times \frac{7}{22} = 11200$
no. of female worker in company R = $35000 \times \frac{75}{100} \times \frac{12}{25} = 12600$
Required difference=12600-11200 =1400

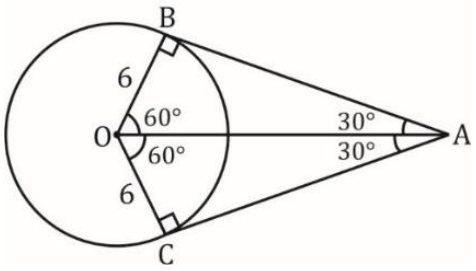
14. (a): no. of worker in company R = $35000 \times \frac{75}{100} = 26250$
no. of worker in company S = $24000 \times \frac{68}{100} = 16320$
required percentage = $\frac{26250-16320}{16320} \times 100 \approx 61\%$

15. (c): no. of worker in company Q = $36000 \times \frac{90}{100} = 32400$
no. of female officer in company T = $30000 \times \frac{15}{100} \times \frac{27}{50} = 2430$
Required difference $= 32400 - 2430 = 29970$

16. (a): male officer in company S= $\frac{7140}{178.5} \times 100 = 4000$
Number of female officers in company S $= 24000 \times \frac{32}{100} - 4000 = 3680$

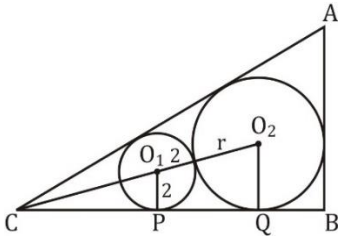
17. (d): no. of officer in company P= $40000 \times \frac{12}{100} = 4800$
no. of officer in company Q= $36000 \times \frac{10}{100} = 3600$
no. of officer in company T= $30000 \times \frac{15}{100} = 4500$
Average number of officers in P, Q & T = $\frac{4800+3600+4500}{3} = 4300$
no. of worker in company S = $24000 \times \frac{68}{100} = 16320$
required percentage = $\frac{4300}{16320} \times 100 \approx 26\%$

18. (a):



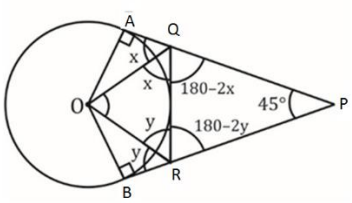
OB = 6
So, AB =OB/Tan(30)= $6\sqrt{3}$
Now
$\sqrt{(AB^2 + AC^2)}$
$\Rightarrow \sqrt{(6\sqrt{3})^2 + (6\sqrt{3})^2}$
$= \sqrt{216} = 6\sqrt{6}$ cm

19. (b):



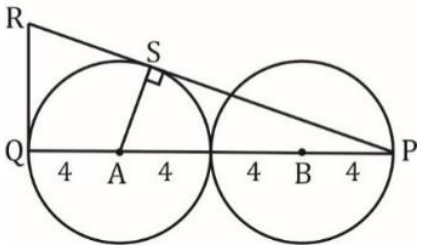
Let the centers are O_1 & O_2
From ΔCO_1P,
$\sin 30° = \frac{O_1P}{O_1C}$
$O_1C = 4$ cm
$CO_2 = 6 + r$
$QO_2 = r$
From ΔCO_2Q,
$\sin 30° = \frac{r}{CO_2}$
$CO_2 = 2r$
$2r = 6 + r$
$r = 6$ cm

20. (a):



Let
$\angle OQA = \angle OQR = x$
$\angle QRO = \angle ORB = y$
In triangle PRQ
$\angle Q + \angle R + \angle P = 180$
$\Rightarrow 180 - 2y + 180 - 2x + 45 = 180$
$2(x + y) = 225$
$x + y = 112\frac{1}{2}$
$\angle QOR = 180\text{-}(x+y) = 180 - 112\frac{1}{2}$
$\Rightarrow 67\frac{1}{2}°$

