

CB QA-PT

QUANTITATIVE TECHNIQUES

Practice Tests



These questions build your basics and hone your speed & accuracy.

You need to learn these before combatting IPMAT Level Questions, just like how one learns to draw shapes before drawing portraits.

CONTENTS

PRACTICE TESTS

	Page No.	
	Question	Solution
Calculation Techniques	1.1 - 1.3	2.1 - 2.3
Averages 1,2	1.3 - 1.7	2.3 - 2.7
Percentages 3	1.7 - 1.10	2.7 - 2.12
Simple and Compound Interest 2	1.11 - 1.14	2.12 - 2.17
Profit and Loss all	1.14 - 1.18	2.17 - 2.21
Ratio and Proportion 2,3	1.18 - 1.23	2.21 - 2.28
Mixtures and Alligation	1.23 - 1.26	2.28 - 2.32
Variation	1.26 - 1.29	2.32 - 2.36
Time and Work	1.29 - 1.34	2.36 - 2.42
Time and Distance	1.34 - 1.39	2.42 - 2.49
Numbers	1.39 - 1.44	2.49 - 2.56
Algebraic Formulae and Operations	1.45 - 1.47	2.56 - 2.59
Surds and Indices	1.47 - 1.49	2.59 - 2.62
Linear Equations	1.49 - 1.54	2.62 - 2.69
Quadratic Equations	1.54 - 1.56	2.69 - 2.72
Geometry	1.56 - 1.63	2.72 - 2.79
Mensuration	1.63 - 1.67	2.79 - 2.83
Sequences, Progressions and Series	1.67 - 1.70	2.83 - 2.88
Permutations and Combinations	1.70 - 1.74	2.89 - 2.94
Probability	1.74 - 1.77	2.94 - 2.99
Clocks and Calendars	1.78 - 1.81	2.99 - 2.105
Venn Diagrams	1.81 - 1.89	2.105 - 2.112

CONTENTS

GENERAL TOPICS

Page No.	Section	Page No.	Section	Page No.	Section
8.5 - 1.5	General	1.1 - 1.3	Definition	1.7 - 1.9	Classification, Equivalents
5.5 - 6.5		3.1 - 3.1		1.10 - 1.12	7.9 & 10.7
2.5 - 3.5		1.11 - 1.1		1.13 - 1.14	11.2
3.5 - 3.5		1.15 - 1.17		1.15 - 1.16	Simplest Form Equivalent
1.5 - 1.5		1.18 - 1.19		1.17 - 1.18	Brackets and Punctuation
8.5 - 8.5		1.20 - 1.21		1.19 - 1.20	Periods and Tildes
2.5 - 2.5		1.22 - 1.23		1.21 - 1.22	Mixtures and Allusions
2.5 - 2.5		1.24 - 1.25		1.23 - 1.24	Assumption
2.5 - 2.5		1.26 - 1.27		1.25 - 1.26	Time and Work
2.5 - 2.5		1.28 - 1.29		1.27 - 1.28	Time and Distance
2.5 - 2.5		1.30 - 1.31		1.29 - 1.30	Numbers
2.5 - 2.5		1.32 - 1.33		1.31 - 1.32	Abbreviations for Figures and Quantities
2.5 - 2.5		1.34 - 1.35		1.33 - 1.34	Sums and Justice
2.5 - 2.5		1.36 - 1.37		1.35 - 1.36	Percent Provisions
2.5 - 2.5		1.38 - 1.39		1.37 - 1.38	Qualitative Provisions
2.5 - 2.5		1.40 - 1.41		1.39 - 1.40	Geometric
2.5 - 2.5		1.42 - 1.43		1.41 - 1.42	Measurement
2.5 - 2.5		1.44 - 1.45		1.43 - 1.44	Schedules, Protocols and Series
2.5 - 2.5		1.46 - 1.47		1.45 - 1.46	Periodicity
2.5 - 2.5		1.48 - 1.49		1.47 - 1.48	Choice and Certainty
2.5 - 2.5		1.50 - 1.51		1.49 - 1.50	Open Discrepancy
2.5 - 2.5		1.52 - 1.53		1.51 - 1.52	Science, Protocols and Series
2.5 - 2.5		1.54 - 1.55		1.53 - 1.54	Periodicity
2.5 - 2.5		1.56 - 1.57		1.55 - 1.56	Choice and Certainty
2.5 - 2.5		1.58 - 1.59		1.57 - 1.58	Open Discrepancy
2.5 - 2.5		1.60 - 1.61		1.59 - 1.60	Science, Protocols and Series
2.5 - 2.5		1.62 - 1.63		1.61 - 1.62	Periodicity
2.5 - 2.5		1.64 - 1.65		1.63 - 1.64	Choice and Certainty
2.5 - 2.5		1.66 - 1.67		1.65 - 1.66	Open Discrepancy
2.5 - 2.5		1.68 - 1.69		1.67 - 1.68	Science, Protocols and Series
2.5 - 2.5		1.70 - 1.71		1.69 - 1.70	Periodicity
2.5 - 2.5		1.72 - 1.73		1.71 - 1.72	Choice and Certainty
2.5 - 2.5		1.74 - 1.75		1.73 - 1.74	Open Discrepancy
2.5 - 2.5		1.76 - 1.77		1.75 - 1.76	Science, Protocols and Series
2.5 - 2.5		1.78 - 1.79		1.77 - 1.78	Periodicity
2.5 - 2.5		1.80 - 1.81		1.79 - 1.80	Choice and Certainty
2.5 - 2.5		1.82 - 1.83		1.81 - 1.82	Open Discrepancy
2.5 - 2.5		1.84 - 1.85		1.83 - 1.84	Science, Protocols and Series
2.5 - 2.5		1.86 - 1.87		1.85 - 1.86	Periodicity
2.5 - 2.5		1.88 - 1.89		1.87 - 1.88	Choice and Certainty
2.5 - 2.5		1.90 - 1.91		1.89 - 1.90	Open Discrepancy
2.5 - 2.5		1.92 - 1.93		1.91 - 1.92	Science, Protocols and Series
2.5 - 2.5		1.94 - 1.95		1.93 - 1.94	Periodicity
2.5 - 2.5		1.96 - 1.97		1.95 - 1.96	Choice and Certainty
2.5 - 2.5		1.98 - 1.99		1.97 - 1.98	Open Discrepancy
2.5 - 2.5		1.100 - 1.101		1.101 - 1.100	Science, Protocols and Series

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CB-QA-PT

Practice Tests

CALCULATION TECHNIQUES

PRACTICE TEST 1

1. $456785 - 348543 + 11111 \times 9 - 9 \times 10101 = ?$
(1) 107342 (2) 117332 (3) 85342 (4) -41342
2. $13.05 \times 9.1 + 1196 \div 52 \times ? = 232.22$
(1) 5.5 (2) 10.4 (3) 12.5 (4) 4.9
3. $\frac{209}{133} - \frac{162}{126} - \frac{33}{231} = ? \% \text{ of } 1$
(1) 14.28 (2) 16.67 (3) 25 (4) 20
4. $? = \{5 + [(1/3) + (1/4)] \times 12 - 3\} - 3 \times 1/3$
(1) 8 (2) 3 (3) 6 (4) 5
5. $111.22 + 222.11 + 333.44 + 444.33 - 100.1 = ?$
(1) 1101 (2) 1111 (3) 1011 (4) 1110
6. $35.94 + 47.11 = 1.98 + ?^2$
(1) 9 (2) 11 (3) 7 (4) 8
7. $\left\{30 \div \overline{10+2} \times \left[\frac{3}{2} \text{ of } (-4 \times -6)\right]\right\} - ? = -10$
(1) 100 (2) 80 (3) 120 (4) 90
8. $? = (16.67\% \text{ of } 32172) + (62.5\% \text{ of } 132000) - (14.28\% \text{ of } 22890)$
(1) 84592 (2) 91132 (3) 89130 (4) 101392
9. $? = \frac{[2^4 + (16 - 3 \times 4)]}{[(6 + 3^2) \div (7 - 4)]}$
(1) 2.4 (2) 4 (3) 5 (4) 13.6
10. $3434344 - 434343 + 3434343 = ?$
(1) 6434343 (2) 6434344 (3) 3643433 (4) 6343334
11. $14.28\% \text{ of } 2401 = ? \% \text{ of } 686$
(1) 50 (2) 12.5 (3) 33.33 (4) 37.5
12. $21.999\% \text{ of } 149.999 + 39.888\% \text{ of } 199.888 = ? + 99.99$
(1) 17 (2) 21 (3) 13 (4) 19
13. $34634 + 45785 - 36457 - 125 = ?$
(1) 43837 (2) 43737 (3) 53837 (4) 43817

- 14.** $3458.022 + 391.984 - 7867.07 + 4137.31 = ?$
- (1) 139 (2) 120 (3) 171 (4) 113
- 15.** $7344 \div (24 \times 18) + 153 - 345 = ? - 88$
- (1) 5404 (2) -87 (3) 87 (4) 175

PRACTICE TEST 2

- 16.** 3.7% of 729 + 2.7% of 1369 = ?
- (1) 63.82 (2) 64 (3) 63.94 (4) 64.22
- 17.** $? = \frac{[(24^2) + (3^6) + (21^2) - 18]}{\sqrt[3]{1728}}$
- (1) 1 (2) 12 (3) 144 (4) None of these
- 18.** $? = [(2197)^{(1/3)} + 44 \div 4 \times 12] \div \sqrt{841}$
- (1) 2 (2) 1.6 (3) 1.5 (4) 5
- 19.** 11.11% of 10% of x + 6.67% of 16.67% of x - 11.11% of 20% of x = ?
- (1) 1 (2) $x/45$ (3) $2x/25$ (4) 0
- 20.** $7 + 77 + 777 + 7777 + 77777 = 100000 - ?$
- (1) 1640 (2) 1840 (3) 2240 (4) 2540
- 21.** $\sqrt[3]{216} \times \sqrt[2]{961} \times \sqrt[3]{2744} = ?^2 + 3$
- (1) 57 (2) 67 (3) 63 (4) 51
- 22.** (6.66% of 45) + (6.25% of 80) + (28.56% of 56) + (40% of 10) = ? + 1
- (1) 18 (2) 27 (3) 15 (4) 30
- 23.** $\left(3\frac{2}{3} + 4\frac{2}{4} - 5\frac{2}{12}\right)^2 \times \sqrt[3]{729} = (?)^2$
- (1) 81 (2) 3 (3) 9 (4) 27
- 24.** $? = 4\frac{1}{3} - \left\{ \frac{1}{6} \times \left(3 + 2\frac{1}{5} + 5 - 4\frac{1}{5} \right) \right\}$
- (1) $\frac{11}{3}$ (2) $3\frac{1}{3}$ (3) $\frac{1}{3}$ (4) $4\frac{1}{3}$
- 25.** $? = [2.96 + (2.14 - 3.78) \times 6.96 + 3.21 - (7.99 \times 1.79 - 12.19) \div 3.91]$
- (1) -5.78 (2) -21.33 (3) -32.73 (4) 1.75
- 26.** (15.012% of 200.336) + (24.969% of 175.663) + (89.999% of 999.999) = 1000 - ?
- (1) 21 (2) 26 (3) 29 (4) 25
- 27.** $0.5\overline{45} \times \frac{1331}{216} = ? \% \text{ of } \frac{121}{36}$
- (1) 50 (2) 100 (3) 25 (4) None of these

28. $? = (3.4545\dots \times 198) \div 171$

- (1) 4.4545... (2) 5.4545...

(3) 4

(4) 5

29. $? = \frac{2}{2\left[3 + \frac{3}{2 + \frac{3}{2}}\right] + 2} + \frac{1}{1 + \frac{2}{2\left[3 + \frac{3}{2 + \frac{3}{2}}\right]}}$

(1) $2/3$

(2) $3/2$

(3) 1

(4) $1/3$

30. $10 \times \left(3 + \frac{3}{5}\right)^{\text{th}}$ of $3.45\bar{6}$ + $\left(5 + \frac{3}{5}\right)^{\text{th}}$ of $\frac{6}{5} = ?$

(1) $\frac{3452}{25}$

(2) $\frac{658}{5}$

(3) $\frac{456}{5}$

(4) None of the above

AVERAGES

PRACTICE TEST 1

1. The average rainfall in a city on Wednesday, Thursday and Friday was 25 mm while the average rainfall on Thursday, Friday and Saturday was 24 mm. If the rainfall on Saturday was 27 mm, what was the rainfall (in mm) on Wednesday?

(1) 27

(2) 30

(3) 32

(4) 26

2. For two positive numbers, their geometric mean is 20 and their arithmetic mean is 50. What is their harmonic mean?

(1) 40

(2) 20

(3) 8

(4) 12

3. The average units sold over 20 days were calculated as 550. However, it was noticed that on a particular day, the number of units sold were over-reported by 40. What was the correct average units sold per day?

(1) 552

(2) 550

(3) 546

(4) 548

change in average

4. What is the average of the first 75 natural numbers?

(1) 38

(2) 37

(3) 37.5

(4) 38.5

5. The average age of 20 students is 9 years. If their 51 year old principal is also included, what is the change in the group's average age?

(1) +1

(2) +2

(3) -2

(4) -1

6. The average salary of three boys is Rs. 34,000. This drops to Rs. 29,000 when a girl joins their group. What is the girl's salary?

(1) Rs. 14,000

(2) Rs. 15,000

(3) Rs. 16,000

(4) Rs. 17,000

7. What is the average of the first 8 multiples of 9?

(1) 38.05

(2) 39

(3) 41

(4) 40.5

8. The average age of a group of friends is 25 years. If four more friends, with an average age of 21 years, join the group; the average age of the entire group becomes 23 years. How many friends were there in the group initially?

(1) 4

(2) 5

(3) 6

(4) 2

9. The average weight of six students increases by 2 kg if a student weighing 48 kg is replaced by another student. What is the weight of the new student?

(1) 36 kg

(2) 46 kg

(3) 50 kg

(4) 60 kg

- 10.** 15 boys and 12 girls went for a picnic. The average age of the boys was 25 years while that of the girls was 20 years. What was the average age of the group?
 (1) 23.78 (2) ~~22.78~~ (3) 23 (4) 22
- 11.** The average cost of three pens and an eraser is Rs. 8.5. This average falls by 50 paise if three pens and a sharpener are considered instead. If a sharpener costs Rs. 2, what is the cost of an eraser?
 (1) Rs. 1 (2) Rs. 6 (3) ~~Rs. 4~~ (4) Rs. 3
- 12.** Ajanta Garments started in 2013 and spent 32, 44, 49, 67 and 78 (in Rs. lakhs) on advertising over the last five years. Imperial Fabrics started in 2014 and correspondingly spent 48, 57, 61 and 82 (in Rs. lakhs) on advertising over the last four years. What was the average annual advertising spend per company?
 (1) 60 (2) 53 (3) ~~58~~ (4) 44
- 13.** In a cricket match, the top five batsmen together scored 30 more runs than the bottom six batsmen taken together. What is the difference in the average runs scored by the top five batsmen and the average runs scored by the bottom six batsmen if the total score of the eleven batsmen is 210?
 (1) 6 (2) 8 (3) 10 (4) ~~9~~
- 14.** A company has two divisions – A and B – and it gives an average monthly allowance of Rs. 1,200 to each employee. The 200 employees of division A get Rs. 900 as average monthly allowance while the employees in division B get Rs. 1,400 as average monthly allowance. How many employees does division B have?
 (1) 200 (2) 400 (3) 150 (4) 300
- 15.** In an exam, the average marks were found to be 60. During revaluation, marks of 150 students had to be changed from 80 to 55 each and the overall average marks dropped by 15. How many students appeared for the exam?
 (1) 300 (2) 325 (3) ~~250~~ (4) 350

PRACTICE TEST 2

- 16.** The total salary cost in a particular company is $(x^2 + 4x + 3)$. There are $(x + 1)$ employees in the class. If the average salary per employee is 49, how many employees are there in the company?
 (1) ~~46~~ (2) 47 (3) 48 (4) 49
- 17.** The average age of a batch of MBA (Tech) students today is 28 years. All these students will be together for a five-year course. What will be the average age of this unchanged batch of students, two years after they complete their course? For two positive numbers, their geometric mean is 20 and their arithmetic mean is 50. What is their harmonic mean?
 (1) 40 (2) ~~20~~ (3) 8 (4) 12
- 18.** The average age of P, Q, R and S is 26 years. The average age of Q and S is 28 years. What is R's age if P is two years older than R?
 (1) ~~23~~ (2) 24 (3) 25 (4) 26
- 19.** The average number of toys with five friends is 25. If the two youngest friends have 13 toys with them on an average, what is the average number of toys with the remaining three friends?
 (1) ~~33~~ (2) 34 (3) 30 (4) 31
- 20.** A class of 25 students took a test. Two-fifth of the students had an average score of 80 while the rest had an average score of 60. What was the average score of the whole class?
 (1) 66 (2) ~~68~~ (3) 70 (4) 64

- Running confusion
21. A batsman's score in the third innings was 2.5 times his average score for the first two innings. If his average score over all three innings put together was 90, what was his score in the third innings?
- (1) 50 (2) 120 (3) 100 (4) 150
22. The average marks in Maths for a class of 30 students are 53. However, the marks of two students were misread as 54 and 63 instead of 57 and 69. What was the correct average?
- (1) 56.6 (2) 54.6 (3) 51.3 (4) 53.3
23. In a college, the average age of 10 male teachers, 7 female teachers and 1 student is 46 years. If the average age of the male teachers is 47 years and that of the female teachers is 48 years, what is the age of the student?
- (1) 14 years (2) 22 years (3) 18 years (4) 20 years
24. The average of three numbers is 18. If 3 is added to the second number, the average of the first two numbers (post modification) is still 18. What is the value of the third number?
- (1) 12 (2) 15 (3) 18 (4) 21
25. The average monthly salary of 17 workers and 8 managers in a factory was Rs. 650. When one of the managers, whose salary was Rs. 1,200, was replaced with a new manager, the average salary of the team went down to Rs. 630. What is the salary of the new manager?
- (1) Rs. 800 (2) Rs. 850 (3) Rs. 700 (4) Rs. 950
26. Fifteen numbers, with an average value of 54, are arranged in a line. The average of the first eight numbers is 64 and the average of the last eight numbers is 60. What is the value of the eighth number?
- (1) 182 (2) 152 (3) 214 (4) 180
27. The average weight of a class of 42 was calculated as 39 kg. It was later realized that the weight of two students was wrongly calculated. Actual weight of one of the students in the class was 43 kg, but it was calculated as 40 kg and weight of another student was calculated as 47 kg instead of 44 kg which is his actual weight. What is the actual average weight of the 42 students? (Rounded off to two-digits after decimals)
- (1) 39.12 (2) 38.88 (3) 39.52 (4) None of the above
28. A family has a father, mother, son and daughter. The average age of the females is 32 years and the average age of the males is 36 years. If the son and daughter are 22 and 18 years old respectively, what is the average age of the parents?
- (1) 45 (2) 46 (3) 47 (4) 48
29. The average weight of D, E and F is 78 kg. G joins the group, bringing the average weight of the group down to 75 kg. Then, H, whose weight is 7 kg more than G, replaces D. If this takes the average weight of the group to 73 kg, what is the weight of D?
- (1) 84 kg (2) 81 kg (3) 66 kg (4) 75 kg
30. A student finds the average of 20 positive integers. Each integer contains two digits. By mistake, the boy interchanges the digits of one number i.e. considers one number as ba instead of ab . Due to this, the average becomes 2.7 less than the earlier value. What is the difference between a and b ?
- (1) 4 (2) 2 (3) 8 (4) 6

PRACTICE TEST 3

31. The average age of three brothers is 10 years. The total age of the family (including their parents) is 115 years. If the ratio of the age of the father and mother is 9 : 8, what is the father's age (in years)?
- (1) 63 (2) 54 (3) 45 (4) 40

- 32.** A couple got married five years ago at an average age of 24 years. Today, they are a three member family with an average age of 20 years. If they have one child, how old is the child (in years)?
- (1) 2 (2) 3 (3) 4 (4) 1
- 33.** The average of six consecutive even numbers is 47 while the average of five consecutive odd numbers is 93. What is the difference between the largest odd number and the second largest even number?
- (1) 51 (2) 47 (3) 65 (4) 69
- 34.** The average age of 40 workers and a contractor is 24 years, which drops by six months if only the 40 workers are considered. What is the contractor's age?
- (1) 40 (2) 42 (3) 44 (4) 45
- 35.** A student's score in four mocks was 141, 147, 162 & 178 out of 200. If his score in the fifth mock was seven less than his average score over the first four mocks, how much did he score in the fifth mock?
- (1) 151 (2) 152 (3) 153 (4) None of these
- 36.** In an organization, Grade I workers have an average monthly salary of Rs. 42 while Grade II workers have an average monthly salary of Rs. 36. What is the total monthly expenditure (in Rs.) of the organization on salaries if employees in grade I to grade II are in the ratio 2 : 3? There are no other grades in this organisation.
- (1) 288 (2) 672 (3) 1344 (4) Cannot be determined
- 37.** Heena bought 15 red balls for Rs. 5 each and 5 blue balls for Rs. 6 each. What would be the change in average price per ball if she interchanged number of balls bought of each type?
- (1) Increases by 1 (2) Decreases by 0.5 (3) Increases by 0.5 (4) Decreases by 1
- 38.** The average of p numbers is l . If one of the numbers q is replaced by r , the average becomes m . Which of the following is true?
- (1) $p(l - m) = q - r$ (2) $p(l - m) = r - q$ (3) $p(r - q) = l - m$ (4) $p(q - r) = l - m$
- 39.** P and Q are classmates. A Mathematics and English test is held in their class, but Q misses the Mathematics test and P misses the English test. The total score of the class in both tests combined is 1920 while the average score of the class in the Mathematics and English test is 26 and 34 respectively. How many students are there in the class?
- (1) 34 (2) 33 (3) 32 (4) 36
- 40.** The average of ten numbers is N . Each number is first doubled and then 15 is added to each number. What is the new average of the ten numbers?
- (1) $2N + 15$ (2) $N + 10$ (3) $0.5N + 7.5$ (4) $2N + 10$
- 41.** Two groups of people with average weights of 80 and 90 kg are combined to form a fresh group with average weight 84 kg. What can be the total number of people in the third group?
- (1) 36 (2) 42 (3) 54 (4) 50
- 42.** The average marks scored by a class of 35 students are 48. If the highest and the least marks are excluded, the average falls by 3 marks. The difference between the highest and the lowest marks is 33. What are the least marks that any student has obtained?
- (1) 76 (2) 78 (3) 87 (4) 81
- 43.** The average weight of a class of 40 students is 44000 gms, which increases by 600 gms when their teacher is also considered. The same thing happens when two equally heavy students are removed from the class. What is the weight (in kg) of each of those two students?

(1) 33.8

(2) 32.2

(3) 32.6

(4) 33.4

44. The average age of 20 men is 49 years. If two men (aged 45 and 50 years) leave the group and three men join the group, the average age remains unchanged. What is the average age of the three men who joined the group later?
 (1) 32 years (2) 35 years (3) 38 years (4) 48 years

45. The average age of a family of five people, ten years ago, was 42 years. Some years later, Shilpa got married to a member of this family and entered this family. Three years after her marriage, Shilpa gave birth to a baby girl. The average age of the family today is 43 years. If the baby girl is celebrating her third birthday today, and no one left the family, how old was Shilpa when she got married?

(1) 38

(2) 28

(3) 35

(4) 32

PERCENTAGES

PRACTICE TEST 1

1. $90\% \text{ of } 140 \times 18\% \text{ of } 50 = ? \times 24\% \text{ of } 25$

(1) 199

(2) 189

(3) 149

(4) 139

2. $11.11\% \text{ of } 20\% \text{ of } 30 + 9.09\% \text{ of } (33/2) = ?$

(1) $13/6$

(2) 1

(3) 0

(4) $3/2$

3. Two numbers are respectively 20% and 50% less than a third number. What is the ratio of the two numbers?

(1) 8 : 5

(2) 3 : 2

(3) 4 : 5

(4) 5 : 2

4. The pocket money of Vidhi, Priya and Minu is 5 : 7 : 8. If it increases this year by 40%, 50% and 75% respectively, what will be the new ratio of pocket money?

(1) 2 : 3 : 4

(2) 2 : 4 : 5

(3) 2 : 3 : 5

(4) 3 : 4 : 2

5. Abhinav planned to purchase a flat at a rate of Rs. 15,000 per sq.ft. He delayed for a month and the price per sq.ft went up by 20%. He could increase his original budget of Rs. 1.2 crores only by an additional 8%. How many sq.ft would he have to sacrifice in the flat's area?

(1) 125

(2) 75

(3) 80

(4) 100

6. Since the price of a product decreases by 15%, Seema buys 20% more of that product. What is the percentage change in her expenditure?

(1) -5%

(2) 5%

(3) -2%

(4) 2%

7. Rohit scored 110 runs in a match, with 3 fours and 8 sixes. A four and six correspond to 4 and 6 runs respectively, and are called boundaries". What percent of his total score did Rohit not score in boundaries?

(1) 45%

(2) 45.45%

(3) 55%

(4) 54.63%

8. In 2017, Arjun was able to hit 18 out of 40 targets in an archery contest. In 2018, he managed to hit 33 out of 60. What was the percentage improvement in his accuracy rate?

(1) 22.22%

(2) 83.33%

(3) 10%

(4) 20%

9. Arushi multiplied a number by $5/4$ instead of $4/5$. What is the percentage error in her calculation?

(1) 62.5%

(2) 55.55%

(3) 56.25%

(4) 36%

10. Had Anuj scored twice the marks that he actually scored, he would have still failed in a test by 2% of the total marks. What percentage did he actually score, if the passing percentage was 40%?
 $T=100$

- 10. ~~Wrong option~~**
11. What is the value of:
 $(42.86\% \text{ of } 8.33\% \text{ of } 336) + (83.33\% \text{ of } 27.27\% \text{ of } 264) - (133.33\% \text{ of } 54)$
- (1) 0 (2) -4 (3) 2 (4) -3
12. A 1-litre of Gokul milk costs Rs. 60 while a 500 ml packet of Gokul costs Rs. 33. Both Jay and Rima buy 5 litres each of Gokul; but Jay buys only 1-litre packets while Rima buys 500 ml packets. By what percentage is Rima's expenditure more than Jay's expenditure?
- (1) 30% (2) 33.33% (3) 32.5% (4) 35%
13. If the length of a rectangle increases by 50% and its breadth decreases by 20%, what is the percentage change in its area?
- (1) -10% (2) +20% (3) -20% (4) +25%
14. In an election between A and B, A defeated B by 10 percentage points in terms of valid votes. 20% of the votes cast were rejected as invalid. If B got 2700 valid votes, how many votes were cast in all?
- (1) 6600 (2) 7200 (3) 7500 (4) 6000
15. Vinay dines at a cafe and pays Rs. 400 to settle the bill. He leaves the change received as the waiter's tip. The bill comprises the actual cost of food and a service tax of 12.5% on the actual cost. What is the waiter's tip if the service tax incurred was Rs. 40?
- (1) Rs. 10 (2) Rs. 20 (3) Rs. 30 (4) Rs. 40
- PRACTICE TEST 2**
16. $43\% \text{ of } 474 + 38\% \text{ of } 948 - 28\% \text{ of } 237 - 5\% \text{ of } 474 = ? + 33$
- (1) 23 (2) 25 (3) 27 (4) 21
17. The profits of companies P and S are in the ratio 3 : 5. If the profit of P increases by 20% and that of S decreases by 10%, their profits differ by Rs. 4,050. What is S's original profit?
- (1) Rs. 27,000 (2) Rs. 36,000 (3) Rs. 30,500 (4) Rs. 22,500
18. $(x\% \text{ of } y) + (2y\% \text{ of } x) = a\% \text{ of } 2y$. What is the value of a ?
- (1) $3x$ (2) $2x$ (3) $1.5x$ (4) $2.5x$
19. One-fourth of two-fifth of five-twelfth of 60% of 600 is thrice a number. What is that number?
- (1) 5 (2) 15 (3) 10 (4) 12
20. Seema had an FD for her three daughters. When it matured, she gave 25% of the amount to her second daughter and again, 30% of the remaining to her eldest daughter, 20% of the remaining to her youngest daughter. If Seema still had Rs. 8,400, what was the value of the FD? Ignore the interest earned on the FD.
- (1) Rs. 24,000 (2) Rs. 20,000 (3) Rs. 18,000 (4) Rs. 16,000
21. Ganesh spends 15% of his income on EMIs, 20% on transport, 40% on household expenditures and saves the rest. If he saves Rs. 5,000 per month, what are his monthly EMIs?
- (1) Rs. 3,000 (2) Rs. 2,000 (3) Rs. 4,000 (4) Rs. 4,500
22. The hourly wages of a labourer have increased by 15% while his working hours have reduced by 12.5%. If he was earning Rs. 80 per day earlier, how much does he earn now in a 30-day month?
- (1) Rs. 2,340 (2) Rs. 2,700 (3) Rs. 2,415 (4) Rs. 2,775

23. The price of a pen is more than that of a pencil by 40%. By what percent is the price of 15 pens more than that of 10 pencils?
 (1) 10% (2) 110% (3) 52% (4) 125%
24. If $A = p\%$ of q and $B = q\%$ of p , which of the following is true?
 (1) $A < B$ (2) $A > B$ (3) $A \leq B$ (4) $A = B$
25. Pari has savings of Rs. 66,000. Of these, she has invested Rs. 12,000 in a mutual fund scheme that grows at 25% annually; and has invested the rest in a ULIP scheme that grows at 20% annually. If these growth rates are constant, what approximate amount will she get five years from now? → Successive %
 (1) Rs. 1.71 lakhs (2) Rs. 1.43 lakhs (3) Rs. 2.18 lakhs (4) Rs. 2.01 lakhs
26. Amrita, Ankita and Anuja are colleagues. Amrita and Ankita's total salary is 300% of Anuja's salary. Amrita and Anuja's total salary is 200% of Ankita's salary. If Anuja earns Rs. 7,500 per month, how much does Amrita earn per month? →
 (1) Rs. 10,000 (2) Rs. 12,500 (3) Rs. 15,000 (4) Rs. 17,500
27. In 2014, a cottage worth Rs. 13.31 lakhs is constructed on a plot worth Rs. 7.29 lakhs. In which year will both be of the same value if the cost of the plot increases by 10% annually and that of the cottage decreases by 10% annually?
 (1) 2016 (2) 2017 (3) 2018 (4) 2019
28. Water forms four-fifth the weight of fresh grapes and only one-fifth the weight of dried grapes. What is the weight of dried grapes obtained from 500 kg of fresh grapes? → Solution → ~~Approach~~ Hit & Trial → Approach
 (1) 175 kg (2) 180 kg (3) 150 kg (4) 125 kg
29. A tournament was held in two parts. A team participating in this tournament won half the matches that it played in the first part and three-fourth of all the matches that it played throughout the tournament. The team won all its matches in the second part. If it played six matches in the first part, how many matches did it win in the second part?
 (1) 6 (2) 4 (3) 5 (4) 10
30. Zeeshan takes a salary cut while changing industries. In his new company, he proves himself and gets a salary hike of 10%, 12% and 8% for the next three years. He used to earn Rs. 16,000 per month in the earlier job and earns Rs. 33,28 less after these salary hikes. What percent salary cut did he take while changing industries? → Approach → Calculations
 (1) 20% (2) 25% (3) 15% (4) 30%

PRACTICE TEST 3

31. Ritu scored half the total marks in a test of five subjects. If she scored 36%, 41%, 53% and 30% in the first four subjects, what percentage did she score in the fifth subject? All subjects had equal total marks.
 (1) 80 (2) 60 (3) 70 (4) 90
32. Since the price of sugar reduced by 20%, Rohan was able to purchase 10 kg more for Rs. 80. What was the original price per kg of sugar?
 (1) Rs. 4 (2) Rs. 10 (3) Rs. 3 (4) Rs. 2
33. P earns 20% more than Q, who earns 20% less than R. Who earns the most?
 (1) P (2) Q (3) R (4) Cannot be determined
34. At what growth rate over five years has the population of Dahanu increased from 258600 in 2009 to 382728 in 2014?
 (1) 48% (2) 44% (3) 52% (4) 46% $\frac{382728 - 258600}{258600} \times 100 = 48.1\%$

- 35.** Manan's incentive was Rs. 1,890, which was 14% of his salary. Next month, he got an additional incentive of Rs. 1,485 but his salary remained the same. The incentive formed what part of his salary this month?
 (1) 18.67% (2) 22.75% (3) 25% (4) 26.67%
- 36.** A number is increased by 40% and then decreased by 20%. What is the value of the original number, if its value increases by 9 in this process?
 (1) 58 (2) 75 (3) 60 (4) 65
- 37.** An ice-cream parlour had five flavours. One day, of the total customers who walked in, 10% tasted all the flavours and 10% did not taste a single flavour. Of the remaining, 25% tasted exactly one flavour and 10% tasted exactly four flavours. Of the people now remaining, 25% tasted exactly two flavours and 273 tasted exactly one flavour. How many customers walked in that particular day?
 (1) 700 (2) 950 (3) 800 (4) 720
- 38.** A and B are two numbers. A first increases by 30%, then decreases by 25% and finally increases by 40%. B first decreases by 24% and then increases by 20%. What is the percentage change in the value of AB?
 (1) 17.8% (2) 26% (3) 19.9% (4) 24.5%
- 39.** P, Q, R and S pooled money to buy a gift. P first gave 40% of the total amount. Q then gave 50% of the shortfall. Now, R contributed 60% of the current shortfall. Finally, S contributed the balance Rs. 924. What is the difference between P and R's contribution?
 (1) 770 (2) 1694 (3) 2310 (4) 2156
- 40.** A company has 400 employees across three departments - P, Q, R. Q has 30% of the total employee strength and R has 25% more employees than Q. If the staff strength in only R first increases by 20% and then decreases by 30%, what is the change in the number of employees in the company? There is no change in employee count in P and Q.
 (1) 24 (2) 6 (3) 18 (4) 12
- 41.** Babu, is able to sell 60% of his paddy crop in May and has to throw away 15% of the remainder. In June, he is able to sell half the remaining crop and has to throw away the rest. If Babu does not cultivate paddy in June, what percentage of his paddy crop has he thrown away?
 (1) 25% (2) 23% (3) 33% (4) 40%
- 42.** What percent of two-digit numbers have a prime unit's digit?
 (1) 40% (2) 22.22% (3) 23.33% (4) 44.44%
- 43.** PQR Ltd has six divisions - A to F. B has 80% the employee strength of A. E has 20% more employees than C. D has 12.5% less employees as compared to B. F has 30% the employee strength of C, which has 33.33% more employees than A. If D has 18 more employees than F, how many employees does PQR Ltd have?
 (1) 400 (2) 300 (3) 280 (4) 350
- 44.** Guru gets a salary of Rs. 20,000 per month as a sales manager. For all sales up to Rs. 3,00,000 per month, he gets a 5% commission on actual sales; and for sales above this value, he gets a 10% commission on actual sales above Rs. 3,00,000. What are his sales for June (in Rs.) if he gets a total amount of Rs. 49,430 for that month?
 (1) 396900 (2) 412700 (3) 444300 (4) 348500
- 45.** A printer charges Rs. 10 to print a single page. Though there is no discount on the first 100 pages, he gives a bulk discount post 100 pages. After 100 pages, he gives a 1% discount on the next 100 pages, 2% discount on the next 100 pages and so on. If Sahil pays Rs. 3,676 to get a report printed, how many pages does the report have?
 (1) 461 (2) 456 (3) 431 (4) 446

SIMPLE AND COMPOUND INTEREST

PRACTICE TEST 1

1. If the simple interest on a sum of money for 2 years at 5% per annum is Rs. 100, what is the compound interest on the same sum at the same rate and for the same time?
 (1) Rs. 102.5 (2) Rs. 104 (3) Rs. 108.5 (4) Rs. 120

2. An amount placed at simple interest grows 35% in five years. What will be the simple interest earned on Rs. 15,000 after 3 years at the same rate?
 (1) Rs. 2,160 (2) Rs. 3,150 (3) Rs. 3,970 (4) Rs. 4,240

3. The difference between the compound interest and the simple interest for 2 years on Rs. 32,000 at a certain rate of interest is Rs. 460.8. What is the rate of interest?
 (1) 10.5% (2) 9 (3) 12% (4) 15%

4. A certain amount earns Rs. 2,000 as simple interest after 5 years. If the rate of interest goes down by 1 percentage point, what is the new interest?
 (1) Rs. 1,840 (2) Rs. 1,900 (3) Rs. 1,970 (4) Cannot be determined

5. Simple interest on a certain sum of money for 4 years at 24% per annum is 80% of the compound interest on Rs. 42,000 for 2 years at 10% per annum. What is this sum?
 (1) Rs. 7,350 (2) Rs. 8,210 (3) Rs. 9,880 (4) Rs. 6,160

6. What is the compound interest on Rs. 35,000 at 24% p.a. for 6 months compounded quarterly?
 (1) Rs. 4,510 (2) Rs. 4,058 (3) Rs. 4,326 (4) Rs. 3,942

7. Nabi lent Rs. 4,000 at simple interest for twice as many years as the rate of interest. If he got Rs. 2,880 as interest at the end of the loan period, what was the rate of interest (in %)?
 (1) 3.6 (2) 6 (3) 18 (4) 7.2

8. In how many months does Rs. 62,500 amount to Rs. 1,08,000 at 20% per annum compounded annually?
 (1) 60 (2) 24 (3) 48 (4) 36

9. What is the simple interest earned on Rs. 3,50,000 at 12% per annum for 5 years?
 (1) Rs. 1,80,000 (2) Rs. 2,35,000 (3) Rs. 2,10,000 (4) Rs. 1,95,000

10. The difference between simple and compound interests compounded annually on a certain sum of money for 3 years at 4% per annum is Rs. 100. What is the sum? → *calculation*.
 (1) Rs. 20,000 (2) Rs. 23,000 (3) Rs. 21,000 (4) Rs. 24,000

11. Vikas invests money in two different schemes for 48 and 120 months at 18% and 8% simple interest respectively. On maturity of each scheme, he gets the same interest. What is the ratio of his investments?
 (1) 5 : 4 (2) 11 : 14 (3) 8 : 3 (4) 10 : 9

12. Hemang buys a Pulsar bike worth Rs. 1.1 lakhs by paying a down payment of Rs. 50,000. The deal is such that he has to pay the remaining amount 21 months later as a one-time payment, for which he is charged 9% simple interest annually. What is the total cost of the bike for him?
 (1) Rs. 1,21,200 (2) Rs. 1,19,450 (3) Rs. 1,18,540 (4) Rs. 1,23,100

- 13.** If a sum of Rs. 15,400 amounts to Rs. 19,712 at 7% simple interest, what is the tenure?
 (1) 3 years (2) 4 years (3) 6 years (4) 7 years
- 14.** Rs. 4,500 is placed at annual compound interest for two years. The interest for the second year exceeds that for the first year by Rs. 180. What is the rate of interest?
 (1) 15% (2) 18% (3) 20% (4) 24%
- 15.** A bank lent Rs. 4,000 to Manoj at a certain rate of simple interest and Rs. 5,000 to Aditi at simple interest at a rate 0.5 percentage points greater than Manoj. Two years later, the bank got Rs. 860 as the total interest from both of them. At what annual rate of interest was the amount lent to Aditi?
 (1) 4.5% (2) 4% (3) 5.5% (4) 5%
- PRACTICE TEST 2**
- 16.** Jigar lends money to three people at simple interest at rates of 5%, 8% and 10% respectively. The time duration for these three people is 2 years, 5 years and 3 years respectively. In what ratio has he lent the money, if he gets equal interest from all three people?
 (1) 2 : 3 : 5 (2) 12 : 3 : 4 (3) 8 : 1 : 3 (4) 3 : 3 : 10
- 17.** Find the amount to be paid after $2\frac{1}{2}$ years, if the principal is Rs. 96,000 rate of simple interest is $15\frac{2}{3}\%$ and this period is $2\frac{1}{2}$ years?
 (1) Rs. 1,46,600 (2) Rs. 1,33,600 (3) Rs. 1,05,000 (4) Rs. 1,89,600
- 18.** What will be the compound interest on Rs. 6.25 lakhs after three years at 6% annual compounding?
 (1) Rs. 1,14,756 (2) Rs. 1,08,985 (3) Rs. 1,16,905 (4) Rs. 1,19,385
- 19.** Chetna borrowed Rs. 50,000 at 10% simple interest for 3 years and invested the same amount at 10% annual compounding for the same period. What was her profit or loss?
 (1) Lost Rs. 1,750 (2) Gained Rs. 5,000 (3) Gained Rs. 1,550 (4) Neither gained nor lost
- 20.** Gautam lends Rs. 12,000 each to two people at different rates of simple interest. The difference between the simple interest received from those people after 3.5 years is Rs. 84. What is the difference between their rates of interest?
 (1) 0.2 (2) 1.25 (3) 0.5 (4) 0.4
- 21.** A sum of Rs. 7,000 was lent partly at 11% and partly at 8% simple interest. If the total interest received after a year was Rs. 680, in what ratio were the amounts lent at 11% and 8% respectively?
 (1) 9 : 5 (2) 5 : 2 (3) 11 : 10 (4) 4 : 3
- 22.** A certain sum of money lent at simple interest triples itself in 5 years. In how many years does it become thirteen times itself, at the same rate?
 (1) 42 (2) 33 (3) 30 (4) 45
- 23.** Ali invested an amount of Rs. 6,000 in a fixed deposit scheme for two years at 5% annual compound interest rate. What amount will he get on maturity of the fixed deposit?
 (1) Rs. 6,345 (2) Rs. 6,615 (3) Rs. 6,520 (4) Rs. 6,420
- 24.** The effective annual rate of compound interest corresponding to a compound interest rate of 8% per annum payable half-yearly is:
 (1) 8.05% (2) 8.08% (3) 8.16% (4) 8.20%

25. A certain principal is lent out at 20% annual compounding for two years. If the compounding is half-yearly instead, the interest increases by Rs. 241. What is the principal?

