ANSWERS WITH EXPLANATION

DATA SUFFICIENCY

1. 4
2. 3; Use the formula:
   Area of square = Side × Side
   Perimetre of a square = 4 × Side
3. 5
4. 2
5. 1; 90 is the only such number
6.
6. 5; **From I and II:**
   Ratio of the length and the breadth
   = 140 : 100 = 7 : 5
   Perimeter of the rectangle = 96 cms
   ie 2(7K + 5K) = 96 cms
   or, K = 4
   ∴ the area of the rectangle
   $= 7K \cdot 5K = 35.K^2 = 35.4^2 = 560\ cm^2$
7. 2; We know difference between CI and SI (for two years)
   $= P \times \frac{r^2}{100^2}$ ie $400 = P \times \frac{r^2}{100^2}$
   Since, we have no information regarding sum (P). Hence, I alone is not sufficient.
   From II: We have sum (P) = x (suppose)
   Time (t) = 5 years
   Interest (I) = x
   We know that the rate of interest
   $= \frac{I \times 100}{P \times t} = \frac{x \times 100}{x \times 5} = 20\%$
8. 4; Neither statement I nor statement II alone is sufficient. Again, since the information given in the two statements contradict each other. Hence, opt answer 4.
9. 3; **From I:** The speed of the train
   $= \frac{250}{10} \times \frac{18}{5} = 90$ km/hr
   From II: The speed of the train
   $= \frac{2502}{20} \times \frac{18}{5} = 90$ km/hr
10. 5; **From I and II:** 24 pencils + 8 pens = ₹ 168
    ie, 216 pencils + 72 pens = ₹ 1512 ..... (i)
    Again,
    9 pencils + 9 pens = ₹ 117
    ie, 72 pencils + 72 pens = ₹ 936 ... (ii)
    From (i) and (ii)
    Cost of 144 pencils = 1512 - 936
    ∴ The cost of 10 pencils
    $= ₹ \frac{(1512 - 936)}{144} \times 10$ (₹ 40)
11. 5; From I and II: We get speed of the running train
    $= \frac{L_1 + L_2}{\text{Time}} = \frac{(180 + 120)}{60} = 5$ m/sec
12. 4; To answer the given question we need some more information.
13. 5; From I and II: We get
    7k - 9k = 5 × 5 × 2 or, 16k = 48 ∴ k = 3
    Thus the required difference between the ages of Samir and Shrikant = 9 × 3 - 7 × 3 = 6 years
14. 2; From II: We get:
    Ratio of the efficiencies of Rakesh and Mohan = 2 : 1
    Since Rakesh alone can complete the work in 10 days, Mohan will complete the same work in (10 × 2 ÷ 1 =) 20 days.
15. 1; **From I:** The required rate of interest = $\frac{100}{5} = 20\%$
16. 5; **From I and II:**
    The speed of the train = $\frac{240}{10} = 24$ m/s
    From II and III:
    The speed of the train = $\frac{240 + 240}{20} = 24$ m/s
17. 2; **From I and II:**
    Suppose the two-digit number is 10x + y. Then from I, we get
    (10y + x) - (10x + y) = 18
    ⇒ 9(y - x) = 18 ∴ y - x = 2 .... (i)
    And from II, we get x + y = 14 ... (ii)
    Solving (i) and (ii), we get x = 6 and y = 8
    Hence, the required number is 10 × 6 + 8 = 68
    From II and III:
    The number is either 68 or 86
18. 4; **From I and II:**
    If 8 men complete the piece of work in 10 days then 16 men will complete the work in 5 days.
    Similarly, if 16 women complete the piece of work in 10 days then 8 women will complete the work in 20 days.
    Hence, the required number of days to complete the piece of work = $\frac{20 \times 5}{20 + 5} = 4$ days.
    Using the above process we can get the answer with the help of I and III also.
19. 5; Look at the following relationships.
    Area of the square
    $= \left(\frac{\text{Diagonal}}{\sqrt{2}}\right)^2 = \text{Side}^2 = \left(\frac{\text{Perimeter}}{4}\right)^2$
    Obviously, any one of the information is enough to get the answer.
20. 4; **From I and II:** For two years
    $\text{Rate} = 2 \times \frac{\text{Difference in CI and SI}}{\text{SI}} \times 100$
    Thus, in this case Rate = $\frac{2 \times 1060}{5300 \times 2} \times 100 = 20\%$
    From III: Using the formula
    $\text{Rate} = \frac{\text{Interest} \times 100}{\text{Amount} \times \text{time}} = \frac{1 \times 100}{1 \times 5} = 20\%$
21. 5; Note that capacity of a cylinder = $\pi r^2 h$
    We have
    I. r : h = 1 : 2 II. $\pi r^2 = 616$ sq m III. h = 28 m
    Combination of any two statements will be sufficient to get the capacity ie $\pi r^2 h$.
22. 4; **From I and III:**
    Required speed = $\frac{300}{18} = 16\frac{2}{3}$ m/sec
    From II and III:
    Required speed = $\frac{(300 + 300)}{36} = 16\frac{2}{3}$ m/sec
23. 5; We need some more information to answer the questions.
24. 2; **From I and II:**
    We get $x - y = \frac{9}{9} = 1$ and x + y = 7
    Solving the above equations we get
    $x = \frac{7 + 1}{2} = 4$ and $y = \frac{7 - 1}{2} = 3$
    Now, since 34 < 43, hence, the number is 34.
    From II and III: We get two possibilities. The number is either 34 or 43.
25. 3; From I, II and III: The required number of articles
    $= \frac{1596}{(765 - 632)} = \frac{1596}{133} = 12$

PERMUTATION, COMBINATION & PROBABILITY

Q.1. In how many different ways can the letters of the word GROUP be arranged?
(1) 120 (2) 60 (3) 48 (4) 720 (5) None of these

Q.2. In how many different ways can the letters of the word LAWYER be arranged?
(1) 120 (2) 60 (3) 48 (4) 720 (5) None of these