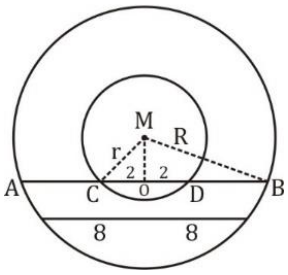
21. (c):



$QP = 4 \times 4 = 16$
$AP = 12$, $AS = 4$
$PS = \sqrt{(12)^2 - (4)^2}$
$= 8\sqrt{2}$
$\Delta PQR \sim \Delta PSA$
$\frac{RQ}{AS} = \frac{QP}{PS} \Rightarrow \frac{RQ}{4} = \frac{16}{8\sqrt{2}}$
$RQ = 4\sqrt{2}$ cm

22. (b): $r = 3$, $R = 4$, $D = 10$
Direct common Tangent =
$\sqrt{(D)^2 - (R - r)^2}$
$= \sqrt{100 - 1} = \sqrt{99}$
Indirect common Tangent =
$\sqrt{(D)^2 - (R + r)^2} = \sqrt{51}$
DCT : ICT = $\sqrt{99} : \sqrt{51}$
$= \sqrt{33} : \sqrt{17}$

23. (c): AB=16 & CD=4 (GIVEN IN QUES)



SO,
CO = OD = 2 &
AO = OB = 8
In ΔMCO, let CM=r (radius of smaller circle)
$CM^2 = OM^2 + OC^2$
$r^2 = OM^2 + OC^2$
$r^2 = OM^2 + (2)^2$ ...(i)
In ΔMBO , let MB =R (radius of bigger circle)
$MB^2 = OM^2 + OB^2$
$R^2 = OM^2 + (8)^2$ ...(ii)
From (i) & (ii)
$r^2 - 2^2 = R^2 - (8)^2$
$R^2 - r^2 = 64 - 4 = 60$

24. (a): Sum of No.
$\Rightarrow (4+5) \times 16 = 144$

25. (d): 4 : 7
HCF = 26
Sum of no. = (4 + 7) 26
$= 11 \times 26 = 286$

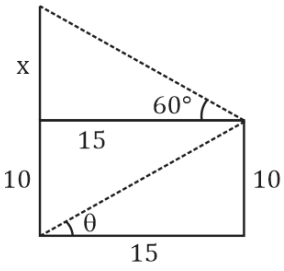
26. (a): Number are 5×24 & 11×24
Sum is = 24(5+11)
=24×16
= 384

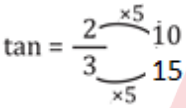
27. (b): (6 + 18)28 = 17×28
= 448

28. (b): L C M of two natural number is divided by their H C F

29. (b): A. T. Q
LCM × HCF = Product of no.
$\frac{6\times5040}{210} = x$
$x = 144$
other no. is → 144

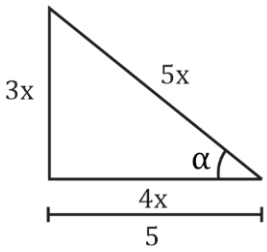
30. (c):





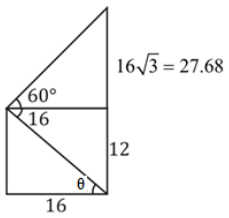
tan 60°= $\frac{x}{15}$
x = $15\sqrt{3}$
Height of Tower = 25.98+10
Approx. = 36

31. (c):



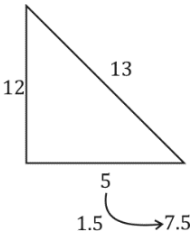
Tan α = $\frac{3}{4}$
4x →5
5x = $\frac{5}{4}\times 5 = \frac{25}{4}$
length of ladder = 6.25 cm

32. (c):



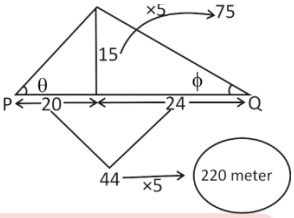
3----------12
1----------4
4----------16
Height of tower = 27.68 + 12 = 39.68 cm