- (1) Rs. 5,000 (2) Rs. 10,000 (3) Rs. 15,000 (4) Rs. 20,000

26. What is the present value of Rs. 950 that is received five years from now, when placed at 8% per annum?

- (1) Rs. 898 (2) Rs. 679 (3) Rs. 589 (4) Rs. 778

27. ~~Imp~~ A sum of money was borrowed at 10% simple interest per annum. At the end of the first year, Rs. 6,500 was paid off and the rate of simple interest on the balance was increased to 12% per annum. If the interest for the second year was three-fourth of the interest for the first year, what was the original sum borrowed (approximately)? → ~~calcu~~
HOT

- (1) Rs. 13,684 (2) Rs. 15,888 (3) Rs. 15,000 (4) Cannot be determined

28. P borrowed a certain sum at 10% S.I. for 4 years. Q borrowed Rs. 950 more than P for 2 years at 10% C.I., compounded annually. If they paid the same amount at the end of their respective tenure, how much did P borrow?

- (1) Rs. 7,840 (2) Rs. 7,000 (3) Rs. 4,500 (4) Rs. 6,050

29. Himanshu borrowed Rs. 72,000 at 12% simple interest and lent the whole amount to Abhishek at 16% compound interest, at annual compounding, for two years. If Himanshu had to return his loan at the end of four years but pay annual interest, what was his gain at the end of two years?

- (1) Rs. 76,339 (2) Rs. 72,414 (3) Rs. 50,180 (4) None of the above

30. A bank offers 6% compound interest calculated on a half yearly basis. A customer deposits Rs. 2,800 each on 1st January and 1st July of a year. At the end of the year, what amount would he have gained as interest?

- (1) Rs. 336 (2) Rs. 255 (3) Rs. 426 (4) Rs. 674

PRACTICE TEST 3

31. The simple interest on a certain amount placed for 3 years at 10% is 60% of the compound interest on Rs. 6,000 for 2 years at 15% per annum. What amount has been placed at simple interest?

- (1) Rs. 5,240 (2) Rs. 6,100 (3) Rs. 3,870 (4) Rs. 4,400

32. A sum of Rs. 10,000 deposited at compound interest doubles after 6 years. What will be its value after 18 years?

- (1) Rs. 40,000 (2) Rs. 1,20,000 (3) Rs. 60,000 (4) Rs. 80,000

33. A certain principal amount lent at simple interest becomes Rs. 7,000 in 4 years and 8,500 in 7 years. What is the rate of interest?

- (1) 5% (2) 10% (3) 15% (4) 20%

34. If a sum amounts to Rs. 1,620 in two years and Rs. 1,944 in three years at compound interest, what is the sum?

- (1) Rs. 1225 (2) Rs. 1075 (3) Rs. 1125 (4) Rs. 1250

35. Mohit earns Rs. 39,936 as interest by lending Rs. 2.4 lakhs at annual compound interest of 8%. What is the duration of his loan?

- (1) 2 years (2) 2.5 years (3) 3 years (4) 3.5 years

36. Ashish invested Rs. 30,000 at 9% simple interest for three years. At the end of the period, he reinvested the total amount received at 11% annual compound interest for the next three years. What was the total interest earned by him in this period?

- (1) Rs. 28,600 (2) Rs. 26,435 (3) Rs. 22,107 (4) Rs. 19,512

- 37.** Sampark invests 40% of his capital at 15% S.I., 42.86% of his capital at 14% S.I. and the rest at 10% S.I. If he earns Rs. 384 as additional revenue from these investments after a year, what is his capital?
- (1) Rs. 5,300 (2) Rs. 4,500 (3) Rs. 2,800 (4) Rs. 6,400
- 38.** What is the approximate value of the overall compound interest earned if a sum of Rs. 20,000 is placed for 4 years at annual compounding? The rate of interest for the first, second, third and the fourth year is 5%, 6%, 8% and 14% respectively.
- (1) Rs. 8,266 (2) Rs. 5,872 (3) Rs. 7,407 (4) Rs. 7,148
- 39.** What is the difference between the compound interest earned on Rs. 16,000 for 2 years at 10% compounded yearly and half yearly?
- (1) Rs. 88 (2) Rs. 94 (3) Rs. 126 (4) Rs. 64
- 40.** A borrowed Rs. 6,600 from B at 8% S.I. for 3 years. He added some money to the borrowed sum and lent it to C for the same period at 13% S.I. If A gained Rs. 3,096 in the whole transaction, how much money did he add from his side?
- (1) Rs. 9,800 (2) Rs. 5,400 (3) Rs. 10,500 (4) Rs. 6,900
- 41.** If the principal is increased by Rs. 250, the simple interest increases by Rs. 150. If the time period is doubled, the simple interest increases by Rs. 1,500. What is the compound interest on the original principal, for half of the original time period at the same rate?
- (1) Rs. 500 (2) Rs. 600 (3) Rs. 650 (4) Cannot be determined
- 42.** Bharat invested Rs. 20,600 in two schemes - one part at 13% S.I. and the remaining at 20% C.I., compounded annually. At the end of three years he obtained Rs. 33,964. What amount did he place at compound interest?
- (1) Rs. 11,500 (2) Rs. 19,325 (3) Rs. 14,454 (4) Rs. 15,769
- 43.** After how many years approximately would the amount payable on a loan be twice the principal, if the principal is lent at the rate of 20% per annum, compounded quarterly?
- (1) 5 (2) 6.5 (3) 8 (4) 3.5
- 44.** A sum of Rs. 12,615 is divided between a brother and sister who are 12 and 10 years old respectively, in such a way that if their portions are invested at the rate of 5% annual compound interest, they get equal amounts at the age of 21 years. What amount does the brother get initially?
- (1) Rs. 6,615 (2) Rs. 6,000 (3) Rs. 16,165 (4) Rs. 7,612
- 45.** Anuja borrows Rs. 54,000 at 13% C.I., the interest compounded annually. She pays Rs. 37,620 after 2 years. What is the final single instalment that she has to pay to clear the loan at the end of six years?
- (1) Rs. 56,240 (2) Rs. 51,088 (3) Rs. 57,331 (4) Rs. 58,209

PROFIT AND LOSS

PRACTICE TEST 1

- A global store is offering bags at Rs. 750 after giving a 10% discount. At what cost price (in Rs.) should it buy the bags from a supplier, so that it can get a profit of 25%?
 (1) 700 (2) 600 (3) 750 (4) 650
- An Activa sold at Rs. 18,700 causes a 15% loss. At what selling price would the Activa get a 15% gain?
 (1) Rs. 25,100 (2) Rs. 24,700 (3) Rs. 25,300 (4) Rs. 25,500

3. A shopkeeper marked the selling price of an article at 20% above its cost price. While selling, he allowed a certain discount and suffered a loss of 4%. What was the discount allowed by him on that article?
 (1) 12.5% (2) 17% (3) 20% (4) 15%
4. Sahara was an online shopping website that was offering a flash discount. If you could buy two extra shirts if you paid for only six shirts, what was your discount percentage?
 (1) 16.67% (2) 20% (3) 25% (4) 33.33%
5. A toy sold at Rs. 2,500 results is equivalent to a 20% discount off the marked price. What selling price (in Rs.) is equivalent to a 40% discount off the marked price?
 (1) 1875 (2) 2000 (3) 2025 (4) 2075
6. Two plots were purchased at the same price. One was sold at a 20% profit and the other was sold at a 20% loss. What was the overall profit or loss percentage?
 (1) 4% profit (2) 4% loss (3) No profit no loss (4) Cannot be determined
7. Vinod purchases a book and sells it at five times its original value. What is his percentage gain?
 (1) 500% (2) 400% (3) 600% (4) 300%
8. A store has a Diwali offer of "Buy 5 shirts and get 2 free". What is the percentage discount that Shashi gets?
 (1) 7.14% (2) 42.86% (3) 28.57% (4) 14.28% $\frac{2}{7} \times 100$
9. A shopkeeper bought 120 balls for Rs. 1,080. After selling all the balls, the profit he earned is the same as the cost of 12 balls. How much is the profit earned by him?
 (1) 10% (2) 20% (3) 15% (4) 25%
10. A shopkeeper bought 120 balls for Rs. 1,080. After selling all the balls, the profit he earned is the same as the cost of 12 balls. How much is the profit earned by him?
 (1) 10% (2) 20% (3) 15% (4) 25%
11. A student bought 40 chocolates for three rupees. How many should he sell for nine rupees to earn a 20% profit?
 (1) 110 (2) 100 (3) 120 (4) 130
12. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:
 (1) 15 (2) 16 (3) 18 (4) 20
13. Gopi offers a 10% discount on the marked price of a saree and still makes a 15% profit. For a marked price of Rs. 460, what is the cost price?
 (1) Rs. 360 (2) Rs. 342 (3) Rs. 366 (4) Rs. 324
14. By what percent must the cost of an item be marked up so that even after a discount of 20%, the same amount is realized as before the markup and discount?
 (1) 25 (2) 20 (3) 15 (4) Data insufficient
15. A trader gets a profit of 25% on an article. If he buys the article at 10% less and sells it for Rs. 2 less, he still gets 25% profit. What is the actual cost of the article?
 (1) Rs. 15 (2) Rs. 16 (3) Rs. 18 (4) Rs. 20

PRACTICE TEST 2

16. Ramesh and Suresh are two shopkeepers. On a plasma TV which has a marked price of Rs. 20,000, Ramesh offers two successive discounts of 20% and 5% respectively and Suresh offers two successive discounts of 15% and 10% respectively. What is the difference between the discounts offered by Ramesh and Suresh?

- (1) Nil (2) Rs. 50 (3) Rs. 100 (4) Rs. 500

17. Ajay buys a toy at a certain price and sells it at Rs. 60 to make a certain profit percent. He makes the same percent loss if he sells it at Rs. 30. At what price should he sell it for break-even? *approach*

- (1) Rs. 45 (2) Rs. 40 (3) Rs. 50 (4) Rs. 48

18. Tejas gives a discount of 10% on the marked price and still makes a profit of 20% on his cost price. What was his percentage markup?

- (1) 15% (2) 20% (3) 26.66% (4) 33.33%

19. Mani sold an article at a loss of 8%. Had she sold it for Rs. 540 more, she would have made a profit of 10%. What is the cost price of the article?

- (1) Rs. 1,800 (2) Rs. 2,000 (3) Rs. 2,500 (4) Rs. 3,000

20. Maya sells two objects at the same selling price. He makes a 30% profit on the first and a 30% loss on the other. What is his overall percentage profit or loss?

- (1) 9 loss% (2) 15 profit% (3) No profit no loss (4) 18% loss

21. Rajat used to buy wheat at Rs. 10 per kg and sell it at a 20% profit. But, in this month, Rajat had to buy the wheat at Rs. 11 per kg and sell it at the original selling price. What is his new profit percentage?

- (1) 10% (2) 15% (3) 8.25% (4) 9.09%

22. The marked price of a camera is Rs. 35,000. If Jay gets successive discounts of 10%, 5% and 4%, what price does he pay?

- (1) Rs. 28,728 (2) Rs. 25,278 (3) Rs. 27,208 (4) Rs. 22,572

23. Ramesh gets 50% percentage profit percentage on selling price instead of on cost price. What is the actual profit percentage?

- (1) 100% (2) 50% (3) 75% (4) 60%

24. Raju makes an 8% profit if he offers two successive discounts of 10% on a particular product. If the total discount offered is Rs. 190, what is the cost price of the product?

- (1) Rs. 1,000 (2) Rs. 810 (3) Rs. 750 (4) Rs. 900

25. A customer gives Janak a fake note of Rs. 200 to buy a gift and gets Rs. 40 as change. What is Janak's percentage loss? *[IMP]*

- (1) 20 (2) 100 (3) 125 (4) 120

26. A shopkeeper buys a single chair for Rs. 125. He sells 10 chairs for Rs. 175 per chair, 15 chairs for Rs. 200 per chair and x chairs for Rs. 250 per chair. He makes the profit of Rs. 3,125. What is the value for x ?

- (1) 18 (2) 14 (3) 12 (4) 10

27. A sold a painting to B at 20% profit. B spent Rs. 1,000 on restoration and sold it to C at 10% profit. If C paid Rs. 15,000 to B for the painting, how much did A pay for the painting?

- (1) Rs. 10,350 (2) Rs. 10,000 (3) Rs. 10,530 (4) Rs. 10,050

28. P sells an article to Q for Rs. 1,100 at a 10% profit and Q sells it back to P at a 10% loss. What is P's overall gain/loss in the entire transaction?

(1) No gain no loss (2) Loss of 1% (3) Gain of 11% (4) Loss of 4%

$$\begin{array}{ccccccc} P & \xrightarrow{\text{100%}} & Q & \xrightarrow{\text{100%}} & P \\ & (1100) & & & (990) & & \frac{110}{990} \times 100 \\ & & & & 100 & & 10 \end{array}$$

29. The sales price of an article including the sales tax is Rs. 836. The rate of sales tax is 10%. If the shopkeeper has made a profit of 15%, then the cost price of the article is:

(1) Rs. 890 (2) Rs. 750 (3) Rs. 660 (4) Rs. 560

30. If we increase C.P. by 20% and keep the S.P. constant, the profit percentage falls by 25 percentage points. What is the original profit percentage?

(1) 40 (2) 30 (3) 60 (4) 50

PRACTICE TEST 3

31. Snehaanjali has two offers for the purchase of a mobile costing Rs. 35,000.

Offer 1: Get a direct discount of 30%.

Offer 2: Get successive discounts of 20% and 10%.

Which offer is more profitable for Snehaanjali?

(1) Offer 1 (2) Offer 2 (3) Either offer 1 or offer 2 (4) Data insufficient

32. A man saved Rs. 290 with two successive discounts of 10% and 5% on an oven. What was the marked price of the oven?

(1) Rs. 1,800 (2) Rs. 2,000 (3) Rs. 2,200 (4) Rs. 2,400

33. A shopkeeper sells grocery items by marking up the price of all items by 30% and then giving a 10% discount. What is his profit when he sells an item costing Rs. 500?

(1) Rs. 80 (2) Rs. 95 (3) Rs. 105 (4) Rs. 85

34. The cost price of 11 pens is the same as the selling price of 8 pens. What is the percentage profit when 35 such pens are sold?

(1) 32.5 (2) 37.5 (3) 42.5 (4) 35

35. What is the profit/loss incurred when Raju marks his goods 30% above the cost price and then gives a 20% discount on the marked price?

(1) 4% profit (2) 3% loss (3) 4% loss (4) 2% profit

36. Ram sold his bag at a loss of 6%. Had he sold it for Rs. 42 more, he would have made a profit of 8%. What is the cost price of the bag?

(1) Rs. 250 (2) Rs. 350 (3) Rs. 400 (4) Rs. 300

37. The percentage profit earned by selling an article for Rs. 1,920 is equal to the percentage loss incurred by selling the same article for Rs. 1,280. At what price should the article be sold to make 25% profit?

(1) Rs. 2,000 (2) Rs. 2,200 (3) Rs. 2,400 (4) Data insufficient

38. On selling 17 balls at Rs. 720, there is a loss equal to the cost price of 5 balls. The cost price of a ball is:

(1) Rs. 45 (2) Rs. 50 (3) Rs. 55 (4) Rs. 60

39. A shopkeeper professes to sell the rice at cost price but he uses false weights and gains 30% while buying and gains 40% while selling. What is the profit or loss percentage after selling and buying 1 kg of rice?

(1) 25% (2) 50% (3) 75% (4) None of these

40. A company got 20% profit on the selling price of its land. If the cost price of the land is Rs. 1,000 per square foot, what is its selling price per square foot?
 (1) Rs. 1,200 (2) Rs. 1,250 (3) Rs. 1,400 (4) Rs. 1,300
41. Sam buys 600 scooters at Rs. 40,000 per unit from A and 500 scooters at Rs. 35,000 per unit from B. He then sells all the scooters at Rs 50,000 per unit. What is the profit percentage?
 (1) 32.5% (2) 47.5% (3) 57% (4) 65%
42. A shopkeeper gives 20% discount on the printed price of a book. Raju gets a further 10% discount on the already discounted price of the book. If the shopkeeper still makes 8% profit in the transaction, by what percentage is the printed price more than the cost price of the book?
 (1) 40% (2) 48% (3) 45% (4) 50%
43. By selling 16 pens for a rupee, a man loses 10%. How many for a rupee should he sell to get a gain of 20%?
 (1) 8 (2) 10 (3) 12 (4) 16
44. If some goods are purchased for Rs. 150 and two-fifth of them are sold at a loss of 10%, at what profit percentage should the rest of them be sold to get an overall profit percentage of 10%?
 (1) 19.33% (2) 23.33% (3) 33.33% (4) 20.33%
45. A milkman adulterates milk by adding water. One day he mixed an amount of water equal to 20% of the milk content. He was not happy with the outcome and added some water and increased the volume by 10%. If pure milk costs him Rs. 20 per litre, what is the profit percentage that he now makes if he sells the final milk solution at Rs. 22 per litre?
 (1) 10% (2) 21% (3) 37.5% (4) None of these

RATIO AND PROPORTION

PRACTICE TEST 1

1. A and B invest in a business in the ratio 3 : 2. If 5% of the total profit goes to charity and A's share of the total profit is Rs. 855, the total profit is:
 (1) Rs. 1,425 (2) Rs. 1,500 (3) Rs. 1,550 (4) Rs. 1,475
2. Rs. 432 is divided amongst three workers A, B and C such that one-third of A's share is the same as half of B's share which in turn is the same as one-fourth of C's share. How much did A get?
 (1) Rs. 248 (2) Rs. 144 (3) Rs. 122 (4) Rs. 136
3. The sum of three numbers is 98. The ratio of the first to the second is 2 : 3 and that of the second to the third is 5 : 8. What is the second number?
 (1) 25 (2) 35 (3) 30 (4) 45
4. What is the fourth proportional to 4, 5 and 10?
 (1) 2 (2) 7.5 (3) 12.5 (4) 8
5. What number should be added to each term in the ratio 37 : 67, so that it becomes equal to 2 : 3?
 → wrong options.
 (1) 20 (2) 29 (3) -91 (4) -30
6. Two numbers are in the ratio 7 : 5. What is their sum if the sum of their cubes is 29952?
 (1) 96 (2) 72 (3) 48 (4) 60

$$7x^3 + 5x^3 = 29952$$

7. A is planning to divide his wealth between B and C in the ratio 4 : 5. If C is expected to get Rs. 60 lakhs, how much will B get (in Rs.)?
 (1) 34 lakhs (2) 48 lakhs (3) 42 lakhs (4) 54 lakhs
8. Rs. 675 is divided amongst X, Y and Z such that 8 times X's share is equal to 12 times Y's share which is equal to 6 times Z's share. How much did X get?
 (1) Rs. 150 (2) Rs. 225 (3) Rs. 258 (4) Rs. 183
9. For every Rs. 9 that Rahul spends, Vijay spends Rs. 19. For every Rs. 9 that Vijay spends, Ram spends Rs. 19. If Rahul spends Rs. 1,620, how much does Ram spend?
 (1) Rs. 2,320 (2) Rs. 7,220 (3) Rs. 3,820 (4) None of these
10. The cost of three mobile brands is in the ratio 3 : 2 : 4. If the cost falls by 24%, 16% and 28% respectively, what is the new ratio of costs?
 (1) 17 : 13 : 20 (2) 19 : 14 : 24 (3) 21 : 16 : 23 (4) 17 : 13 : 19
11. If $x:y = 5:6$, what is the value of $(3x+7y):(10x-2y)$?
 (1) 1 : 1 (2) 3 : 1 (3) 5 : 2 (4) None of the above Ans. 3 : 2
12. Two numbers are in the ratio 3 : 5. If 9 is subtracted from each number, the ratio becomes 12 : 23. Originally, what is the smaller number?
 (1) 27 (2) 33 (3) 39 (4) 51
13. Neha has three different types of coins i.e. of Re. 1, Rs. 2 and Rs. 5 in the ratio 5 : 3 : 2 respectively. If she has 15 coins of Rs. 2, what is the total amount that she has?
 (1) Rs. 100 (2) Rs. 105 (3) Rs. 90 (4) Rs. 125
14. Which of these fractions is the largest?
 (1) $\frac{13}{90}$ (2) $\frac{9}{62}$ (3) $\frac{11}{76}$ (4) $\frac{3}{20}$
15. If $x:y = a$ and $(x/y) + (4y/x) = 4$, then:
 (1) $x = 3y$ (2) $2x = 3y$ (3) $x = 2y$ (4) $3x = 2y$
- PRACTICE TEST 2**
16. Tejas invested Rs. 56,000 per month in a business. Four months later, Hetal joined the business and invested Rs. 60,000 per month. If Hetal's share in the profit was Rs. 8,750, what was the total profit?
 (1) Rs. 21,000 (2) Rs. 18,500 (3) Rs. 22,500 (4) Rs. 19,000
17. If $p:q = 5:2$, what is the value of $(4p+3q):(4p-3q)$?
 (1) 3 : 2 (2) 13 : 7 (3) 14 : 11 (4) 2 : 1
18. A, B and C are in continued proportion such that B is six times A. What is the ratio of C to A?
 (1) 12 : 1 (2) 24 : 1 (3) 18 : 1 (4) None of these Ans. C

$$\begin{matrix} & & & 3 \\ & & & \sqrt[3]{x} : \sqrt[3]{y} \\ & & & 3 : 1 \end{matrix}$$
19. If x is 1728 times y , what is the sub-triplicate ratio of x and y ?
 (1) 576 : 1 (2) 144 : 1 (3) 12 : 1 (4) 72 : 1
20. A person gives Rs. 63,800 to his sons P and Q in the ratio 4 : 7. What is the difference between thrice the share of P and twice the share of Q?

- (1) Rs. 17,600 (2) Rs. 13,500 (3) Rs. 8,400 (4) Rs. 11,600
- 21.** Two numbers are in the ratio 17 : 19. If 6 is added to the denominator and 7 is subtracted from the numerator, the numbers are now in the ratio 19 : 24. What is the original value of the greater number?
 (1) 57 (2) 114 (3) 95 (4) 247
- 22.** P and Q earn in the ratio 4 : 5 and spend in the ratio 5 : 6. If P saves Rs. 50 per month and Q saves Rs. 100 per month, what is their total income?
 (1) Rs. 1,800 (2) Rs. 1,350 (3) Rs. 2,250 (4) Rs. 2,700
- 23.** Three partners shared the profit in a business in the ratio 5 : 7 : 8. They had partnered for 14 months, 8 months and 9 months respectively. What was the ratio of their investments?
 (1) 5 : 4 : 4 (2) 2 : 3 : 7 (3) 5 : 6 : 11 (4) $20 : 49 : 64 \frac{5}{14} : \frac{7}{8} : \frac{8}{9}$
- 24.** A school had two divisions A and B with students in the ratio 6 : 5. In the next semester, 24 students from A were moved to B. The new ratio of students in divisions A and B was 2 : 3. How many students were there in division A initially?
 (1) 90 (2) 75 (3) 240 (4) 30
- 25.** Rahul has notes of denominations 2000, 500, 200 and 100 in the ratio 1 : 4 : 5 : 3. If he has Rs. 26,500 in all, how many notes does he have?
 (1) 65 (2) 90 (3) 80 (4) 55
- 26.** P, Q and R started a partnership business. P invested 6 times as much as Q and $\frac{4}{3}$ of what R invested. If the total annual profit was Rs. 13,317, what was R's share in it?
 (1) Rs. 5,224 (2) Rs. 5,211 (3) Rs. 3,521 (4) Rs. 5,641
- 27.** If $a : b = 1 : 3$; then what number, when added to a and subtracted from b will reverse the original ratio?
 (1) $a/2$ (2) $3a$ (3) $2a$ (4) a
- 28.** Rs. 4,800 is divided among P, Q and R in such a way that the share of P is $\frac{5}{11}$ of the combined share of Q and R. The share of Q is $\frac{3}{13}$ of the combined share of R and P. What amount does R get?
 (1) More than Rs. 2,400 (2) Less than Rs. 2,500
 (3) Less than Rs. 2,200 (4) More than Rs. 2,600
- 29.** The current weight of Tina and Tiny is in the ratio 4 : 5 respectively. Tina increases her weight by 20% while Tiny drops her weight by 20%. If the ratio of their weights is now 6 : 5, what is Tiny's current weight?
 (1) Rs. 18,500 (2) Rs. 24,000 (3) Rs. 27,000 (4) Cannot be determined
- 30.** Ajay has coins of 50 paise, 25 paise and Rs. 1.50 in the ratio 1 : 2 : 3. If the total amount with him is the minimum integral amount possible (in Rs.), how many coins does he have in all? (1 rupee = 100 paise)?
 (1) 12 (2) 10 (3) 8 (4) 14

PRACTICE TEST 3

- 31.** Yash began a business with Rs. 85,000. He was joined some time later by Vatsal with Rs. 42,500. For what period did Vatsal join, if the profits at the end of the year are divided in the ratio of 3 : 1?
 (1) 6 months (2) 9 months (3) 3 months (4) 8 months

32. X and Y start a partnership business by investing Rs. 20,000 and Rs. 15,000 respectively. Six months later, Z joins them with Rs. 20,000. What is Y's share in the total profit of Rs. 25,000 earned at the end of 2 years from the starting of the business?
- (1) Rs. 7,500 (2) Rs. 8,000 (3) Rs. 7,750 (4) Rs. 7,250
33. Rs. 1,116 is to be distributed among A, B, C and D such that 2 times A's share is 3 times B's share; 4 times B's share is 5 times C's share and 6 times C's share is 7 times D's share. What is D's share (in Rs.)? → calculation.
- (1) 96 (2) 192 (3) 48 (4) None of these
34. Harish and Soham started a business with an initial investment in the ratio 9 : 8 and their annual profits were in the ratio 3 : 4. If Soham invested for 18 months, for how many months did Harish invest?
- (1) 12 (2) 18 (3) 24 (4) 27
35. There are three numbers such that 4 times the first number is equal to 3 times the second number and 6 times the second number is equal to 4 times the third number. If the first number is 9 less than the third number, what is the value of the second number?
- (1) 21 (2) 15 (3) 12 (4) 18
36. If $(a:b) = (c:d) = (e:f) = (g:h) = 3:2$, what is the value of $2(a+c+e+g):(b+d+f+h)$?
- (1) 2 (2) 3 (3) $\frac{2}{3}$ (4) $\frac{3}{2}$
37. The annual income of Ravi and Kishor is in the ratio 9 : 8 and their expenditures are in the ratio 5 : 4. If both individually manage to save Rs. 5,000, what is Kishor's actual expenditure?
- (1) Rs. 1,250 (2) Rs. 5,000 (3) Rs. 6,250 (4) Rs. 11,250
38. Amar and Prem enter into a partnership by investing Rs. 3,000 and Rs. 4,000 respectively. Amar receives Rs. 10 per month as salary of working partner. The remaining profit is divided as per their investment ratio. If Amar receives Rs. 390 in all at the end of the year, how much more/less does Prem receive?
- (1) Rs. 40 less (2) Rs. 30 less (3) Rs. 90 more (4) Rs. 60 more
39. A, B and C divide Rs. 1,105 amongst them in such a way that if Rs. 10, Rs. 20 and Rs. 15 are respectively removed from their original receipts, the amounts left with them are in the ratio 11 : 18 : 24. What amount (in Rs.) did C originally receive?
- (1) 420 (2) 350 (3) 495 (4) 525
40. Mr. Shashank has three wives - Hema, Rekha and Jaya and two sons - Prashant and Rajbir. In his will, Shashank distributed his money as under:
He gave one-fifth of his wealth to Prashant, 45% of his wealth to Rajbir and distributed the remaining amount among Hema, Rekha and Jaya in the ratio 2 : 3 : 4. If the difference between the amount received by Prashant and Rajbir was Rs. 45,000, what amount (in Rs.) did Jaya get?
- (1) 34000 (2) 36000 (3) 24000 (4) 28000
41. If the duplicate ratio of the duplicate ratio of $a:b$ is $625:81$, what is the value of $(a+b)$? a and b are natural numbers, and a is smaller than 9.
- (1) 3 (2) 8 (3) 13 (4) 10
42. An election is conducted in a village. 15% of the votes cast are rejected as invalid. The valid votes are split among 3 candidates A, B and C. A and C have received votes in the ratio 1 : 3. B won the election by getting 42000 votes. If B beat his nearest rival by 32,700 votes, how many votes were cast?

(1) 80000

(2) 52000

(3) 64000

(4) 75000

43. Ganesh brought two identical pizzas. He cut one pizza into 6 equal parts and the other one into 9 equal parts. Ramesh ate 2 pieces from the first pizza and 5 pieces from the second. Suresh ate 3 pieces from the first one and 3 pieces from the second. What is the ratio of the pizzas eaten by Ramesh and Suresh?

(1) 16 : 15

(2) 15 : 16

(3) 14 : 15

(4) 15 : 14

44. Monish and Mahesh enter into a partnership by investing Rs. 700 and Rs. 300 respectively. At the end of one year, they divide their profits such that a third of the profit is split equally for the efforts that they have put into the business and the remaining profit is divided in the ratio of their investments. If Monish received Rs. 800 more than what Mahesh did, what was the profit made by their business in that year?

(1) Rs. 1,500

(2) Rs. 3,000

(3) Rs. 1,800

(4) Rs. 2,700

45. By mistake, Rs. 4,940 was divided among P, Q and R in the ratio 6 : 8 : 5 instead of the ratio 1/2, 1/3, 1/4. Who gained the most and how much?

(1) P, Rs. 720

(2) Q, Rs. 630

(3) R, Rs. 560

(4) Q, Rs. 680

PRACTICE TEST 4

46. Six numbers - a to f are in continued proportion such that $a : b = 1 : 3$ and $d = 54$. What is the difference between the largest and smallest number?

(1) 160

(2) 484

(3) 322

(4) 380

47. Rs. 7,200 is divided among A, B and C such that A's share is $(7/11)$ of B and C's combined share. What is A's share (in Rs.)?

(1) 1400

(2) 3500

(3) 2800

(4) 2100

48. X and Y have submitted their bids for a tender. Since X comes to know that his bid is higher and the bids are in the ratio 3 : 2, he reduces his bid amount by Rs. 4 lakhs. Now, Y realizes that the bids are in the ratio 7 : 10 for X and himself respectively. By how much should he reduce his bid to equalize the two bids?

(1) Rs. 1,60,000

(2) Rs. 3,50,000

(3) Rs. 2,40,000

(4) None of these

49. If $(2a^3 + 7b^3) : (2a^3 - 7b^3) = 257 : 243$; $(3a^2 - 4b^2) : (3a^2 + 4b^2) = ?$

(1) 85 : 79

(2) 77 : 71

(3) 71 : 79

(4) 63 : 67

50. A shop has two kinds of note books - single line and double line. The ratio of single line books to double line books is 7 : 9 and there are 5392 note books in the shop. The shopkeeper now buys only some more single line books to make the ratio 10 : 9. How many new books does he buy?

(1) 1348

(2) 1516

(3) 1011

(4) 1027

51. Last year, the ratio of the salaries of Rohan and Raj was 3 : 4. The ratio of their individual salaries for last year and this year was 4 : 5 and 2 : 3 for Rohan and Raj respectively. If their total current salary is Rs. 83,200, what is Rohan's salary this year?

(1) Rs. 42,000

(2) Rs. 28,000

(3) Rs. 32,000

(4) Rs. 48,000

52. R and S enter into a partnership. R puts Rs. 24,750 initially and adds Rs. 2,750 to his capital at the end of 4 months. S withdraws Rs. 4,000 from his initial investment at the end of seven months. At the end of the year, both receive the same amount of profit. How much did S initially invest?

(1) Rs. 28,250

(2) Rs. 24,750

(3) Rs. 26,500

(4) Rs. 13,550

53. The ratio of marks obtained by Piyush and Samiksha is 9 : 8. If the average of their individual percentages is 76.5% and their combined marks are 306, what were the maximum marks for that test?
- (1) 175 (2) 300 (3) 225 (4) 200
54. A and B enter into a partnership for a year such that A invests Rs. 10,000 for the first four months, increases Rs. 3,000 for the next five months and reduces Rs. 4,000 for the remainder of the period. B invests Rs. 8,000 for half the period and halves his investment for the remaining period. If A earns Rs. 24,200 as profit, what is the total annual profit earned?
- (1) Rs. 38,200 (2) Rs. 37,400 (3) Rs. 38,600 (4) Rs. 38,000
55. A and B enter into a partnership for a year such that A invests Rs. 10,000 for the first four months, increases Rs. 3,000 for the next five months and reduces Rs. 4,000 for the remainder of the period. B invests Rs. 8,000 for half the period and halves his investment for the remaining period. If A earns Rs. 24,200 as profit, what is the total annual profit earned?
- (1) Rs. 38,200 (2) Rs. 37,400 (3) Rs. 38,600 (4) Rs. 38,000
56. a, b, c are in continued proportion. b, c, d are also in continued proportion. If $b : c = 2 : 3$ and all the four numbers are positive integers, what is the minimum possible value of $(a + d)$?
- (1) 25 (2) 30 (3) 35 (4) None of these
57. The sum of three numbers in ascending order is 368. The ratio of the sum of the two smallest numbers to the largest number is 1 : 3 and the ratio of the smallest number to the sum of the two largest numbers is 1 : 15. What is the value of the second largest number?
- (1) 54 (2) 48 (3) 90 (4) 69
58. The ratio of Re. 1 coins, 50 paisa coins and 25 paisa coins with Sameer is equal to the ratio of three consecutive odd numbers that are also prime and are in ascending order. The total value of coins with Sameer is Rs. 58. If the number of Re. 1 coins and 25 paisa coins is reversed, what is the difference between the initial amount and new amount that Sameer has?
- (1) Rs. 46 (2) Rs. 78 (3) Rs. 24 (4) Cannot be determined
59. At an airport, the the number of ground staff has decreased while the salary per person has increased. If the ratio of change in staff size to current staff size is 2 : 7 and the ratio of old salary to increase in salary (per person) is 3 : 2, what will be the ratio of the old total salary to the new total salary?
- (1) 11 : 18 (2) 19 : 21 (3) 32 : 35 (4) 27 : 35
60. The incomes of three friends - P, Q, R - are in the ratio 5 : 7 : 9 and their corresponding expenditures are in the ratio 7 : 9 : 11. If P saves Re. 1 out of every Rs. 3 that he earns, what is the ratio of the savings of P, Q and R?
- (1) 23 : 36 : 43 (2) 35 : 57 : 79 (3) 21 : 25 : 29 (4) Cannot be determined

MIXTURES AND ALLIGATION

PRACTICE TEST 1

- What is the concentration (in %) of a mixture obtained when 5 litres of 30 % NaCl solution is added with 2 litres of 40 % NaCl solution and 4 litres of 25 % NaCl solution?
 (1) 30% (2) 33% (3) 37% (4) 40%
- A scientist mixes 80% sulphuric acid with water to get 60% sulphuric acid. If 9 litres of 80% sulphuric acid was mixed, what was the quantity of water mixed?
 (1) 27 litres (2) 3 litres (3) 4.5 litres (4) 6 litres

Alloy 1 has Copper, Zinc and Iron in the ratio $1 : 2 : 3$ and Alloy 2 has Copper, Zinc and Iron in the ratio $2 : 3 : 5$. If the two alloys are equally mixed, what is the ratio of Copper, Zinc and Iron in the new alloy?