Q.3. In how many different ways can the letters of the word ORANGES be arranged?
(1) 120 (2) 5040 (3) 48 (4) 720 (5) None of these

Q.4. In how many different ways can the letters of the word EDUCATION be arranged?
(1) 362880 (2) 181440 (3) 40320 (4) 5040 (5) None of these

Q.5. In how many different ways can the letters of the word TEACHER be arranged?
(1) 5040 (2) 2025 (3) 2520 (4) 50400 (5) None of these

Q.6. In how many different ways can the letters of the word ARRANGEMENT be arranged?
(1) 39916800 (2) 19958400 (3) 9979200 (4) 4989600 (5) None of these

Q.7. In how many different ways can the letters of the word COMMITTEE be arranged?
(1) 36280 (2) 362800 (3) 181440 (4) 90720 (5) None of these

Q.8. In how many different ways can the letters of the word MILLENNIUM be arranged?
(1) 362800 (2) 181440 (3) 90720 (4) 226800 (5) None of these

Q.9. In how many different ways can the letters of the word PANAMA be arranged?
(1) 120 (2) 60 (3) 48 (4) 72 (5) None of these

Q.10. In how many different ways can the letters of the word UMBRELLA be arranged?
(1) 5040 (2) 2520 (3) 1680 (4) 720 (5) None of these

Q. 11-15: Study the information carefully to answer the following questions.

An urn contains 5 red, 3 green, 2 blue and 4 yellow marbles.

Q. 11. If two marbles are picked at random, what is the probability that both are blue?

(1) $\frac{1}{7}$ (2) $\frac{1}{14}$ (3) $\frac{2}{91}$ (4) $\frac{1}{28}$ (5) None of these

Q. 12. If three marbles are picked at random, what is the probability that one is green and two are yellow?

(1) $\frac{3}{14}$ (2) $\frac{2}{91}$ (3) $\frac{9}{182}$ (4) $\frac{7}{545}$ (5) None of these

Q. 13. If two marbles are picked at random, what is the probability that either both are red or both are green?

(1) $\frac{5}{7}$ (2) $\frac{5}{14}$ (3) $\frac{1}{7}$ (4) $\frac{1}{14}$ (5) None of these

Q. 14. If four marbles are picked at random,, what is the probability that none is red?

(1) $\frac{18}{143}$ (2) $\frac{6}{91}$ (3) $\frac{9}{14}$ (4) $\frac{7}{143}$ (5) None of these

Q. 15. If three marbles are picked at random, What is the probability that at least one is yellow?

(1) $\frac{2}{7}$ (2) $\frac{4}{91}$ (3) $\frac{27}{143}$ (4) $\frac{7}{143}$ (5) None of these

Q. 16-20: Study the following information carefully to answer the questions that follow:

A box contains 2 blue caps, 4 red caps, 5 green caps and 1 yellow cap.

Q. 16. If four caps are picked at random, what is the probability that none is green ?

(1) $\frac{7}{99}$ (2) $\frac{5}{99}$ (3) $\frac{7}{12}$ (4) $\frac{5}{12}$ (5) None of these

Q. 17. If two caps are picked at random, what is the probability that both are blue ?

(1) $\frac{1}{6}$ (2) $\frac{1}{10}$ (3) $\frac{1}{12}$ (4) $\frac{1}{45}$ (5) None of these

Q. 18. If one cap is picked at random, what is the probability that it is either blue or yellow ?

(1) $\frac{2}{9}$ (2) $\frac{1}{4}$ (3) $\frac{3}{8}$ (4) $\frac{6}{11}$ (5) None of these

Q. 19. If two caps are picked at random, what is the probability that at least one is red ?

(1) $\frac{1}{3}$ (2) $\frac{16}{21}$ (3) $\frac{19}{33}$ (4) $\frac{7}{19}$ (5) None of these

Q. 20. If three caps are picked at random, what is the probability that two are red and one is green ?

(1) $\frac{9}{22}$ (2) $\frac{6}{19}$ (3) $\frac{1}{6}$ (4) $\frac{3}{22}$ (5) None of these

Q. 21-23: Study the given information carefully and answer the questions that follow. A basket contains 4 red, 5 blue and 3 green marbles.

Q. 21. If three marbles are picked at random, what is the probability that either all are green or all are red?

(1) $\frac{7}{44}$ (2) $\frac{7}{12}$ (3) $\frac{5}{12}$ (4) $\frac{1}{44}$ (5) None of these

Q. 22. If two marbles are drawn at random, what is the probability that both are red ?

(1) $\frac{3}{7}$ (2) $\frac{1}{2}$ (3) $\frac{2}{11}$ (4) $\frac{1}{6}$ (5) None of these

Q. 23. If three marbles are picked at random, what is the probability that at least one is blue ?

(1) $\frac{7}{12}$ (2) $\frac{37}{44}$ (3) $\frac{5}{12}$ (4) $\frac{7}{44}$ (5) None of these

Q. 24-25: Study the given information carefully and answer the questions that follow :

A committee of five members is to be formed out of 3 trainees, 4 professors and 6 research associates. In how many different ways can this be done if —

Q. 24. The committee should have all 4 professors and 1 research associate or all 3 trainees and 2 professors?

(1) 12 (2) 13 (3) 24 (4) 52 (5) None of these

Q. 25. The committee should have 2 trainees and 3 research associates ?

(1) 15 (2) 45 (3) 60 (4) 9 (5) None of these

Q. 26-30: Study the given information carefully and answer the questions that follow:

An urn contains 6 red, 4 blue, 2 green and 3 yellow marbles.