33. (c):

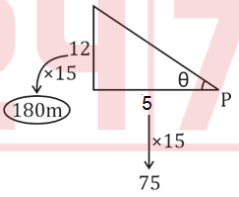


Sin θ = $\frac{12}{13} = \frac{P}{H}$
12 × 1.5 = 18 m

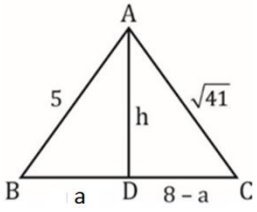
34. (d):



35. (d):



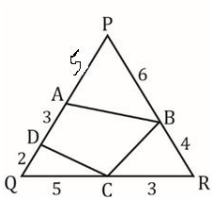
36. (b):



AS BC=8
LET BD=a then CD=8-a
$(5)^2 - a^2 = \left(\sqrt{41}\right)^2 - (8-a)^2$
$25 - a^2 = 41 - 64 - a^2 + 16a$
a = 3
So, h = 4 cm
A = $\frac{1}{2}\times 4\times 3 = 6$cm

[**Hitting method** → ABD is right angle triangle Hypotenuse = 5 so, either base (BD) and perpendicular (Ad) is 3 & 4. Because of Triplets (3, 4, 5). In any case area = $\frac{1}{2} \times 4 \times 3 = 6$]

37. (c):



Are of $\Delta = \frac{1}{2} \times ab \sin\theta$

Let $\Delta PAB = x$, $\Delta DQC = y$

$\Delta BCR = z$

$$\Rightarrow \frac{\text{area of } \Delta PAB}{\text{area of } \Delta PQR} = \frac{\frac{1}{2} \times 5 \times 6 \times \sin P}{\frac{1}{2} \times 10 \times 10 \times \sin P} = \frac{3}{10}$$

Similarly,

$\frac{\text{area of } \Delta CQD}{\text{area of } \Delta PQR} = \frac{1}{8}$ AND $\frac{\text{area of } \Delta BRC}{\text{area of } \Delta PQR} = \frac{3}{20}$

Let area of $\Delta PQR = 40$

area of PAB:area of DQC:area of BCR

12 : 5 : 6

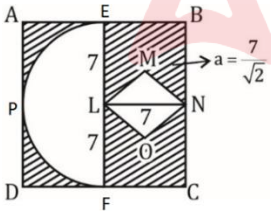
Then of $\Delta PQR = \frac{1}{2} \times 8 \times 2\sqrt{21} = 8\sqrt{21}$

$40 — 8\sqrt{21}$,

So, AREA ABCD= $(40 - \{12 + 5 + 6\}) =$

$17 \rightarrow \frac{8\sqrt{21}}{40} \times 17 = \frac{17\sqrt{21}}{5}$

38. (b):



FROM THE FIG. Let side of smaller square=a(LO)

$LN=\sqrt{2}a = 7$

$a=(MN) = \frac{7}{\sqrt{2}}$

area of shaded region —

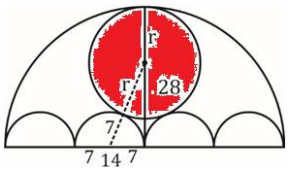
⇒ area of large square – (area of semicircle + area of smaller square)

$$\Rightarrow 14 \times 14 - \left[\frac{22}{7} \times \frac{7 \times 7}{2} + \frac{7}{\sqrt{2}} \times \frac{7}{\sqrt{2}}\right]$$

$$\Rightarrow 196 - \left[77 + \frac{49}{2}\right]$$

$\Rightarrow 94.5 \text{ cm}^2$

39. (d):



According to question

$(7 + r)^2 = (7)^2 + (28 - r)^2$

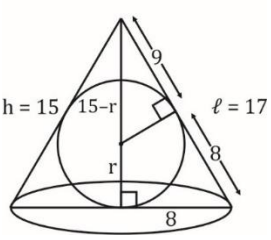
$(7 + r)^2 - (28 - r)^2 = 7^2$

$\Rightarrow 2r = \frac{112}{5}$

Area of shaded region = πr^2

$= \frac{22}{7} \times \frac{112}{10} \times \frac{112}{10} = 394.24 \text{ cm}^2$

40. (a):



According to fig.