- (1) $13 : 19 : 30$ (2) $11 : 19 : 20$ (3) $11 : 19 : 30$ (4) $13 : 20 : 30$

A vessel contains 30 litres of milk. From this, 2 litres of milk is taken out and replaced by water. This process is repeated two more times. How many litres of milk does the vessel now have?

- (1) 25.49 litres (2) 24.39 litres (3) 15.36 litres (4) 23.56 litres

How many litres of water must be added to 20 litres of 24% solution of kerosene in water to make it a 10% solution of kerosene in water?

- (1) 17 (2) 15 (3) 24 (4) 28

In what ratio should two alloys with zinc and tin in the ratio $3 : 5$ and $5 : 3$ respectively, be mixed to get a new alloy containing zinc and tin in the ratio $1 : 1$?

- (1) $1 : 1$ (2) $5 : 4$ (3) $2 : 3$ (4) $2 : 1$

A shopkeeper mixes two varieties of pulses to get a mixture. He uses 1 kg and 4 kg of pulses costing Rs. 10 and Rs. 20 per kg respectively. What is the cost of the resultant mixture (in Rs. per kg)?

- (1) 11 (2) 15 (3) 17 (4) 18

Rs. 35,000 was collected from 150 men and women in an office. Each man contributed Rs. 200 and each woman contributed Rs. 300. How many women worked in this office?

- (1) 75, 75 (2) 125, 25 (3) 100, 50 (4) 80, 70

A businessman buys two different kinds of rice which cost him Rs. N per kg and Rs. 42 per kg. He mixes them in the respective ratio $3 : 2$ and sells the mixture at the rate Rs. 38 per kg to make a 9.19% profit. What is the cost (in Rs. per kg) of the cheaper rice has he mixed?

- (1) 30 (2) 28 (3) 36 (4) 24

In what ratio is wheat costing Rs. 72 per kg to be mixed with wheat costing Rs. 57 per kg to produce a wheat mixture costing Rs. 63 per kg?

- (1) $1 : 3$ (2) $2 : 3$ (3) $3 : 4$ (4) None of these

1. In what ratio should a 20% toluene solution be mixed with a 40% toluene solution to get a 25% toluene solution?

- (1) $3 : 1$ (2) $1 : 2$ (3) $2 : 3$ (4) $1 : 5$

2. Motilal mixed coffee powder worth Rs. 2 per kg and Rs. 4 per kg and then sold the mixture at Rs. 3.75 per kg, thereby gaining a profit of 50%. In what proportion did he mix the two types of coffee powder?

- (1) $2 : 1$ (2) $3 : 2$ (3) $3 : 1$ (4) $1 : 2$

3. A can contains a mixture of two liquids, A and B, in the ratio $7 : 5$. When 9 litres of mixture are drawn and the can is filled with liquid B, the ratio of A and B becomes $7 : 9$. How many litres of liquid A were present in the can initially?

- (1) 10 (2) 15 (3) 21 (4) 24

4. Kewal purchased quality A sugar for Rs. 17.5 per kg and quality B sugar at some other rate. He mixed quality A and B in the ratio $1 : 2$. He sold the mixture at Rs. 18 per kg and made a 10% loss. What is the price of quality B sugar (in Rs. per kg)?

- (1) Rs. 22.50 (2) Rs. 22.25 (3) Rs. 21.50 (4) Rs. 21.25

15. 5 kg of sand is added to a bag that contains only wheat. The resulting mixture has 20% sand by weight. How much sand (in kg) must be added to the bag in order to form a mixture which has 50% wheat by weight?
- (1) 12 (2) 12.5 (3) 20 (4) 15

PRACTICE TEST 2

16. A vessel of capacity 42 litres is completely filled with a milk and water solution. 6 litres of this solution is replaced with pure water, to bring the concentration of milk in the new solution to 30%. What was the concentration of milk in the original solution?
- (1) 25% (2) 35% (3) 40% (4) 30%

17. A man mixes some quantity of inferior sugar at Rs. 2.4 per kg with superior sugar at Rs. 4 per kg in the ratio 1 : 3? At what price should he sell the sugar to get a 25% profit?
- (1) Rs. 3.6 (2) Rs. 4.5 (3) Rs. 5 (4) Rs. 4.2

18. If 20 liters of 30% alcohol solution is mixed with 25 liters of 20% alcohol solution, what is the alcohol content in 50 litres of the new solution?
- (1) 22.66 (2) 12.22 (3) 24.44 (4) 11.33

19. A certain heart stimulant is supposed to contain 2% strychnine. It is prepared from two solutions that contain 10% and 0.1% strychnine respectively. If the amount of heart stimulant to be made is 10 ml, what approximate volume (in ml) of the 0.1% solution is to be used in its preparation?
- (1) 1.9 (2) 2.1 (3) 7.9 (4) 8.1

20. 6 litres are drawn from a cask full of wine and replaced by water. This operation is performed three more times. The proportion of wine now left in the cask is 16 : 81. How much wine (in litres) did the cask hold originally?
- (1) 18 (2) 24 (3) 32 (4) None of these

21. The average of the test scores of a class of x students is 70, and the average of the test scores of a class of y students is 92. When the scores of both classes are combined, the average is 86. What is the value of (x/y) ?
- (1) 4 : 9 (2) 2 : 5 (3) 3 : 8 (4) 3 : 10

22. Tarun mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of another variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. What is his profit percentage?
- (1) No profit, no loss (2) 5% (3) 8% (4) 10%

23. In what ratio should two different types of rice, one costing Rs 14/kg and another costing Rs. 24/kg, be mixed to obtain an average price of mixture as Rs. 26/kg?
- (1) 6 : 5 (2) 4 : 3 (3) 3 : 2 (4) They can never be mixed

24. Milk contained in a vessel of capacity 72 litres is diluted by replacing it with water twice. After the final replacement the ratio of milk to water is 25 : 11. What is the quantity of water added each time?
- (1) 24 litres (2) 30 litres (3) 12 litres (4) 42 litres

25. Vessel 1 contains 38 litres of milk and vessel 2 contains 24 litres of water. 8 litres of milk is taken from vessel 1 and placed in vessel 2. Then, 20 litres of the mixture is taken from vessel 2 and placed in vessel 1. What is the ratio of milk in vessel 1 to water in vessel 2 now?
- (1) 4 : 9 (2) 15 : 4 (3) 35 : 9 (4) 35 : 3

26. Two conical flasks, each with capacity of 10 ml, have wine and water. Flask A has 6 ml of wine and flask B has 7 ml of wine. If the contents of the 2 flasks are mixed and poured in a 3rd flask having twice the capacity as flask A, what is the percentage of wine in the solution in the third flask?
- (1) 60% (2) 70% (3) 130% (4) 65%
27. The alloy Cuzi contains copper and zinc in the ratio 3 : 4. The alloy Zial contains zinc and aluminium in the ratio 5 : 2. The alloy Alfie contains aluminium and iron in the ratio 1 : 3. Equal amounts of each alloy are melted together and recast into a new alloy. What is the ratio of the amount of copper to the amount of aluminium in this new alloy?
- (1) 1 : 2 (2) 2 : 3 (3) 3 : 4 (4) 4 : 5
28. 4 litres of oil costing Rs. 25 per litre is mixed with n litres of oil costing Rs. 20 per litre. If the average cost of the mixed oil (in Rs. per litre) has to be between Rs. 23 and 24, which of these is not the value of n ?
- (1) 1.5 (2) 2 (3) 2.5 (4) 3
29. A solution of ethanol is to be made from equal volumes of two existing solutions. The first solution contains 5% ethanol and 95% impurity. If the final solution cannot contain more than 3% ethanol, what is the minimum possible percentage of impurity in the second solution?
- (1) 92.5 (2) 95 (3) 99 (4) None of these
30. A vessel has 4 litres of milk and 1 litres of it is removed from it and replaced with water. Again, 1 litre of the final solution is removed and replaced with water. How many more such replacements need to be done so that percentage of milk in the solution falls below 30%?
- (1) 1 (2) 2 (3) 3 (4) 4

VARIATION**PRACTICE TEST 1**

1. The power of a circuit is directly proportional to the voltage in the circuit, if the current is constant. At a voltage of 4 V, the power is 200 W. What is the power (in W) when the voltage is 5.2 V?
- (1) 240 (2) 275 (3) 260 (4) 270
2. 6 people, working 5 hours a day, can complete a work in 16 days. How many days will 4 people take to do the same work, each working 6 hours a day?
- (1) 15 days (2) 20 days (3) 22 days (4) 25 days
3. A cabinet has 300 folders with 28 files per folder. How many files should a folder have if the number of folders is to be reduced by 20?
- (1) 32 (2) 30 (3) 35 (4) 28
4. The ratio of the volume of two cylinders is 3 : 5. The ratio of their respective heights is 27 : 5. What is the ratio of their radii?
- (1) 1 : 9 (2) 5 : 3 (3) 27 : 5 (4) 1 : 3
5. The length of a violin string varies inversely as the frequency of its vibrations. A violin string 14 inches long vibrates at a frequency of 450 cycles per second. What is the frequency of a foot long violin string?
- (1) 325 cycles/second (2) 345 cycles/second
 (3) 525 cycles/second (4) 500 cycles/second
6. The cost of pencils is directly proportional to its quantity. If 10 pencils cost Rs. 250, what is the cost of 17 pencils?
- (1) Rs. 475 (2) Rs. 375 (3) Rs. 425 (4) Rs. 465

7. An 8 m long copper wire has an electrical resistance of 28 ohms. What is the difference between the length of two wires having an electrical resistance of 63 ohms and 77 ohms, if the resistance is directly proportional to the length of the wire?
- (1) 4 m (2) 6 m (3) 5 m (4) 8 m
8. The length of the shadow of a 3 m high pole at a certain time of the day is 3.6 m. What is the height (in m) of another pole, whose shadow at the same time is 54 m long?
- (1) 45 (2) 50 (3) 54 (4) 60
9. The area S of a trapezoid varies jointly as its height and the sum of its bases. If the area of a trapezoid with height 19 m and bases of 11 m and 19 m is 285 sq.m., what is the area (in sq.m.) of another trapezoid whose height is 10 m and whose bases are 10 m and 15 m respectively?
- (1) 250 (2) 150 (3) 125 (4) 100
10. It takes 6 workers to lift 8 cars with 4 cranes. The number of cranes (C) required for W workers to lift Y cars varies directly as the number of cars and inversely as the number of workers. How many workers are required to lift 20 cars with 5 cranes?
- (1) 14 (2) 10 (3) 11 (4) 12
11. x varies directly as the cube root of y and varies directly as z . When $y = 27$, $z = 18$ and $x = 51$. What is the value of x when $y = 2744$ and $z = 45$?
- (1) 595 (2) 625 (3) 550 (4) 525
12. A lawyer charges a flat consultation fee and an "appearance" fee for every appearance in a court trial. He recovers Rs. 6.5 lakhs from Garima for six appearances in court and Rs. 3 lakh more from Purab for twice the number of appearances in court. What amount (in Rs. lakhs) does he get from Rhea if he gives her a 40% discount on the consultation fee but makes ten appearances in court?
- (1) 9 (2) 8 (3) 7.1 (4) 8.8
13. The kinetic energy of a moving body is directly proportional to its mass when the velocity is constant and to the square of the velocity when mass is constant. When mass is 40 kg and velocity is 15 m/s, its kinetic energy is 4500 J. What is the velocity (in m/s) when the mass is 20 kg and kinetic energy is 1960 J.
- (1) 10 (2) 11 (3) 12 (4) 14
14. The maximum load that a cylindrical column with a circular cross section can hold varies directly as the fourth power of the diameter and inversely as the square of the height. A 9 m high column that has a radius of 1 m will support 64 metric tons. How many metric tons can be supported by a column 9 m high and having a diameter of 3 m?
- (1) 162 (2) 243 (3) 432 (4) 324
15. 60 litres of diesel is required to travel 600 km using a 800 cc engine. If the volume of diesel required to cover a distance varies directly as the capacity of the engine, how many litres of diesel is required to travel 800 km using 1200 cc engine?
- (1) 80 (2) 90 (3) 120 (4) 150
- PRACTICE TEST 2**
16. 200 workers complete 4 floors of a building in 5 days. How many floors of the same building would 300 workers complete in 5 days?
- (1) 8 (2) 6 (3) 12 (4) 10

- 17.** Intensity of light produced by a light source varies inversely as the square of the distance from the source. If intensity of light produced at a distance of 3 feet from a light source is 750 lumens, what is the intensity of light produced at 5 feet from the same source?
- (1) 320 lumens (2) 250 lumens (3) 270 lumens (4) 280 lumens
- 18.** Ram and Shyam have borrowed some money in the ratio 2 : 3 from Arjun at simple interest; at the same rate and for the same period. Shyam pays Rs. 3,120 interest to Arjun. What interest does Ram pay to Arjun?
- (1) Rs. 2080 (2) Rs. 1560 (3) Rs. 1890 (4) Rs. 2170
- 19.** I and R are inversely proportional to each other. When R is 3, I is 2. What is the value of R when I is 5 and the value of I when R is 5?
- (1) 1, 1 (2) 2, 1 (3) 1.2, 1 (4) 1.2, 1.2
- 20.** Electric field strength is directly proportional to the charge and inversely proportional to square of the distance between the charge and the test charge. When the charge is 1 C and the distance between the charge and the test charge is 1 m, the field strength is 9×10^9 N/C. What is the field strength when the charge is 2 C and the distance is 2 m?
- (1) 18×10^9 N/C (2) 9×10^9 N/C (3) 13.5×10^9 N/C (4) 4.5×10^9 N/C
- 21.** 6 men or 8 women can do some work in 28 days. How long would 9 men and 2 women take to do the same work?
- (1) 14 days (2) 16 days (3) 15 days (4) 20 days
- 22.** In a mathematical puzzle, area of a circle is inversely proportional to the cube of its radius, and perimeter of the circle is inversely proportional to its area, with the same constant of proportionality in both cases). For a circle with radius 8 units in this puzzle, what would be the perimeter?
- (1) 8 units (2) 16 units (3) 64 units (4) None of these
- 23.** In a mathematical puzzle, area of a circle is inversely proportional to the cube of its radius, and perimeter of the circle is inversely proportional to its area, with the same constant of proportionality in both cases). For a circle with radius 8 units in this puzzle, what would be the perimeter?
- (1) 8 units (2) 16 units (3) 64 units (4) None of these
- 24.** A diamond weighing 20 units breaks into three pieces whose weights are in the ratio 2 : 3 : 5, thereby causing a loss of Rs. 2,232 in the overall cost. What is the initial cost of the unbroken diamond if the cost of the diamond varies as the square of its weight?
- (1) Rs. 4,000 (2) Rs. 4,500 (3) Rs. 3,000 (4) Cannot be determined
- 25.** P varies directly with Q , Z varies inversely with Q . A varies directly with P and inversely with Z . If $P = 27$, then $Q = 9$, $Z = 3$ and $A = 90$. What is the value of A if $P = 81$?
- (1) 120 (2) 270 (3) 810 (4) None of these
- 26.** Ram found that the marks of Mahesh vary jointly with the square of the marks of Ramesh and the fourth power of the marks of Durgesh. By what percentage would the marks of Mahesh increase/decrease if the marks of Ramesh were doubled and those of Durgesh were halved?
- (1) 75% Increase (2) 75% Decrease (3) 25% Increase (4) No change
- 27.** The volume of a cone is directly proportional to the product of the height and the square of the base radius. If the base radius and height of the cone are tripled, what is the percentage change in the volume of the cone?
- (1) 2600% (2) 1700% (3) 1000% (4) 900%

28. A palace had provisions for 300 soldiers for 90 days. After 20 days, 50 soldiers joined the palace. Another group of 40 soldiers joined after 10 more days. After the last group joined, provisions for approximately how many days were left in the palace?
- (1) 42 days (2) 45 days (3) 30 days (4) 39 days

29. An engine without any wagon can go at a rate of 60 km. per hour. Its speed diminishes by a quantity which varies as the square root of the number of wagons attached. With 25 wagons, its speed gets halved. How many more wagons should be attached for the engine to just come to rest?
- (1) 80 (2) 75 (3) 100 (4) 125

30. An engine without any wagon can go at a rate of 60 km. per hour. Its speed diminishes by a quantity which varies as the square root of the number of wagons attached. With 25 wagons, its speed gets halved. How many more wagons should be attached for the engine to just come to rest?
- (1) 80 (2) 75 (3) 100 (4) 125

TIME AND WORK

PRACTICE TEST 1

1. 3 men can complete a piece of work in 6 days. Two days after they started the work, 3 more men joined them. How many days will they take to complete the remaining work, if all the men work at the same rate?
- (1) 1 (2) 2 (3) 3 (4) 4
2. Twenty women can do a work in sixteen days. Sixteen men can complete the same work in fifteen days. What is the ratio of the capacity of a man and a woman?
- (1) 3 : 4 (2) 4 : 5 (3) 5 : 4 (4) 4 : 3
3. A and B can complete the piece of work in 12 days and 10 days respectively. They worked together for 4 days and then B left the work. In how many days can A alone finish the remaining work?
- (1) 3.2 (2) 4.8 (3) 4.5 (4) 5.6
4. A is twice as efficient as B. Together they finish a piece of work in 18 days. In how many days can A alone finish the work?
- (1) 24 (2) 25 (3) 27 (4) 30
5. A can do a work in 20 days and B can do the same work in 40 days. If both A and B work with 80% efficiency, in how many days can they together finish the work?
- (1) 20.33 (2) 30 (3) 18 (4) 16.67
6. A and B can independently complete a project in 20 days and 30 days respectively. They start working on the project together and A quits 10 days before project completion. In how many days is the project completed?
- (1) 21 (2) 15 (3) 11 (4) 18
7. 5 men and 4 women finish a job in 6 days, and 6 men and 8 women can do the same job in 5 days. How long will 1 man and 1 woman take to do the work?
- (1) 40 (2) 24 (3) 30 (4) 36
8. A can do a job in 16 days. B is 60% more efficient than A. How many days will B take to complete the job alone?
- (1) 15 days (2) 12 days (3) 10 days (4) 18 days

9. A and B together complete a task in 14 days. B and C together complete the same task in 8 days. A and C together complete it in 7 days. How many days does the least efficient person take to complete the task?
 (1) 112 (2) $112/3$ (3) $112/5$ (4) $112/7$
10. Anil can complete a job in 6 days while Sunil can complete it in 10 days. If Anil and Sunil finish the job together and get Rs. 160, what is Sunil's share?
 (1) Rs. 100 (2) Rs. 80 (3) Rs. 60 (4) Rs. 40
11. One pipe can fill a tank three times as fast as another pipe. If together the two pipes can fill the tank in 36 minutes, then the slower pipe will be able to fill the tank alone in how many minutes?
 (1) 81 (2) 108 (3) 144 (4) 192
12. 8 students working for 5 hours a day can solve a certain number of problems in 9 days. How many students are needed to solve five times the original number of problems, if they work at 4 hours a day for 15 days?
 (1) 12 (2) 30 (3) 45 (4) 10
13. Pipe A can fill a tank in 4 minutes whereas pipes A and B together can fill the same tank in 3 minutes. How much time (in minutes) will pipe B take to fill the tank?
 (1) 10 (2) 12 (3) 9 (4) 16
14. Naresh and Suresh can do a piece of work in 40 and 45 days respectively. They started the work but Suresh left after some days and Naresh completed the remaining work in 23 days. After how many days did Suresh leave the work?
 (1) 11 (2) 9 (3) 13 (4) None of the above
15. 7 men take 12 days to complete a job. They worked for 5 days, after which 2 men left the job. In how many days will the remaining 5 men complete the job?
 (1) $39/8$ days (2) $49/5$ days (3) $12/7$ days (4) $11/9$ days
- PRACTICE TEST 2**
16. 24 people can construct a house in 15 days. How many additional workers are needed to construct the same house in 12 days?
 (1) 6 (2) 7 (3) 8 (4) 9
17. An inlet pipe fills a tank of capacity 1400 m^3 at the rate of $200 \text{ m}^3/\text{min}$. When an outlet pipe is also opened, the tank gets filled in 20 minutes. In what time (in minutes) does the outlet pipe empty a completely filled tank of the same capacity, if the inlet pipe is not open?
 (1) 7.77 min (2) 7 min (3) 70 min (4) None of these
18. A and B can together do some work in 12 days. B and C together can do it in 15 days. A and C together can do it in 20 days. In how many days can A alone finish it?
 (1) 25 (2) 30 (3) 35 (4) 40
19. A is 50% more efficient than B. How much time will they, working together, take to complete a job which B alone could have done in 30 days?
 (1) 9 (2) 15 (3) 18 (4) 12
20. Two inlet pipes A and B fill a tank completely in 4 hours and 12 hours respectively. If both pipes are opened simultaneously, what proportion of the pipe is filled in an hour?
 (1) One-third (2) One-half (3) Two-third (4) One-fourth

21. A is thrice as efficient as B, who is twice as efficient as C. If A, B and C working together complete a task in 6 days, in how many days does C complete the task alone?
 (1) 9 (2) 18 (3) 36 (4) 54
22. 12 men work 8 hours per day to complete a work in 10 days. To complete the same work in 8 days, working 15 hours a day, what will be the number of men required?
 (1) More than 8 (2) Less than 5 (3) More than 10 (4) Less than 9
23. X alone can do a piece of work in 15 days and Y alone can do it in 10 days. X and Y undertook to do it for Rs. 720. With the help of Z they finished it in 5 days. How much is paid to Z?
 (1) Rs. 120 (2) Rs. 75 (3) Rs. 240 (4) Rs. 90
24. If A and B can independently complete a job in 4 and 5 days respectively, in how many days can they complete the job together
 (1) $50/9$ (2) $20/9$ (3) $1/20$ (4) $9/20$
25. Ajay does a work in 15 days and Abhay does a work in 20 days which Ajay can do in 18 days. Which of these statements is true?
 (1) Abhay is more efficient than Ajay. (2) Ajay is more efficient than Abhay.
 (3) Abhay and Ajay are both equally efficient. (4) None of the above
26. A completes 60% of a task in 15 days and then takes the help of B and C. B is 50% as efficient as A is and C is 50% as efficient as B is. In how many more days will they complete the work?
 (1) $40/7$ (2) 7 (3) $39/8$ (4) 4
27. P can complete a piece of work in 40 days. He worked for 5 days and then Q completed the remaining work in 21 days. In how many days can P and Q complete the work, if they start together?
 (1) 7 days (2) 10 days (3) 12 days (4) 15 days
28. Four men of equal capacity work with person A to complete a task in 5 days. If 3 men with equal capacity as before had worked with a man with twice the capacity as A, they would have finished the task in 3 days. In how many days can one of the men of equal capacity complete the task alone?
 (1) $75/7$ (2) 75 (3) $75/11$ (4) $75/22$
29. A can complete a project in 20 days and B can complete the same project in 30 days. They start working on the project together but A quits a few days before the project is completed. B completes the remaining part of the project alone. If the total project was completed in 18 days, how many days before the end did A quit?
 (1) 10 (2) 8 (3) 12 (4) Cannot be determined
30. The cost of manufacturing a circular cast iron plate is directly proportional to the square root of its diameter. A plate having diameter 24 cm costs Rs. 346. How much more or less will it cost to manufacture 2 plates with diameters 18 cm and 8 cm respectively?
 (1) Rs. 143 more (2) Rs. 153.41 more (3) Rs. 282.31 more (4) Rs. 282.31 less
- PRACTICE TEST 3**
31. A tank is initially full. Pipe A can empty it in 3 hours while pipes B and C fill it in 9 and 12 hours respectively. If all the pipes are opened simultaneously, after how many hours will the tank be empty?
 (1) 7.2 (2) 4 (3) 2.7 (4) 9.6

- 32.** P builds a wall in 9 days and Q breaks it in 15 days. They work on alternate days such that P begins the work. In how many days is the wall built?
(1) 45 (2) 41 (3) 42.6 (4) 44.5

33. If P and Q together complete a job in 10 hours and P takes 25 hours to do the job alone, in how many hours can Q alone complete the job?
(1) 30 (2) 15 (3) 16.66 (4) 6.16

34. A pipe can fill the tank in 25 minutes. If the efficiency of the pipe is increased by 25% then how much time it will take to fill the tank?
(1) 15 minutes (2) 20 minutes (3) 18 minutes (4) 22 minutes

35. Prashant is 25% less efficient than Blesson. If they work together for 5 days on this job, what fraction of the job is completed?
(1) $1/4$ (2) $1/10$ (3) $7/12$ (4) Cannot be determined

36. Two outlet pipes together empty a 1584 litre tank in 7.2 minutes. What is the rate at which the tank gets empty?
(1) 210 litres/min (2) 195.5 litres/min (3) 205.5 litres/min (4) 220 litres/min

37. A and B together complete a task in 28 days. B and C complete the same task in 16 days while A and C together complete it in 14 days. Who is the most efficient of these three?
(1) A (2) B (3) C (4) B as well as C

38. Kapil completes 87.5% of the work in one day. If he were to work only for half a day, what percentage of work would be left incomplete?
(1) 56.25% (2) 60% (3) 87.5% (4) 66.67%

39. A tank is filled in 5 hours by three pipes A, B and C. Pipe C is twice as fast as B and pipe B is twice as fast as A. How much time will pipe A alone take to fill the tank?
(1) 20 (2) 25 (3) 35 (4) Cannot be determined

40. It takes 16 days for 10 workers working 7 hours a day to build a room 60 m long, 5 m high and 14 m wide. How many men will be required to build a room 50 m long, 6 m high and 28 m wide if the number of days is halved but the working hours remain the same?
(1) 25 (2) 30 (3) 40 (4) 20

41. A does a work in 15 days and B does the same work in 10 days. What is the efficiency of the work if both of them are working together?
(1) $1/6$ (2) $2/3$ (3) $1/2$ (4) None of these

42. Shyam can do a job in 20 days, Ram in 30 days and Singhal in 60 days. If Shyam is helped by both Ram and Singhal every third day, how long will it take for them to complete the job?
(1) More than 10 days (2) Less than 15 days
(3) More than 15 days (4) Less than 10 days

43. If 2 men and 5 women can complete a piece of work in 5 days while 4 men and 3 women can complete the same work in 3 days, what will be the time taken by 35 women to complete the same work?
(1) 4.2 days (2) 4 days (3) 5 days (4) 3 days

44. Pipes A and B can individually fill a tank in 15 minutes and 20 minutes respectively. Both pipes are opened together but after 4 minutes, pipe A is turned off. What is the total time required to fill the tank?
 (1) 620 seconds (2) 705 seconds (3) 750 seconds (4) 880 seconds
45. A fort has 2000 soldiers stationed in it. Each soldier eats 1200 gms of food per day and the fort has food stock to last for 60 days. 400 extra soldiers arrive at the fort to help defend it against an enemy and this force defends the fort for 20 more days than thought, after which the food runs out. By how much (in gms) did the fort commander reduce the daily food consumption of each soldier?
 (1) 400 (2) 750 (3) 450 (4) 600

PRACTICE TEST 4

46. A can finish a work alone in 18 days while B can finish it alone in 15 days. B worked alone for 10 days and then left the job. In how many days can A alone finish the remaining work?
 (1) 5 (2) 4 (3) 7 (4) 6
47. If a woman completes one-third of a task in 2 days, in how many days does a man, 75% as efficient as the woman, complete the task?
 (1) 8 (2) 7.5 (3) 6 (4) 10.5
48. A does 80% of a work in 20 days. In the next three days, A and B work together and finish the remaining work. How many days would B alone take to do the whole work?
 (1) 27 (2) 32.5 (3) 37.5 (4) 40
49. A can do a work in 12 days and B in 16 days. If they work on it together for 4 days, what fraction of work is left?
 (1) $5/12$ (2) $7/12$ (3) $9/16$ (4) $11/16$
50. Amol and Vinod work on a project on alternate days, starting with Amol. Amol alone can complete it in 8 days while Vinod alone requires 16 days. In how many days will they be able to finish the project?
 (1) 10.25 (2) 11 (3) 10 (4) 10.5
51. To complete a piece of work A and B take 8 days, B and C take 12 days while A, B and C take 6 days. How many days will A and C together take to complete the work?
 (1) 7 (2) 8 (3) 5 (4) 6
52. A can do piece of work in 6 days, B can do the same work in 8 days and C can do it in 12 days. What percent of time will be saved if all of them work together as compared to A working alone?
 (1) 55.5% (2) 50% (3) 66.6% (4) 60%
53. If 20 men work for 5 hours a day, they can build a 190 feet long wall in 10 days. If after working for 6 days, 4 men leave the job, how many days will be required to complete the job if the number of working hours per day is the same?
 (1) 25 days (2) 5 days (3) 10 days (4) 15 days
54. Three pipes A, B and C can fill a tank from empty to full in 30 minutes, 20 minutes, and 10 minutes respectively. When the tank is empty, all the three pipes are opened simultaneously. A, B and C discharge chemical solutions D, E and F respectively. What is the proportion of solution F in the liquid in the tank after 3 minutes?
 (1) $7/12$ (2) $5/7$ (3) $9/13$ (4) $6/11$

55. A and B can together complete a piece of work in 20 days. B and C can together complete the same work in 36 days. A starts a work and works on it alone for six days. Then B takes up the work and continues it for 12 days. Finally, C finishes it in 54 days. In how many days can A alone do the work?

(1) 60

(2) 72

(3) 90

(4) 30

56. Three pipes A, B and C can fill a tank in 8 hours. After filling the tank together for 3 hours, C is closed. Now, A and B fill the remaining part in 9 hours. How many hours does C alone take to fill the tank?

(1) 14 hours

(2) 12 hours

(3) 18 hours

(4) 15 hours

57. Two inlet pipes A and B fill a tank completely in 4 hours and 12 hours respectively. An outlet pipe C empties the tank in 3 hours. The tank is initially full. If all pipes are opened simultaneously, what is the status of the tank 5 hours later?

(1) The tank overspills
(3) The tank is empty(2) The tank remains full
(4) The tank empties in 2 hours

58. Three pipes A, B and C can fill a tank in 6 hours. After filling the tank together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. What proportion of the tank can C fill alone in 3 hours?

(1) 0.2

(2) 0.2142

(3) 0.2222

(4) 0.2333

59. Ram completes 60% of a task in 15 days and then takes the help of Rahim and Rachel. Rahim is 50% as efficient as Ram is and Rachel is 50% as efficient as Rahim is. In approximately how many more days will they complete the work, if working more than half a day is also counted as a full day?

(1) 6 days

(2) 8 days

(3) 7 days

(4) 5 days

60. Working together, X and Y can complete a task in 20 days. If X worked alone and completed half the work and then Y took over and completed the remaining, the task was completed in 45 days. How long will X take to complete the task working alone; if Y is more efficient than X?

(1) 50 days

(2) 48 days

(3) 60 days

(4) 55 days

TIME AND DISTANCE**PRACTICE TEST 1**

1. A car covers 145 km in 195 minutes. What is its speed (in m/s)?

(1) 11.2

(2) 12.4

(3) 6.2

(4) 8.9

2. A jet flies at 240 kmph and reaches its destination in 5 hours. At what speed (in kmph) does it reach the same destination in one-third the time?

(1) 360

(2) 480

(3) 600

(4) 720

3. If Arun drives at 40 kmph, he reaches office late by 15 minutes. If he drives at 60 kmph, he reaches early by 10 minutes. What is the usual time that he takes to reach his office exactly on time?

(1) 40 minutes

(2) 45 minutes

(3) 50 minutes

(4) 60 minutes

4. Manish spent one-fifth of his journey time walking at a speed of 10 kmph, half the journey time by bus at 40 kmph and the rest of the journey by car at 50 kmph. What is his average speed for the entire journey?

(1) 37 kmph

(2) 26 kmph

(3) 42 kmph

(4) 40 kmph

5. P, Q and R can travel 100 m in 10, 20 and 40 seconds. What is the ratio of the respective distances travelled by them in 400 seconds?

(1) 4 : 3 : 2

(2) 6 : 3 : 1

(3) 10 : 5 : 1

(4) 4 : 2 : 1

6. The upstream speed of a boat is 25 kmph and downstream speed is 55 kmph. What is the speed of the boat in still water?

(1) 30 kmph

(2) 40 kmph

(3) 15 kmph

(4) 20 kmph

7. A bus can cover the 240 km distance between Mumbai and Goa at 60 kmph without stops. With stops, it takes 8 hours. If each stop is 10 minutes long, how many stops does the bus have?
- (1) 24 (2) 25 (3) 30 (4) 36
8. In a 100 m race, A beats B by 20 m and B beats C by 25 m. What is the ratio of speed of A and C?
- (1) 5 : 4 (2) 3 : 2 (3) 5 : 3 (4) 2 : 1
9. A train travelling at 108 kmph crosses a stationary car in 13 seconds. What is the train's length (in m)? Ignore the car's length.
- (1) 390 (2) 290 (3) 216 (4) 324
10. A person goes from Mumbai to Pune at 55 kmph and from Pune to Nashik at 110 kmph. If the distance between Mumbai and Pune, as well as between Pune and Nashik is 220 km each, in how many hours does he reach Nashik from Mumbai, via Pune?
- (1) 10 (2) 8 (3) 6 (4) 5
11. Rajeev covers 6 km of the distance from his house to office in 2 hours. If his office is 15 km away from his house, how much more time will he need?
- (1) 1.5 hours (2) 3 hours (3) 4 hours (4) 2 hours
12. Two joggers, A and B, simultaneously start from the same point and run at 5 m/s and 10 m/s respectively in the same direction around a 300 m long circular track. After what time will they meet again for the first time?
- (1) 4 minutes (2) 3 minutes (3) 2 minutes (4) 1 minute
13. Anurag goes from A to B at 6 kmph and returns from B to A at 9 kmph. What is his average speed for the whole journey?
- (1) 3 km/hr (2) 6 km/hr (3) 7.5 km/hr (4) None of these
14. How much time does a train of length 100 m travelling at 144 kmph take to cross another train of length 200 m travelling at 108 kmph. Assume that the trains are moving in opposite directions.
- (1) 6 seconds (2) 8.4 seconds (3) 5.16 seconds (4) 4.28 seconds
15. The time taken by P, Q and R to complete a race is in the ratio 8 : 3 : 6. What is the ratio of their speeds?
- (1) 6 : 3 : 8 (2) 3 : 8 : 4 (3) 1 : 2 : 3 (4) 4 : 3 : 1

PRACTICE TEST 2

16. A train running at 80 kmph crosses a man running in the same direction at 10% of the train's speed in 10 seconds. What is the length of the train (in m)?
- (1) 400 (2) 500 (3) 200 (4) 100
17. The ratio of speeds of P and Q = 1 : 3 and the ratio of speeds of Q and R = 4 : 7. If P covers 200 m in 105 seconds, in how many seconds does R cover the same distance?
- (1) 45 (2) 20 (3) 60 (4) 15
18. A person runs 12.5 kmph. What distance does he run in 225 minutes? *Wrong option*
- (1) 255 m (2) 195 m (3) 225 m (4) 470 m
19. Jay drove for 3 hours at 50 kmph and for 2 hours at 60 kmph. What was his average speed for the whole journey?
- (1) 52 kmph (2) 54 kmph (3) 56 kmph (4) 58 kmph

- 20.** The speed of a yacht is 20 kmph and the river flows at 4 kmph. The yacht travelled 120 km in the direction of the flow. What distance can the yacht cover in the same time, but against the direction of the flow?
- (1) 80 km (2) 180 km (3) 60 km (4) 100 km
- 21.** A boat goes from port A to port B at 40 kmph and returns at 14 kmph. At what speed (in kmph) is the river flowing?
- (1) 13 (2) 14 (3) 27 (4) Data insufficient
- 22.** A train running at 72 kmph crosses a 250 m long platform in 26 seconds. What is the train's length?
- (1) 270 m (2) 240 m (3) 260 m (4) 250 m
- 23.** A train is 110 m long and is moving at a speed of 132 kmph. How many seconds will it take to cross a railway platform 165 m long?
- (1) 8 (2) 7 (3) 7.5 (4) 9.5
- 24.** Alok travels 20 km in one hour and 30 km in the next hour. What is his average speed (in kmph)?
- (1) 24 (2) 25 (3) 27.5 (4) 23.5
- 25.** Asgar travels 290 km from Delhi to Jaipur in 8 hours. He travels for some time at 30 kmph and then increases his speed by 10 kmph and travels at that speed till the end. What distance does he travel at 30 kmph?
- (1) 140 kms (2) 200 kms (3) 90 kms (4) 70 kms
- 26.** Popatlal travels 50 m at 5 m/s, 70 m at 14 m/s and 60 m at 12 m/s. What is the average speed (in m/s) for the overall distance?
- (1) 9 m/s (2) 10 m/s (3) 8 m/s (4) 7 m/s
- 27.** Two vans travel in the same direction at 40 kmph with a certain gap between the two vans. A car comes from the opposite direction at 60 kmph. It meets the two vans at a gap of 9 seconds. What is the distance between the two vans?
- (1) 300 m (2) 200 m (3) 250 m (4) 275 m
- 28.** Rehan can reach Agra at 2 p.m. if he travels at 10 kmph. If he travels at 15 kmph, he can reach Agra at noon. At what speed (in kmph) must he travel to reach Agra at 1 p.m.?
- (1) 8 (2) 11 (3) 12 (4) 20
- 29.** Over 1500 m, Akhil beats Nikhil by 100 m. Over 1200 m, Nikhil beats Mithil by 75 m. By how many m does Akhil beat Mithil over 900 m race?
- (1) 52.5 (2) 56.25 (3) 112.5 (4) 116.25
- 30.** Vinay travelled 295 kms by covering the first 25 kms at 45 kmph, the next 120 km at double the speed and the remaining distance at two-thirds more than the original speed. What was his average speed for the journey?
- (1) 68.75 kmph (2) 72.25 kmph (3) 73.33 kmph (4) 75.86 kmph

PRACTICE TEST 3

- 31.** A and B start walking towards each other from points P and Q respectively. They meet somewhere in between. After meeting, B reaches point P in 45 minutes while A reaches point Q in 125 minutes. If A's speed is 30 kmph, what is B's speed (in kmph)?
- (1) 50 (2) 18 (3) 60 (4) 24

- 32.** A cruise ship starts from Mumbai on 01 March at 3:00 p.m. and reaches Singapore on 04 March at 11:00 a.m. (India time). What is the speed of the cruise if the distance between Mumbai and Singapore is 2560 miles? Consider 1 mile as 1.6 km.
- (1) 83.4 km/hr (2) 54.8 km/hr (3) 60.2 km/hr (4) 79.1 km/hr
- 33.** Roshni's average speed for a return journey from Meerut to Kanpur is 24 kmph. If her onward speed is 20 kmph, what is her return speed?
- (1) 40 kmph (2) 28 kmph (3) 25 kmph (4) None of the above
- 34.** A and B start jogging from the same point in a circular Joggers Park at 6:15 a.m. They jog in opposite directions with speeds of 5 kmph and 10 kmph respectively. At what time do they meet for the second time, if the length of Joggers Park is 5 km?
- (1) 6:55 a.m. (2) 6:40 a.m. (3) 6:45 a.m. (4) 6:50 a.m.
- 35.** A train leaves Chennai for Hyderabad at 9 a.m. at 50 kmph. On the same day, another train leaves Chennai for Hyderabad at 1 p.m. at 75 kmph on a parallel track. When will the two trains meet each other?
- (1) 10 a.m. on the next day. (2) 9 p.m. on the same day. (3) 8 p.m. on the same day. (4) 9 p.m. on the next day.
- 36.** Guru starts walking from a point at 8:00 a.m. with a uniform speed of 4 kmph. Deepu starts walking from the same point in the same direction at 8:45 a.m. and overtakes Guru at 9:21 a.m. What is Deepu's speed?
- (1) 9 kmph (2) 5 kmph (3) 4.5 kmph (4) 6 kmph
- 37.** A, B and C simultaneously start, in the same direction and from the same point, to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds. After what time will they meet again at the starting point?
- (1) 26 minutes and 18 seconds (2) 42 minutes and 36 seconds (3) 45 minutes (4) 46 minutes and 12 seconds
- 38.** A boat can cover 40 miles upstream and 90 miles downstream in 10 hours. It can also cover 60 miles upstream and 60 miles downstream in the same time. What is the speed of the stream (in miles/hour)?
- (1) 10 (2) 12.5 (3) 2.5 (4) 7.5
- 39.** A train passes a platform in 36 seconds and a man standing on the platform in 20 seconds. If the speed of the train is 54 kmph, what is the length of the platform?
- (1) 120 m (2) 240 m (3) 200 m (4) 300 m
- 40.** If Pranav walks 50 m per minute, how many miles does he walk in a day? 1 mile = 1.6 km
- (1) 75 (2) 45 (3) 50 (4) None of these
- 41.** Sameer travels one-third of his journey by train at the speed of 75 kmph, half of his remaining journey by bus at a speed of 50 kmph and the rest of the distance by bike at a speed of 60 kmph. What is his average speed for the whole journey?
- (1) 55 km/hr (2) 60 km/hr (3) 61.66 km/hr (4) 65 km/hr
- 42.** A jet travels at 1100 kmph without air resistance. The air current is from east to west at a speed of 100 kmph. How many hours will the jet take to complete a return journey from Dubai to Singapore, if they are 4800 kms apart? (Dubai is in the west, and Singapore is in the east.)
- (1) 4.5 (2) 4 (3) 8 (4) 8.8

- 43.** Two boats are rowing in a stream, heading towards each other. When they started, the distance between them was 25 kms. The speed of the stream is 5 kmph while each boat has a speed of 10 kmph. What is the gap between the boats one minute before they meet?
- (1) $1/4$ km (2) $1/3$ km (3) $1/6$ km (4) $1/12$ km

- 44.** A person goes downstream at a speed of 15 kmph. His speed decreases by two-thirds when he goes upstream. What is the net speed of his boat when it travels upstream at twice the stream speed?
- (1) 0 kmph (2) 5 kmph (3) 2.5 kmph (4) 20 kmph

- 45.** A train crosses a man travelling in another train in the opposite direction in 10 seconds. But the train requires 30 seconds to cross the same man if the train were travelling in the same direction. If the length of the first train is 180 meters and that of the other train in which the man is sitting is 120 meters, what is the speed of the first train (in m/s)?
- (1) 12 (2) 10 (3) 6 (4) 9

PRACTICE TEST 3

- 46.** A and B respectively take 4 seconds and 24 seconds to cross a 840 m long bridge. If they start from opposite ends, in how much time do they cross the bridge?