Q. 26. If four marbles are picked at random, what is the probability that at least one is blue?

(1) $\frac{4}{15}$ (2) $\frac{69}{91}$ (3) $\frac{11}{15}$ (4) $\frac{22}{91}$ (5) None of these

Q. 27. If two marbles are picked at random, what is the probability that both are red?

(1) $\frac{1}{6}$ (2) $\frac{1}{3}$ (3) $\frac{2}{15}$ (4) $\frac{2}{5}$ (5) None of these

Q. 28. If three marbles are picked at random, what is the probability that two are blue and one is yellow?

(1) $\frac{3}{91}$ (2) $\frac{1}{5}$ (3) $\frac{18}{455}$ (4) $\frac{7}{15}$ (5) None of these

Q. 29. If four marbles are picked at random, what is the probability that one is green, two are blue and one is red?

(1) $\frac{24}{455}$ (2) $\frac{13}{35}$ (3) $\frac{11}{15}$ (4) $\frac{7}{91}$ (5) None of these

Q. 30. If two marbles are picked at random, what is the probability that either both are green or both are yellow?

(1) $\frac{5}{91}$ (2) $\frac{1}{35}$ (3) $\frac{1}{3}$ (4) $\frac{4}{105}$ (5) None of these

Q. 31-35: Study the given information carefully to answer the questions that follow.
A basket contains 6 blue, 2 red, 4 green and 3 yellow balls.

Q. 31. If 2 balls are picked at random, what is the probability that either both are green or both are yellow?

(1) $\frac{2}{5}$ (2) $\frac{3}{35}$ (3) $\frac{1}{3}$ (4) $\frac{3}{91}$ (5) None of these

Q. 32. If 5 balls are picked at random, what is the probability that at least one is blue?

(1) $\frac{137}{143}$ (2) $\frac{9}{91}$ (3) $\frac{18}{455}$ (4) $\frac{2}{5}$ (5) None of these

Q. 33. If 2 balls are picked at random, what is the probability that both are blue?

(1) $\frac{1}{5}$ (2) $\frac{8}{91}$ (3) $\frac{2}{15}$ (4) $\frac{7}{27}$ (5) None of these

Q. 34. If 4 balls are picked at random, what is the probability that 2 are red and 2 are green?

(1) $\frac{4}{15}$ (2) $\frac{5}{27}$ (3) $\frac{1}{3}$ (4) $\frac{2}{455}$ (5) None of these

Q. 35. If 3 balls are picked at random, what is the probability that none is yellow?

(1) $\frac{3}{455}$ (2) $\frac{1}{5}$ (3) $\frac{44}{91}$ (4) $\frac{4}{5}$ (5) None of these

Q. 36-37: Study the following information carefully to answer the questions that follow:
A committee of five members is to be formed out of 5 Professors, 6 Teachers and 3 Readers.
In how many different ways can it be done if—

Q. 36. The committee should consist of 2 Professors, 2 Teachers and 1 Reader?

(1) 450 (2) 225 (3) 55 (4) 90 (5) None of these

Q. 37. The committee should include all the 3 Readers?

(1) 90 (2) 180 (3) 21 (4) 55 (5) None of these

Q. 38. In how many different ways can 4 boys and 3 girls be arranged in a row such that all the boys stand together and all the girls stand together?

(1) 75 (2) 576 (3) 288 (4) 24 (5) None of these

Q. 39. Out of 5 women and 4 men a committee of three members is to be formed in such a way that at least one member is a woman. In how many different ways can it be done?

(1) 80 (2) 84 (3) 76 (4) 96 (5) None of these

Q. 40. In how many different ways can the letters of the word TOTAL be arranged?

(1) 120 (2) 60 (3) 48 (4) 72 (5) None of these

Q. 41. A palace has total 18 gates of which 2 are permanently closed. To check visitors security men stand on 12 gates. What is the probability that a man can enter the palace unchecked?

(1) $\frac{1}{4}$ (2) $\frac{2}{9}$ (3) $\frac{2}{3}$ (4) Data inadequate (5) None of these

Q. 42-43: Study the information carefully to answer the questions that follow:
A basket contains 3 blue, 2 green and 5 red balls.

Q. 42. If three balls are picked at random, what is the probability that at least one is red ?

(1) $\frac{1}{2}$ (2) $\frac{7}{12}$ (3) $\frac{11}{12}$ (4) $\frac{1}{5}$ (5) None of these

Q. 43. If four balls are picked at random, what is the probability that two are green and two are blue?

(1) $\frac{1}{18}$ (2) $\frac{1}{70}$ (3) $\frac{3}{5}$ (4) $\frac{1}{2}$ (5) None of these

Q. 44. In how many different ways can the letters of the word 'FLEECED' be arranged ?

(1) 840 (2) 2520 (3) 1680 (4) 49 (5) None of these

45-47: Study the information and answer the questions that follow.

A basket contains 3 red balls, 5 blue balls and 2 green balls.

Q. 45. If three balls are drawn at random what is the probability that none is blue?

(1) $\frac{1}{6}$ (2) $\frac{1}{12}$ (3) $\frac{1}{5}$ (4) $\frac{3}{10}$ (5) None of these

Q. 46. If four balls are drawn at random what is the probability that at least one is green?

(1) $\frac{2}{3}$ (2) $\frac{1}{2}$ (3) $\frac{1}{3}$ (4) $\frac{2}{5}$ (5) None of these

Q. 47. If two balls are drawn at random what is the probability that both are red?

(1) $\frac{1}{5}$ (2) $\frac{3}{10}$ (3) $\frac{2}{5}$ (4) $\frac{1}{15}$ (5) None of these

Q. 48-50: Study the following information to answer the given questions.

A Committee is to be formed from a Group of 6 women and 5 men. Out of the 6 women 2 are Teachers, 2 Social Workers and 2 Doctors. Out of the 5 men 3 are Teachers and 2 Doctors. In how many different ways can it be done?

Q. 48. Committee of 6 persons in which at least 2 are Doctors.

(1) 210 (2) 102 (3) 371 (4) 350 (5) None of these

Q. 49. Committee of 2 Teachers, 2 Doctors and 1 Social Worker.

(1) 462 (2) 210 (3) 32 (4) 120 (5) None of these

Q. 50. Committee of 5 with 3 Females and 2 Males and out of which having 2 Social Workers and at least 1 Female Doctor and at least 1 Male Doctor.