$(15 - r)^2 - r^2 = 9^2$and,

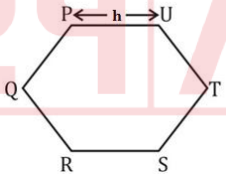
$(15 - 2r) = \frac{81}{15} = \frac{27}{5} \Rightarrow r = \frac{24}{5}$

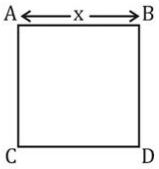
ratio of radius cone:Ratio of radius of sphere

$8 : {}^{24}/_{5}$

5 :3

41. (d):





Given in question

Area of PQRSTU = Area of ABCD

Let side of hexagon is h and side of square is x

$6 \times \frac{\sqrt{3}}{4} \times [\text{side of hexagon (h)}]^2 = [\text{side of square (x)}]^2$

$\frac{h^2}{x^2} = \frac{2}{3\sqrt{3}}$

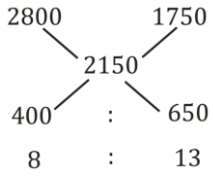
$\frac{h}{x} = \frac{\sqrt{2}}{\sqrt{3\sqrt{3}}}$

$\frac{perimeter\ of\ hexagonal}{Perimeter\ of\ square} = \frac{6 \times \sqrt{2}}{4 \times \sqrt{3\sqrt{3}}}$

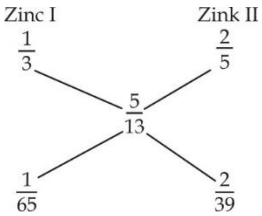
$= \frac{\sqrt{2 \times 3 \times 3 \times \sqrt{3}}}{\sqrt{3 \times 4 \times \sqrt{3} \times \sqrt{3}}} = \frac{\sqrt{6\sqrt{3}}}{2\sqrt{3}}$

42. (c): copper Zink Nickel
32% 44% 24%
44% Zink is 1kg. alloy.
in 12 kg Zink = $12 \times \frac{44}{100} = \frac{132}{25} = 5 \cdot 28kg$

43. (a):



44. (a):



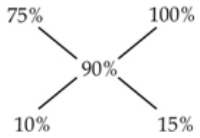
45. (d): $4x - \frac{4}{5} \times 10 = 4x - 8$
$x = \frac{1}{5} \times 10 = x - 2$
$\frac{4x-8}{x-2+10} = \frac{2}{3}$
x = 4 ⇒ 4x = 16 l

46. (d):

	Milk	Water
Mix I	$4_{\times 4} = 16$	$1_{\times 4} = 4$
Mix II	9	11

Now, Mix I × 3 and Mix II × 2
We get Mix I : Mix II = 66: 34 or 33: 17

47. (c):



Quality of milk to be added = $\frac{3}{2} \times 6 = 9$ liters

48. (c): 45789 is divisible by single digit no. 3.

49. (b): Sum of digits is divisible by 3.

50. (b): No of rows = x
No of columns = x
$x^2 = 1936$
x = 44

51. (c):

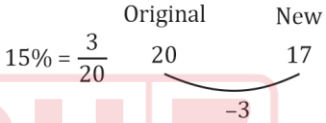
$$37\overline{)1000}\ 27$$
$$\frac{74}{260}$$
$$\frac{259}{1}$$

37-1=36
36 should be added.

52. (b): 78y is divisible by 8, So y = 4
$\frac{9+8+5+x+3+6+7+8+4}{9} = \frac{50+x}{9}$
So x = 4
x + y = 8

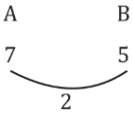
53. (a): Let total capacity of pond = 16 unit
On 42th day, water in pond = 16 unit
On 41th day, water in pond = 8 unit
On 40th day, water in pond = 4 unit
On 39th day, water in pond = 2 unit
On 38th day, water in pond = 1 unit
On 38th day pond is filled with $\frac{1}{16}$ of total capacity.