(1) 4.2 seconds (2) 3.4 seconds (3) 5.0 seconds (4) 2.8 seconds

- 47.** Two runners are running on a 420 m long circular track in opposite directions. The ratio of the speeds is 9 : 5. If the slower runner runs at 10 m/s; how many times do they meet in 1 minute and 40 seconds?

(1) 8 (2) 6 (3) 4 (4) 10

- 48.** Two trains start simultaneously from Milan and Athens towards each other with speeds of 80 kmph and 100 kmph respectively. When they meet each other, one train has covered 320 km more than the other. What is the distance between Milan and Athens (in km)?

(1) 2400 (2) 2560 (3) 2880 (4) 2740

- 49.** To cover 30 km, Abhay takes two hours more than Sameer. If Abhay doubles his speed and Sameer continues at the old speed, takes an hour less than Sameer to cover 30 km. What is Sameer's speed?

(1) 5 kmph (2) 6 kmph (3) 6.25 kmph (4) 7.5 kmph

- 50.** A 600 km long journey takes eight hours if 120 km is done by train and the rest by car. It takes 20 minutes more, if 200 km is done by train and the rest by car. What is the ratio of the train's speed to the car's speed?

(1) 2 : 3 (2) 3 : 4 (3) 3 : 2 (4) 4 : 3

- 51.** A man goes from A to B, situated 60 kms apart, by a boat. His onward journey was upstream. He completed the round trip in 4.5 hours. If the speed of the stream is 10 kmph, in how many hours did he complete the onward journey?

(1) 3 hours (2) 3.5 hours (3) 2.25 hours (4) 1.5 hours

- 52.** A and B start on a 1080 m long cycling track from the same point at the same time in opposite directions. Their speeds are 43.2 kmph and 54 kmph. When they meet at the starting point for the first time, how many times have they met each other including their meeting at the starting point for the first time?

(1) 4 (2) 5 (3) 8 (4) 9

- 53.** In a 100 m race, Shashi beats Manohar by 15 m and Manohar beats Randhir by 7 seconds. How fast is Shashi compared to Randhir, if Manohar runs with a speed of 10 m/s?

(1) 3 times (2) 1.5 times (3) 2 times (4) 2.5 times

54. A and B run on a 14 m long circular track. When they start running simultaneously in the same direction, they meet each other every 22 seconds. When they start running simultaneously in opposite directions, they meet each other every 10 seconds. Now, they run on a straight 100 m track in the same direction. If they maintain their original speed, what headstart (in m) must the faster runner give the slower one, so that they both reach the finish line together?
- (1) 62.5 (2) 50 (3) 75 (4) 37.5
55. On day 1, Abhay runs 600 m at a certain constant speed. However, to save time on day 2, he starts at the original speed and then keeps doubling his speed every 150 m. If he saves 63.75 seconds in this process, how much time would he save on day 3 compared to day 1, if he ran the whole journey at day 2's maximum speed?
- (1) 60 (2) 75 (3) 135 (4) 105
56. A man was rowing downstream in a boat having its speed in still water as 9 kmph, and speed of the stream being 3 kmph. After travelling a certain distance, the speed of the stream increased by 3 kmph and hence, he reached his destination earlier by 10 minutes. If the man travelled 180 km in all, for what distance (in km) did the man travel at the new speed?
- (1) 10 km (2) 25 km (3) 15 km (4) 20 km
57. A cat spots a mouse 200 m ahead and starts chasing it. Four minutes later, the mouse sees this and starts running away from the cat. In one leap, the cat covers 3 m and the mouse covers 2 m. Also, in one minute, the cat takes 12 leaps and the mouse takes 16 leaps. In how many minutes would the cat catch the mouse after it started chasing the mouse?
- (1) 18 (2) 12 (3) 15 (4) 14
58. A bus going to Nashik met with an accident 180 km from its start point i.e. Mumbai. It completed the remaining journey at $\frac{5}{6}$ th of the previous speed and reached Nashik late by 30 minutes. Had the accident happened 50 kms further, it would have been late by only 10 minutes. What was the original speed of the bus?
- (1) 20 km/hr (2) 18 km/hr (3) 25 km/hr (4) 30 km/hr
59. A fox is chasing a hare, which is $\frac{4}{5}$ of its own leaps ahead of the fox. 2 leaps of the fox are equivalent to 3 leaps of the hare. The hare takes 4 leaps in the same time that the fox takes 3 leaps. In how many leaps will the fox catch the hare?
- (1) 240 leaps (2) 290 leaps (3) 255 leaps (4) 270 leaps
60. A car starts for Pune from Mumbai at 8 p.m. The car meets a bus, which is moving in the same direction, at 10 p.m. and overtakes it. At 12.30 a.m., the car reaches Pune and it starts on its return journey after an hour. At 2 a.m., the car meets the bus which is still on its way to Pune. When will the bus reach Pune?
- (1) 4 a.m. (2) 3 a.m. (3) 5 a.m. (4) Cannot be determined

NUMBERS

PRACTICE TEST 1

1. Which is the least number which when divided by 8, 12, 14 leaves a remainder of 5 in each case?
- (1) 160 (2) 168 (3) 176 (4) 173
2. How many factors does 225 have?
- (1) 6 (2) 3 (3) 2 (4) 5 → wrong options.
3. How many factors does the number 550 have?
- (1) 12 (2) 16 (3) 10 (4) 8

4. What is the HCF of $12/9, 2/25, 30/40$ and $50/60$?
 (1) $60/1500$ (2) $2/1800$ (3) $6/1000$ (4) None of these
5. A yellow, white and red bulb is installed in a room. They light up every 4, 6 and 10 seconds respectively. How many times will all three be lit up together in 5 minutes?
 (1) 5 (2) 10 (3) 6 (4) 4
6. If Ravi distributes equal number of candies among 4 children, he has 2 candies left. If he tries to distribute the same number of candies per child among 5 children, he falls short by 3 candies. How many candies does he have?
 (1) 22 (2) 18 (3) 26 (4) 14
7. What is the HCF of $6x^2y, 4x^3y^3, 3xy^5, 6xy^2$ and $12xy$?
 (1) $2xy$ (2) xy (3) xy^2 (4) $3xy$
8. What is the remainder when the product of the first five even natural numbers is divided by 7?
 (1) 0 (2) 4 (3) 6 (4) 3
9. If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, what is the sum of their reciprocals?
 (1) $55/601$ (2) $601/55$ (3) $11/120$ (4) $120/11$
10. In a certain division, the divisor is twice the remainder and five times the quotient. If the remainder is 10, what is the dividend?
 (1) 110 (2) 90 (3) 85 (4) 125
11. Which is the least number, which when divided by 3, 4 and 5, leaves remainder 1, 2 and 3 respectively?
 (1) 58 (2) 59 (3) 67 (4) 116
12. On dividing a certain number by 15, we get 10 as a remainder and 3569 as its quotient. What is the number?
 (1) 45545 (2) 35545 (3) 53545 (4) 55455
13. Three alarm clocks go off every 140 minutes, 210 minutes and 280 minutes respectively. What is the time gap between two successive instances of all three alarm clocks ringing together?
 (1) 12 hours (2) 13 hours (3) 14 hours (4) 15 hours
14. What is the sum of factors of 120?
 (1) 180 (2) 360 (3) 160 (4) 270
15. An electronic watch beeps every 70 seconds, and another beeps every 72 seconds. They beep together for the first time at 10 a.m. When will they beep together for the fifth time?
 (1) 12:12 p.m. (2) 11:24 p.m. (3) 12:48 p.m. (4) 1:02 p.m.

PRACTICE TEST 2

16. The least number which should be added to 2497 so that the sum is exactly divisible by 5, 6, 4 and 3 is:
 (1) 3 (2) 13 (3) 23 (4) 33
17. Which of these numbers has odd number of factors?
 (1) 169 (2) 256 (3) 361 (4) All of the above

18. Which is the greatest number which, on dividing 1657 and 2037, leaves a remainder of 6 and 5 respectively?
 (1) 123 (2) 127 (3) 235 (4) 305
→ Revise concept
19. How many numbers from 100 to 250 (both included) are divisible by 3 or 5?
 (1) 71 (2) 74 (3) 81 (4) 83
20. When 682 chocolates are equally divided among a group of children, 2 chocolates are left. When 578 chocolates are distributed instead, 2 chocolates are still left. What is the greatest number of chocolates that a child can get?
 (1) 4 (2) 8 (3) 6 (4) 10
21. Which is the smallest number that needs to be added to or subtracted from 4500 to make it a perfect cube?
 (1) 404 (2) 431 (3) 413 (4) 427
→ manually 216 & 641
→ 641 → cubes
22. The LCM of 234 and 300 is 1950. What is their HCF?
 (1) 36 (2) 30 (3) 35 (4) 27
23. What is the value of the least four-digit number that is exactly divisible by 3, 4, 5 and 8?
 (1) 1120 (2) 1080 (3) 1140 (4) 1020
24. Which is the greatest number that leaves an equal remainder when 1086, 946 and 995 are divided by it?
 (1) 4 (2) 5 (3) 7 (4) Data inadequate
25. What is the units digit of $(474)^{100} + (229)^{50}$?
 (1) 8 (2) 3 (3) 7 (4) 5
26. There are three divisions of 91, 143 and 208 employees respectively who go for a picnic. All employees are divided into groups of equal sizes to accommodate in a single bus and each group contains employees only from one division. What would be the largest possible group size in a single bus?
 (1) 4 (2) 7 (3) 11 (4) 13
27. What is the least number that must be subtracted from 3489, so that the resulting number is divisible by 37?
 (1) 11 (2) 14 (3) 13 (4) 24
28. What is the largest number that divides all of 12, 24, 16, 32 and 18?
 (1) 2 (2) 4 (3) 6 (4) 8
29. If n is a prime number and $164(n^3 + 12n)$ is exactly divisible by 32, what is the value of n ?
 (1) 2 (2) 3 (3) 5 (4) 4
30. When a number N is divided successively by 5 and 7, the remainders are 2 and 4 respectively. What is the remainder when N is divided by 35?
 (1) 27 (2) 22 (3) 0 (4) 11
- PRACTICE TEST 3**
31. If the LCM of two numbers is 432 and their ratio is 8 : 9, what is the value of the two numbers?
 (1) 32 and 41 (2) 53 and 36 (3) 48 and 54 (4) 78 and 36
32. If the number 974p132 is divisible by 4, what is the least integer that will replace p ?
 (1) 8 (2) 6 (3) 5 (4) 0

- 33.** What is the sum of the first 100 odd numbers?
 (1) 9989 (2) 10031 (3) 10000 (4) 9997
- 34.** What least number must be added to 2512, so that the sum is completely divisible by 23?
 (1) 20 (2) 13 (3) 18 (4) 11
- 35.** How can the recurring decimal 5.242424... be expressed as a fraction?
 (1) $519/99$ (2) $527/90$ (3) $519/90$ (4) $527/99$
- 36.** A tailor has two cloth pieces measuring 2.8 m and 9.8 m respectively. Which of these lengths will allow him to cut each cloth into minimum pieces of equal sizes without any wastage?
 (1) 105 (2) 70 (3) 280 (4) 140
- 37.** What is the L.C.M and H.C.F. of 15, 75, 35?
 (1) 425, 10 (2) 325, 25 (3) 625, 15 (4) 525, 5
- 38.** Which of these pairs of numbers do not have the same HCF as the others?
 (1) (5, 11) (2) (23, 37) (3) (17, 89) (4) (27, 63)
- 39.** When two three-digit numbers - $9a2$ and $44a$ - are added, the result is a four-digit number $1a75$. If this number is divisible by 11, what is the value of a ?
 (1) 3 (2) 4 (3) 1 (4) 5
- 40.** A person plants equal number of saplings in each row and the number of rows is thrice the number of saplings per row. If the person plants 1452 saplings in all, in how many rows does he plant saplings?
 (1) 60 (2) 33 (3) 54 (4) 66
- 41.** If $1p2q3r$ is divisible by 11, then $(p, q, r) = ?$
 (1) (4, 0, 2) (2) (4, 5, 3) (3) (5, 2, 7) (4) (5, 3, 6)
- 42.** If the digits of a two-digit number are reversed, its value increases by 18. If the difference between the square of digits of the original number is 20, what is the reversed number?
 (1) 53 (2) 64 (3) 35 (4) 46
- 43.** A certain number when divided by 15 leaves a remainder of 4. What is the remainder when the square of that number is divided by 15?
 (1) 2 (2) 4 (3) 1 (4) 3
- 44.** Which of these expressions definitely divides $(x^8 - y^8)$?
 (1) $(x^2 + y^2)$ (2) $(x + y)$ (3) $(x^4 + y^4)$ (4) All of these
- 45.** When certain chocolates are equally distributed among p children, one chocolate is left. When the same number of chocolates is equally distributed among q children, again one chocolate is left. If the number of chocolates received by each child is in the ratio 9 : 5, which of these can be the number of chocolates distributed?
 (1) 586 (2) 633 (3) 410 (4) 772
- PRACTICE TEST 4**
- 46.** What is the largest number that divides 99, 148, 269 and 366 to leave a remainder of 3, 4, 5 and 6 respectively?
 (1) 16 (2) 24 (3) 48 (4) None of these

47. Which of these numbers is not divisible by 8?
 (1) 3140824 (2) 1025442 (3) 1046224 (4) 9743328
48. What is the units digit of $(2356)^{476}$?
 (1) 6 (2) 5 (3) 4 (4) 7
49. What is the LCM of 32, 128, 512 & 1024?
 (1) 4096 (2) 2048 (3) 512 (4) None of these
50. What is the difference between the HCF and LCM of 40 and 28?
 (1) 324 (2) 244 (3) 276 (4) 280
51. What is the LCM of: $(2/16)$, $(5/20)$, $(10/14)$, $(3/44)$ and $(24/36)$?
 (1) 120 (2) 60 (3) 40 (4) 30
52. How many three-digit numbers are divisible by every single-digit prime number?
 (1) 2 (2) 4 (3) 1 (4) 3
53. A number when divided by 6 and 5 leaves remainder 2 and 3 respectively. What is the smallest such number?
 (1) 38 (2) 16 (3) 12 (4) 8
54. What is the sum of the 5th prime number and the 25th prime number?
 (1) 111 (2) 105 (3) 110 (4) 108
55. Four white bulbs turn red in 8s, 12s, 16s and 20s respectively. If they simultaneously turn red at zero seconds for the first time, after how many seconds will they simultaneously turn red for the third time?
 (1) 6 (2) 4 (3) 9 (4) None of these
56. What is the largest number which divides 96 but leaves a remainder of 3, 4 and 5 respectively when it divides 147, 268 and 365?
 (1) 24 (2) 36 (3) 48 (4) 12
57. Which of these numbers is not a perfect square?
 (1) 1050625 (2) 11778624 (3) 8345728 (4) 54626881
58. The product of two numbers is 9375. If the HCF of these numbers is 25, what is the larger number?
 (1) 625 (2) 375 (3) 125 (4) Cannot be determined
59. What is the smallest multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15 and 18?
 (1) 74 (2) 94 (3) 184 (4) 364
60. The product of two numbers is 2890. What is the largest possible sum of the two numbers when their HCF takes its largest possible value?
 (1) 243 (2) 187 (3) 129 (4) More than one of the above
- PRACTICE TEST 5**
61. What is the HCF of 0.0001 and 0.000001?
 (1) 0.000000001 (2) 0.0001 (3) 0.000001 (4) 0.01

- 62.** What is the smallest number that should be multiplied to 1260 to make it a perfect square?
 (1) 14 (2) 70 (3) 35 (4) 45
- 63.** If the number $7a49b$ is divisible by 88, what is the value of $(a + b)$?
 (1) 17 (2) 9 (3) 14 (4) 11
- 64.** There are two queues - of 27 and 18 - at the metro ticket counter. To manage the queue, each is divided into groups of equal size. What is the largest possible size of the group?
 (1) 10 (2) 11 (3) 8 (4) 9
- 65.** A number $16x7$ is divisible by 7. What is the value of x if the number is also divisible by 3?
 (1) 1 (2) 4 (3) 7 (4) Multiple values of x are possible
- 66.** How many factors does 289 have?
 (1) 6 (2) 3 (3) 2 (4) 5
- 67.** The LCM of two numbers is 30 times their HCF and the sum of the HCF and LCM is 620. If one number is 120, what is the other number?
 (1) 225 (2) 90 (3) 125 (4) None of the above
- 68.** N is a three-digit number. The sum of its digits is subtracted from N . Which of these numbers always divides the resultant difference?
 (1) 11 (2) 6 (3) 2 (4) 9
- 69.** The LCM and HCF of two numbers is 18 and 7200 respectively. If one of the numbers is 450, what is the difference between the two numbers?
 (1) 162 (2) 314 (3) 288 (4) 320
- 70.** Which of these operations on 2160 will not make it a perfect cube?
 (1) Multiply by 100 (2) Divide by 80 (3) Multiply by 10 (4) Multiply by 0.8
- 71.** There are four prime numbers written in descending order. The product of the first three is 385 and that of the last three is 105. What is the last number?
 (1) 3 (2) 5 (3) 7 (4) 11
- 72.** If N is the second largest four digit number divisible by 12, 40, 32 & 72, what is the value of N ?
 (1) 9920 (2) 9840 (3) 8640 (4) 7200
- 73.** What is the possible number of ordered pairs of integers x, y such that their LCM is 108 and HCF is 9?
 (1) 4 (2) 6 (3) 3 (4) 5
- 74.** A five-digit number $2p90q$ is divisible by 12 such that q divided by p is an integer. How many unique values can $(p + q)$ take?
 (1) 2 (2) 6 (3) 5 (4) 3
- 75.** If both 17^2 and 3^3 are factors of $(n \times 4^3 \times 6^2 \times 13^{11})$, what is the smallest possible value of n ?
 (1) 242 (2) 726 (3) 867 (4) 484

ALGEBRAIC FORMULAE AND OPERATIONS

PRACTICE TEST 1

1. What is the value of $(111111)^2$?
 (1) 123454321 (2) 12345654321 (3) 1234321 (4) None of these
2. What is the remainder when $(x^4 + x^3 - 16x^2 - 4x + 48)$ is divided by $(x - 4)$?
 (1) 16 (2) 0 (3) 96 (4) 132
3. If $(x - 2a)$ is a factor of $4x^2 - 15x - 54 = 0$, what is the value of a ? Consider a to be a natural number.
 (1) 1 (2) 3 (3) 6 (4) 4
4. If $(x - y) = 31$, $(x + y) = 35$ and $xy = 66$, what is the value of $(x^3 - y^3) + (x^2 + y^2)$?
 (1) 32434 (2) 27356 (3) 18935 (4) 37022
5. What is the value of 997^3 ?
 (1) 991010003 (2) 991029813 (3) 991016883 (4) 991026973
6. If $ab = 12$, $a^3 + b^3 = 1440$ and $a + b = 45$, what is the value of $a^2 + b^2$?
 (1) 52 (2) 36 (3) 44 (4) 57
7. If $(p + q + r)^2 = 207$, $p^2 + q^2 + r^2 = 135$, $pq + qr + pr = ?$
 (1) 35 (2) 36 (3) 107 (4) 72
8. If $y + 36/y = 12$, what is the value of $(\sqrt{y} + 6/\sqrt{y})$?
 (1) $3\sqrt{2}$ (2) $2\sqrt{6}$ (3) 12 (4) 8
9. What is the sum of $(12x^2 - 12xy + 9y^2)$ and $(6xy + 7y^2)$?
 (1) $12x^2 - 6xy + 16y^2$ (2) $12x^2 + 6xy - 16y^2$
 (3) $12x^2 - 6xy - 16y^2$ (4) $12x^2 + 6xy + 16y^2$
10. What is the product of $(5x - 8y + 3z)$ and $(6x^2 - 7y^2)$?
 (1) $30x^3 + 35xy^2 - 48x^2y + 56y^3 + 18x^2z - 21y^2z$ (2) $30x^3 - 35xy^2 + 48x^2y + 56y^3 + 18x^2z - 21y^2z$
 (3) $30x^3 - 35xy^2 - 48x^2y - 56y^3 + 18x^2z - 21y^2z$ (4) $30x^3 - 35xy^2 - 48x^2y + 56y^3 + 18x^2z - 21y^2z$
11. If $p - q = 14$, $p + q = 20$, then $pq = ?$
 (1) 48 (2) 51 (3) 54 (4) 52
12. What is the value of x^5 if $(x - 2)(x + 2)(x^2 + 4)(x^4 + 16) = 0$? Assume that x is a natural number.
 (1) 8 (2) 128 (3) 32 (4) 16
13. If $5x + 4y = 22$ and $xy = 6$, what is the value of $125x^3 + 64y^3$?
 (1) 2728 (2) 3206 (3) 4610 (4) 2764
14. If $(x + 1/x)^2 = 8$, what is the value of $(x^3 - 1/x^3)$?
 (1) 14 (2) 28 (3) 18 (4) 21
15. If $a = 80$, $b = -43$, $c = -37$, what is the value of $80^3 - 43^3 - 37^3$?
 (1) 240 (2) 0 (3) 120 (4) None of the above

PRACTICE TEST 2

- 16.** $58^2 - 50^2 - 38^2 + 70^2 = ?$
- (1) 41350 (2) -980 (3) 4320 (4) -4870
- 17.** If $(a+b)^2 = 81$ and $(a-b)^2 = 64$, what is the least value of $a^2 - b^2$?
- (1) -18 (2) 72 (3) 18 (4) -72
- 18.** What is the value of:
- $$\frac{24^2 + 144 + 6^2}{24^3 - 6^3}$$
- (1) 1800 (2) 300 (3) 1200 (4) None of the above
- 19.** If $(x/y) + (y/x) = 2$; what is the value of $(5x - 2y)$?
- (1) y (2) $3y$ (3) $-y$ (4) $-2y$
- 20.** The degree of the polynomial $\frac{4xy^2}{z^3} - \frac{8x^{10}y^2}{z^8} + \frac{14x^{14}y^8}{x^{12}}$ is?
- (1) 0 (2) 4 (3) 10 (4) 14
- 21.** If $a^2 + \frac{1}{a^2} = 7$, what is the value of $\left(a + \frac{1}{a}\right)$?
- (1) -3 (2) 2 (3) 4 (4) -4
- 22.** What is the value of $(3x + y - z)^2$?
- (1) $9x^2 + y^2 + z^2 + 6xy - 2yz - 6xz$
 (2) $9x^2 + y^2 + z^2 + 6xy + 2yz + 6xz$
 (3) $9x^2 + y^2 + z^2 - 6xy + 2yz + 6xz$
 (4) None of these
- 23.** If $5x - (5/x) + 7 = 0$, what is the value of $x^3 - (1/x^3) + 7$?
- (1) $12/125$ (2) $7/125$ (3) $-24/125$ (4) $11/125$
- 24.** If $a + b = 13$ and $ab = 25$, what is the value of $a^3 + b^3$?
- (1) 1332 (2) 942 (3) 1222 (4) None of the above
- 25.** If $p^2/16q^2 + 16q^2/p^2 = 2$, what is the value of $(p^3/q^3 + 12)$?
- (1) 74 (2) 69 (3) 76 (4) 62
- 26.** If $a^2 + b^2 + 6a - 10b + 34 = 0$, what is the value of $a^2 + b^2$? Assume that a and b are integers.
- (1) 46 (2) 56 (3) 34 (4) 39
- 27.** If $y^2 + 7y + 3 = 0$, what is the value of $y^3 + (27/y^3)$?
- (1) -240 (2) 360 (3) -280 (4) -320
- 28.** If $x + y + z = 24$ and $xy + yz + zx = 192$, such that x, y and z are natural numbers, what is the value of $(7x + 5y + 6z)/3y^2$?
- (1) 6 (2) 12 (3) 8 (4) 15
- 29.** If $x^4 = y + z$, $y^4 = z + x$, $z^4 = x + y$, where x, y and z are non-zero numbers, what is the value of $[1/(x^3 + 1)] + [1/(y^3 + 1)] + [1/(z^3 + 1)]$?
- (1) 7 (2) 5 (3) 4 (4) 1

30. If $7x^2 + 11y^2 + (7/x^2) + (11/y^2) = 36$, what is the value of $(3x + 7y)$ such that x and y are natural numbers?
- (1) 8 (2) 14 (3) 10 (4) 6

SURDS AND INDICES

PRACTICE TEST 1

1. If $x = 1/2$, what is the value of $[\sqrt{(2-x)} + \sqrt{(2+x)}]^2$?
- (1) $2 - \sqrt{15}$ (2) $2 + \sqrt{15}$ (3) $4 - \sqrt{15}$ (4) $4 + \sqrt{15}$
2. What is the value of x if: $\sqrt{1 + \frac{x}{1156}} = \frac{35}{34}$?
- (1) 54 (2) 57 (3) 63 (4) 69
3. If $19^a = 19^{2.9} \times 19^{6.8} \div 19^{3.2}$, what is the value of a ?
- (1) 6.5 (2) 5.5 (3) 6.7 (4) 5.7
4. What is the value of:
 $x^{(a^2 + 3a + 2)} \times x^{(-3 - 4a)} \times x^{(2 - a - a^2)}$?
- (1) x^{2a} (2) x (3) 1 (4) None of the above
5. What is the value of $\sqrt{20} - \sqrt{180} + \sqrt{245} - \sqrt{45}$?
- (1) $\sqrt{20}$ (2) $2\sqrt{20}$ (3) 1 (4) 0
6. If $x = 7 + 4\sqrt{3}$, what is the value of $(x^1 + x^{-1})$?
- (1) $7/\sqrt{3}$ (2) $14 + 8\sqrt{3}$ (3) 17 (4) 14
7. What is the value of $3\sqrt{7} + \sqrt{28} - \sqrt{63}$?
- (1) $\sqrt{7}$ (2) $3\sqrt{7}$ (3) $2\sqrt{7}$ (4) 0
8. If $2^x = 4^{2.8} \times 16^{1.4} \div 2^5$, what is the value of x ?
- (1) 4.6 (2) 5.8 (3) 6.2 (4) 5.2
9. What is the result after rationalizing the denominator of $1/(4 - \sqrt{3})$?
- (1) $4 + \sqrt{3}$ (2) $4 - \sqrt{3}$ (3) $1/(4 + \sqrt{3})$ (4) $(4 + \sqrt{3})/13$
10. Which of the following is true?
- (1) $\sqrt[3]{16} < \sqrt{12} < \sqrt[6]{320}$ (2) $\sqrt[6]{3} > \sqrt[3]{2}$
 (3) $\sqrt[3]{4} > \sqrt[4]{5}$ (4) All of the above
11. Arrange the following surds in descending order.
 $\sqrt[3]{4}, \sqrt[6]{3}$ and $\sqrt[4]{7}$
- (1) $\sqrt[3]{4} > \sqrt[4]{7} > \sqrt[6]{3}$ (2) $\sqrt[4]{7} > \sqrt[3]{4} > \sqrt[6]{3}$ (3) $\sqrt[4]{7} > \sqrt[6]{3} > \sqrt[3]{4}$ (4) $\sqrt[6]{3} > \sqrt[4]{7} > \sqrt[3]{4}$
12. If $(a + b\sqrt{2}) = (3 + 2\sqrt{2}) / (3 - 2\sqrt{2})$; what is the value of a and b respectively? Both a and b are rational numbers.
- (1) 17, 12 (2) 12, 17 (3) 3, 2 (4) 1, 0

- 13.** What is the value of m in terms of x and y ? $m = \frac{\sqrt{x^2 - y^2} + x}{\sqrt{x^2 + y^2} + y} \div \frac{\sqrt{x^2 + y^2} - y}{x - \sqrt{x^2 - y^2}}$
- (1) y^2/x^2 (2) y/x (3) $x^2 - y^2$ (4) $x + y$

- 14.** What is the value of: $\frac{8a^2b^{-2}c}{5a^{-1}bc^3} \div \frac{6a^2b^{-4}c^{-3}}{15a^{-2}b^{-3}c}$?
- (1) $4a^{-1}b^{-2}c^2$ (2) $4ab^{-7}c^2$ (3) $8a^{-1}b^{-2}c^2$ (4) $2a^{-1}b^{-2}c^2$

- 15.** What is the value of: $\left(\sqrt[3]{\sqrt[3]{4^2}}\right)^{12} \times \left(\sqrt[5]{\sqrt[3]{4^{10}}}\right)^{12}$
- (1) 4^8 (2) 4^9 (3) 4^5 (4) 4^6

PRACTICE TEST 2

- 16.** What is the value of $(\sqrt{17} + 4) \div (\sqrt{17} - 4)$?
- (1) $32 + 8\sqrt{17}$ (2) $33 + 8\sqrt{17}$ (3) $35 + 8\sqrt{17}$ (4) $33 + 8\sqrt{17}$

- 17.** What is the value of $(\sqrt{9} \times \sqrt{2916})/2$?
- (1) 81 (2) 102 (3) 54 (4) 162

- 18.** What is the value of the sixth power of $(\sqrt{2} \times \sqrt[3]{5} \times \sqrt{7})$?
- (1) 48600 (2) 68600 (3) 51200 (4) 72400

- 19.** What is the positive square root of $(5 + \sqrt{24})$?
- (1) $\sqrt{3} + 2\sqrt{2}$ (2) $\sqrt{5} + 2\sqrt{2}$ (3) $\sqrt{3} + \sqrt{5}$ (4) $\sqrt{2} + \sqrt{3}$

- 20.** What is the value of P and Q respectively if: $\frac{\sqrt{11} - 1}{\sqrt{11} + 1} + \frac{\sqrt{11} + 1}{\sqrt{11} - 1} = P + Q\sqrt{11}$
- (1) 20, 0 (2) 0, 2.4 (3) 2, 0 (4) 2.4, 0

- 21.** If $2^n = 4^3 \times 512 \div 2^5 \times 16^2$; what is the value of n ?
- (1) 12 (2) 18 (3) 10 (4) 16

- 22.** What is the value of: $\frac{1}{\sqrt{11} - \sqrt{10}} - \frac{1}{\sqrt{10} - \sqrt{9}} + \frac{1}{\sqrt{9} - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}}$?
- (1) $\sqrt{17}$ (2) $\sqrt{11} - \sqrt{6}$ (3) 4 (4) $\sqrt{11} + \sqrt{6}$

- 23.** If $2^a = 3$; $3^b = 5$; $5^c = 4$ and $4^d = 16$, what is the value of $abcd$?
- (1) 1 (2) 4 (3) 9 (4) 16

- 24.** What is the value of $\left(\frac{2^a}{2^b}\right)^{a+b-c} \cdot \left(\frac{2^b}{2^c}\right)^{b+c-a} \cdot \left(\frac{2^c}{2^a}\right)^{c+a-b}$?
- (1) 0 (2) 1 (3) 2 (4) -1

- 25.** What is the value of $374 - \sqrt{8 + 23\sqrt{19 + 6\sqrt{1 + \sqrt{576}}}}$?

(1) 19

(2) 27

(3) 21

(4) 29

26. How are a and b related if $a = (\sqrt{15} - \sqrt{13})$ and $b = (\sqrt{9} - \sqrt{7})$?(1) $a > b$ (2) $b > a$ (3) $a = b$

(4) The relation cannot be established.

$$27. \sqrt{0.25} \times \sqrt{?} \div \sqrt{\frac{25}{16}} + \sqrt{0.0169} = 0.25$$

(1) 0.3

(2) 0.09

(3) 0.25

(4) 0.16

$$28. \frac{1}{(1024)^{-3/5}} - \frac{1}{(343)^{-2/3}} + \frac{1}{(324)^{-1/2}} = ?$$

(1) 95

(2) 113

(3) 33

(4) 131

$$29. ? = \frac{\sqrt{p^2 q^6 r^8} \times \sqrt[3]{p^3 q^2 r^6}}{(pqr)^2 \times \sqrt{p^5 q^4 r^7}}$$

(1) $p^{-\frac{5}{2}} q^{\frac{1}{3}} r^{\frac{1}{2}}$ (2) $(p^{-5} r)^{-\frac{1}{2}} q^{-\frac{1}{3}}$ (3) $p^{-\frac{5}{2}} r^{\frac{1}{3}} q^{\frac{1}{2}}$ (4) $(p^{-5} r)^{\frac{1}{2}} q^{-\frac{1}{3}}$

$$30. ? = \frac{3^{7a} \times 9^{2a+1} \times 243^{3a-5}}{3^{a-1} \times 81^{3a-4} \times 27^{4a}}$$

(1) 3^{a-2} (2) 3^{2a-4} (3) 3^{4a-5} (4) 3^{a-6} **LINEAR EQUATIONS****PRACTICE TEST 1**

1. Manisha has to return money to Akash and Arjun in the ratio 5 : 3 and simultaneously receive Rs. 300 from Pihu. If she has Rs. 180 left after the transaction, what amount does she have to return to Arjun? Consider that she starts with no amount before the transaction.

(1) Rs. 45

(2) Rs. 75

(3) Rs. 60

(4) Rs. 30

2. Four apples, seven bananas and an orange cost Rs. 210. One apple, two bananas and two oranges cost Rs. 110. What is the cost of seven apples and twelve bananas?

(1) Rs. 290

(2) Rs. 310

(3) Rs. 350

(4) Cannot be found

3. Jayesh asked Mahesh - "What is your age?" Mahesh replied - "Take my age 4 years hence, multiply it by 4 and subtract four times my age four years ago to get my age." If Jayesh is two years older than Mahesh, what is the age of Jayesh?

(1) 34 years

(2) 32 years

(3) 36 years

(4) 30 years

4. How many solutions do $5x + 3y = 14$ and $15x + 9y = 42$ have?

(1) None

(2) Unique

(3) Infinite

(4) None of the above

5. 300 added to a number gives the same result as 100 removed from twice the number. What is the value of thrice the number?

(1) 1200

(2) 1050

(3) 900

(4) 750

6. How many two digit numbers are 72 less than the number obtained by reversing the digits of the original number?

(1) 1

(2) 5

(3) 3

(4) 2

7. The ratio of ages of A and B is 11 : 8 and the sum of their ages is 38 years. What is the ratio of the ages of A and B, eight years from now?