(1) 32 (2) 14 (3) 9 (4) 8 (5) None of these

Q. 51-52: Study the following information to answer the given questions.

A box contains 8 Red, 16 Blue, 4 Yellow and 12 Black Balls.

Q. 51. One ball is picked up randomly. What is the probability that it is **not** Blue?

(1) 0.24 (2) 0.8 (3) 0.3 (4) 0.5 (5) None of these

Q. 52. Two balls are picked up randomly. What is the chance that both are Red?

(1) $\frac{56}{4039}$ (2) $\frac{1}{5}$ (3) $\frac{7}{39}$ (4) $\frac{7}{195}$ (5) None of these

Q. 53-55: Study the given information carefully to answer the following questions.

A basket contains 3 blue, 5 black and 3 red balls.

Q. 53. If two balls are drawn at random, what is the probability that none of them is blue?

(1) $\frac{21}{55}$ (2) $\frac{3}{55}$ (3) $\frac{28}{55}$ (4) $\frac{9}{11}$ (5) None of these

Q. 54. If 2 balls are drawn at random, what is the probability that one is black and one is red?

(1) $\frac{2}{11}$ (2) $\frac{8}{11}$ (3) $\frac{9}{11}$ (4) $\frac{3}{11}$ (5) None of these

Q. 55. If 3 balls are drawn at random what is the probability that all are black?

(1) $\frac{2}{33}$ (2) $\frac{1}{11}$ (3) $\frac{3}{11}$ (4) $\frac{8}{33}$ (5) None of these

ANSWER

PERMUTATION, COMBINATION AND PROBABILITY

1.1	2.4	3.2	4.3	5.3	6.5	7.5	8.4	9.2	10.5	11.5	12.3	13.3
14.1	15.4	16.1	17.5	18.2	19.3	20.4	21.4	22.5	23.2	24.1	25.3	26.2
27.5	28.3	29.1	30.1	31.2	32.1	33.5	34.4	35.3	36.1	37.4	38.3	39.1
40.2	41.1	42.3	43.2	44.1	45.2	46.1	47.4	48.3	49.4	50.2	51.5	52.4
53.3	54.4	55.1										

ANSWERS WITH EXPLANATION

PERMUTATION, COMBINATION & PROBABILITY

1. 1; Required number of ways = $5! = 120$
2. 4; Required number of ways = $6! = 720$
3. 2; Required number of ways = $7! = 5040$
4. 3; Required number of ways = $8! = 40320$
5. 3; Required number of ways = $\frac{7!}{2!} = \frac{5040}{2}$
   $= 2520$
6. 5; Required number of ways
   $= \frac{11}{2!\times 2!\times 2!\times 2!} = \frac{39916800}{16} = 2494800$
7. 5; Required number of ways
   $= \frac{9!}{2!\times 2!\times 2!} = \frac{362880}{8} = 45360$
8. 4; Required number of ways
   $= \frac{10!}{2!\times 2!\times 2!\times 2!} = \frac{3628800}{16} = 226800$
9. 2; Required number of ways
   $= \frac{6!}{3!\times 2!} = \frac{720}{12} = 6$
10. 5; Required number of ways
    $= \frac{8!}{2!} = \frac{40320}{2} = 20160$
11. 5; Reqd probability $= \frac{^2C_2}{^{14}C_2} = \frac{1}{91}$
12. 3; Reqd probability $= \frac{^2C_1 \times {}^4C_2}{^{14}C_3}$
13. 3; Reqd probability $= \frac{^5C_2}{^{14}C_2} + \frac{^3C_2}{^{14}C_2}$
14. 1; Reqd probability $= \frac{^4C_4}{^{14}C_4} + \frac{18}{143}$
    $= 1 - \frac{125}{143} = \frac{28}{143}$
15. 4; Required probability $= 1 - \frac{^{10}C_4}{^{14}C_4}$
16. 1; The probability of being [illegible] green
    $= \frac{^7C_4}{^{12}C_4} = \frac{\lfloor 7}{\lfloor 4 \lfloor 12}$
    $= \frac{7\times 6\times 5}{4\times 3\times 2} = \frac{7\times 5}{12\times 11\times 10\times 9} = \frac{7}{495} = \frac{7}{99}$
17. 5; The probability of being both blue
    $= \frac{^2C_2}{^{12}C_2} = \frac{1}{66}$
18. 2; The probability of one being blue or yellow
    $= \frac{^3C_1}{^{12}C_1} = \frac{3}{12} = \frac{1}{4}$
19. 3; The probability of one being red
    $= \frac{^8C_2}{^{12}C_2} = \frac{28}{66} = \frac{14}{33}$
    ∴ The probability of at least one being red
    $= 1 - \frac{14}{33} = \frac{19}{33}$
20. 4; The probability of being two red and one green in three
    $= \frac{^4C_2 \times {}^5C_1}{^{12}C_3} = \frac{6\times 5}{220} = \frac{3}{22}$
21. 4; Required probability
    $= \frac{^4C_3 + {}^4C_3}{^{12}C_3} = \frac{5}{220} = \frac{1}{44}$
22. 5; Required probability $= \frac{^4C_2}{^{12}C_2} = \frac{6}{66} = \frac{1}{11}$
23. 2; Required probability
    $= 1 - \frac{^7C_3}{^{12}C_3} = 1 - \frac{35}{220} = \frac{37}{44}$
    OR Required probability
    $= {}^4C_0 \times {}^5C_3 \times {}^3C_0 + {}^4C_1 \times {}^5C_2 \times {}^3C_0 + {}^4C_3 \times {}^5C_0 \times {}^3C_0 + {}^3C_2 \times {}^5C_1 \times {}^4C_0 + {}^3C_1 \times {}^5C_2 \times {}^4C_0 + {}^3C_2 \times {}^5C_1 \times {}^4C_1$
    $= \frac{185}{220} = \frac{37}{44}$
24. 1; Required ways $= {}^4C_4 \times {}^6C_1 + {}^3C_3 \times {}^4C_2$
    $= 1\times 6 + 1\times 6 = 12$ ways
25. 3; Required ways $= {}^3C_2 \times {}^6C_3$
    $= 3 \times 20 = 60$ ways
26. 2; Required probability = 1 - (probability of not choosing any blue marble)
    $= 1 - \frac{^{11}C_4}{^{15}C_4} = 1 - \frac{22}{91} = \frac{69}{91}$
27. 5; Required probability $= \frac{^6C_2}{^{15}C_2} = \frac{1}{7}$
28. 3; Required probability $= \frac{^4C_2 \times {}^3C_1}{^{15}C_3} = \frac{18}{455}$
29. 1; Reqd probability $= \frac{^2C_1 \times {}^4C_2 \times {}^6C_1}{^{15}C_4} = \frac{24}{455}$
30. 1; Reqd probability $= \frac{\left({}^2C_2 + {}^3C_2\right)}{^{15}C_2}$
    = probability of choosing 2 green marbles + probability of chosing 2 yellow marble
    $= \frac{1+3}{105} = \frac{4}{105}$
31. 2; Total number of balls in the basket = 15
    Exhaustive number of cases = Number of ways of selecting 2 balls out of 15 balls = $^{15}C_2$