54. (b):



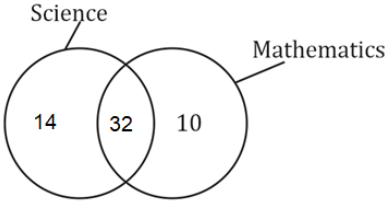
$\frac{3}{17} \times 100 = \frac{300}{17}\%$

55. (d):



40% = $\frac{2}{5}$
B's less than A = $\frac{2}{7} \times 100 = 28\frac{4}{7}\%$

56. (d): Failed in science = 100 – 54 = 46.



Total failed = 14 + 32 + 10 = 56
Passed in Both = 100 –56 = 44%

57. (d): $24\% = \frac{24}{100} = \frac{6}{25}$

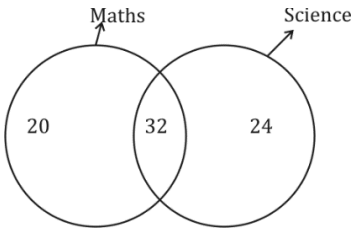
A B

31 25

6

$= \frac{600}{31}\%$

58. (a):



Passed in Both = 100 – 76 = 24%

59. (c):

10 9

-1

$\frac{1}{9}$ x 100= $\frac{100}{9}\%$

60. (a): loss = 23%

Gain = 23%

Over all loss = $\frac{23\times23}{100}$ = 5.29%

61. (a):

CP (100-Discount) 100-25 75

MP (100+Profit) 100+20 120

460

M.P. = $\frac{460}{75} \times 120$

= 736 Rs.

62. (c): $20\% = \frac{1}{5}$, $10\% = \frac{1}{10}$, $15\% = \frac{3}{20}$

5 4

10 9

20 17

1000 612

388

Equivalent discount= $\frac{388}{1000} \times 100 = 38.8\%$

63. (d): Gain → 13%

Loss → 13%

Over all loss → $\frac{13\times13}{100}$ = 1.69% loss

64. (a):

4 3

5 4

10 9

50 27

23 → 46%

100

65. (c): CP MP SP

5 8 6

$\frac{736}{120} \times 75 = 460$

66. (a): Mean proportion = $\sqrt{ab}$,

$\sqrt{10.8 \times 4.8}$,

third proportion = $\frac{b^2}{a}$

= $\frac{4\times4}{2}$ = 8

Sum = 7.2 + 8 = 15.2

67. (d): Mean proportion = a : b :: b : c

b = $\sqrt{ac}$

= $\sqrt{8.1 \times 3.6}$ = 5.4

Third proportion = a : b :: b : C

c = $\frac{b^2}{a} = \frac{9}{2}$

Ratio

$\frac{54}{10} : \frac{9}{2} \Rightarrow 5.4 : 4.5$

6 : 5

68. (b): 1.8 : X :: X : 3.2

mean proportion ⇒ $x^2 = \sqrt{1.8 \times 3.2}$

x = 2.4

And 5 : 3 :: 3 : X

Third proportion⇒

X= $\frac{9}{5}$

Req r atio ⇒ $\frac{12}{5} : \frac{9}{5}$

⇒ 4 : 3

69. (d): Mean proportion = $\sqrt{ab}$

$\sqrt{36 \times 12.1}$ = 6.6

Third proportion = $\frac{(11)^2}{2}$ a : b : : b : c

(Third proportion = $\frac{b^2}{a}$= c)

Ratio = $\frac{66}{10} : \frac{121}{2}$

6 : 55

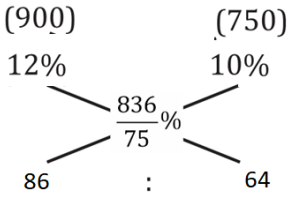
70. (a): $12 - 780516$
$1 - 65043$
$4 - 260172$

71. (b):