(4) 7 : 5

- (1) 4 : 3 (2) 6 : 5 (3) 5 : 4
8. The sum of three-fourth of a number and three-fifth of that number is two less than seven-tenth of twice that number. What is the number?
 (1) 20 (2) 40 (3) 80 (4) 60
9. A player plays two overs in a cricket match and hits each ball in these overs for 4 runs or 6 runs. He hits two more 4s than 6s. How many runs does he score if an over comprises eight balls each?
 (1) 90 (2) 78 (3) 66 (4) 58
10. Mohan spends half his money to buy a house, half of the remaining amount to buy a car and 20% of the remaining amount to buy a motorcycle. If he is left with Rs. 2 lakhs, what amount (in Rs.) did he start with?
 (1) 7.5 lakhs (2) 12.5 lakhs (3) 10 lakhs (4) 5 lakhs
11. A concert's tickets cost Rs. 16 for adults and Rs. 8 for students. A total of 14 tickets worth Rs. 160 were sold. How many student and adult tickets were sold respectively?
 (1) 6 and 8 (2) 7 and 7 (3) 8 and 6 (4) 10 and 6
12. P gave one-fourth of his toys to Q and one-sixth of his toys to R. R gave 2 toys to S and now has 4 toys left. How many toys did P give to Q?
 (1) 12 (2) 36 (3) 5 (4) 9
13. Three people - A, B and C - have won different lottery amounts. A has won Rs. 9 million. B has won as much as A and C combined. C has won an amount equal to the sum of A's winning and half of B's winning. What amount (in Rs. millions) have all three people won together?
 (1) 48 (2) 54 (3) 63 (4) 72
14. Tarun has 32 coins in all, amounting to Rs. 2,750, in denominations of hundred and fifty. How many hundred rupee coins does he have?
 (1) 23 (2) 9 (3) 24 (4) 8
15. The age of Shlok is 5 years more than thrice Sharvari's age. Seven years hence, Shlok's age will be 10 years more than double Sharvari's age. What is the age of Shlok?
 (1) 43 years (2) 31 years (3) 41 years (4) 37 years

PRACTICE TEST 2

16. Arjun's age, six years from now, will be three-seventh of his father's age then. Ten years ago, the ratio of their ages was 1 : 5. What is Arjun's father's age at present?
 (1) 40 years (2) 45 years (3) 55 years (4) 50 years
17. If 1 is added to the numerator of a certain fraction, its value becomes $7/19$ and if 1 is added to the denominator of the original fraction, its value becomes $1/3$. What is the original fraction?
 (1) $20/57$ (2) $13/40$ (3) $17/48$ (4) $13/38$
18. In a test, the marking scheme for every correct and incorrect answer is (+3) and (-1) respectively. No marks are lost or gained for unattempted questions. Priya attempted 70 out of 100 questions and scored 170 marks. How many questions did she answer correctly?
 (1) 60 (2) 50 (3) 55 (4) 65

19. Eight years from now, Abdul will be twice as old as he was six years ago. How old is he now (in years)?
(1) 14 (2) 8 (3) 12 (4) 20
20. A and B are two natural numbers such that A is not more than 20 while B is not less than 14. Which of these cannot be a value of $(A \times B)$?
(1) 256 (2) 95 (3) 44 (4) None of these
21. Alia's age ten years from now will be twice Kriti's present age. Six years ago, Kriti's age was 60% of Alia's at that time. What is the respective current age of Alia and Kriti?
(1) 36, 18 (2) 26, 18 (3) 36, 12 (4) 48, 36
22. What value of (a, b) satisfies $10a + 11b = 117$ and $11a + 10b = 114$?
(1) (5, 6) (2) (4, 7) (3) (3, 10) (4) Cannot be determined
23. A man earns Rs. 800 more than his wife per month. One-fourth of the man's monthly salary and one-eighth of the wife's monthly salary together amount to Rs. 500, which is saved every month. What is their total monthly expenditure?
(1) Rs. 1,600 (2) Rs. 1,700 (3) Rs. 1,800 (4) Rs. 1,900
24. How many solutions do $6x + 5y = 33$ and $30x + 25y = 42$ have?
(1) None (2) Unique (3) Infinite (4) None of the above
25. A has as many cards less than B as he has more than C. B and C together have 50 cards. How many more cards does B have compared to A?
(1) 2 (2) 3 (3) 4 (4) Cannot be determined
26. Amit bought three qualities of sweets from Sweet Bengal. He bought $(4p)$ kg of type A at Rs. $(4n)$ per kg; then bought $(p + 3)$ kg of type B at Rs. $(n - 3)$ per kg and finally bought $(p - 3)$ kg of type C at Rs. $(n + 3)$ per kg. What was his total expenditure (in kg)?
(1) $18(pn + 2)$ (2) $9(pn + 1)$ (3) $18(pn - 1)$ (4) $9(2pn - 1)$
27. Jesnic collects all his savings amounting to Rs. 1.05 lakhs to buy a plot; but realises that he is still short of the exact amount required by 30%. He borrows Rs. 60,000 from Rosemary. What is his financial status now?
(1) He has Rs. 15,000 extra. (2) He has the exact amount required to buy the plot.
(3) He is still short by Rs. 5,000. (4) He is still short by Rs. 15,000.
28. The ratio of ages of a father and son are $33 : 19$. How old will the father be (in the future) when his age is 50% more than that of his son?
(1) 42 (2) 54 (3) 50 (4) 48
29. 5 candies, 3 packets of chips and 2 pastries cost Rs. 140. The difference between the costs of 1 packet of chips and 1 pastry is Rs. 10 and the difference between the costs of 1 packet of chips and 1 candy is Rs. 28. How much will Anil need to pay if he has to buy 10 candies, 2 packets of chips and 5 pastries? Assume that the chips are the costliest on an individual basis.
(1) Rs. 160 (2) Rs. 200 (3) Rs. 150 (4) Rs. 180
30. In an exam, 1 mark is awarded for every correct answer and one-fourth mark is deducted for each incorrect answer. The exam has two sections and a student gets 75% accuracy across each section. What is the least number of questions that he should attempt in all to clear the test, if the sectional cut-offs for the sections are 22 and 11 marks respectively?

(1) 16

(2) 32

(3) 64

(4) 48

PRACTICE TEST 3

- 31.** The current ages of Karan and Arjun are in the ratio $6 : 5$. Five years from now, the same ratio will become $13 : 11$. What is Arjun's current age?
- (1) 40 years (2) 50 years (3) 35 years (4) 45 years
- 32.** What is the value of p if $(6/p) + (21/q) = 4$ and $(3/q) - (8/p) = 5$?
- (1) -2 (2) 1 (3) 2 (4) -3
- 33.** If $3(a - 2) + 10(12 - 2a) - 7(6a - 17) + 62 = 0$; what is the value of a ?
- (1) 6 (2) -2 (3) 5 (4) -3
- 34.** If $A = (8B/5)$ and $C = 5(A - 10)$, what is the value of $B + C$?
- (1) 59 (2) 63 (3) 65 (4) Cannot be determined
- 35.** The units digit of a certain two-digit number is three more than the tens digit. What is the difference between the original number and the number obtained by reversing it?
- (1) 18 (2) 9 (3) 36 (4) 27
- 36.** Ketaki's age is 43 years and Seema's age is 25 years. How many years ago was Ketaki's age twice Seema's age?
- (1) 4 years (2) 7 years (3) 8 years (4) 3 years
- 37.** The investments of a son, mother, father and grandfather are in the ratio of $3 : 9 : 10 : 18$. If the average investments of the son and father are Rs. 26,000, what is the difference between the investments (in Rs.) of the mother and grandfather?
- (1) 32000 (2) 34000 (3) 40000 (4) 36000
- 38.** If 7 years are subtracted from the present age of Madhav and the resultant is divided by 16, then the present age of his granddaughter is obtained. If the granddaughter is 3 years younger to Raghav, whose age is 7 years, what is Madhav's present age?
- (1) 68 years (2) 75 years (3) 65 years (4) 71 years
- 39.** The ages of Suresh, Ravi and Tushar are in the ratio of $8 : 10 : 11$ and the sum of their ages four years from now will be 99 years. What was the sum of ages of Suresh and Tushar three years ago?
- (1) 54 years (2) 57 years (3) 51 years (4) 48 years
- 40.** P purchases 3 apples, 7 mangoes and 1 orange for Rs. 120. Q buys 4 apples, 5 mangoes and an orange for Rs. 164.5 from the same shop. If C picks 1 apple, 11 mangoes and an orange from the same shop, then how much does he have to pay?
- (1) Rs. 29 (2) Rs. 31 (3) Rs. 35 (4) Rs. 40
- 41.** How many whole number solutions does $(2x + 3y = 30)$ have?
- (1) 5 (2) 3 (3) 4 (4) 6
- 42.** The sum of the present ages of Saurabh and Shashi is seven times the difference of their ages. Total age will be nine times the difference of their ages. What is the present age of the elder of the two? Five years hence, their
- (1) 24 years (2) 15 years (3) 20 years (4) Cannot be determined

43. Rohit and Sid are 50 years and 40 years old respectively. How many years ago was the ratio of their ages 7 : 5?
- (1) 18 (2) 12 (3) 22 (4) 15
44. Ram and Shyam have notes only in denominations of 2 and 5, such that Shyam has double the Rs. 2 notes that Ram has. The ratio of Rs. 2 notes and Rs. 5 notes with Ram is 4 : 11. The ratio of Rs. 5 notes to Rs. 2 notes with Shyam is 7 : 2. Together, they have Rs. 657. What is the total amount with them in the form of Rs. 2 notes?
- (1) 72 (2) 172 (3) 182 (4) 96
45. On a certain day, an automobile service centre gets two-wheeler bikes, three-wheeler autos and four-wheeler cars for service. As such, there are 25 drivers and 79 wheels in the service centre that day. A vehicle has two more gears than wheels and there are 129 gears in all in the service centre that day. How many more cars are present as compared to bikes?
- (1) 5 (2) 3 (3) 4 (4) 6
- PRACTICE TEST 4**
46. If $(x + y) = -7$ and $(3x - 5y) = 19$, what is the value of (x, y) ?
- (1) (3, -10) (2) (-2, -5) (3) (0, -7) (4) (-6, -13)
47. Rohan has five green balls for every three red balls that he has and he has thrice as many blue balls as green balls. How many yellow balls does he have if he has hundred balls in all?
- (1) 16 (2) 14 (3) 8 (4) 6
48. X has thrice as many keys as Y and two-fifth the number of keys that Z has. The average number of keys with them is 46. What is the difference between the number of keys with Y and Z?
- (1) 81 (2) 78 (3) 75 (4) 72
49. Two shirts and three trousers together cost Rs. 4,500. Paresh bought five shirts and four trousers while Rohit bought three shirts and eight trousers. What was the total amount paid by both of them together?
- (1) Rs. 10,500 (2) Rs. 18,000 (3) Rs. 15,500 (4) Data insufficient
50. What value of P and Q would ensure that the given system of equations do not have a unique solution?
Equations: $4x + Py = 14$ and $6x + 4.5y = Q$
- (1) 3, 21 (2) 4, 42 (3) 6, 30 (4) 6, 56
51. Sapna's age is five times more than her daughter's age. Six years from now, her age will be four times her daughter's age. What was daughter's age (in years) three years ago?
- (1) 9 (2) 24 (3) 6 (4) 18
52. If $\frac{7}{1 + \frac{1}{1 + \frac{x}{1-x}}} = 4$, what is the value of x?
- (1) $1/4$ (2) $7/2$ (3) $1/8$ (4) $1/16$
53. A three digit number is equal to 17 times the sum of its digits. If 198 is added to the number, the digits get reversed; also the sum of the extreme digits of the original number is less than the middle digit by unity. What is the sum of digits of the original number?
- (1) 9 (2) 8 (3) 11 (4) 10

- 54.** Suraj has a total of 100 bags with either 2 mangoes or 5 mangoes in a bag. The total mangoes in the bags with fewer mangoes per bag are 40% less than the total mangoes in the bags with more mangoes per bag. How many bags have 2 mangoes per bag?
- (1) 50 (2) 55 (3) 60 (4) 65
- 55.** When a two digit number is divided by the sum of its digits, the quotient is 4. If the digits are reversed, the new number is 6 less than twice the original. What is the original number?
- (1) 24 (2) 42 (3) 16 (4) None of these
- 56.** A, B and C had some toffees each. A and B together had 19 toffees. Even after giving three toffees to C, A had two more toffees than him. Now, B gave two of his toffees to C and was also left with two more toffees than him. How many toffees does C finally have?
- (1) 8 (2) 6 (3) 5 (4) Cannot be found
- 57.** Students were standing in rows for exercise, with equal number of students per row. If 5 students less were to stand per row, 6 more rows would be required. If 5 students more were to stand per row, the number of rows required would reduce by 2. What was the total number of students?
- (1) 40 (2) 50 (3) 70 (4) None of these
- 58.** One-half of Harish's age two years from now plus one-third of his age three years ago is twenty years. How old is he now?
- (1) 30 (2) 24 (3) 21 (4) 27
- 59.** In 8 hours, a person covered 60% of a journey by train and the rest by road. He can cover the same journey in 12 hours if he covers 30% of the journey by train and the rest by road. The speed for the train journey and road journey remains constant in both cases. What is the speed of the train journey to that of the road journey?
- (1) 1 : 6 (2) 6 : 1 (3) 3 : 1 (4) Cannot be determined
- 60.** A two digit number is reversed. The sum of the original number and its reverse is one more than twice the difference of the original number and its reverse. What is the reversed number?
- (1) 15 (2) 27 (3) 39 (4) 14
-
- ### QUADRATIC EQUATIONS
-
- #### PRACTICE TEST 1
- An equation has two roots such that one is greater than the other by 3. If their product is 40, what is the magnitude of their sum?
- (1) 10 (2) 13 (3) 16 (4) 18
- What is the smallest integral value of p for which the equation $x^2 - 9x + p$ has imaginary roots?
- (1) 21 (2) 18 (3) 5 (4) 12
- If one of the roots of the equation $x^2 + 2x + a = 0$ is 3, what is the value of a ?
- (1) -15 (2) 15 (3) 25 (4) -25
- What is the quotient when $(12a^2 - 12ab - 9b^2)$ is divided by $(6a + 3b)$?
- (1) $(2b - 3a)$ (2) $(2a + 3b)$ (3) $(2b + 3a)$ (4) $(2a - 3b)$

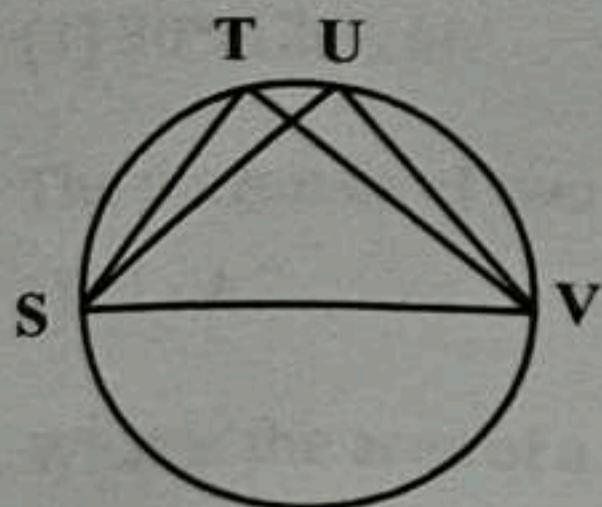
5. A person puts certain marbles in each row, such that the number of rows is equal to the number of marbles per row. If he has 328 marbles, but is unable to put 4 marbles in the arrangement given above, how many rows does he put the marbles in?
 (1) 18 (2) 20 (3) 15 (4) 24
6. What are the roots of the equation $(x - 6)(x - 5) = (x - 5)(8 - x)$?
 (1) 5, 7 (2) 5, 6 (3) 6, 8 (4) 5, 8
7. If α and β are the roots of the equation $x^2 - 7x + 8 = 0$, what is the value of $\alpha^2 + \beta^2$?
 (1) 32 (2) 33 (3) 34 (4) 35
8. The equation $4x^2 - 12x + c = 0$ has equal roots. What is the value of c ?
 (1) 12 (2) 36 (3) 3 (4) 9
9. If 2 and -5 are the roots of an equation $ax^2 + bx + c = 0$, what are the roots of the equation $cx^2 + bx + a = 0$?
 (1) -2 and 5 (2) 0.2 and 0.5 (3) 0.5 and -0.2 (4) None of the above
10. If the equation $x^2 + ax + 9 = 0$ has real and unequal roots, what is the value of a , if $a > 0$?
 (1) 5 (2) 7 (3) 4 (4) 6
11. If $p = -17$ and $q = 22$, what is the value of $4p^2 - 20pq + 25q^2$?
 (1) 8946 (2) 12286 (3) 20736 (4) 5776
12. The roots of $x^2 - 2x + r = 0$ are p and q such that $2q + p = 8$. What is the value of r ?
 (1) -24 (2) 21 (3) -18 (4) 24
13. What is the nature of roots of $x^2 + 4x + 20 = 0$?
 (1) Imaginary (2) Real and Equal (3) Rational and Unequal (4) Irrational and Unequal
14. If $ax^2 + 4x + 2 = 0$ has real roots, what is the maximum value of a ?
 (1) 4 (2) 2 (3) 3 (4) -2
15. If $3x^3 = 1323x$, what is the minimum value of x^4 ?
 (1) 484 (2) 361 (3) 400 (4) None of these
- PRACTICE TEST 2**
16. Five times a natural number when added to sixteen times the reciprocal of the number is equal to 24. What is the number?
 (1) 6 (2) 2 (3) 4 (4) 8
17. What is the relation between x and y if $x^2 - 18x - 115 = 0$ and $y^4 - 39y^2 = -224$?
 (1) $x > y$ (2) $x = y$ (3) $x < y$ (4) The relation cannot be established
18. Which of these expressions is equivalent to $(x^4 - 11x^2 + 10)$?
 (1) $(x - 1)(x + 1)(x^2 + 10)$ (2) $(x - 1)(x - 1)(x^2 - 10)$
 (3) $(x - 1)(x + 1)(x^2 - 10)$ (4) $(x + 1)(x + 1)(x^2 - 10)$
19. The roots of an equation $px^2 + qx + r = 0$ are twice the roots of $x^2 - 46x + 528 = 0$. What is the value of $(p + q + r)$?
 (1) 1889 (2) 2111 (3) 2001 (4) 1992

- 20.** What are the roots of the equation $x^4 - 34x^2 + 225 = 0$?
 (1) 3, -5, 3, -4 (2) 3, 5, 3, 7 (3) 5, -2, 3, -1 (4) None of the above
- 21.** What is the ratio when the product of roots of the equation $5x^2 - 156x + 24 = 0$ is divided by the sum of the roots of the same equation?
 (1) 2 : 15 (2) 2 : 13 (3) 1 : 26 (4) 1 : 12
- 22.** The roots of an equation $3x^2 - 20x + 33 = 0$ are x and y . What is the product of roots of the equation whose roots are $(1+x)$ and $(1+y)$?
 (1) $45/3$ (2) $54/3$ (3) $46/3$ (4) $56/3$
- 23.** The roots of the equation $20x^2 - 41x + m = 0$ are reciprocal of each other. What is the value of m ?
 (1) -20 (2) 41 (3) 20 (4) $1/20$
- 24.** The equations $x^2 + x - 12 = 0$ and $x^2 + 4x - 21 = 0$ have one root in common. What is the product of their distinct roots?
 (1) -84 (2) 28 (3) 56 (4) None of these
- 25.** For what value of m does the quadratic equation $x^2 - (3m + 4)x + (8m + 9) = 0$ have equal roots?
 (1) -10 (2) -2 (3) $10/9$ (4) $-10/9$
- 26.** If $4(x^2 + 1/x^2) - 7(x + 1/x) + 11 = 0$, what are the possible values of $(x + 1/x)$?
 (1) 2 or $3/5$ (2) $1/3$ or $2/5$ (3) $1/3$ or $2/5$ (4) 1 or $3/4$
- 27.** The roots of an equation $x^2 + 2kx - 5r = 0$ are two consecutive odd integers. What is the value of $(5r + k^2)$?
 (1) 0 (2) 1 (3) -5 (4) -2
- 28.** Which of these equations does not have both prime numbered roots?
 (1) $x^2 - 40x + 391 = 0$ (2) $x^2 - 72x + 1247 = 0$
 (3) $x^2 - 34x - 403 = 0$ (4) $x^2 - 236x + 13843 = 0$
- 29.** Two divisions of a school are contributing funds for a cancer charity. The first class has x students, with each student contributing twice as much amount as the number of students in the class. The second class has 20 more students with each student contributing Rs. 10 less per head than the first class. If both classes contribute Rs. 16,000 in all, how many students do both classes have in all?
 (1) 180 (2) 120 (3) 150 (4) 140
- 30.** A group of volunteers contribute Rs. 24,000 in all to a cause with equal contributions per head. This individual contribution goes up by Rs. 200 if 20 volunteers decline to contribute. What is the individual contribution (in Rs.) in the second case?
 (1) 1000 (2) 400 (3) 800 (4) 600

GEOMETRY**PRACTICE TEST 1**

- 1.** Two triangles are such that their corresponding angles are equal and their corresponding sides are in proportion. Their sides are in the ratio 4 : 5 and the perimeter of the smaller triangle is 36 cm, what is the perimeter of the other triangle?
 (1) 40 cm (2) 50 cm (3) 55 cm (4) 45 cm

2. In the given figure, STV and SUV are two triangles inscribed in the same circle. If $\angle SUV = 75^\circ$, what is the value of $\angle STV$?



- (1) 45° (2) 105° (3) 75° (4) 90°

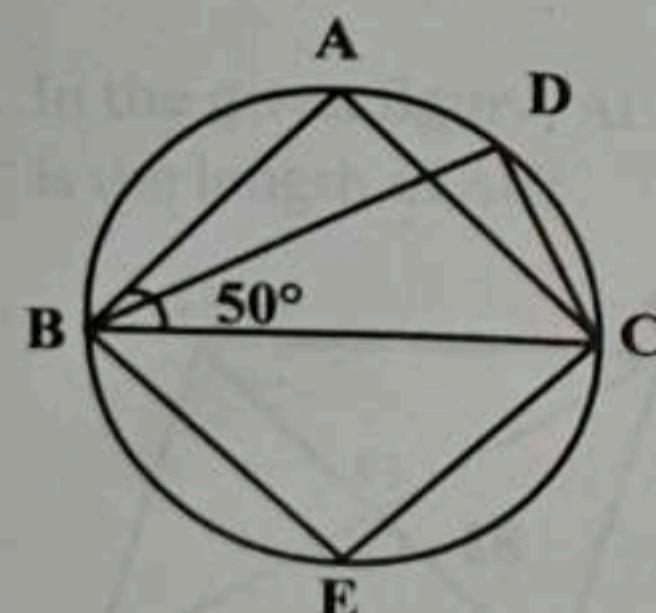
3. What is the radius of a garden that is 140π m long?

- (1) 42 cm (2) 140 cm (3) 70 cm (4) 84 cm

4. ABCD is a parallelogram, within which ABC is an equilateral triangle. What is the value of $\angle BCD$?

- (1) 60° (2) 120° (3) 90° (4) 30°

5. In the figure below, $\triangle ABC$ is an isosceles triangle with $AB = AC$ and $\angle ABC = 50^\circ$. What is the value of $\angle BDC$?



- (1) 80° (2) 75° (3) 90° (4) 100°

6. Two triangles have their bases in the ratio 3 : 5 and heights in the ratio 3 : 1. What is the ratio of their areas?

- (1) 1 : 5 (2) 9 : 25 (3) 5 : 1 (4) 9 : 5

7. Two opposite sides of a parallelogram measure $(4x + 3)$ cm and $(7x - 6)$ cm respectively. What is the perimeter of a square with sides equal to $(x + 5)$ cm?

- (1) 28 cm (2) 20 cm (3) 32 cm (4) 16 cm

8. A quadrilateral is inscribed in a circle such that three of its angles are 44° , 78° and 138° . What is the fourth angle?

- (1) 94° (2) 86° (3) 100° (4) 104°

9. $\angle A$ is 35° more than the measure of its supplementary angle. What is the measure of $\angle A$?

- (1) 100° (2) 105.5° (3) 110.5° (4) 107.5°

10. L₁, L₂ and L₃ are three parallel lines. Line T₁ intersects L₁, L₂ and L₃ at A, B and C respectively, and line T₂ intersects L₁, L₂ and L₃ at E, F and G respectively. If AB = 6, BC = 8 and EG = 28, what is the value of FG?

- (1) 12 (2) 16 (3) 14 (4) 10

11. In a right triangle ABC, AB = 12 cm, AC = 9 cm and BC is the largest side. If AD bisects BC, what is the length of AD?

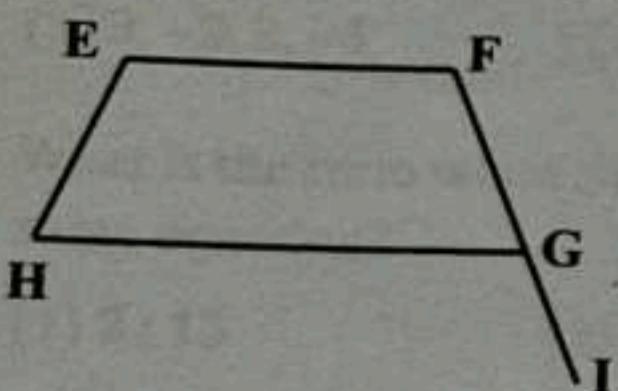
- (1) 7.5 cm (2) 7 cm (3) 6.5 cm (4) 8 cm

12. What is the measure of each exterior angle (in $^\circ$) of a regular polygon with 45 sides?

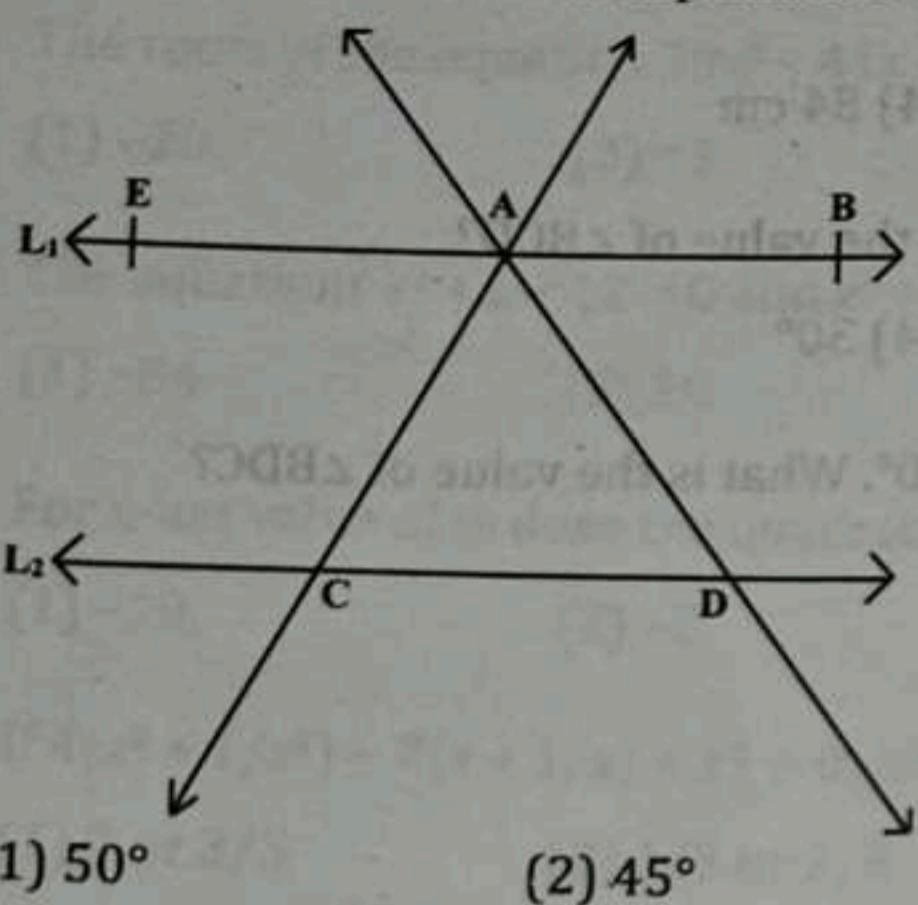
- (1) 6 (2) 8 (3) 9 (4) 10

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13. EFGH is a trapezoid. If $\angle EFG = 108^\circ$, what is the value of $\angle HGI$?

(1) 120° (2) 135° (3) 108° (4) 72°

14. In the given figure, lines L_1 and L_2 are parallel and line segments AC and AD are perpendicular to each other. Lines AB , AC , and AD intersect at point A such that $m \angle ACD = 35^\circ$. What is the value of $m \angle BAD$?

(1) 50° (2) 45° (3) 35° (4) 55°

15. If the radius of a wheel is 49 cm, what is the distance travelled by it in 80 revolutions?

(1) 292 m

(2) 264.8 m

(3) 276 m

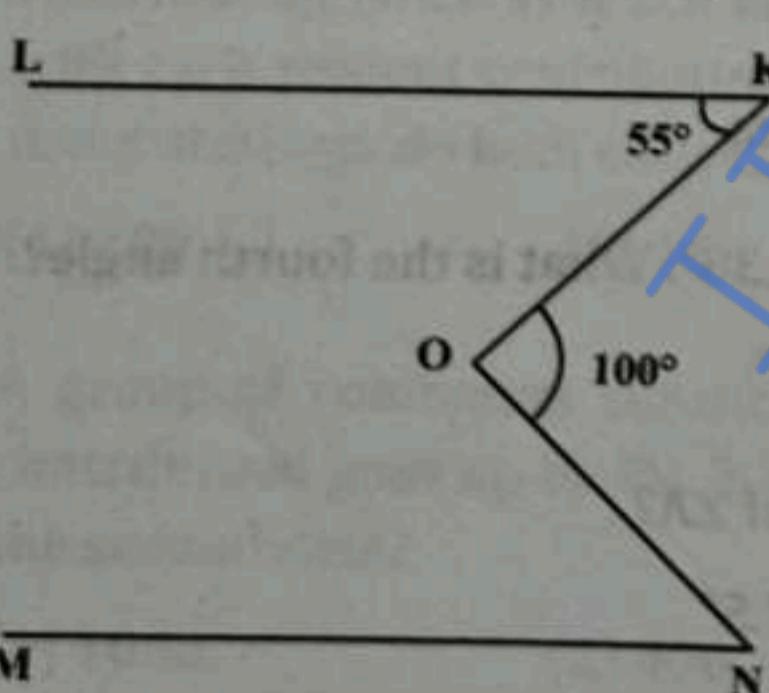
(4) 246.4 m

PRACTICE TEST 2

16. If the interior angles of a triangle are in the ratio $3 : 4 : 5$, what is the measure of the greatest exterior angle?

(1) 160° (2) 135° (3) 140° (4) 120°

17. In the given figure, MN and LK are along parallel lines. $m\angle LKO = 55^\circ$ and $m\angle KON = 100^\circ$. What is $m\angle MNO$?

(1) 55° (2) 35° (3) 45° (4) 40°

18. Two chord AB and CD intersect inside a circle at point P . $AP = 6$, $BP = 10$ and $CP = 12$. What is the length of DP ?

(1) 5

(2) 8

(3) 4

(4) 9

19. If the length of a chord of a circle, which makes an angle of 45° with the tangent drawn at any end point of the chord is 6 cm, what is the radius of the circle?

(1) $6\sqrt{2}$ cm

(2) 3 cm

(3) $3\sqrt{2}$ cm

(4) 4 cm

20. Three angles X, Y and Z are such that their sum is 210° . Y measures twice as much as Z. If Y and Z are supplementary angles, what are the measures of X, Y and Z respectively?

- (1) $30^\circ, 120^\circ, 60^\circ$ (2) $120^\circ, 60^\circ, 30^\circ$ (3) $45^\circ, 110^\circ, 55^\circ$ (4) $90^\circ, 80^\circ, 40^\circ$

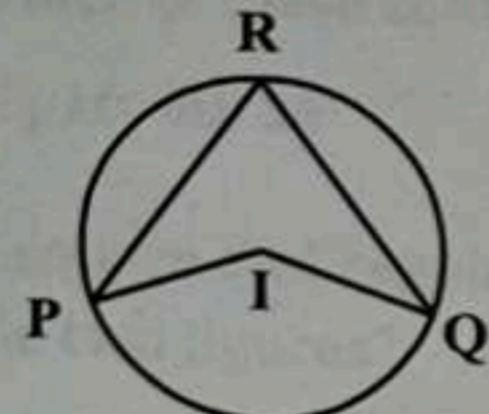
21. The diagonals of two squares are in the ratio $1 : 4$. What is the ratio of their respective areas?

- (1) $1 : 4$ (2) $1 : 8$ (3) $1 : 16$ (4) $1 : 32$

22. What is the area of a sector (in sq.cm) formed by an arc of length 6 cm in a circle of radius 14 cm?

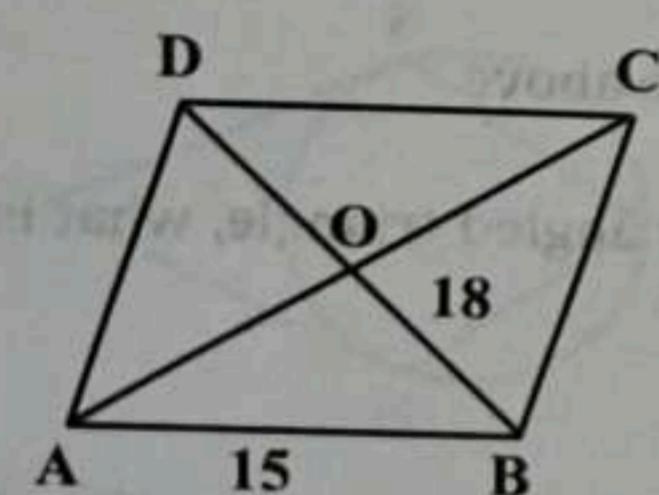
- (1) 42 (2) 24 (3) 36 (4) 48

23. In the figure given below, I is the centre of the circle and $\angle PRQ = 40^\circ$. What is the value of $\angle PIQ$?



- (1) 60° (2) 20° (3) 80° (4) 40°

24. In the given figure, ABCD is a rhombus whose diagonals intersect each other at O. If AB = 15 cm and BD = 18 cm, what is the length of AC?

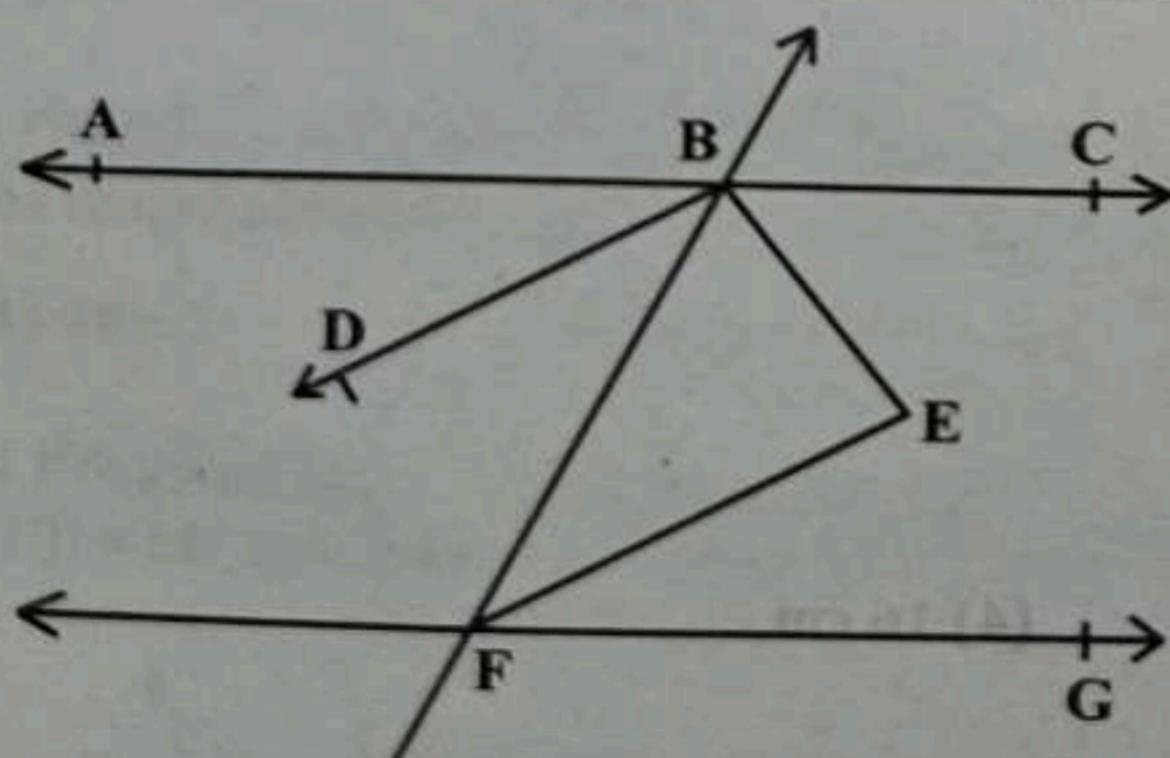


- (1) 20 cm (2) 32 cm (3) 24 cm (4) 30 cm

25. From a point P, a tangent is drawn to a circle with centre O and radius 8 cm. The tangent meets the circle at point M such that PM is 15 cm. How far is P from the centre of the circle?

- (1) 17 cm (2) 20 cm (3) 12 cm (4) 23 cm

26. As shown in the figure, line AC and line FG are parallel to each other and $m \angle ABF = 75^\circ$. If ray BD and segment EF are along parallel lines and $m \angle DBF = 40^\circ$, then find $m \angle EFG$.

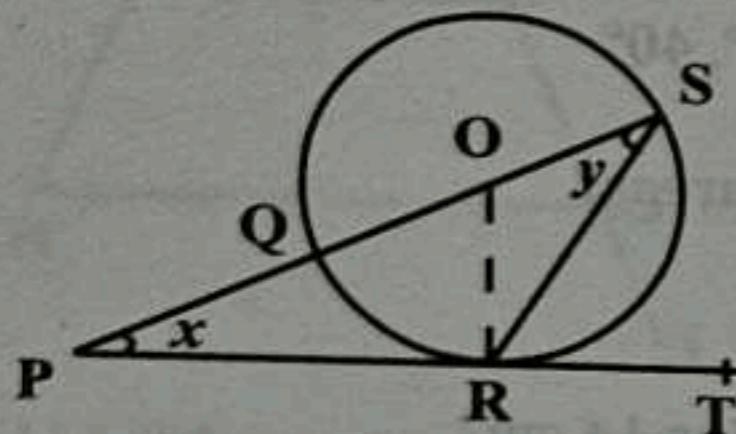


- (1) 55° (2) 35° (3) 45° (4) 40°

27. What is the circumradius of a triangle whose sides are 5, 12 and 13?

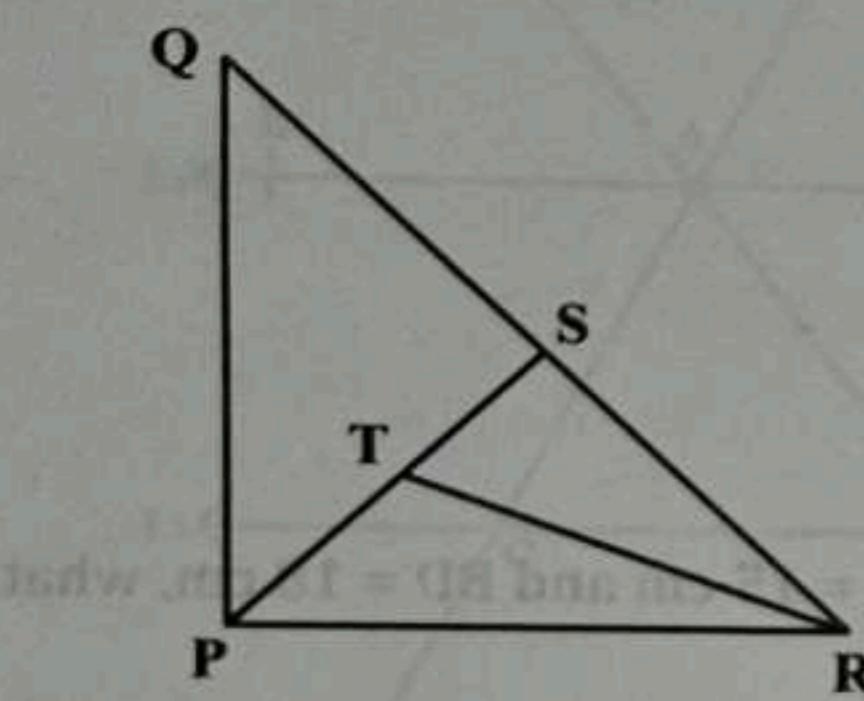
- (1) 6.5 (2) 8 (3) 9.5 (4) 11

28. In the figure below, PT is tangential to the circle with centre O at R. If the diameter SQ is extended, it meets PT at point P. If $\angle SPR = x^\circ$ and $\angle QSR = y^\circ$, what is the value of $(x + 2y)$?