$$\frac{15\times14}{1\times2}=105$$

Favourable number of cases

$$= {}^4C_2 + {}^3C_2 = \frac{4\times3}{1\times2}+\frac{3\times2}{1\times2} = 6+3=9$$

$\therefore$ Required probability $= \frac{9}{105}=\frac{3}{35}$

32. 1; Exhaustive number of cases = Number of ways of selecting 5 balls out of 15 balls
$= {}^{15}C_5$
Let no blue ball be selected
$\therefore$ Number of ways of selecting 5 balls out of 9 balls without blue balls $= {}^9C_5$
Required probability

$$= 1-\frac{{}^9C_5}{{}^{15}C_5}=1-\frac{9\times8\times7\times6\times5}{15\times14\times13\times12\times11}$$

$$=1-\frac{6}{143}=\frac{137}{143}$$

33. 5; Exhaustive number of cases

$$= {}^{15}C_2=\frac{15\times14}{1\times2}=105$$

Favourable number of cases

$$= {}^6C_2=\frac{6\times5}{1\times2}=15$$

$\therefore$ Required probability $= \frac{15}{105}=\frac{1}{7}$

34. 4; Exhaustive number of cases

$$= {}^{15}C_4=\frac{15\times14\times13\times12}{1\times2\times3\times4}=1365$$

Favourable number of cases

$$= {}^2C_2\times{}^4C_2=1\times\frac{4\times3}{1\times2}=6$$

$\therefore$ Required probability $= \frac{6}{1365}=\frac{2}{455}$

35. 3; Exhaustive number of cases

$$= {}^{15}C_3=\frac{15\times14\times13}{1\times2\times3}=455$$

Favourable number of cases

$$= {}^{12}C_3=\frac{12\times11\times10}{1\times2\times3}=220$$

$\therefore$ Required probability $= \frac{220}{455}=\frac{44}{91}$

36. 1; Required number of ways
$= {}^5C_1\times{}^6C_2\times{}^3C_1 = 450$

37. 4; Required number of ways

$$= {}^3C_3\times{}^{11}C_2 = 1\times\frac{10\times11}{2}=55$$

38. 3; No. of groups formed = 2
No. of ways boys could be arranged = 4!
No. of ways girls could be arranged = 3!
Required number of ways = 2 × 4! × 3!

39. 1; No. of ways $= {}^5C_1\times{}^4C_2+{}^5C_2\,{}^4C_1+{}^5C_3$

40. 2; Required no. of ways $= \frac{\lfloor5}{\lfloor2}=60$

41. 1; Out of the total 18 gates 2 are permanently closed.
$\therefore$ A man can enter from any one of the remaining 18 – 2 = 16 gates.

On 12 gates there are security men to check the visitors.
$\therefore$ No. of gates which are open but don't have security men = 16 – 12 = 4.
$\therefore$ Chances favourable to the man entering the place unchecked = 4
Total possible ways of entring the places = 16
$\therefore$ Probability that a man can enter the palace unchecked $= \frac{4}{16}=\frac{1}{4}$

42. 3; Required probability

$$= 1-\frac{{}^5C_3}{{}^{10}C_3}=1-\frac{10}{120}=\frac{110}{120}=\frac{11}{12}$$

43. 2; Required probability $= \frac{{}^2C_2\times{}^3C_2}{{}^{10}C_4}=\frac{1\times3}{210}=\frac{1}{70}$

44. 1; Required number of ways $= \frac{7!}{3!}=840$

45. 2; The required Probability $= \frac{{}^5C_3}{{}^{10}C_3}=\frac{10}{120}=\frac{1}{12}$

46. 1; The required Probability $= 1-\frac{{}^8C_4}{{}^{10}C_4}=1-\frac{1}{3}=\frac{2}{3}$

47. 4; The required Probability $= \frac{{}^3C_2}{{}^{10}C_2}=\frac{3}{45}=\frac{1}{15}$

18. 3, The required number of ways
$= {}^{11}C_6-\left[\left({}^7C_5\times{}^4C_1\right)+{}^7C_6\right] = 462-84-7=371$

49. 4; The required number of ways
$= {}^5C_2\times{}^4C_2\times{}^2C_1 = 10\times6\times2=120$

50. 2; If the group of five persons (the committee) includes two social workers, one female doctor, one male doctor and one male teacher, then the possible number of ways
$= {}^2C_2\times{}^2C_1\times{}^2C_1\times{}^3C_1 = 12$ ways
If the group of five persons includes two social workers, one female doctor and two male doctors, then the possible number of ways $= {}^2C_2\times{}^2C_1\times{}^2C_2 = 2$ ways
Total number of ways = 12 + 2 = 14 ways

51. 5; Required probability $= \frac{{}^{24}C_1}{{}^{40}C_1}=\frac{24}{40}=0.6$

52. 4; Required probability $= \frac{{}^8C_2}{{}^{40}C_2}=\frac{28}{780}=\frac{7}{195}$