50P	5	250P
25P	8	200P
1Rs	1	100P
		550P ——— 5500
		1 ——— 10

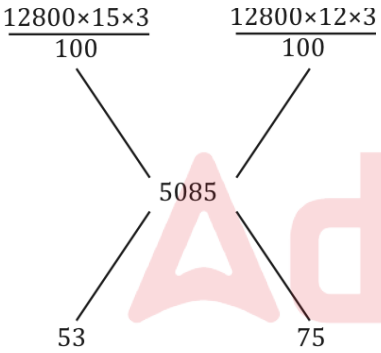
No. of coins of 25P = 80

72. (c):



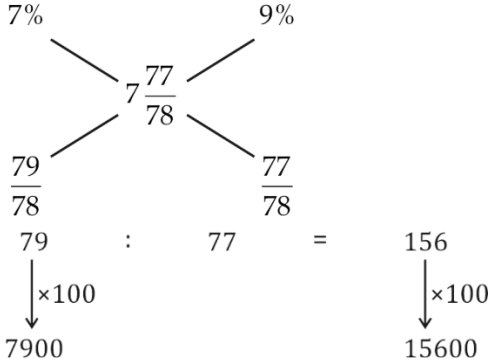
86+64=150
150unit-15000
Invest at 10% = 64 × 100
= 6400 R.s

73. (d):



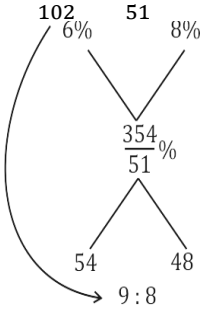
128 → 12800
Amount invested at 15% → 5300

74. (b): Total % interest $= \frac{3738}{3\times1560}\times100 = 7\frac{77}{78}\%$



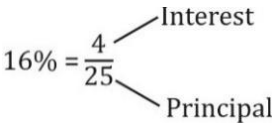
75. (d): Average rate of interest $= \frac{2124}{3\times10200}\times100$

$= \frac{708}{102} = \frac{354}{51}$



17 → 10200
$1 \rightarrow \frac{10200}{17}\times9$ → investat 6% = 5400

76. (c): Rate of interest = 8%
for two year = 8×2
=16%



Amount taken for lone = $191864 \times \frac{25}{29}$
= 165400 Rs.

77. (d): S.I $= \frac{264000\times3\times8.25}{100} = 65340$

78. (a): $\frac{39}{4} \div \left[\frac{13}{6} + \left\{\frac{13}{3} - \left(\frac{5}{2} + \frac{3}{4}\right)\right\}\right]$
$= \frac{39}{4} \div \left[\frac{13}{6} + \frac{13}{12}\right]$
$= 3$

79. (d): $\frac{24}{5} \div \frac{3}{7}\text{of}7 + \frac{4}{5}\times\frac{3}{10} - \frac{1}{5}$
$= \frac{24}{5}\times\frac{1}{3} + \frac{4}{5}\times\frac{3}{10} - \frac{1}{5}$
$\Rightarrow \frac{8}{5} + \frac{6}{25} - \frac{1}{5} = \frac{41}{25}$

80. (b): $5\frac{5}{6} + \left[2\frac{2}{3} - \left\{3\frac{3}{4}\left(\frac{19}{5}\times\frac{2}{19}\right)\right\}\right]$
$\frac{35}{6} + \left[\frac{8}{3} - \left\{\frac{15}{4}\times\frac{2}{5}\right\}\right]$
$\frac{35}{6} + \left[\frac{8}{3} - \frac{3}{2}\right]$
$\frac{35}{6} + \frac{7}{6} = \frac{42}{6} = 7$

81. (c): $\frac{16}{5} - \left[\frac{5}{2} - \left\{\frac{5}{6} - \left(\frac{12+9-8}{30}\right)\right\}\right]$
$\frac{16}{5} - \left[\frac{5}{2} - \left\{\frac{5}{6} - \frac{13}{30}\right\}\right]$
$\frac{16}{5} - \left[\frac{5}{2} - \frac{12}{30}\right]$
$\frac{16}{5} - \frac{63}{30} = \frac{33}{30} = \frac{11}{10}$