- (1) 60° (2) 120° (3) 75° (4) 90°

29. In the figure below, $PQ : QR : PR = 4 : 5 : 3$. PS and RT are medians on QR and PS respectively. What is the value of $TS : PQ$?



- (1) $1 : 4$ (2) $2 : 5$ (3) $3 : 8$ (4) None of the above

30. If $(x - 2)$, $(x + 5)$ and $(2x - 1)$ are the base, height and hypotenuse respectively of a right angled triangle, what is the value of x ? $x > 0$

- (1) 5 (2) 7 (3) 12 (4) 4

PRACTICE TEST 3

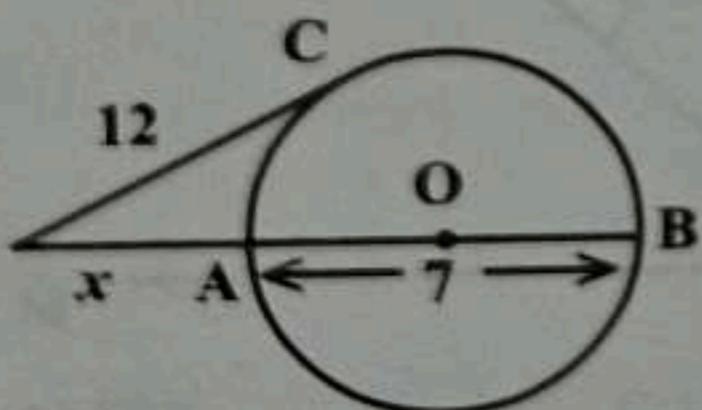
31. The angles of a triangle are in A.P. If one of the angles is 65° , what is the value of the smallest angle?

- (1) 30° (2) 35° (3) 45° (4) 55°

32. The circumference of a semicircle is (numerically) four times the area of the semicircle. What is the circumference of the circle (in units)?

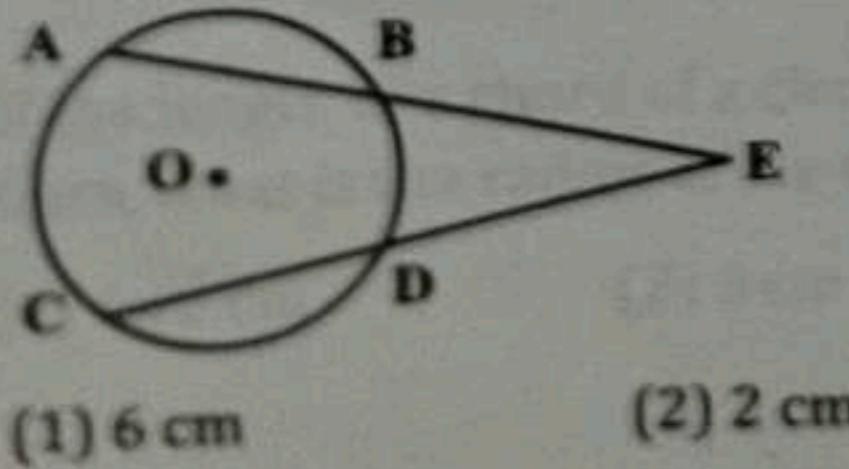
- (1) $\pi + 4$ (2) $\pi + 2$ (3) $2\pi + 4$ (4) 2π

33. What is the value of x in the figure below?



- (1) 7 cm (2) 9 cm (3) 8 cm (4) 16 cm

34. In the figure below, $AE = 6$ cm and $DE = 2EB$. What is the length of EC?



- (1) 6 cm (2) 2 cm (3) 4 cm (4) 3 cm

35. Diagonals AC and BD of a rhombus intersect each other at O. AC and BD measure 8 cm and 6 cm respectively. What is the perimeter of the rhombus?

(1) 20 cm (2) 16 cm (3) 24 cm (4) 18 cm

36. The perimeter of a circular field and a square field is the same. If the side of the square field is 22 m, what is the area of the circular field?

(1) 616 m^2 (2) 464 m^2 (3) 528 m^2 (4) 382 m^2

37. What is the perimeter of a regular polygon that has each interior angle as 150° and side as 2 units?

(1) 20 (2) 22 (3) 18 (4) 24

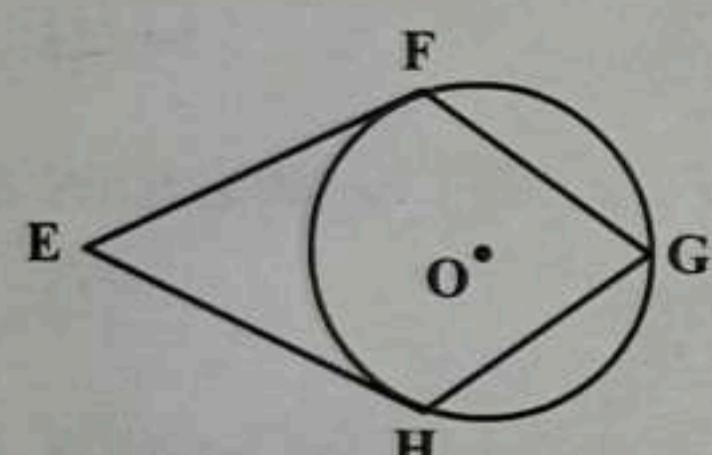
38. Which of these combinations of sides can never form a triangle?

(1) 16, 30, 34 (2) 7, 10, 11 (3) 2, 2, 3 (4) 3, 7, 10

39. A square and regular hexagon has one side in common. If the square has an area of 529 sq.m., what is the total area of the two figures?

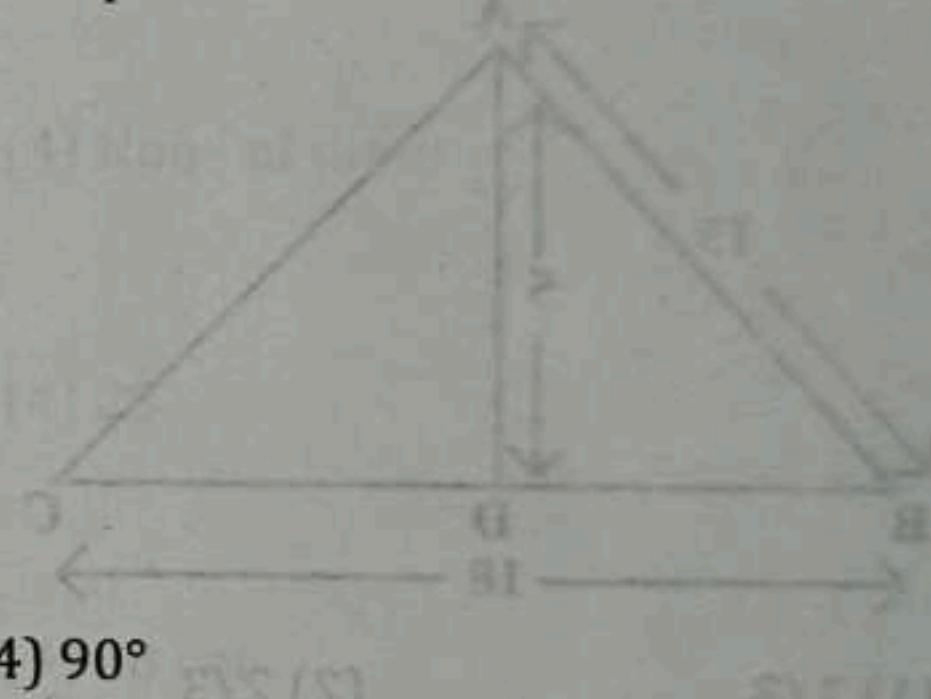
(1) 1852 sq.m. (2) 1912 sq.m. (3) 2720 sq.m. (4) 1696 sq.m.

40. EF and EH are tangents to the circle below. O is the centre of the circle and G is a point on the circle. $\angle FEG = 50^\circ$. What is the value of $\angle FGH$?



(1) 65° (2) 70°

(3) 60° (4) 90°



41. In triangles ABC and PQR, corresponding angles are equal and corresponding sides are in the ratio 7 : 6 respectively. If the difference between the areas of triangles ABC and PQR is 65 sq.cm, what is the area of $\triangle PQR$ (in sq.cm)?

(1) 245 (2) 180 (3) 196 (4) 144

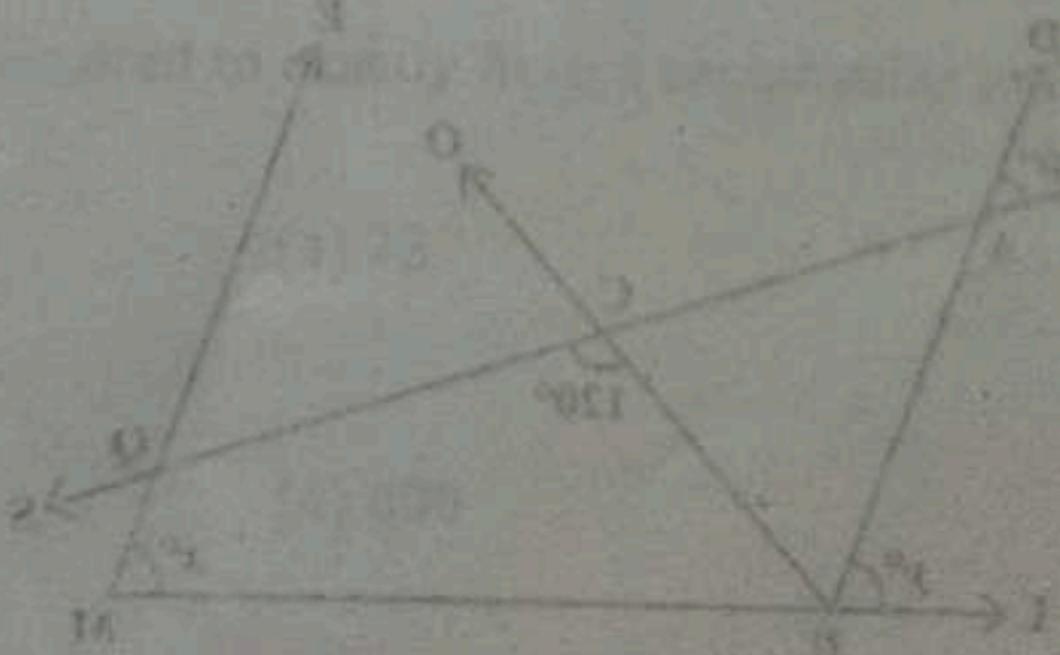
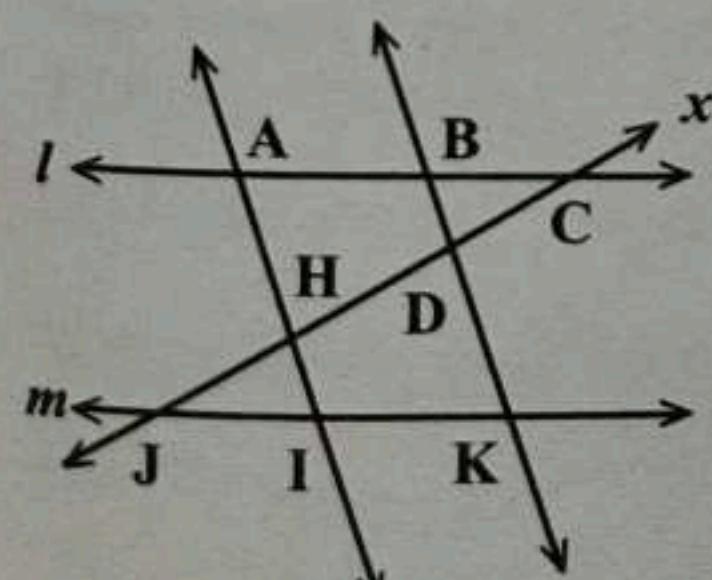
42. PQRS is a square. T is some point outside the square such that PQT is an equilateral triangle. What is the value of $\angle STP$?

(1) 60° (2) 50° (3) 45° (4) 30°

43. A rhombus is formed by joining the midpoints of the sides of a square. What is the area of the rhombus (in sq.cm) if the diagonal of the square measures 12 cm?

(1) $48\sqrt{2}$ (2) $24\sqrt{2}$ (3) 36 (4) 48

44. In the given figure, lines l and m are parallel to each other. Transversals AI and BK are also parallel to each other. If $\angle HJI = 60^\circ$ and $\angle JHI = 55^\circ$, what is the value of $\angle ABD$?



- (1) 105° (2) 125° (3) 115° (4) 120°

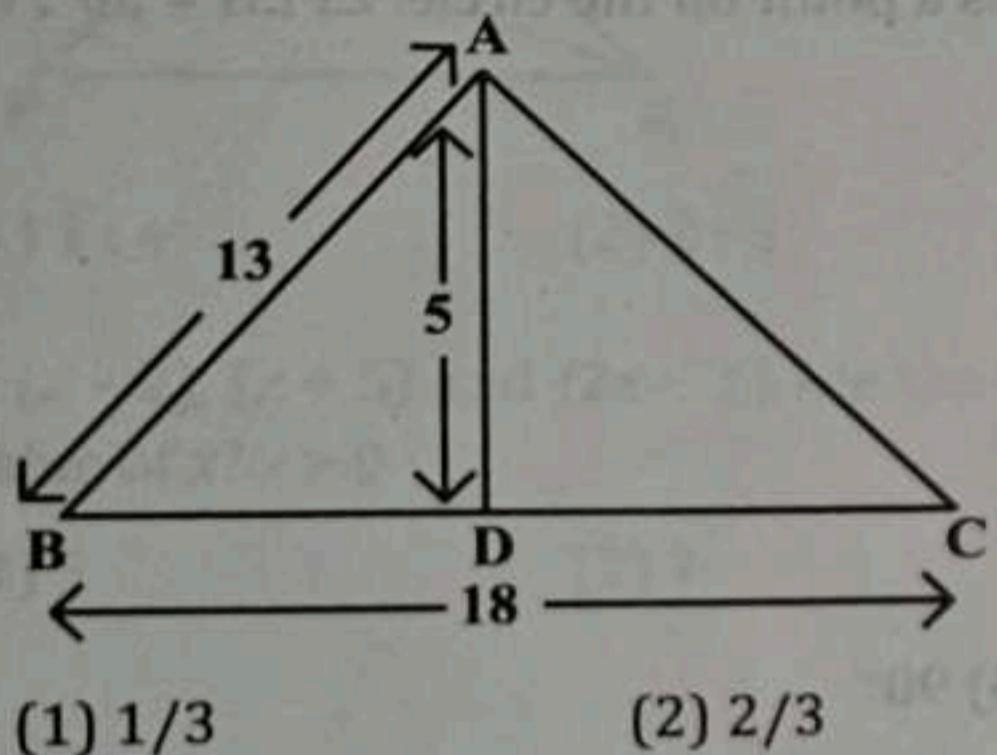
45. If the radius of a wheel is 49 cm, what is the distance travelled by it in 80 revolutions?
 (1) 292 m (2) 264.8 m (3) 276 m (4) 246.4 m

PRACTICE TEST 4

46. ABCD is a trapezium such that $AB \parallel CD$ and $AB < CD$. Let E be some point on CD such that, $AE = EB$. What is the value of $\angle EAB$ if $\angle AEB = 50^\circ$?
 (1) 50° (2) 60° (3) 65° (4) 55°

47. What is the area (in sq.cm) of a triangle with sides 20 cm, 27 cm and 33 cm respectively?
 (1) $24\sqrt{316}$ (2) $20\sqrt{182}$ (3) $15\sqrt{56}$ (4) None of these

48. If a regular polygon has 35 diagonals, how many sides does it have?
 (1) 10 (2) 14 (3) 12 (4) 18

49. In the figure below: what is $A(\Delta ADC) : A(\Delta ABC)$; where $AB = 13$ units, $AD = 5$ units and $BC = 18$ units. AD is perpendicular to BC.


- (1) $1/3$ (2) $2/3$ (3) $1/6$ (4) $1/2$

50. The angles of a quadrilateral are in the ratio $10 : 7 : 3 : 4$. The largest angle of a triangle is twice the smallest angle of this quadrilateral. The difference between the other two angles of the triangle is the same as the value of the third largest angle of the quadrilateral. What is the value of the second largest angle of the triangle?

- (1) 45° (2) 60° (3) 80° (4) 75°

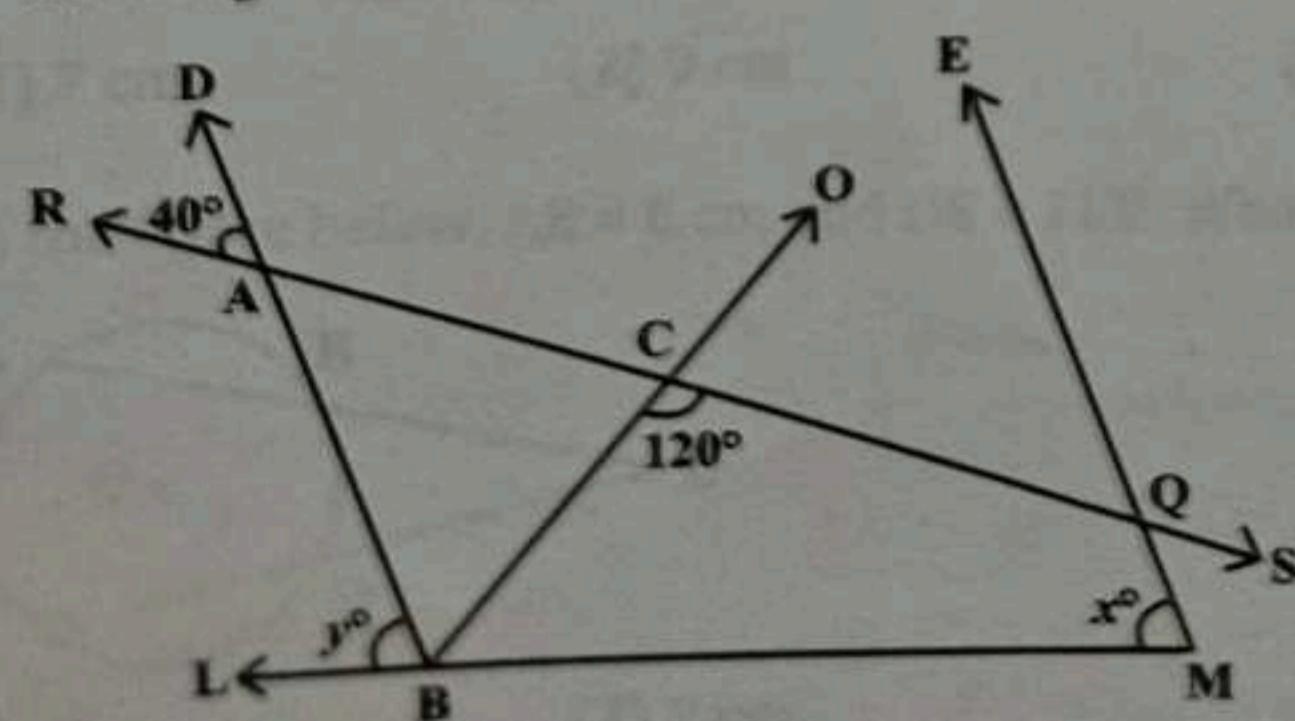
51. A regular hexagon is inscribed in a circle having circumference 88 cm. What is the approximate area of the region outside the hexagon and inside the circle (in sq.cm)?

- (1) 90 (2) 143 (3) 135 (4) 107

52. If S is the circumcentre of $\triangle ABC$ and $\angle BAC = 50^\circ$, what is the value of $\angle BCS$?

- (1) 80° (2) 60° (3) 30° (4) 40°

53. In the figure below, $DB \parallel EM$ and line BO bisects $\angle ABM$. What is the value of x (in $^\circ$)?



- (1) 40° (2) 25° (3) 20° (4) 50°

54. In $\triangle ABC$, E is some point on BC such that B-E-C and $BE = EC = AE$. What is the value of $\angle A$?

- (1) 60° (2) 120° (3) 90° (4) Cannot be determined

55. Abhay bought two similar shaped triangular plots in Kalyan and Panvel by paying Rs. 29 lakhs. The plot at Panvel was larger than the plot at Kalyan by 17 sq.m. Abhay fenced his Kalyan plot by putting a 6 m fence on its boundaries. If Abhay bought each plot at Rs. 20,000 per sq.m, what length of fence would he require for the Panvel plot?

- (1) 7.5 m (2) 5.33 m (3) 8 m (4) 6.75 m

56. There are six identical circles on the same diagonal of a square such that the centre of each lies on the diagonal. No two circles intersect each other at more than one point and each circle intersects its adjacent circle(s) at exactly one point. What is the ratio of the side of the square to the radius of the circle?

- (1) $(5 + \sqrt{2})/2$ (2) $6\sqrt{2}$ (3) 6 (4) $\sqrt{2(5 + \sqrt{2})}$

57. O is the incentre of $\triangle LMN$, such that $\angle LON = 120^\circ$ and $\angle MON = 140^\circ$. What is the value of $\angle LNM$?

- (1) 10° (2) 36° (3) 20° (4) 25°

58. What is the area of $\triangle ABC$ (in sq.cm)?

- (1) 14 (2) 28 (3) 49 (4) None of these

59. What is the area (in sq.cm) of the shaded region?

- (1) 7 (2) 14 (3) 21 (4) 28

60. What is the length of DE?

- (1) $24\sqrt{2}$ cm (2) 22 cm (3) $21\sqrt{3}$ cm (4) 28 cm

MENSURATION

PRACTICE TEST 1

1. The length, breadth and height of a room are in the ratio $3 : 2 : 1$. If the breadth and height are halved and the length is doubled, what will be the change in the total area of the four walls?
 (1) 5% decrease (2) 0% (3) 30% decrease (4) 10% increase

2. If the capacity of a cylindrical tank is 2464 m^3 and the diameter of its base is 14 m, what is the depth of the tank?
 (1) 21 m (2) 12 m (3) 16 m (4) 24 m

3. The perimeter of squares A and B is 36 m and 48 m respectively. What is the perimeter of square C, the area of which is equal to the sum of areas of squares A and B?
 (1) 60 m (2) 50 m (3) 55 m (4) 65 m

4. How many square tiles measuring half feet by half feet will be required to exactly fit in a rectangular hall measuring 33 feet by 24 feet?

- (1) 3168 (2) 4752 (3) 2112 (4) 75

5. What is the total surface area of a cube with side as 10 m?
 (1) 900 (2) 750 (3) 1200 (4) 600

6. What is the area (in sq. units) of a parallelogram ABCD with $AB = 10$, $BC = 5\sqrt{2}$ and $\angle ABC = 45^\circ$?
 (1) 25 (2) 50 (3) $25/\sqrt{2}$ (4) $50\sqrt{2}$
7. What is the cost of the gift wrapping required to exactly wrap a cuboidal box of dimensions $(16 \text{ cm} \times 5 \text{ cm} \times 8 \text{ cm})$ once? The gift wrapping cost 25 paise per sq.cm.
 (1) Rs. 62 (2) Rs. 45 (3) Rs. 57 (4) Rs. 60
8. If each side of a cube is increased by 50%, what is the percentage increase in its total surface area?
 (1) 110% (2) 150% (3) 175% (4) 125%
9. What is the largest distance between any two points on a cuboid that has its length, breadth and height as 18, 24 and 30 cm respectively?
 (1) 30 cm (2) $30\sqrt{2}$ cm (3) $24\sqrt{2}$ cm (4) 36 cm
10. A large cube is formed from the material obtained by melting three smaller cubes of sides 3 cm, 4 cm and 5 cm respectively. What is the ratio of the total surface areas of the three smaller cubes to the newly formed cube?
 (1) 17 : 15 (2) 19 : 15 (3) 25 : 18 (4) 18 : 17
11. A right circular cylinder is completely filled with sand. All this sand is poured in another right cylinder with thrice the radius and half the height as the first cylinder. What proportion of the capacity of the second cylinder is not filled?
 (1) 75% (2) 83.33% (3) 77.77% (4) 66.66%
12. What is the volume of a right circular cylinder having radius as 7 cm and height as 12 cm?
 (1) 1228 cm^3 (2) 1848 cm^3 (3) 1456 cm^3 (4) 904 cm^3
13. If the volume of a room is 792 m^3 and the area of the floor is 132 sq.m, what is the height of the room (in m)?
 (1) 6.5 m (2) 6 m (3) 8 m (4) 5.5 m
14. What is the area (in sq.m) of a circular path if its external radius is 25 m and the width of the path is 4 m?
 (1) 578.28 (2) 538.28 (3) 528.28 (4) 548.28
15. A rectangle has its breadth greater than its length by 5 cm. When the length is decreased by 2 cm and the breadth is increased by 5 cm, the area increases by 1 sq.cm. What is the original area (in sq.cm) of the rectangle?
 (1) 90 (2) 84 (3) 77 (4) 65
- PRACTICE TEST 2**
16. The perimeter of a square is 60 cm. The area of a rectangle is 9 sq.cm. less than the area of this square. If the length of the rectangle is 18 cm, what is its perimeter (in cm)?
 (1) 55 (2) 65 (3) 60 (4) 50
17. If the body diagonal of a cube is $\sqrt{300}$ cm, what is the volume of the cube?
 (1) 512 cm^3 (2) 1331 cm^3 (3) 1728 cm^3 (4) 1000 cm^3
18. What is the total surface area (in sq.cm) of a right cylinder with radius 8 cm and height 6 cm?
 (1) 832 (2) 928 (3) 704 (4) 616
19. If a wire is bent into the shape of a circle, area of the circle is 38.5 sq.cm. If the wire is bent into a square shape, what is the side of the square?
 (1) 5.5 cm (2) 6.5 cm (3) 7.5 cm (4) 4.5 cm

20. A right angled triangle has its area equal to that of a square whose side is 6 cm. What is the altitude of the triangle, if it is twice its base?
- (1) 8 cm (2) 12 cm (3) 16 cm (4) 18 cm
21. The length of two circular grounds is 132 feet and 220 feet respectively. What is the difference between their areas (in sq.feet)?
- (1) 1386 (2) 1078 (3) 2772 (4) 2464
22. What is the total surface area of a right circular cone with radius 5 m and height 12 m?
- (1) 75π sq.m. (2) 60π sq.m. (3) 100π sq.m. (4) 90π sq.m.
23. If the sides of a square increase by 20%, what is the corresponding increase in its area and perimeter respectively?
- (1) 44%, 20% (2) 20%, 44% (3) 44%, 44% (4) 20%, 20%
24. How many cubes having sides equal to 20 cm can be put in a cubical box having each edge equal to 1 m?
- (1) 250 (2) 50 (3) 100 (4) 125
25. The curved surface area of a pillar is 238 m^2 and its volume is 828 m^3 . What is the ratio of its diameter to its height?
- (1) 1.44 (2) 2.57 (3) 2.86 (4) 1.33
26. The circumference of the front wheel of a cart is 30 ft long and that of the back wheel is 36 ft long. What is the distance travelled by the cart, when the front wheel has done five more revolutions than the rear wheel?
- (1) 750 ft (2) 900 ft (3) 850 ft (4) 950 ft
27. A hemispherical bowl of diameter 54 cm is completely filled with water. This water is to be filled in cylindrical bottles of radii 3 cm and height 9 cm. How many bottles are required to empty the bowl?
- (1) 343 (2) 216 (3) 189 (4) 162
28. Four horses are tethered at four corners of a square field of sides measuring 70 m such that horses tied at two adjacent corners are just able to touch each other. What is the area that remains ungrazed?
- (1) 1050 sq.m (2) 3850 sq.m (3) 950 sq.m (4) 1075 sq.m
29. A cuboidal drum without a lid can hold 8000 litres of water. The length, breadth and height of the drum are 2.6 m, 3.3 m and 1.1 m respectively. The walls of the drum are 5 cm thick. What is the thickness of the bottom of that drum (in cm)? 1 litre = 1000 m^3
- (1) 18 (2) 12 (3) 10 (4) 16
30. X crossed a rectangular field walking diagonally at 48 m/min in 20 seconds while Y covered the same field along its sides walking at 54 m/min in the same time. What is the area of the field?
- (1) 34 m^2 (2) 42 m^2 (3) 36 m^2 (4) Cannot be determined
- PRACTICE TEST 3**
31. What is the volume (in cm^3) of a cylinder which has its lateral surface area as $20\pi \text{ cm}^2$ and height 5 cm?
- (1) 10π (2) 20π (3) 30π (4) 50π
32. The ratio of the total surface area of two spheres is 196 : 324. What is the ratio of their diameters?
- (1) 5 : 6 (2) 7 : 9 (3) 14 : 17 (4) 8 : 9

33. What is the volume of a right circular cone of height 21 cm and base diameter 14 cm?
 (1) 2164 cm^3 (2) 1078 cm^3 (3) 978 cm^3 (4) 1226 cm^3
34. There are two cubes with the sides of the larger cube being 6 cm greater than the sides of the smaller cube. What is the difference between their volumes?
 (1) 35 (2) 15 (3) 5 (4) Cannot be determined
35. The lid of a 5 feet high cylindrical drum is to be painted on both sides at Rs. 25 per sq.feet. The drum can contain a maximum of 220 cubic feet of sand. What is the cost incurred in the painting process?
 (1) Rs. 2,060 (2) Rs. 2,200 (3) Rs. 2,420 (4) Rs. 1,800
36. If the length of a rectangle decreases by 20% and breadth increases by 20%, a square of area 144 sq.cm is obtained. What is the original area of the rectangle (in sq.cm)?
 (1) 125 (2) 145 (3) 135 (4) 150
37. A rectangular football field has a uniform jogging track adjacent to it and just outside to it. The dimensions of the football field are 160 feet by 360 feet. The jogging track has a uniform width of 20 feet. What is the area of the jogging track (in sq. feet)?
 (1) 41100 (2) 58700 (3) 22400 (4) 38300
38. Four identical solid metal spheres are melted and recast into a hemisphere without losing any metal. What is the percentage change in the total surface area of the solid?
 (1) 100% (2) 20% (3) 25% (4) 50%
39. A spherical ball whose radius is 21 cm is dropped in a vessel filled with water up to the brim. What is the volume of water displaced by the ball?
 (1) 35550 cm^3 (2) 36308 cm^3 (3) 39604 cm^3 (4) 38808 cm^3
40. A cylindrical iron pipe has a length of 21 cm and external diameter of 10 cm. The thickness of the pipe is 2 cm. If iron weighs 13 g/cm^3 , what is the weight of the pipe?
 (1) 13.7 kg (2) 14.8 kg (3) 16.4 kg (4) 12.8 kg
41. There is a cylinder circumscribing a hemisphere such that their bases are common. What is the ratio of their volumes?
 (1) 5 : 2 (2) 3 : 2 (3) 4 : 1 (4) 5 : 3
42. Ajay grows potatoes in a square shaped garden. Each potato occupies 1 sq.feet area in this garden. This year, he has increased his output compared to last year by 173 potatoes. The shape of the total area used to grow the potatoes has remained a square in both years. How many potatoes has he grown this year?
 (1) 8464 (2) 6889 (3) 7569 (4) 9604
43. Volume of a cone is one-fourth the volume of a cylinder which in turn is also one-fourth the volume of a hemisphere. The ratio of heights of the cone and the cylinder is 3 : 1 and the radius of the hemisphere is two times the radius of the cone. What is the value of the ratio:
 Radius of the cone : Radius of the cylinder : Height of the cone?
 (1) 1 : 2 : 1 (2) 2 : 6 : 8 (3) 2 : 4 : 5 (4) 2 : 3 : 2
44. A hemispherical showpiece is exactly mounted on a right circular cone. The radius of the hemisphere is 4.8 cm and the total height of the showpiece is 10.6 cm. What is the approximate volume of the showpiece?
 (1) 322 cm^3 (2) 372 cm^3 (3) 288 cm^3 (4) 402 cm^3

45. A rectangular tank 10 m in length, 4 m in width and 4 m in height is half filled with water. How much time is required by a circular pipe, which has a radius 10 cm, to fill the remaining portion of the tank, if water flows into the tank at a rate of 5 m/s?
- (1) 509 sec (2) 650 sec (3) 600 sec (4) 565 sec

SEQUENCES, PROGRESSIONS AND SERIES

PRACTICE TEST 1

1. The geometric mean of two positive numbers is 6 and it exceeds its harmonic mean by 2. What is the arithmetic mean of these numbers?
 (1) 4 (2) 2 (3) 6 (4) 9
2. A sequence is defined by the relationship: $a_n + 1 = 2a_{n-1}$. If the fifth term of this sequence is 17, what is the value of the first term?
 (1) 1 (2) 2 (3) 3 (4) 4
3. The population of a country is 250 million and it grows by 10% every subsequent year. In which year will it cross 375 million?
 (1) Fourth (2) Sixth (3) Seventh (4) Fifth
4. What is the sum of the infinite G.P. 2, 6, 18, 54, ...?
 (1) 24 (2) 32 (3) 36 (4) Infinity
5. How many terms are there in the given series: 29, 34, 39, ..., 99?
 (1) 18 (2) 17 (3) 16 (4) 15
6. The sum of the third and seventh term of an A.P. is 12. What is the sum of the first nine terms of this progression?
 (1) 54 (2) 45 (3) 36 (4) Cannot be determined
7. What is the sum of the first 26 terms of the following series:
 $2^2 + 3^2 + 4^2 + 5^2 + 6^2 + \dots$?
 (1) 7032 (2) 4722 (3) 6201 (4) 6929
8. For an A.P. with common difference as 4 and third term as 11, after how many terms does 207 appear?
 (1) 49 (2) 51 (3) 50 (4) 52
9. The product of three consecutive terms of a G.P. is 1728. If the third term is four times the first term, what is the third term?
 (1) 24 (2) -8 (3) 16 (4) Cannot be determined
10. A is the sum of cubes of the first 199 natural numbers while B is the sum of the first 199 natural numbers. What is the value of $A \div B$?
 (1) 19900 (2) 20000 (3) 20050 (4) 21000
11. If 20, 2x and 80 are in G.P., what is the value of x?
 (1) +40 (2) -20 (3) +20 (4) Cannot be determined
12. The first three terms of an H.P. are $\frac{1}{6}$, $\frac{1}{9}$ and $\frac{1}{12}$ respectively. What is the seventh term of this H.P.?
 (1) $\frac{1}{21}$ (2) $\frac{1}{24}$ (3) $\frac{1}{27}$ (4) $\frac{1}{18}$

13. The fifth term of a G.P. is 64 times the second term. If the third term is 80, what is the sixth term?
 (1) -5120 (2) 1280 (3) -1280 (4) 5120
14. If the 5th term of an A.P. is zero, what is the ratio of the 12th term to the 13th term of the A.P.?
 (1) 3 : 4 (2) 4 : 5 (3) 7 : 8 (4) 2 : 3
15. Prem bought a sports bike whose value is Rs. 100000. His bike depreciates each year in the following manner: Year 1 - 15%; Year 2 - 14%; Year 3 - 13%; and so on. What is the value of bike after 6 years? Assume that the % is applicable on the initial value.
 (1) Rs. 57,000 (2) Rs. 46,000 (3) Rs. 35,000 (4) Rs. 25,000

PRACTICE TEST 2

16. What is the 27th term of the series 3, 5, 7, ...?
 (1) 57 (2) 55 (3) 59 (4) 51
17. Every month, Akash buys mutual funds of value exceeding the last month's purchase by Rs. 1,000. After a year, he finds that the total value of the mutual funds purchased by him is Rs. 78,000. What was the value of the mutual fund purchased by him in the 7th month?
 (1) Rs. 1,000 (2) Rs. 3,000 (3) Rs. 5,000 (4) Rs. 7,000
18. What is the seventh term of a G.P. whose first term is 7 and the common ratio is 1/7?
 (1) 1/98965 (2) 1/16807 (3) 3/16807 (4) 1/25625
19. In an A.P. of 100 terms, sum of the 2nd and 99th term is 202. What is the average of all the terms of the A.P.?
 (1) 11 (2) 121 (3) 99 (4) 101
20. How many terms are there in the given series: 29, 34, 39, ..., 99?
 (1) 18 (2) 17 (3) 16 (4) 15
21. The sum of the third and seventh term of an A.P. is 12. What is the sum of the first nine terms of this progression?
 (1) 54 (2) 45 (3) 36 (4) Cannot be determined
22. What is the sum of the squares of the first twenty natural numbers?
 (1) 5740 (2) 2870 (3) 1435 (4) 4420
23. There are ten bags. The first bag has four keys and every subsequent bag has three keys more than the previous bag. How many keys do all the bags have in all?
 (1) 120 (2) 156 (3) 126 (4) 175
24. The difference between the thirteenth term and sixth term of an A.P. is zero. If the eighth term of this A.P. is 10, what is the value of the fifteenth term?
 (1) 12 (2) 16 (3) 10 (4) 15
25. Jayesh borrows Rs. 3,625 from a friend and has to pay it in n installments, without any interest. Jayesh pays an installment at the end of each month. The installment for the first month is Rs. 25 and each subsequent installment is Rs. 75 more than the previous installment. In how many installments, does Jayesh repay the loan?
 (1) 7 (2) 10 (3) 13 (4) 16