53. 3; Required probability

$$= \frac{{}^8C_2}{{}^{11}C_2}=\frac{28}{55}$$

or,
Required probability

$$= 1-\frac{{}^3C_2+{}^5C_1.\,{}^3C_1+{}^3C_1.\,{}^3C_1}{{}^{11}C_2} = 1-{}^{27}/_{55}={}^{28}/_{55}$$

54. 4; The required probability $= \frac{{}^5C_1\times{}^3C_1}{{}^{11}C_2}=\frac{5\times3}{55}=\frac{3}{11}$

55. 1; The required probability $= \frac{{}^5C_3}{{}^{11}C_3}=\frac{10}{165}=\frac{2}{33}$

MATHEMATICAL PUZZLE-I

1-5: Study the following data carefully and answer the questions given below.
A survey conducted on 1800 villages shows that 25% of the total villages have only adequate water supply. 15% of the total number of villages have proper supply of electricity only. 7% of the total number of villages have only proper education facilities. 12% of the total number of villages have telecommunication services only. 16% of the total number of villages have proper health care services only. 6% of the total number of villages have adequate water as well as supply of electricity. 8% of the total number of villages have adequate supply of water, supply of electricity as well as health care services. 5% of the total number of villages have proper supply of electricity, tele-communication services as well as health care services and 6% of the total number of villages have all the facilities.

1. How many villages in all have adequate water supply?
(1) 702 (2) 450 (3) 594 (4) 810 (5) None of these
2. How many villages in all have adequate supply of water as well as electricity ?
(1) 360 (2) 108 (3) 720 (4) 972 (5) None of these
3. How many villages in all do not have proper supply of electricity ?
(1) 720 (2) 850 (3) 920 (4) 1080 (5) None of these
4. How many villages have only proper education facilities ?
(1) 108 (2) 126 (3) 234 (4) 216 (5) None of these
5. How many villages have all the facilities ?
(1) 90 (2) 126 (3) 144 (4) 106 (5) None of these

6-10: Study the following data carefully and answer the question given below.
Out of 6500 students from the Arts-wing of a college, 21% of the total number of students have majored only in Psychology. 12% of the total number of students have majored only in English Literature, 15% of the total number of students have majored only in Politics. 7% of the total number of students have majored only in Philosophy and 10% of the total number of students have majored only in History. 8% of the total number of students have majored in both Psychology as well as Philosophy. 4% of the total number of students have majored in History as well as Politics and 11% of the total number of students have majored in English Literature as well as Politics. 9% of the total number of students have majored in Psychology and English Literature and 3% of the total number of students have majored in History and Philosophy.

6. What is the respective ratio of the number of students majored in Philosophy to the number of students majored only in Psychology?
(1) 4 : 5 (2) 5 : 6 (3) 6 : 7 (4) 7 : 8 (5) None of these
7. Students majored in History are **approximately**, what per cent of the total number of students majored in Politics?
(1) 48 (2) 61 (3) 52 (4) 57 (5) 45
8. How many students have majored only in Politics?
(1) 650 (2) 975 (3) 780 (4) 455 (5) None of these
9. What is the total number of students majored in English Literature?
(1) 780 (2) 1495 (3) 1300 (4) 2050 (5) None of these
10. Lowest number of students have majored in which subject?
(1) History (2) Philosophy (3) Politics (4) English Literature (5) Psychology

11-15: Study the information carefully and answer the questions that follow :
A school has a total of 1200 students. The ratio of girls to boys in the school is 3 : 2. All the students have enrolled in hobby classes viz. Singing, Dancing, Martial Arts and Cooking. One-twelfth of the boys have enrolled in only cooking classes. 25 percent of the girls have enrolled in Cooking and Singing classes together. Number of boys enrolled in only Martial Arts classes is 150 percent of the number of girls enrolled in the same. Number of students enrolled in only Dancing is 26 percent of the total number of students. 5 percent of the girls have enrolled in only Martial Arts classes. One-third of the boys enrolled in only Dancing classes. 35 percent of the girls enrolled in Singing, Dancing and Martial Arts together and the remaining enrolled in only Cooking. 15 percent of the boys enrolled in Cooking and Singing classes together and the remaining enrolled in Singing, Dancing and Martial Arts classes together.

11. How many boys learn Singing ?
(1) 226 (2) 184 (3) 72 (4) 96 (5) None of these
12. How many girls are enrolled in only Cooking classes?
(1) 280 (2) 252 (3) 154 (4) 100 (5) None of these
13. What is the respective ratio of girls to boys enrolled in only Dancing classes ?
(1) 8:7 (2) 14:17 (3) 19:20 (4) 12:7 (5) None of these
14. What is the total number of students learning Martial Arts ?
(1) 90 (2) 496 (3) 342 (4) 128 (5) None of these
15. Number of boys enrolled in Cooking and Singing classes together is what percent of the girls enrolled in the same?
(1) 48 (2) 36 (3) 20 (4) 25 (5) None of these

16-20: Answer the questions given below based on the following data.

A total of 250 students of a class play different games, viz Football, Hockey, Chess, Badminton, Table Tennis and Tennis. The ratio of girls to boys in the class of 250 is 13 :12 respectively. 50% of the girls play Table Tennis and Badminton only. 20% of the boys play Football, Hockey and Tennis only. 15% of the boys play Tennis and Chess only. The ratio of number of girls to boys playing Tennis and Chess only is 2 : 3 respectively. 30% of the girls play Hockey and Chess only. 10% of the girls play Chess, Badminton and Table Tennis only. The remaining girls play only Football. Boys playing Table Tennis and Badminton only are 20% of the girls playing the same. 40% of the boys play only Football. The remaining boys play only Chess.