82. (d): $\frac{a^3-b^3}{a^2+b^2+ab} = (a-b)$

$= \frac{2.5}{100} = 0.025$

83. (a): $= \frac{26}{5} - \left[\frac{7}{2} - \left\{\frac{5}{6} - \frac{13}{30}\right\}\right]$

$= \frac{26}{5} - \left[\frac{7}{2} - \frac{6}{15}\right]$

$\frac{26}{5} - \frac{31}{10}$

$= \frac{21}{10}$

84. (c): Length of train =

$76 \times \frac{5}{18} \times 36$

= 760 m.

85. (c): Speed of airplane = $\frac{980}{35} \times 60$

= 1680

Time to travel distance = $\frac{1470}{1680}$

= $\frac{7}{8}$ hours.

86. (b): Avg speed = $\frac{2\times\frac{15}{7}\times3}{\frac{15}{7}+3} = \frac{\frac{90}{7}}{\frac{36}{7}} = 2.5\ m/s$

87. (c): $D_1 = 80 \times \frac{31.5}{60} = 42km$

$D_2 = 75 \times \frac{16}{60} = 20km$

Total Distance = 62km

88. (b): 600 = 25 × S

S = 24 m/s

380 + 100 = 24 × t

$\frac{480}{24} = t$

t = 20sec

89. (a):

Speed	Time	
24	2	
48	4	
72	6	+2
96	8	

−24

∴ Original speed = 96 km/hr

$33\frac{1}{3}\%$ of original speed = $96 \times \frac{1}{3}$ = 32 km/hr

90. (c):

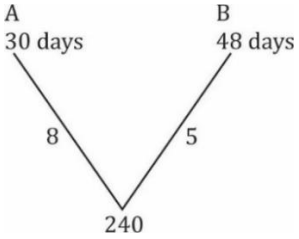
A + B	→	30	4
B + C	→	24	120 5
C + A	→	40	3

2(A + B + C) = 12

A + B + C = 6

A + B + C all together work = $\frac{120}{6}$ = 20 days.

91. (d):



W. D by A in 20 days = 160

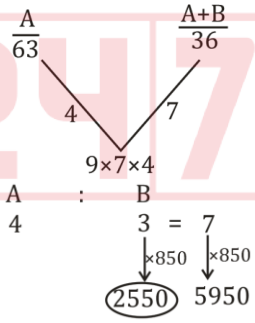
Remaining work by B = $\frac{80}{5} = 16$

92. (c): 15 × 14 = M × 30

M = 7

93. (a): A and C = $\frac{39\times17}{11} \times \frac{266}{300} = \frac{176358}{3300} = 53.4$ days

94. (d):



95. (b): $\frac{12\times8\times10}{100} = \frac{18\times D\times7}{70}$

D = $\frac{16}{3}$ days = $5\frac{1}{3}$ days

96. (b): x + 45 + 2x = 90°

3x = 45

x = 15°

97. (a): = $\frac{sin^2 24° + sin^2(90°-24°)}{cos^2 24° + cos^2(90-24°)} + sin^2 61° +$ cos 61° sin(90° − 61)

$\Rightarrow \frac{sin^2 24° + cos^2 24°}{cos^2 24° + sin^2 24°}$ = 1 + 1 ⇒ 2

98. (a): $\frac{\frac{1}{2}-\frac{1}{2}+1}{\frac{\sqrt{3}}{2}-1+1} = \frac{1}{\frac{\sqrt{3}}{2}}$

$= \frac{2}{\sqrt{3}} = \boxed{\frac{2\sqrt{3}}{3}}$

99. (b): $3x + 30° + 2x = 90°$

$5x = 60°$

$x = 12°$

100. (b): $\frac{1}{4} \times \frac{1}{2} + 2 \times \frac{1}{3} - 4$

$\frac{1}{8} + \frac{2}{3} - 4$

$\frac{3+16-96}{24}$

$-\frac{77}{24}$