- 26.** The ninth term of an A.P. exceeds the fifth term by 32. The sum of these two terms is 114. What is the value of the eighth term?
 (1) 65 (2) 72 (3) 57 (4) 80
- 27.** Till how many terms is the sum of the series comprising the terms i.e. $7 \times 8 + 7 \times 8^2 + 7 \times 8^3 \dots$ a four-digit number
 (1) 4 (2) 3 (3) 5 (4) 7
- 28.** The product of 3 terms in GP is 729 and the sum is 39. What is the highest difference between any 2 of the 3 numbers?
 (1) 24 (2) 27 (3) 30 (4) 36
- 29.** In a school, chocolates are distributed to 71 students. Each student gets the same number of chocolates as the roll number (1 to 71) of the student. For a particular student with number of chocolates being a two-digit number, Anusha wrongly considers the reverse of that number. Hence, she gets the total number of chocolates as 2619. Which number does she incorrectly interchange?
 (1) 26 (2) 29 (3) 18 (4) 17
- 30.** What is the sum of the series $4^2 - 5^2 + 6^2 - 7^2 + \dots + 1400^2 - 1401^2 + 1402^2$?
 (1) 980509 (2) 2947699 (3) 3054601 (4) 1013355
- PRACTICE TEST 3**
- 31.** The first term of a G.P. is 6 and the common ratio is 3. What is the fifth term of this progression?
 (1) 624 (2) 486 (3) 162 (4) 1458
- 32.** Manoj distributed 36 chocolates among his 3 sons Amar, Prem & Manish such that the number of chocolates each of them has is in AP. If Amar received the highest chocolates followed by Manish and then Prem how many chocolates did Manish receive?
 (1) 12 (2) 15 (3) 18 (4) 21
- 33.** What is the sum of all the multiples of 8 up to 500 (included)?
 (1) 17402 (2) 14395 (3) 21347 (4) None of the above
- 34.** If 5 geometric means are inserted between 2 and 128, what is the value of the 3rd geometric mean of these geometric means?
 (1) 18 (2) 64 (3) 16 (4) 32
- 35.** The sum of the first 36 terms of an A.P. is equal to the sum of the first 44 terms of the A.P. What is the sum of the first 80 terms of this A.P.? HFM
 (1) 0 (2) 69 (3) -56 (4) -72
- 36.** How much do you save in fifteen days, if you save Rs. 7 on the first day and keep doubling the savings every subsequent day?
 (1) Rs. 2,29,369 (2) Rs. 41,63,335 (3) Rs. 11,345 (4) Rs. 3,09,45,345
- 37.** Four friends - A, B, C and D - 124 marbles in all such the number of marbles with A, B, C and D respectively form four consecutive terms of an A.P. The product of the number of marbles with B and C is 128 more than the product of the number of marbles with A and D. What is the least number of marbles that any one friend has?
 (1) 11 (2) 19 (3) 53 (4) 27

- 38.** If, in an A.P., the p^{th} term is $2q$, and the q^{th} term is $2p$, what is the common difference of the A.P.?
 (1) $2(p+q)$ (2) -2 (3) 2 (4) $2(p-q)$
- 39.** A sweet is sold in packs of 8 pieces, 12 pieces, 16 pieces and so on, up to 40 pieces being the largest possible size. Ajay buys five packs of each size at Rs. 8 per piece. How much does he pay for the sweets?
 (1) Rs. 1,728 (2) Rs. 5,628 (3) Rs. 8,640 (4) None of these
- 40.** The ratio of the sum of the first six terms of an increasing G.P. to that of the sum of the first three terms of the same G.P. is $217 : 1$. What is the common ratio?
 (1) 5 (2) $3/2$ (3) 6 (4) 3
- 41.** The first term of an A.P. is 17 and the product of the second and fourth term equals the product of the fifth and sixth term. What is the value of the third term, if no two terms are the same?
 (1) 7 (2) -14 (3) -35 (4) 31
- 42.** A ball is thrown up. It reaches a height of 3000 m and comes back to the ground. It bounces to $2/3^{\text{rd}}$ of the previous height each time it touches the ground. What is the total approximate vertical distance travelled by the ball before it finally stops?
 (1) 9000 m (2) 18000 m (3) 6000 m (4) 15000 m
- 43.** What is the 116^{th} term of the series: 9, 11, 15, 21, 29, 39.....?
 (1) 6508 (2) 6412 (3) 5426 (4) None of these
- 44.** The ratio of the sum of the first eight terms of a G.P. to the sum of the first four terms of the same G.P. is $97 : 81$. What is the common ratio, if it is greater than zero?
 (1) 2 (2) 3 (3) $3/2$ (4) $2/3$
- 45.** The sum of the terms of an infinite G. P. is 45 and the sum of their squares is 135. What is the sum of its first term and common ratio?
 (1) $13/2$ (2) $26/3$ (3) $13/4$ (4) 0

PERMUTATIONS AND COMBINATIONS

PRACTICE TEST 1

- In how many ways can you select a king or a diamond from a standard pack of cards?
 (1) 8 (2) 16 (3) 17 (4) 18
- How many words can be formed using all the letters of the word MEDDLE?
 (1) 720 (2) 24 (3) 180 (4) 360
- How many triplets (p, q, r) satisfy $p + q + r = 8$; where p, q and r are whole numbers?
 (1) 30 (2) 45 (3) 21 (4) 36
- City A is connected to 3 cities. Each of these 3 cities is connected to 5 different cities. All these 5 cities are connected to city B. What is the number of ways to reach city B from city A?
 (1) 15 (2) 225 (3) 45 (4) 150
- In how many ways can the letters of the word MISTAKE be arranged such that the arrangement always starts and ends with a consonant?
 (1) 960 (2) 1680 (3) 1440 (4) 720

6. In how many ways can five letters be posted in eight letter boxes?
 (1) 8P_5 (2) 8^5 (3) 5^8 (4) ${}^8P_5 \times 5!$
7. Nine Literature, Sports and Fiction books are to be arranged on a shelf such that there are equal books of each type. If books of a type are to be kept together, in how many ways can this be done?
 (1) 1296 (2) 216 (3) 1680 (4) 6
8. Eight different flags have to be placed in a line, with two flags being red and the rest being of different colours. In how many ways can the flags be arranged such that the red flags are together?
 (1) 720 (2) 10080 (3) 5040 (4) 1440
9. A necklace is to be designed using nine identical beads. In how many ways can it be designed?
 (1) 360 (2) 5040 (3) 20160 (4) 14400
10. A committee of 4 people is to be formed out of 2 students, 3 teachers and 5 researchers. In how many ways can the committee be formed if at most 1 student is to be included in the committee?
 (1) 210 (2) 70 (3) 182 (4) 112
11. In how many ways can 15 purple hats, 10 beige hats and 3 lavender hats be arranged in a single line? All the hats are identical, except for colour.
 (1) ${}^{15}C_{13} \times 13!/10!$ (2) 450 (3) $15! \times 10! \times 3!$ (4) $28!/(15! \times 10! \times 3!)$
12. In how many ways can the letters of the word MYSTERIOUS be arranged, such that all the vowels are together and all the consonants are together?
 (1) 12960 (2) 17280 (3) 25920 (4) 34560
13. How many 4-digit odd numbers can be formed using the digits 0, 1, 3, 4, 5?
 (1) 5P_4 (2) 5C_4 (3) 300 (4) 240
14. Salim makes a necklace for Rajesh. The necklace has beads representing only the alphabets present in Rajesh's name, used exactly once. How many people can use the necklace if all the available beads are to be used in each necklace?
 (1) 720 (2) 60 (3) 240 (4) 120
15. In a conference hall, each person present shook hands with every other person present in that hall. If there were 105 handshakes in all, how many people were present in the hall?
 (1) 19 (2) 20 (3) 10 (4) 15
16. The figure below has four quadrants named A, B, C and D. Any number from 1 to 6 can be put in these four quadrants such that no two quadrants have the same number. In how many ways can Nia put an even number in quadrant C?

A	B
C	D

 (1) 270 (2) 90 (3) 360 (4) 180
17. In how many ways can you arrange the letters of the word DRIVE?
 (1) $5!$ (2) $5! / 2!$ (3) 5^5 (4) $4!$
18. How many four-digit odd numbers that can be formed using the digits 1, 2, 3, 5, 7, 8 and 9 without repetition?
 (1) 100 (2) 300 (3) 120 (4) 600

PRACTICE TEST 2

16. The figure below has four quadrants named A, B, C and D. Any number from 1 to 6 can be put in these four quadrants such that no two quadrants have the same number. In how many ways can Nia put an even number in quadrant C?

A	B
C	D

 (1) 270 (2) 90 (3) 360 (4) 180
17. In how many ways can you arrange the letters of the word DRIVE?
 (1) $5!$ (2) $5! / 2!$ (3) 5^5 (4) $4!$
18. How many four-digit odd numbers that can be formed using the digits 1, 2, 3, 5, 7, 8 and 9 without repetition?
 (1) 100 (2) 300 (3) 120 (4) 600

- 19.** Six boys and six girls are to be seated around a circular table such that no two boys or no two girls are together. In how many ways can these people be arranged?
- (1) $6! \times 6!$ (2) $5! \times 5!$ (3) $5! \times 6!$ (4) $(5! \times 6!) / 2$
- 20.** A person picks two cards from a standard pack of cards. In how many ways can he pick them such that both are numbered red cards?
- (1) 136 (2) 325 (3) 190 (4) 153
- 21.** In how many ways can a committee of 3 people, comprising at least 2 men, be formed from a group of 4 men and 5 women?
- (1) 120 (2) 30 (3) 84 (4) 34
- 22.** In how many ways can a person complete eight tasks one after the other?
- (1) 37120 (2) 43980 (3) 33210 (4) 40320
- 23.** Rakhi multiplies the first N natural numbers to get a certain value. Rekha includes the two natural numbers immediately greater than N and multiplies all natural numbers in her set to get another value. The ratio of Rekha's product to Rakhi's product is 132 : 1. How many numbers did Rekha multiply?
- (1) 12 (2) 13 (3) 10 (4) 11
- 24.** Six people have to sit around a circular dining table have five wooden and one plastic chair. In how many ways can these people sit?
- (1) 720 (2) 120 (3) 60 (4) 360
- 25.** Ten points are drawn on a piece of paper of which five are collinear. How many triangles can be drawn using these points as vertices?
- (1) 120 (2) 110 (3) 50 (4) Cannot be determined
- 26.** What is the number of natural number solutions of $w + x + y + z = 20$?
- (1) 969 (2) 1771 (3) 1021 (4) 948
- 27.** A set of N parallel lines intersects another set of N parallel lines. If 100 parallelograms are formed, what is the value of N ?
- (1) 4 (2) 5 (3) 6 (4) 8
- 28.** Four medical representatives R₁, R₂, R₃ and R₄ are to visit one doctor each (D₁, D₂, D₃ and D₄) on Thursday. R₁ will not visit D₁, and R₂ will visit only D₂ or D₃. In how many ways can the visits be done such that no two representatives visit the same doctor?
- (1) 6 (2) 8 (3) 12 (4) 10
- 29.** There are 10 people in a party. Every person has to give a sealed envelope to every other person in the party, including himself or herself. He/she can also present a received envelope to other people. What is the minimum number of unique envelopes required?
- (1) 55 (2) 45 (3) 40 (4) 200
- 30.** In how many ways can Prashant take five tests in a seven day week if he cannot take the History test on Tuesday and Sunday. Prashant can take only one test per day.
- (1) 504 (2) 312 (3) 252 (4) 624

- PRACTICE TEST 3**
31. In how many ways can a committee of 5 be formed from 3 boys and 4 girls if a particular boy is always selected?
 (1) 21 (2) 15 (3) 24 (4) 30
32. Five dogs and five cats are to be arranged in a line for a photograph. In how many ways can this be done such that no two dogs are next to each other?
 (1) $5! \times 5!$ (2) 10! (3) $5! \times 6!$ (4) $6! \times 6!$
33. A bag contains 5 blue balls, 6 red balls and 7 green balls. In how many ways can 4 balls be drawn from the bag, if atleast one of the balls has to be red?
 (1) 2565 (2) 2790 (3) 1860 (4) 2835
34. What is the number of four-letter words that can be formed, with repetition, using the letters A, B, C, D, E, F and G?
 (1) 840 (2) 280 (3) 2401 (4) 1681
35. The figure below has four quadrants named A, B, C and D. Any number from 1 to 6 can be put in these four quadrants such that no two quadrants have the same number. In how many ways can Nia put an even number in quadrant C?

A	B
C	D

 (1) 270 (2) 90 (3) 360 (4) 180
36. A locker has a 3-digit code using the digits 0 to 9, such that all the digits of the code are not identical. What is the least number of trials for a burglar to be sure of breaking the safe?
 (1) ${}^{10}P_3$ (2) 10^3 (3) 990 (4) None of these
37. Mitali has thirty hats in a box, of which seven are red, four are green, five are blue, eight are pink and the rest are white. What is the greatest number of hats that she can pick from the box till which she cannot be sure of having atleast one hat of each colour?
 (1) 22 (2) 23 (3) 26 (4) 27
38. Out of 7 unique consonants and 5 unique vowels, how many words can be made, each containing 4 consonants and 2 vowels?
 (1) 1764000 (2) 350 (3) 800 (4) 252000
39. There are 15 bulbs numbered 1-15 in a room. In how many ways can the room be lit up only by prime numbered bulb(s) i.e. no other bulb works?
 (1) 64 (2) 31 (3) 50 (4) 63
40. There are ten different coloured balls in a basket. In how many ways can the selection be done such that the balls are picked up in a group of multiples of two?
 (1) 256 (2) 128 (3) 127 (4) 64
41. There are 9 parallel horizontal lines perpendicularly placed on 6 parallel vertical lines. What is the number of rectangles formed?
 (1) 630 (2) 810 (3) 540 (4) 720
42. There are some boys in a group, of which 3 are selected. If this happens in 220 ways, how many boys are not selected?
 (1) 12 (2) 11 (3) 10 (4) 9

43. There are 3 groups consisting of 4 men and 2 women, 3 men and 5 women and 1 man and 4 women respectively. If you have to select at least 1 member from each group, in how many ways can you make a committee of 3 members containing at least 2 women?

(1) 80 (2) 99 (3) 144 (4) 154

44. There are N identical red balloons and M identical yellow balloons, such that all of them can be released. How many different balloon combinations can be seen flying, if atleast 1 balloon of each colour is released?

(1) $NM + 1$ (2) $N + M$ (3) $N + M - 1$ (4) NM

45. 20 identical mangoes are to be distributed among three children A, B and C such that each child gets atleast 2 mangoes. In how many ways can this be done?

(1) 240 (2) 120 (3) 188 (4) 172

PROBABILITY

PRACTICE TEST 1

1. What is the probability that the sum of the two numbers appearing on a single throw of two unbiased dice is odd?

(1) $1/3$ (2) $1/2$ (3) $1/6$ (4) $1/4$

2. Probability of mouse eating cheese = $1/5$; Probability of cat eating mouse = $1/6$; Probability of dog eating cat = $1/7$; Probability of lion eating dog = $1/8$; Probability of man eating lion = $1/9$. What is the probability of a man eating a lion who has eaten a dog which had consumed a cat who ate a mouse which didn't eat cheese?

(1) $1/756$ (2) $1/3780$ (3) $1/4096$ (4) $1/2048$

3. A bag has three green, five red and four blue balls. What is the probability of selecting two non-blue balls?

(1) $12/34$ (2) $14/31$ (3) $14/33$ (4) $12/37$

4. An urn contains 2 pink balls, 1 black ball and 1 purple ball. If a ball is drawn at random, what is the probability of getting a pink ball?

(1) $1/3$ (2) $1/2$ (3) $2/3$ (4) $1/4$

5. What is the probability of getting one head on the toss of three coins?

(1) $3/8$ (2) $1/4$ (3) $1/8$ (4) $5/8$

6. $P(A) = 2/3$; $P(B) = 1/4$; $P(A \cup B) = 8/15$. What is the value of $P(A \cap B)$ and $P(A' \cup B')$?

(1) $23/60; 37/60$ (2) $23/60; 7/15$ (3) $23/60; 13/60$ (4) $17/60; 43/60$

7. If two dice are tossed simultaneously, what is the probability that the number on top is a perfect square and prime?

(1) $1/3$ (2) $1/2$ (3) $1/4$ (4) None of these

8. If 3 coins are tossed, what is the probability that no two coins show dissimilar results?

(1) $1/2$ (2) $1/4$ (3) $1/3$ (4) None of the above

9. There are 3 green, 4 orange and 5 white balls in a bag. If a ball is drawn at random, what is the probability of getting a green or a white ball?

(1) $7/9$ (2) $2/3$ (3) $3/4$ (4) $5/6$

- 10.** The probability that A hits a target is $\frac{4}{9}$. What are the odds that he hits the target?
 (1) 5 : 9 (2) 5 : 4 (3) 4 : 5 (4) 4 : 9
- 11.** A box contains 2 black balls, 3 red balls and 4 blue balls. What is the probability of selecting 3 balls from the box such that at least 1 ball is blue?
 (1) $\frac{12}{40}$ (2) $\frac{29}{31}$ (3) $\frac{23}{28}$ (4) $\frac{74}{84}$
- 12.** The value of π upto 50 decimal places is given below
 $3.14159265358979323846264338327950288419716939937510$
 A boy is asked to select a number from this at random. What is the probability that the number selected is 3?
 (1) $\frac{9}{50}$ (2) $\frac{4}{25}$ (3) $\frac{3}{17}$ (4) $\frac{8}{51}$

Directions for questions 13 to 15: Answer the following questions based on the information given below.
 The value of ABCD can be 0000 to 1111 i.e. each digit takes value 0 or 1.

13. What is the probability that a randomly selected value of ABCD has atleast 3 1s?
 (1) $\frac{5}{16}$ (2) $\frac{1}{4}$ (3) $\frac{1}{2}$ (4) $\frac{3}{16}$

14. What is the probability that there are equal 1s and 0s in ABCD such that the 1s are together and the 0s are together?
 (1) $\frac{1}{2}$ (2) $\frac{1}{4}$ (3) $\frac{1}{8}$ (4) $\frac{1}{16}$

15. What is the probability that ABCD has different starts and end digits?
 (1) $\frac{1}{2}$ (2) $\frac{1}{4}$ (3) $\frac{1}{8}$ (4) $\frac{1}{16}$

PRACTICE TEST 2

Directions for questions 16 to 19: Answer the following questions based on the information given below.
 There are 4 teachers and 6 students in a group.

16. What is the probability that a group of 3 has only teachers or only students?
 (1) $\frac{2}{5}$ (2) $\frac{1}{5}$ (3) $\frac{1}{4}$ (4) $\frac{3}{10}$

17. What is the probability that a group of 5 has people from only one category?
 (1) $\frac{1}{63}$ (2) $\frac{1}{42}$ (3) $\frac{2}{21}$ (4) $\frac{2}{63}$

18. What is the probability that a group of 2 does not have both people from the same category?
 (1) $\frac{1}{3}$ (2) $\frac{4}{9}$ (3) $\frac{1}{4}$ (4) $\frac{2}{9}$

19. What is the probability that a random person selected is a student?
 (1) $\frac{1}{10}$ (2) $\frac{3}{10}$ (3) $\frac{2}{5}$ (4) $\frac{3}{5}$

20. Jyoti draws two cards from a set of 52 cards, without replacement. What is the probability that the first card is the Ace of Hearts and the second is the Jack of Spades?
 (1) $\frac{1}{2704}$ (2) $\frac{4}{663}$ (3) $\frac{2}{663}$ (4) $\frac{1}{2652}$

21. What is the probability of getting a perfect square sum when two dice are thrown?
 (1) $\frac{7}{36}$ (2) $\frac{5}{36}$ (3) $\frac{1}{6}$ (4) $\frac{2}{9}$

22. Seven letters are to be put in seven slots. Of these, six have already been put in the respective slots. What is the probability that atleast one letter is not in its correct slot?
 (1) 1 (2) $\frac{1}{6}$ (3) $\frac{1}{7}$ (4) 0

- 23.** There are ten pens, of which five are working. If a student has to select three pens, what is the probability that all of them are working?
 (1) $\frac{7}{12}$ (2) $\frac{3}{4}$ (3) $\frac{1}{12}$ (4) $\frac{9}{10}$
- 24.** A card is randomly drawn from a pack of 52 cards. What is the probability that it is neither a Heart nor a King?
 (1) $\frac{4}{13}$ (2) $\frac{3}{26}$ (3) $\frac{6}{13}$ (4) $\frac{9}{13}$
- 25.** An unbiased die is rolled and a coin is tossed. What is the probability that the die shows an odd number and the coin shows a head?
 (1) $\frac{1}{4}$ (2) $\frac{3}{4}$ (3) $\frac{1}{6}$ (4) $\frac{2}{7}$
- 26.** A jar has 15 red balls and 10 blue balls. Three balls are picked at random. What is the probability that two balls are red and one is blue?
 (1) $\frac{21}{46}$ (2) $\frac{25}{117}$ (3) $\frac{1}{50}$ (4) $\frac{3}{25}$
- 27.** The odds in favour of A speaking the truth are 2 : 3. The odds against B speaking the truth is 3 : 4. When they lie, they speak the same lie. What are the chances of them contradicting each other?
 (1) $\frac{8}{35}$ (2) $\frac{9}{35}$ (3) $\frac{17}{35}$ (4) $\frac{18}{35}$
- 28.** There are 3 XUVs, 5 TUVs and 6 KUVs in a showroom. What is the probability that four randomly chosen cars belong to the same class?
 (1) $\frac{21}{1001}$ (2) $\frac{20}{1001}$ (3) $\frac{45}{361}$ (4) None of these
- 29.** Arpita has shortlisted 7 schools A, B, C, D, E, F and G for her son. She has decided that if he gets admission in school G, he will continue his education in that school till SSC. For the remaining six schools, she thinks that A and B are good for pre primary, C, D and E are good for primary level and F is good for std. V to std. X. What is the probability that her son studies in school G?
 (1) $\frac{1}{7}$ (2) $\frac{1}{6}$ (3) $\frac{1}{2}$ (4) $\frac{1}{13}$
- 30.** The odds in favour of India winning a match against Pakistan are 3:2. What is the probability that India wins a series of three matches if the probability of a tie is 0.2?
 (1) 0.216 (2) 0.648 (3) 0.72 (4) 0.384
- PRACTICE TEST 3**
- 31.** A class has 100 students, where every student likes atleast one of two subjects. 80 students like Mathematics and 75 students like Chemistry. What is the probability that a certain student likes both the subjects?
 (1) $\frac{11}{20}$ (2) $\frac{9}{20}$ (3) $\frac{17}{20}$ (4) $\frac{19}{20}$
- 32.** A bag contains 5 red balls and 6 pink balls. When 4 balls are drawn at random simultaneously from the bag, what is the probability that not all of the balls drawn are pink?
 (1) $\frac{1}{11}$ (2) $\frac{9}{11}$ (3) $\frac{21}{22}$ (4) $\frac{1}{10}$
- 33.** What is the probability of picking 3 distinct numbers from amongst the first 8 natural numbers such that their sum is 17?
 (1) $\frac{1}{28}$ (2) $\frac{3}{56}$ (3) $\frac{1}{14}$ (4) $\frac{5}{56}$
- 34.** A cap is randomly removed from a basket containing 3 pink, 5 white and 4 blue caps. What is the probability that the cap drawn is not white?
 (1) $\frac{3}{7}$ (2) $\frac{3}{4}$ (3) $\frac{7}{12}$ (4) $\frac{5}{8}$

35. A box contains 20 electric bulbs, out of which 4 are defective. Two bulbs are chosen at random from this box. What is the probability that at least one of these is defective?

- (1) $4/19$ (2) $12/19$ (3) $21/95$ (4) $7/19$

36. Three students are in contention to receive five prizes. Any prize can go to any student, irrespective of the other prizes he/she wins. What is the probability that a certain student does not win any of the 5 prizes, and the other 2 win at least 1 each?

- (1) $32/243$ (2) $31/243$ (3) $10/81$ (4) $24/125$

37. What is the probability that three cards picked at random from a standard deck of cards are of the same suit?

- (1) $1/24$ (2) $16/375$ (3) $22/425$ (4) $13/409$

38. If the letters of the word MANGO are to be arranged in a straight line, what is the probability that the vowels are never together?

- (1) $2/5$ (2) $6/7$ (3) $3/5$ (4) $1/10$

39. Rohit has 20 Balcony and 30 Stall passes for a movie. Each pass can be Standard, Premium or VIP. Standard and Premium categories comprise 40% and 35% of the Balcony passes. 10% and 20% of the Stall passes are VIP and Premium respectively. Iqbal gets a free meal coupon if he has a Premium or VIP Balcony Pass or he has a VIP Stall Pass. What is the probability that Iqbal gets a free meal coupon? Iqbal has just one pass and a person can get only one meal coupon per pass.

- (1) 0.33 (2) 0.3 (3) 0.25 (4) 0.4

40. A person is typing a six-letter word with distinct letters. What is the probability that the word has exactly two vowels?

- (1) $319/3289$ (2) $171/3289$ (3) $771/3289$ (4) $855/3289$

Directions for questions 41 to 45: Answer the following questions based on the information given below.

A bag contains chocolates of different types and prices, such that there are six unique chocolates costing Rs. 10 each, five unique chocolates costing Rs. 5 each and eight unique chocolates costing Rs. 2.5 each.

41. What is the probability that a chocolate drawn at random from the bag costs Rs. 5?

- (1) $1/4$ (2) $2/3$ (3) $5/19$ (4) $4/19$

42. If five chocolates are drawn randomly from the bag, what is the probability that two chocolates cost Rs. 10 and the other three chocolates cost Rs. 2.5?

- (1) $35/480$ (2) $70/969$ (3) $105/1469$ (4) $70/769$

43. If five chocolates are drawn from the bag at random, what is the probability that the total cost of these chocolates is greater than Rs. 12.5?

- (1) $2893/2921$ (2) $2893/4032$ (3) $2488/2907$ (4) $2893/2907$

44. Five chocolates are drawn from the bag one after the other and every time a chocolate is removed it is replaced with a new chocolate costing Rs. 2.5. What is the probability that the 1st, 2nd, 3rd, 4th and 5th chocolates drawn from the bag cost Rs. 10, Rs. 5, Rs. 2.5, Rs. 5 and Rs. 2.5 respectively?

- (1) $\frac{12 \times 10^3}{19^5}$ (2) $\frac{6720}{19^5}$ (3) $\frac{132 \times 10^2}{19^5}$ (4) $\frac{132 \times 10^3}{19^4}$

45. If the number of chocolates costing Rs. 10 is reduced to four, the number of chocolates costing Rs. 5 is increased to six and the number of chocolates costing Rs. 2.5 is reduced to five, then what is the probability that the cost of 5 chocolates drawn at random adds up to Rs. 25?

- (1) $1001/3003$ (2) $202/3003$ (3) $606/1001$ (4) $202/1001$

CLOCKS AND CALENDARS

PRACTICE TEST 1

1. What is the angle (in $^{\circ}$) between the two hands of a clock at 2:35 a.m.?
 (1) $122\frac{1}{2}$ (2) $142\frac{1}{2}$ (3) $132\frac{1}{2}$ (4) $116\frac{1}{2}$
2. If 6th March, 2005 is a Monday, what was the day of the week on 6th March, 2004?
 (1) Saturday (2) Sunday (3) Monday (4) Tuesday
3. A watch that gains uniformly is 3 minutes slow at noon on this Tuesday and shows the correct time on the Saturday of this week at 3 p.m. How much gain will it gain from noon of this Tuesday to 9 a.m. next Tuesday?
 (1) 4 minutes 50 seconds (2) 4 minutes 48 seconds
 (3) 5 minutes (4) 5 minutes 12 seconds
4. How many times do the hands of a clock coincide in a day?
 (1) 22 (2) 20 (3) 21 (4) 23
5. How many days are there in x weeks and x days?
 (1) $7x^2$ (2) $7x$ (3) $14x$ (4) $8x$
6. What will be the time when the minute hand coincides with the hour hand between 3 and 4 o'clock?
 (1) $15\frac{7}{5}$ minutes past 3. (2) $16\frac{4}{11}$ minutes past 3.
 (3) 15 minutes past 3. (4) $12\frac{5}{11}$ minutes past 3.
7. Today is 3rd November. The day of the week is Monday. What will be the day of the week on this date in the third year from now?
 (1) Tuesday (2) Thursday (3) Friday (4) Cannot be determined
8. On which day of the week does 17th May, 2003 fall?
 (1) Saturday (2) Monday (3) Tuesday (4) Friday
9. At what time between 9 and 10 o'clock will the hands of a watch be together?
 (1) 45 minutes past 9 (2) 50 minutes past 9
 (3) $49\left(\frac{1}{11}\right)$ minutes past 9 (4) $48\left(\frac{2}{11}\right)$ minutes past 9
10. At what time between 1 a.m. and 2 a.m. do the hands of a clock coincide with each other?
 (1) $1:05\frac{5}{11}$ (2) $1:05\frac{6}{11}$ (3) $1:02\frac{8}{11}$ (4) 1:02
11. What is the angle between the hour hand and the minute hand of a clock when the time is 4:30?
 (1) $\left(82\frac{22}{31}\right)^{\circ}$ (2) 93° (3) 45° (4) $\left(51\frac{14}{9}\right)^{\circ}$
12. What is the angle between the hour hand and the minute hand when the time is 2:25?
 (1) $\left(65\frac{2}{5}\right)^{\circ}$ (2) 155° (3) $\left(77\frac{1}{2}\right)^{\circ}$ (4) 75°

- 13.** It was Sunday on Jan 1, 2006. What was the day of the week on Jan 1, 2010?
 (1) Sunday (2) Saturday (3) Friday (4) Thursday
- 14.** At what time between 5 p.m. and 6 p.m., will the hands of a clock be at an angle of 62° w.r.t. each other?
 (1) 5 hours $17\frac{2}{11}$ minutes (2) 5 hours $38\frac{6}{11}$ minutes
 (3) 5 hours 16 minutes (4) Both (2) and (3)
- 15.** Between 4:00 and 5:00, the hour hand and minute hand form a right angle twice. What is the time difference (in minutes) between these two timings?
 (1) $32\left(\frac{8}{11}\right)$ (2) $34\left(\frac{5}{11}\right)$ (3) 35 (4) $33\left(\frac{9}{11}\right)$
- PRACTICE TEST 2**
- 16.** At what time between 7:30 and 8:00 will the hands of a clock be at right angles to each other?
 (1) $7:55\frac{6}{11}$ (2) $7:54\frac{6}{11}$ (3) $7:54\frac{5}{11}$ (4) $7:55\frac{5}{11}$
- 17.** A clock which was set right on 9 a.m. shows 3:05 p.m. instead of 3 p.m. on the same day. What time will it show at 6 p.m. on the next day?
 (1) 6:27:30 p.m. (2) 6:15:50 p.m. (3) 6:24:30 p.m. (4) 6:21:50 p.m.
- 18.** Mahesh has two watches. Watch P gains 30 minutes in 8 hours and watch Q loses 15 minutes in 180 minutes. If they are set for the right time at 5 p.m., what will be the difference between the time shown by both watches at 10 p.m. on the same day?
 (1) 40 minutes (2) 37.75 minutes (3) 52.5 minutes (4) None of the above
- 19.** How many degrees does the minute hand gain over the hour hand in 15 hours?
 (1) 45 (2) 65 (3) 185 (4) 31
- 20.** In 2015, 2nd October was celebrated on a Friday. When will it fall on a Friday again?
 (1) 2018 (2) 2019 (3) 2020 (4) 2021
- 21.** If you were born on 28th January 1988, which was a Tuesday, on what day of the week was your birthday in 1989?
 (1) Friday (2) Thursday (3) Tuesday (4) Wednesday
- 22.** Today is Monday. What will be the 61st day after today?
 (1) Tuesday (2) Wednesday (3) Thursday (4) Saturday
- 23.** What day of the week was 20th June 1837, if the first day of the calendar was a Sunday?
 (1) Monday (2) Tuesday (3) Thursday (4) Friday
- 24.** A clock is rotated at its place through a certain angle such that, at noon, the minute hand is pointing towards the west. In which direction will the minute hand point at 6:30 p.m.?
 (1) South (2) East (3) West (4) North
- 25.** The minute hand of a clock overtakes the hour hand at intervals of 66 minutes of the correct time. How much in a day does the clock gain or lose?
 (1) $10\left(\frac{113}{121}\right)$ minutes (2) $11\left(\frac{115}{121}\right)$ minutes (3) $11\left(\frac{109}{121}\right)$ minutes (4) $10\left(\frac{104}{121}\right)$ minutes

26. A watch which gains uniformly is 2 minutes slow at noon on Monday and 4 minutes, 48 seconds fast at 2 p.m. on the following Monday. When was it correct?
 (1) 2 p.m. on Tuesday (2) 2 p.m. on Wednesday (3) 3 p.m. on Thursday (4) 1 p.m. on Friday

27. What is the day of the week on 16th July, 1776; if 1-1-1 is Monday?
 (1) Monday (2) Tuesday (3) Wednesday (4) Thursday

28. Two clocks show the same time at 6 p.m. on a certain day. The first clock loses 20 minutes every 2 hours and the second gains 5 minutes every hour. After how many days will both show the same time again?
 (1) 0.5 (2) 1 (3) 1.5 (4) 2

29. At what time between 7 and 8 o'clock when the hands of a clock are 4 minutes apart?

- (1) $33\frac{9}{11}$ past 7 (2) $42\frac{6}{11}$ past 7 (3) $41\frac{3}{11}$ past 7 (4) Both 1 and 2

30. For a clock, the total area covered by the hour hand in 2 days is $\frac{2}{3}$ rd of the total area covered by the minute hand in one day. What is the ratio of the length of the minute hand to the length of the hour hand?

- (1) 2 : 1 (2) 1 : 2 (3) 4 : 1 (4) 1 : 4

PRACTICE TEST 3

31. What can be the angle between the hands of a clock at 7 p.m., if we count clockwise?

- (1) 210° (2) 150° (3) 135° (4) 210° or 150°

32. If February 1 is a Monday, how many Mondays occur in that particular month?

- (1) 5 (2) 4 (3) 3 (4) Cannot be determined

33. At what time between 3 and 4 p.m. do the minute and hour hand of the clock form a straight line but not overlap?

- (1) $43\frac{2}{11}$ mins past 3 (2) 40 mins past 3 (3) $45\frac{5}{11}$ mins past 3 (4) $49\frac{1}{11}$ mins past 3

34. Imagine that a calendar year had 436 days and each week in that year had 9 days. How many odd days would that year have?

- (1) 0 (2) 2 (3) 7 (4) 4

35. If January 26, 2003 is a Sunday, what day of the week was January 26, 1903?

- (1) Sunday (2) Monday (3) Tuesday (4) Wednesday

36. A clock gains 2 seconds every hour. On Friday at 10:30 p.m. the clock was running slow by 3 minutes. By what time will the clock show the correct time?

- (1) 4:30 p.m. Tuesday (2) 2:30 p.m. Tuesday (3) 6:30 p.m. Monday (4) 4:30 a.m. Tuesday

37. Rohan has two sons. If the birthday of the first son is on the fifth Wednesday of October, when is the birthday of the second son? The second son's birthday is ten days after the first son's birthday.

- (1) 8th (2) 9th (3) 10th (4) Cannot be determined

38. A clock loses 2% of the actual time elapsed during the first week and gains 1% of the actual time elapsed in the second week. If clock was set right on 05 Feb at 1 p.m., what time will it show at 1 p.m. on 19 Feb?

- (1) 12:08 p.m. (2) 11:36 a.m. (3) 12:16 p.m. (4) 11:19 a.m.

39. If there are exactly 25 leap years in a period, there must be _____. (A "century" below represents any year divisible by hundred.).
- Statement 1: at least one century in that period.
 Statement 2: at least two centuries in that period.
 Statement 3: at most one century in that period.
 Statement 4: at most two centuries in that period.
- Which of the given statement(s) satisfy the condition?

(1) 2 and 4 only (2) 1 and 3 only (3) 1 and 4 only (4) 1, 2 and 3 only

40. Clocks P and Q are set at the correct time at 12 p.m. on Saturday. P gains 12 minutes every 3 hours and Q loses 36 minutes every 6 hours. After how many days do the clocks show the right time at 12 noon?

(1) 25 (2) 30 (3) 24 (4) 36

41. A month has only one odd day. Which of these years is it?

(1) 1800 (2) 2200 (3) 2800 (4) 1400

42. How many times does the 29th day of the month occur in 400 consecutive years?

(1) 4497 (2) 4498 (3) 4499 (4) 4500

43. Nachiket has two wrist watches - A and B. He set the right time as 6 p.m. on both watches and set an alarm of 6 a.m. for the next day. Watch A gains 30 seconds per 30 minutes and B loses 60 seconds per 30 minutes. What will be the time shown in watch B when the alarm in watch A rings?

(1) 5:35:36 a.m. (2) 5:28:30 a.m. (3) 5:24:36 a.m. (4) None of the above

44. A test was started by Rahul at a certain time between 5 o'clock and 6 o' clock and ended between 6 o' clock and 7 o' clock. When the test ended, the minutes and hours hands interchanged their positions with those when he started. How much time did he take for the test?

(1) 45 minutes (2) $47\frac{4}{9}$ minutes (3) $52\frac{3}{11}$ minutes (4) $55\frac{5}{13}$ minutes

45. At 4:05 p.m. on a certain day, Rohit sees the angle between the two hands of his clock as 92.5° . At what time should Abhro see the clock to observe the same angle?

(1) 4:39 p.m. (2) 5:10 p.m. (3) 5:44 p.m. (4) 7:21 p.m.

VENN DIAGRAMS

PRACTICE TEST 1

1. Out of 100 students, 20 passed in both Maths and English and 45 passed only in Maths. How many students passed only in English? Each student passed in atleast one subject.

(1) 25 (2) 35 (3) 30 (4) 40

2. 30 children went to an ice-cream parlour. 4 of them ordered only Vanilla ice-cream, 8 ordered only Strawberry ice-cream and 8 ordered only Chocolate ice-cream. 4 of them ordered all three flavours. 3 of them ordered only Vanilla and Strawberry, 2 of them ordered only Vanilla and Chocolate while 1 ordered only Chocolate and Strawberry. How many of them ordered Strawberry?

(1) 4 (2) 8 (3) 12 (4) 16

3. Out of 50 MA students, 36 have chosen Psychology as their major subject and 24 have chosen Sociology. 7 students have opted for a subject other than Psychology and Sociology as their major subject, how many people have opted for a double major in Psychology and Sociology?