16. What is the total number of students playing Football?
(1) 72 (2) 64 (3) 68 (4) 73 (5) None of these

17. How many students play Tennis?
(1) 35 (2) 48 (3) 50 (4) 59 (5) None of these

18. How many girls do not play Chess?
(1) 66 (2) 62 (3) 58 (4) 55 (5) None of these

19. What is the ratio of the number of girls playing Hockey to the number of boys playing Hockey?
(1) 5 : 16 (2) 13 : 8 (3) 8 : 13 (4) 16 : 5 (5) None of these

20. What is the total number of students playing Badminton?
(1) 84 (2) 88 (3) 91 (4) 78 (5) None of these

21-25: These questions are based on the following information.

In a class of 84 students boys and girls are in the ratio 5 : 7 Among the girls 7 can speak Hindi and English. 50 per cent of the total students can speak only Hindi. The ratio of the number of students speaking only Hindi to that speaking only English is 21 : 16. The ratio of the number of boys speaking English only to that of girls speaking English only is 3 : 5.

21. What is the number of boys who speak both the languages?
(1) 4 (2) 5 (3) 3 (4) 2 (5) None of these

22. What is the number of girls who speak English only ?
(1) 12 (2) 20 (3) 22 (4) Can't say (5) None of these

23. What is the ratio of the number of boys who speak Hindi only to that of girls who speak Hindi only?
(1) 10 : 11 (2) 11 : 10 (3) 2 : 5 (4) Can't say (5) None of these

24. How many girls can speak Hindi ?
(1) 29 (2) 22 (3) 27 (4) 23 (5) None of these

25. What is the ratio of the number of boys who speak English to that of girls who do so?
(1) 3 : 5 (2) 3 : 2 (3) 5 : 8 (4) 5 : 4 (5) None of these

26-30: These questions are based on the following information. Study the information carefully and answer the questions.

Total population of a village is 35000. Out of these 70% are literate. 44% of the total population are females. Out of the total illiterate population, males and females are in the ratio of 28 : 47 respectively.

26. What is the ratio of illiterate to literate females?
(1) 63 : 47 (2) 47 : 63 (3) 16 : 47 (4) 47 : 16 (5) None of these

27. Out of the total literate population what is the ratio males to females?
(1) 17 : 8 (2) 8 : 17 (3) 9 : 16 (4) 16 : 9 (5) None of these

28. What is the total number of male population?
(1) 15400 (2) 18600 (3) 17800 (4) 19400 (5) None of these

29. If 5% of the male literate population are graduates, how many male graduates are there in the village?
(1) 784 (2) 196 (3) 980 (4) 120 (5) None of these

30. What is the total number of illiterate females?
(1) 6850 (2) 6480 (3) 6580 (4) 8820 (5) None of these

ANSWER

MATHEMATICAL PUZZLE - I

1.4	2.1	3.4	4.2	5.5	6.3	7.4	8.2	9.5	10.1	11.1	12.4	13.3
14.2	15.5	16.4	17.5	18.1	19.2	20.3	21.3	22.2	23.1	24.1	25.5	26.2
27.4	28.5	29.1	30.3									

ANSWERS WITH EXPLANATION

MATHEMATICAL PUZZLE-I

1-5:

Villages	Water	Elect	Edu	Tele	Health
450	√	×	×	×	×
270	×	√	×	×	×
126	×	×	√	×	×
216	×	×	×	√	×
288	×	×	×	×	√
108	√	√	×	×	×
144	√	√	×	×	√
90	×	√	×	√	√
108	√	√	√	√	√
	810	720	234	414	630

1. 4; The required number of villages
= 450 + 108 + 144 + 108 = 810
2. 1; The required number of villages
= 108 + 144 + 108 = 360
3. 4; The required number of villages
= 450 + 126 + 216 + 288 = 1080
4. 2; Look at the table given.
5. 5; 108
Obvious, from the table given.

6-10: Read the information carefully and tabulate the information as shown in the table given below:

Students	Subjects				
	Psy	Eng	Pol	Phil	Hist
1365	√	×	×	×	×
780	×	√	×	×	×
975	×	×	×	×	×
455	×	×	×	√	×
650	×	×	×	×	√
520	√	×	×	√	×
260	×	×	√	×	√
715	×	√	√	×	×
585	√	√	×	×	×
195	×	×	×	√	√
Total	2470	2080	1950	1170	1105

6. 3; The required ratio

$$= \frac{(455+520+195)}{1365} = \frac{1170}{1365} = \frac{6}{7} \text{ ie } 6:7$$

7. 4; The required per cent

$$= \frac{(650+260+195)}{(975+260+715)} \times 100$$

$$= \frac{1105}{1950} \times 100 = \frac{170}{3} = 56\frac{2}{3}\% \approx 57\%$$

8. 2; Look at the table shown above.
9. 5; The required number of students
= 780 + 715 + 585 = 2080
10. 1; Look at the table given.

11-15: Total number of students = 1200
Number of boys

$$= \frac{2}{(2+3)} \times 1200 = 480$$

Number of girls = 1200 - 480 = 720

Boys (Table - I)

No. of Boys 480	Hobby			
	Singing	Dancing	Martial Arts	Cooking
90	×	×	×	√
54	×	×	√	×
160	×	√	×	×
72	√	×	×	√
154	√	√	√	×

Girls (Table - II)

No. of Girls 720	Hobby			
	Singing	Dancing	Martial Arts	Cooking
180	√	×	×	√
36	×	×	√	×
252	√	√	√	×
100	×	×	×	√
152	×	√	×	×

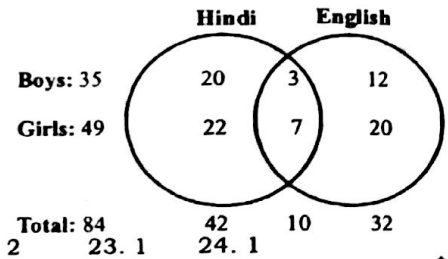
11. 1; Required number of boys = 72 + 154 = 226
12. 4; Obvious from the Table - II.
13. 3; Required ratio = $\frac{152}{160}$ = 19 : 20
14. 2; Required number = 54 + 154 + 36 + 252 = 496
15. 5; Required per cent = $\frac{72}{180} \times 100 = 40\%$