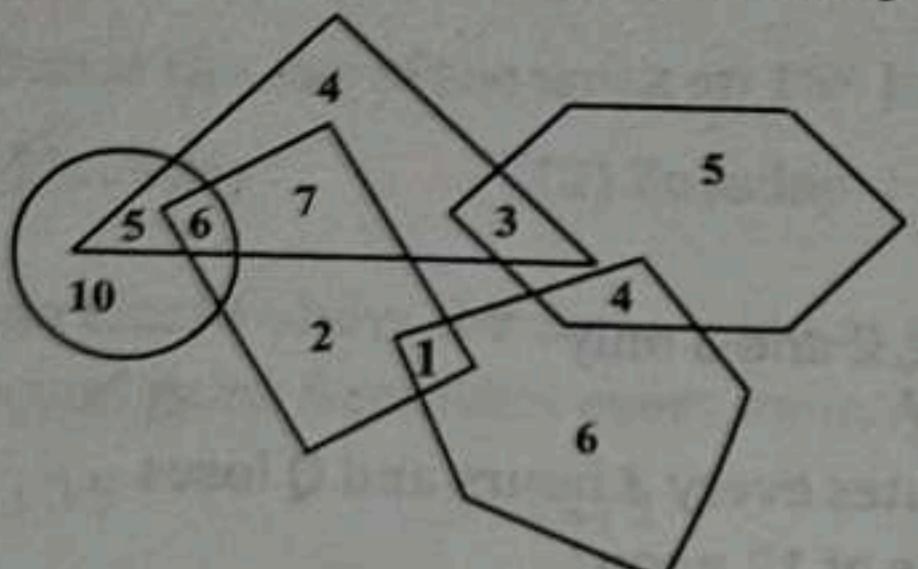
(1) 15

(2) 17

(3) 10

(4) 12

4. In the figure below, the triangle depicts teachers, the circle depicts students, the hexagon depicts married people, the rectangle depicts drivers and the pentagon cricket players. How many people are married teachers?



(1) 3

(2) 2

(3) 1

(4) 4

5. Of the 500 businessmen surveyed, 78% said that they use their laptops at home, 65% said that they use them in hotels, and 52% said that they use them both at home and in hotels. How many businessmen surveyed do not use their laptops either at home or in hotels?

(1) 45

(2) 55

(3) 65

(4) 95

6. If P and Q are sets and $(P \cup Q) = (P \cap Q)$; then which of the statements below is true?

(1) $P = Q$ (2) P is a subset of Q (3) $P = \emptyset$ (4) $Q = \emptyset$

7. The degree of the polynomial $\frac{4xy^2}{z^3} - \frac{8x^{10}y^2}{z^8} + \frac{14x^{14}y^8}{x^{12}}$ is

(1) 0

(2) 4

(3) 10

(4) 14

Direction for questions 8 and 9: There are three sets – P, Q and R – that can be combined in different ways.

Type (1): P includes part of Q and part of R but Q and R are independent of each other.

Type (2): P includes Q and part of R but Q is independent of R

Type (3): All of P, Q and R include parts of one other

Type (4): P includes both Q and R

Note: Assume P, Q and R to be in the same order as the entity given in the question

8. Which of the above types represents the relation between Motherboard, CPU and RAM?

(1) a

(2) b

(3) c

(4) d

9. Hospitality, Oyo Rooms, ITC

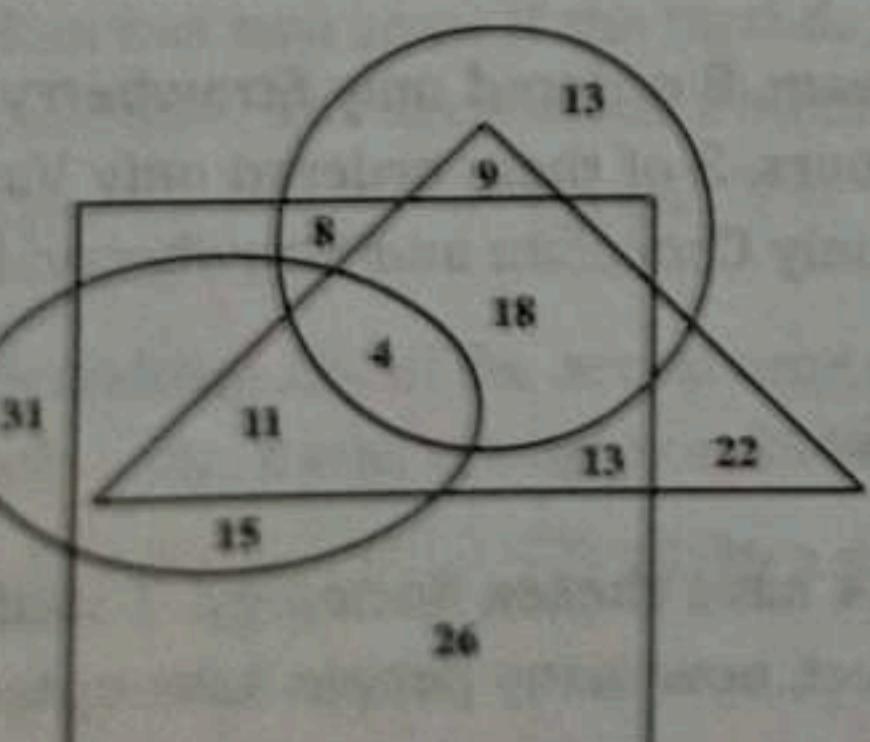
(1) a

(2) b

(3) c

(4) d

10. The following Venn diagram represents the number of people who showed interest in buying different cars: Santro, Matiz, Wagon R and Polo. Santro is represented by the circle, Matiz by the triangle, Wagon R by the square and Polo by the oval.



- How many people are interested in Matiz, Santro as well as Polo?
- (1) 11 (2) 15 (3) 4 (4) 13
11. There are 400 members in a society. The number of members who drink both coffee and tea is the same as the number of members who do not drink tea. The number of members who drink neither tea nor coffee is the same as the number of members who drink coffee. How many members drink only coffee?
- (1) 50 (2) 100 (3) 0 (4) Cannot be determined
12. Among 100 people of a residential complex, 25 subscribed to Magazine A, 29 subscribed to Magazine B and 61 subscribed to at least two of these magazines and 2 subscribed to all three magazines. How many people are not subscribers of any of the three magazines?
- (1) 58 (2) 42 (3) 54 (4) 60
13. In a survey in a city, 80% of the respondents like action movies and 60% like romantic movies. If the percentage of those who like both genres is maximized, what percent would like neither action nor romance?
- (1) 10 (2) 0 (3) 20 (4) Cannot be determined
14. If $a^2 + b^2 + 6a - 10b + 34 = 0$, what is the value of $a^2 + b^2$? Assume that a and b are integers.
- (1) 46 (2) 56 (3) 34 (4) 39
15. If $y^2 + 7y + 3 = 0$, what is the value of $y^3 + (27/y^3)$?
- (1) -240 (2) 360 (3) -280 (4) -320
- PRACTICE TEST 2**
16. 300 students appeared for a test. 40% of the students passed in English, 35% students passed in Maths and 10% students passed in both. How many students failed in both the subjects?
- (1) 90 (2) 105 (3) 120 (4) 100

Directions for questions 17 to 21: Answer the following questions based on the information given below:

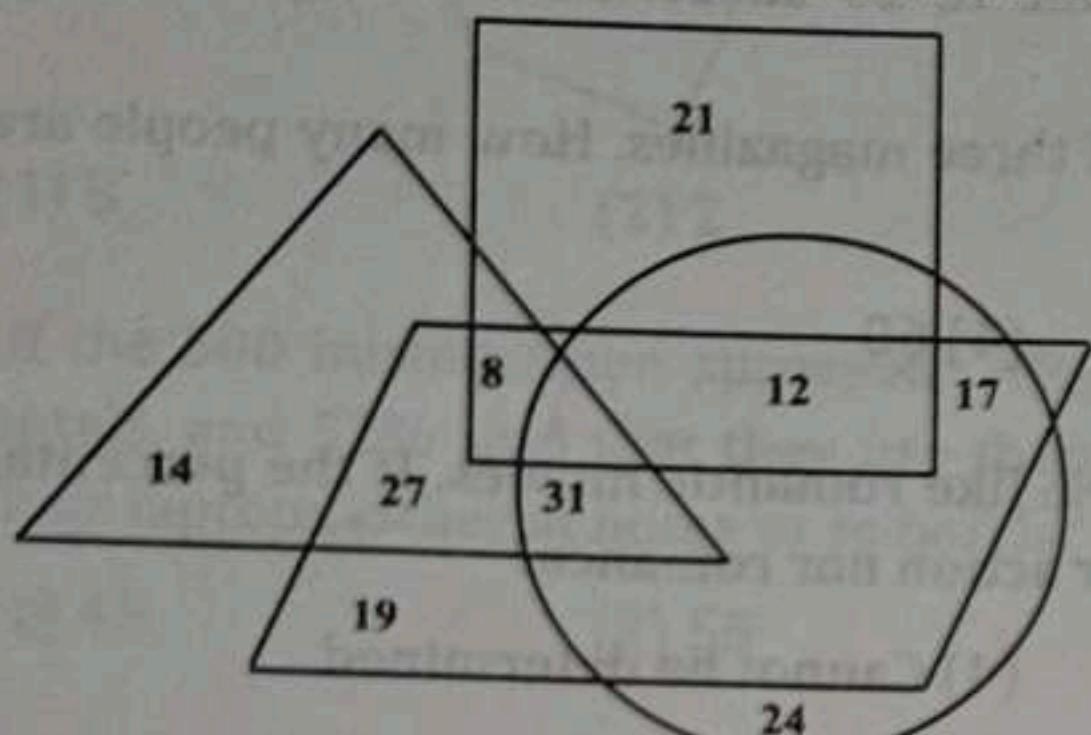
In a survey conducted at a University, it was found that 51% of the students wanted to learn French as a foreign language, 48% wanted to learn German and 52% wanted to learn Russian. Of the surveyed students, 21% wanted to learn both French and German, 23% wanted to learn both German and Russian and 24% wanted to learn both French and Russian. Only 12% wanted to learn all three languages. A total of 500 students were surveyed.

17. How many students wanted to learn only German?
- (1) 240 (2) 80 (3) 90 (4) 70
18. How many students were interested in French and Russian only?
- (1) 60 (2) 24 (3) 12 (4) 78
19. How many students who wanted to learn French or Russian did not want to learn German?
- (1) 420 (2) 395 (3) 235 (4) 175
20. How many students were not interested in studying any of the languages?
- (1) 0 (2) 5 (3) 20 (4) 25
21. What is the ratio of the number of students interested in exactly two languages to those interested in only one language?
- (1) 8 : 13 (2) 16 : 17 (3) 32 : 51 (4) 31 : 52

22. Out of 134 students, 42 students participated in drama competition, 54 students participated in dance competition, 38 students participated in singing competition. 10 students participated in both drama and dance but not in singing competition, 8 students participated in both dance and singing but not in drama competition, 12 students participated in both drama and singing but not in dance competition and 4 students participated in all three competitions. How many students have participated in only drama competition?

- (1) 42 (2) 16 (3) 38 (4) 44

23. The students of a college were asked to name the best teacher in their college. In the following figure, the parallelogram represents Mohan. For how many students is Mohan not the best teacher?

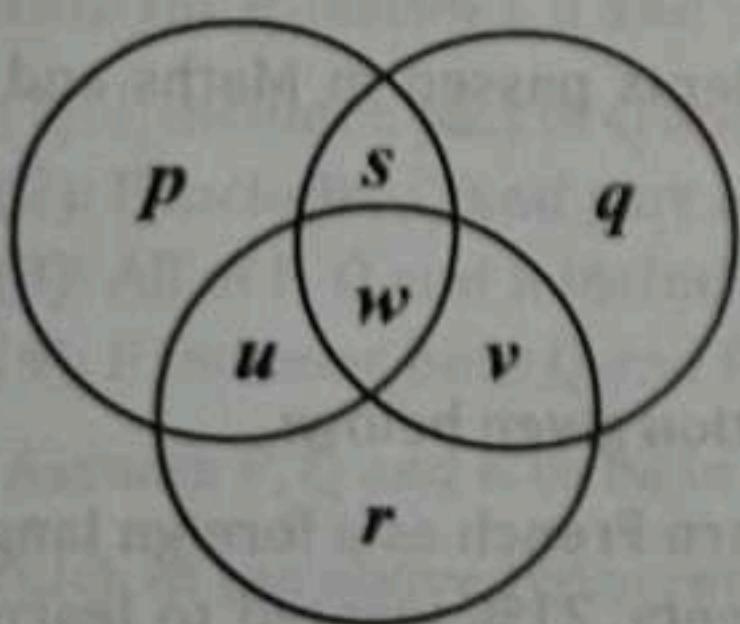


- (1) 93 (2) 132 (3) 79 (4) 59

24. If A and B are mutually exclusive and $A = 32$ and $B = 21$, what is the value of $A \cup B$?

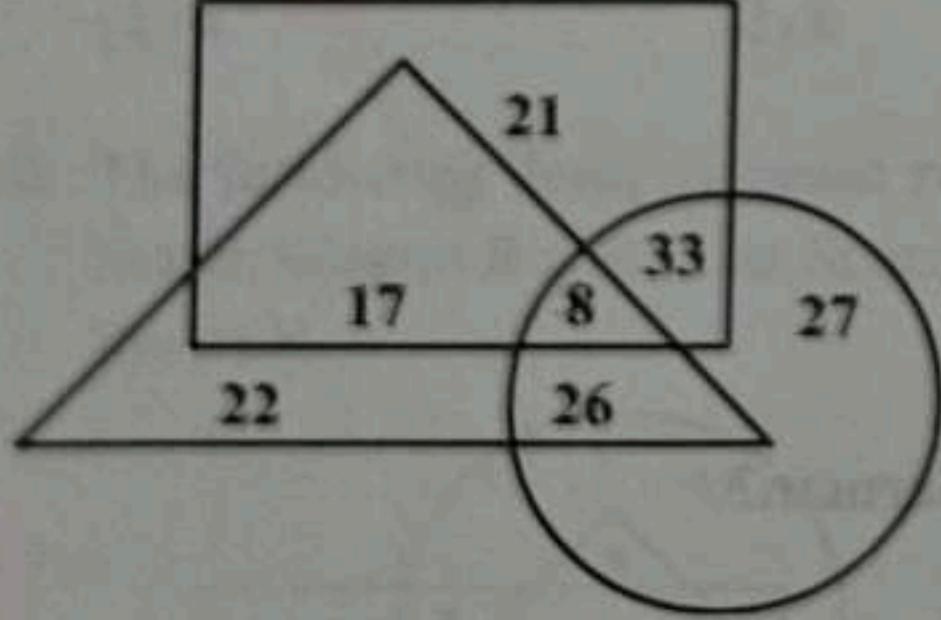
- (1) 11 (2) 53 (3) 32 (4) 21

25. In the figure below, p, s, w, u are in A.P. with $p < s < w < u$. Also q, s, w, v are in A.P. with $q < s < w < v$. It is known that $r = 5$ and $p = 1$. If the common difference of both A.P.s is 1, what is the value of $p + 2s + 3w + 2u + 2v + q + r$?



- (1) 26 (2) 28 (3) 30 (4) 36

Directions for questions 26 to 30: Answer the following questions based on the information given below:



165 people were surveyed to know the festivals they celebrate. In the figure, the rectangle represents the number of people who celebrate Diwali, the circle represents the number of people who celebrate Navratri and the triangle represents the number of people who celebrate Holi.

26. How many people surveyed celebrate exactly one festival?

- (1) 59 (2) 60 (3) 70 (4) 79

27. How many people celebrate both Diwali and Holi but not Navratri?
 (1) 17 (2) 25 (3) 60 (4) 68
28. How many people do not celebrate at least one festival?
 (1) 0 (2) 9 (3) 11 (4) 10
29. What is the difference in the number of people who celebrate all the festivals and those who celebrate a maximum of two festivals?
 (1) 138 (2) 145 (3) 147 (4) 149
30. If among those people who celebrate all the festivals, 3 people stopped celebrating Holi, but continue celebrating the other two festivals, then how many people now celebrate exactly two of the three festivals?
 (1) 87 (2) 84 (3) 76 (4) 79

PRACTICE TEST 3

Directions for questions 31 to 35: Answer the following questions based on the information given below:

A survey conducted at an ice cream parlour revealed the following information. A total of 53% people liked chocolate ice creams, 44% liked strawberry ice creams while 50% people liked vanilla ice creams. 10% people liked chocolate and strawberry ice creams, 13% liked vanilla and chocolate ice creams whereas 11% liked strawberry and vanilla ice creams. 8% people liked all three flavours. A total of 300 people were surveyed.

31. How many people liked only chocolate ice creams?

(1) 55 (2) 45 (3) 66 (4) 60

32. How many people liked vanilla or strawberry but didn't like chocolate ice creams?

(1) 115 (2) 120 (3) 130 (4) 132

33. How many people liked exactly one flavour?

(1) 178 (2) 186 (3) 154 (4) 165

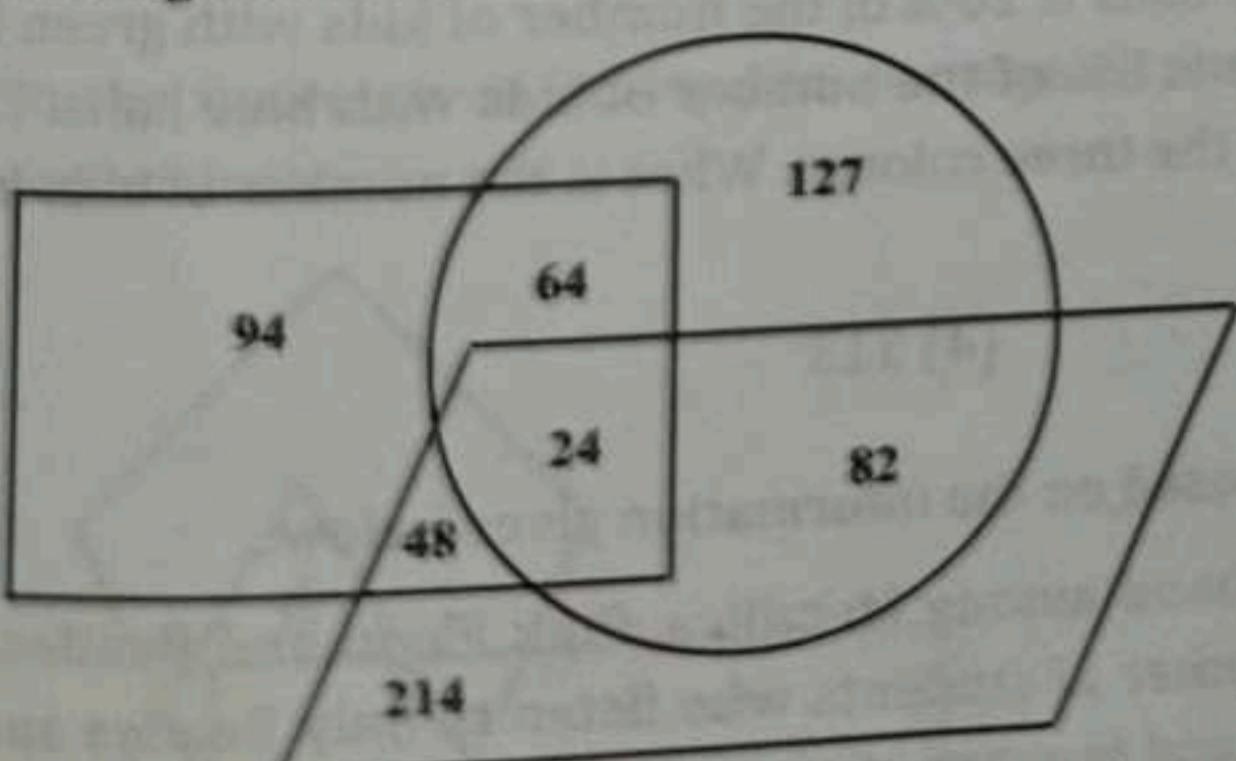
34. How many people didn't like any ice cream flavour?

(1) 9 (2) 11 (3) 5 (4) 8

35. How many people liked all three flavours?

(1) 18 (2) 24 (3) 42 (4) 36

36. The figure below shows the votes received by A, B and C.



A voter can vote for any number of candidates, but has to vote for atleast one candidate. The circle, parallelogram and rectangle correspond to A, B and C respectively. What percentage of people did not vote for B? The rectangle is not to be considered a parallelogram.

(1) 48% (2) 38% (3) 44% (4) 40%

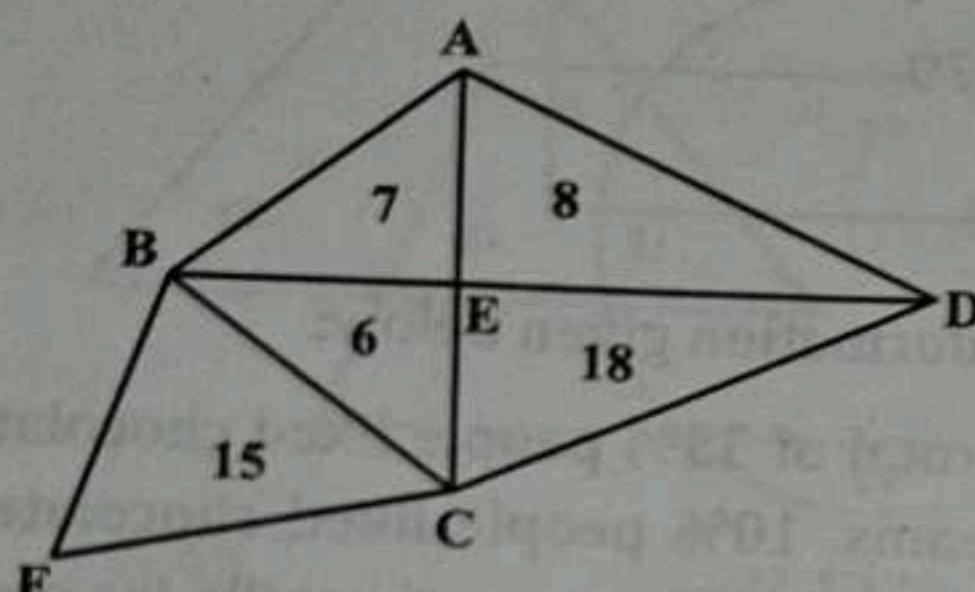
37. In a class of 60 students, 36 students play cricket, 27 students play football and 14 play both cricket as well as football. What is the difference between number of students playing both the games and the number of students not playing either of the given game?

(1) 11 (2) 3 (3) 5 (4) 7

38. In a class of 50 students, 16 participated in dance and drama while 32 participated in dance. If each student participated in atleast one event, how many students participated in only drama?

(1) 14 (2) 34 (3) 16 (4) 18

39. In the figure below, FBECF represents the people who read The Hindu. ABCDEA represents the people who read India Today. BADB represents the people who read The Economic Times. The figures given are the number of people reading that particular daily. How many people read at least two dailies?



(1) 13 (2) 24 (3) 14 (4) 15

40. All Aunts are Efficient. One-third of all Efficient are Aunts. Half of all Technicians are Efficient. One Technician is an Aunt. Eight Technicians are Efficient. If the number of Efficient is 90, how many Efficient are neither Aunt nor Technician?

(1) 65 (2) 79 (3) 82 (4) 53

41. 71 students in a school play atleast one of Golf, Volleyball and Cricket. 40 students play Golf, 30 students play Cricket and 30 students play Volleyball. 15 students play both Golf and Cricket, and 14 students play both Cricket and Volleyball. The number of players who play Golf and Volleyball is the same as the number of players playing all three games.

What is the maximum number of players playing all three games?

(1) 16 (2) 14 (3) 25 (4) 15

42. Kids in a playhouse play with red, blue and green plastic balls. Each kid has at least one ball. The number of kids with red balls is 50% of the number of kids with blue balls. The number of kids with green balls is 75% of the number of kids with red balls. The number of kids with red and blue balls but not green balls is 10% of the number of kids with red balls. The number of kids with red and green balls but not blue balls is 20% of the number of kids with green balls and the number of kids with blue and green balls but not red balls is 8% of the number of kids with green balls. There are 200 kids who have blue balls and 10 kids who have balls of all the three colours. What is the number of kids in the play house?

(1) 316 (2) 315 (3) 314 (4) 313

- Direction for questions 43 and 44:** Answer the following questions based on the information given below:
In a class of 100 students, except 3, everyone listens to at least one band among Metallica, Pink Floyd and Beatles. The number of students who listen to only Metallica is one-fourth the number of students who listen to only Beatles and the number of students who listen to only Pink Floyd is 20 more than the total number of students who listen to only Beatles and the number of students who listen to only Beatles. 10 students listen to all three bands and 27 students listen to at least two of them. The number of students who listen to Metallica is 20 less than the number of students who listen to only Pink Floyd.

43. How many students listen to Pink Floyd and Beatles but not Metallica?

- (1) 6 (2) 7 (3) 8 (4) 9

44. How many students listen to exactly one of the three bands?

- (1) 60 (2) 80 (3) 70 (4) 73

45. A survey is conducted amongst 300 graduates about the sector in which they want to work. The responses are confined to FMCG, Banking, Consultancy and none of those three. 114 people want to go for FMCG.

102 candidates want to go for Banking

150 graduates want to go for Consultancy

24 graduates want to go for FMCG and Banking

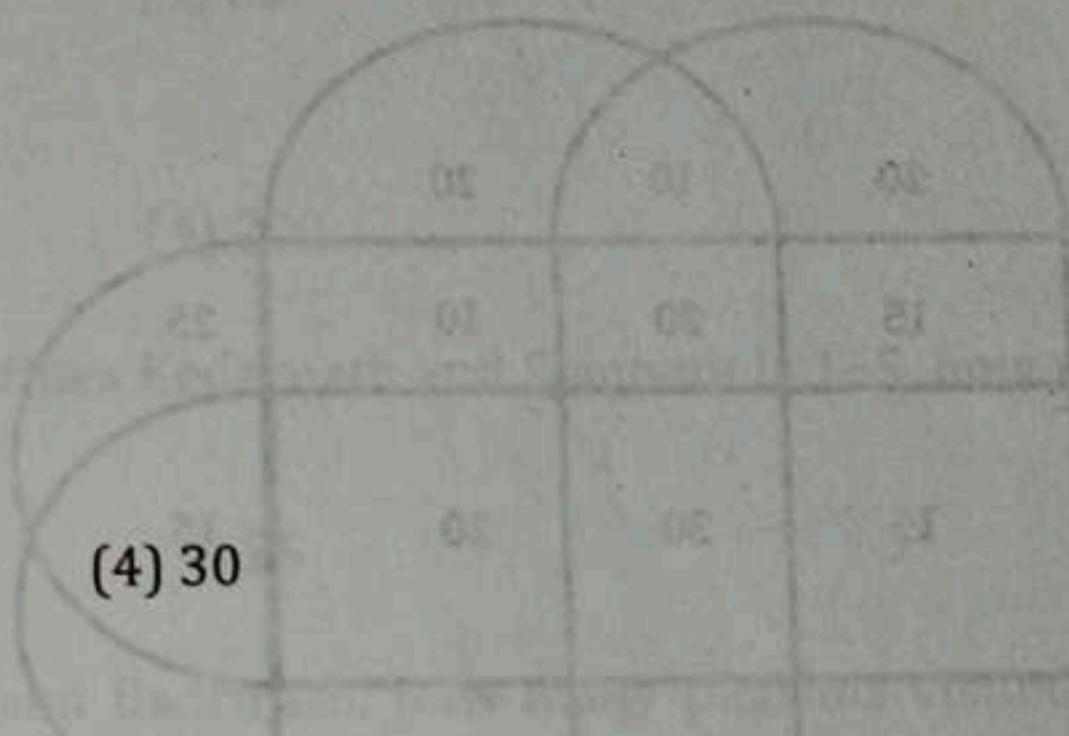
45 graduates want to go for Banking and Consultancy

36 graduates want to go for FMCG and Consultancy

9 people want to go for all three sectors

How many graduates want to go for none of the three sectors?

- (1) 15 (2) 20 (3) 25 (4) 30



PRACTICE TEST 4

Directions for questions 46 to 48: Answer the following questions based on the information given below:

Students of L.S.A play atleast one of kabaddi, khokho and throwball. It is known that:

The number of children who play kabaddi = 88

The number of children who play kho - kho = 108

The number of children who play throwball = 121

The number of people who play only kabaddi is 3 more than $(5/8)^{\text{th}}$ of the number of children who play kabaddi

The number of people who play only kho - kho is $(3/4)^{\text{th}}$ that of the number of children who play kho - kho.

The number of people who play only throwball is 1 more than $(8/11)^{\text{th}}$ of the number of children who play throwball.

The number of children who play all three sports = 15

46. What is the number of students in L.S.A?

- (1) 260 (2) 265 (3) 165 (4) 200

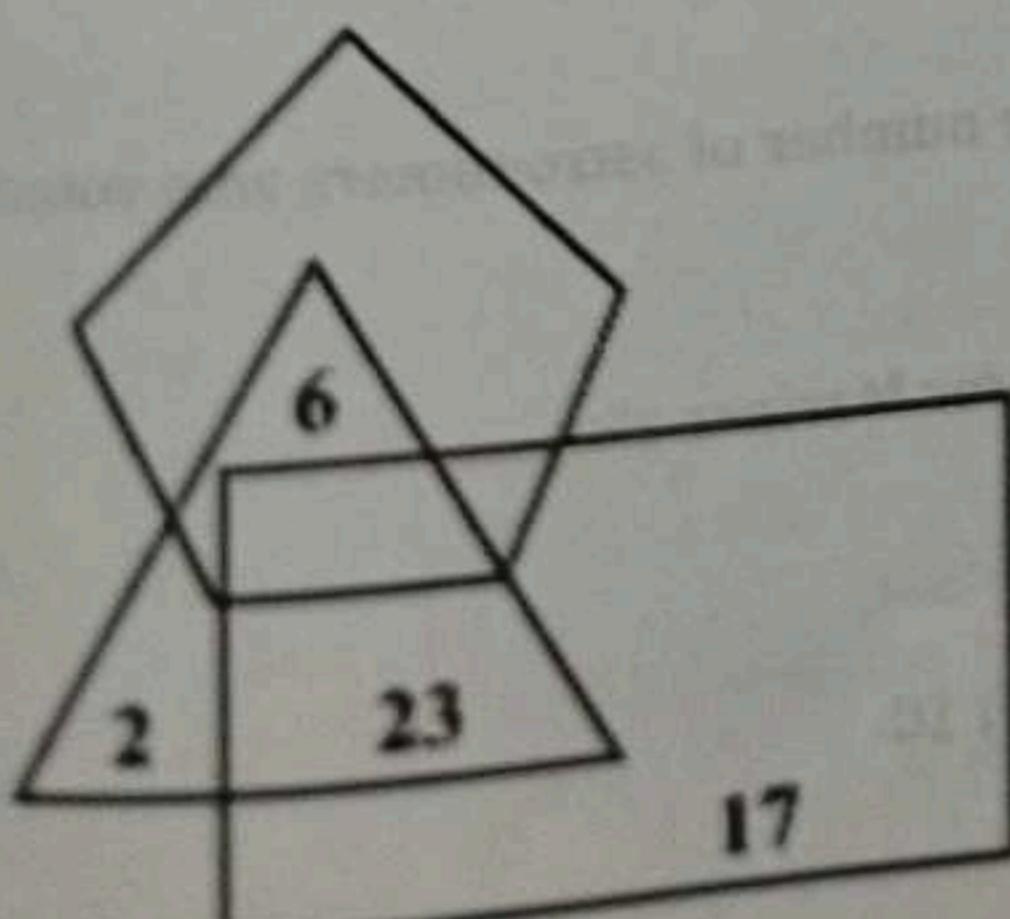
47. How many children play atleast two sports?

- (1) 32 (2) 33 (3) 34 (4) 35

48. How many children play throwball but not kabaddi?

- (1) 96 (2) 94 (3) 93 (4) 91

49. In the figure given below, the pentagon, triangle and rectangle denote people who have seen movies A, B and C respectively.

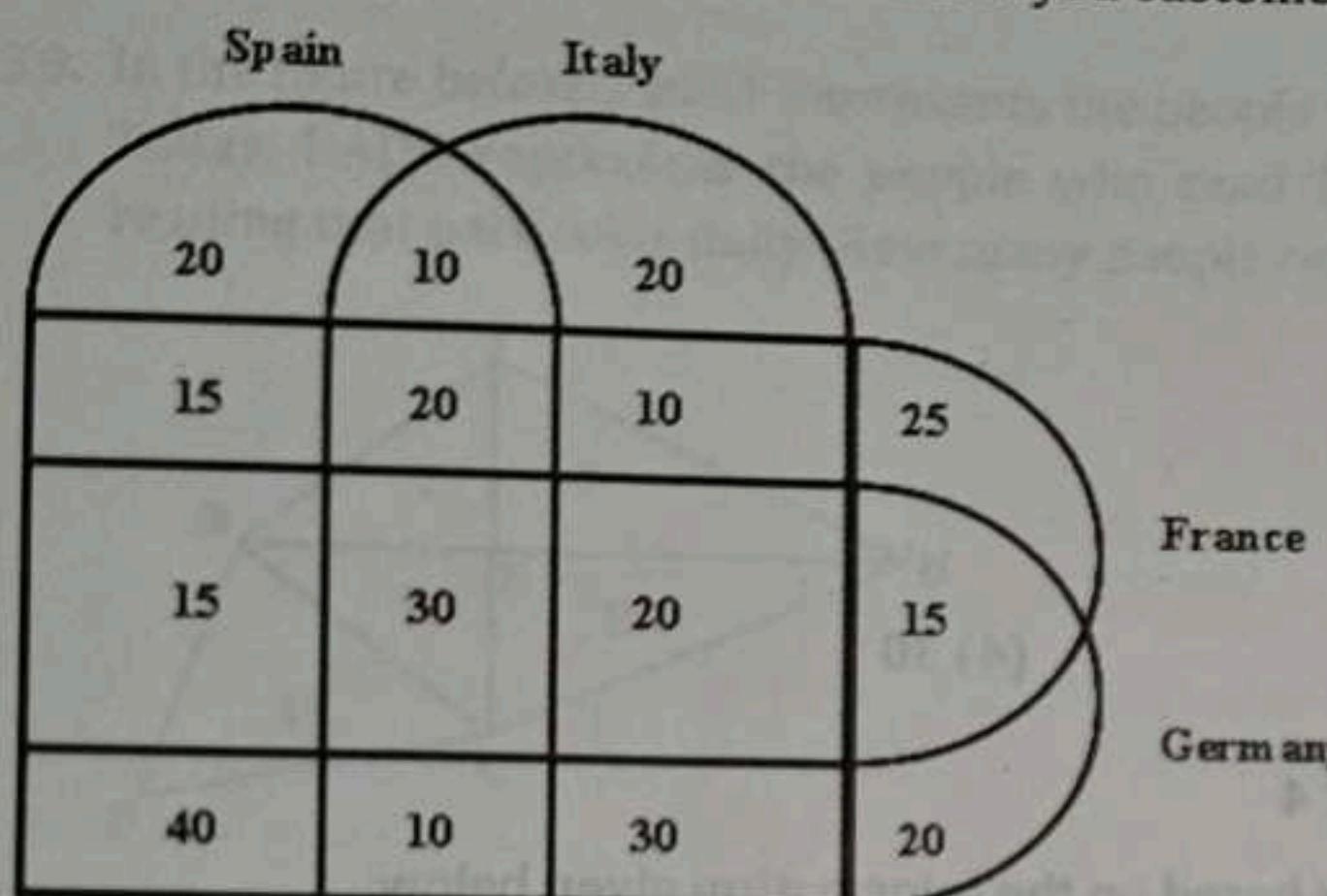


47 people have seen movie B. 13 people have seen movies A and C but not B. If 5 people have seen only movie A, how many people have seen movie A in all?

- (1) 40 (2) 27 (3) 32 (4) None of the above

Directions for questions 50 to 53: Answer the following questions based on the information given below:

A travel agency conducted a customer survey to identify the preference for four European countries: Spain, Italy, France and Germany. Each surveyed customer wanted to visit at least one of these countries. The Venn diagram below represents the country-wise preferences of the surveyed customers.



50. What is the total number of customers surveyed?

- (1) 250 (2) 300 (3) 350 (4) 200

51. How many customers wanted to visit at most two countries?

- (1) 105 (2) 175 (3) 205 (4) 255

52. What is the ratio of number of customers who wanted to visit exactly three countries to the number of customers who wanted to visit exactly one country?

- (1) 13 : 17 (2) 3 : 11 (3) 5 : 7 (4) 11 : 3

53. What is the difference between the number of customers who wanted to visit at most two countries and the number of customers who wanted to visit exactly two countries?

- (1) 70 (2) 75 (3) 80 (4) 85

Directions for questions 54 and 55: Answer the following questions based on the information given below:

150 Astronomers were interviewed and asked which amongst Marsnik, Mariner and Viking is/are their favourite mission(s) to Mars. The following responses were obtained:

- The number of astronomers naming Mariner as one of their favourite missions is 3 times the number of astronomers naming Marisnik as well as Viking.
- The number of astronomers whose favourite mission is Viking only is 42.
- The number of astronomers who voted for all three missions is one-third the number of astronomers who voted only for Marsnik.
- The number of astronomers who voted for Mariner only is 33.
- The number of astronomers who voted for Viking is 83 out of which 26 voted for Mariner also.
- 24 astronomers voted for Marsnik only.

54. How many Astronomers voted for Mariner and Viking but not for Marsnik?

- (1) 18 (2) 15 (3) 8 (4) 10

55. If 10 people voted for Marsnik and Mariner but not Viking, how many astronomers voted for Mariner only?
- (1) 30 (2) 33 (3) 36 (4) 40

Directions for questions 56 to 60: Answer the following questions based on the information given below:

Out of a group of 245 pilgrims, 105 visited Badrinath, 95 visited Kedarnath and 95 visited Somnath. Fifteen of them visited all three shrines, while 190 visited exactly one of the three shrines. The number of pilgrims who visited exactly two out of the three shrines is three times as those who did not visit any one of the shrines.

56. How many pilgrims did not visit any of the shrines?

- (1) 20 (2) 10 (3) 15 (4) 25

57. How many pilgrims visited not more than one shrine?

- (1) 50 (2) 100 (3) 150 (4) 200

58. If the number of pilgrims who have visited at least one of the two shrines Kedarnath and Somnath is 165, how many pilgrims visited only Kedarnath and Somnath?

- (1) 20 (2) 30 (3) 10 (4) 25

59. If 180 pilgrims visited at least one of the two shrines Kedarnath and Badrinath, how many pilgrims visited only Somnath?

- (1) 55 (2) 40 (3) 35 (4) 60

60. If there is nobody who visited only Badrinath and Somnath, how many people visited only Kedarnath?

- (1) 80 (2) 50 (3) 70 (4) 60

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"We must all suffer from one of two pains the pain of discipline or the pain of regret. The difference is discipline weighs ounces while regret weighs tons"



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