16-20: Make a table and tabulate the given information in the table. You will get the table in the following form:

Girls ↓	F	H	C	B	TT	T
65	×	×	×	√	√	×
12	×	×	√	×	×	√
39	×	√	√	×	×	×
13	×	×	√	√	√	×
1	√	×	×	×	×	×
Total 130	1	39	64	78	78	12
Boys ↓	**F**	**H**	**C**	**B**	**TT**	**T**
24	√	√	×	×	×	√
18	×	×	√	×	×	√
13	×	×	×	√	√	×
48	√	×	×	×	×	×
17	×	×	√	×	×	×
Total 120	24	24	35	13	13	42

16. 4; It is obvious from the table that the number of students playing football is 73(=1 + 24 + 48).
17. 5; Required number = 12 + 24 + 18 = 54
18. 1; Number of the girls who play chess
= 12 + 39 + 13 = 64
Hence, number of girls who do not play chess
= 130 - 64 = 66
19. 2; Required ratio = 39 : 24 = 13 : 8
20. 3; Required number of students
= 65 + 13 + 13 = 91

21-25:



21. 3 22. 2 23. 1 24. 1
25. 5; 12 + 3 : 20 +7 = 15 : 27 = 5 : 9
26-30: Total population = 35000

Total literate population = $\frac{35000 \times 70}{100} = 24500$

Total females = $\frac{35000 \times 44}{100} = 15400$

Total males = (35000 – 15400 =) 19600
Total illiterate population = 35000 – 24500 = 10500

Total male illiterate = $\frac{28 \times 10500}{(28+47)} = 3920$

Total female illiterate = 10500 – 3920 = 6580
Total male literate = (19600 – 3920 =) 15680
Total female literate = (15400 – 6580 =) 8820

26. 2; (6580 : 8820 =) 47 : 63
[140 is common in the ratio.]
27. 4; (15680 : 8820 =) 16:9
[2 × 7 × 7 × 10 is common in the ratio]
28. 5; 19600
29. 1; $\frac{15680 \times 5}{100} = 784$
30. 3; Given in the information given above

MATHEMATICAL PUZZLE-II

Q. 1-5: Study the information carefully to answer the questions that follow.
In a school there are 1200 students who have visited five different cities viz. Delhi, Kolkata, Varanasi, Mumbai and Jodhpur. Forty five percent of the total students are boys. Thirty percent of the total girls visited Mumbai. Two-fifth of the total girls visited Delhi. Number of girls who visited Jodhpur is half of the girls visited Delhi. Two-third of the remaining girls visited Kolkata. Total number of students who visited Mumbai is 300. Twenty percent of the total boys visited Delhi. Forty percent of the total boys visited Jodhpur. Equal number of boys visited Kolkata and Varanasi.

1. What is the total number of girls who visited Delhi, Mumbai and Varanasi together ?
(1) 464 (2) 484 (3) 536 (4) 556 (5) None of these

2. Total number of students who visited Jodhpur is approximately what percent of number of girls who visited Delhi?
(1) 111 (2) 91 (3) 132 (4) 32 (5) 72

3. What is the average number of boys who visited Kolkata, Varanasi and Jodhpur together ?
(1) 110 (2) 122 (3) 101 (4) 104 (5) None of these

4. What is the total number of students who visited Varanasi?
(1) 78 (2) 69 (3) 102 (4) 103 (5) None of these

5. What is the respective ratio between the number of girls visited Kolkata and number of boys visited Mumbai?
(1) 22 : 51 (2) 23 : 51 (3) 21 : 55 (4) 51 : 22 (5) None of these

Q. 6-10: Study the given information carefully to answer the questions that follow :
An Organization consists of 2400 employees working in different departments, viz, HR, Marketing, IT, Production and Accounts. The ratio of male to female employees in the Organization is 5 : 3 respectively. Twelve percent of the males work in the HR department. Twenty four percent of the females work in the Accounts department. The ratio of males to females working in the HR department is 6 : 11 respectively. One-ninth of the females work in the IT department. Forty two percent of the males work in the Production department. Number of females working in the Production department is ten percent of the males working in the same. The remaining females work in the Marketing department. The total number of employees working in the IT department is 285. Twenty two percent of the males work in the Marketing department and the remaining work in the Accounts department.

6. The number of males working in the IT department forms approximately what percent of the total number of males in the Organization ?
(1) 5 (2) 12 (3) 21 (4) 8 (5)18

7. How many males work in the Accounts department ?
(1) 170 (2) 165 (3) 185 (4) 160 (5) None of these

8. The total number of employees working in the Accounts department forms what percent of the total number of employees in the organization ? (rounded off to two digits after decimal)
(1) 19.34 (2) 16.29 (3) 11.47 (4) 23.15 (5) None of these

9. The number of females working in the Production department forms what percent of the total number of females in the Organization ?
(1) 7 (2) 12 (3) 4 (4) 15 (5) None of these

10. What is the total number of females working in the HR and Marketing department together ?
(1) 313 (2) 433 (3) 545 (4) 521 (5) None of these

Q. 11-15 : Study the information carefully to answer the questions that follow:
A school consisting of a total of 1560 students has boys and girls in the ratio of 7 : 5. All the students are enrolled in different types of hobby classes, viz Singing, Dancing and Painting. One-fifth of the boys are enrolled in only Dancing classes. Twenty per cent of the girls are enrolled in only Painting classes. Ten per cent of the boys are enrolled in only Singing classes. Twenty four per cent of the girls are enrolled in both Singing and Dancing classes together. The number of girls enrolled in only Singing classes is two hundred per cent of the boys enrolled in the same. One-thirteenth of the boys are enrolled in all the three classes together. The ratio of boys enrolled in Dancing and Painting classes together to the girls enrolled in the same is 2 : 1. Ten per cent of the girls are enrolled in only Dancing classes whereas eight per

cent of the girls are enrolled in both Dancing and Painting classes together. The remaining girls are enrolled in all the three classes together. The number of boys enrolled in Singing and Dancing classes together is fifty per cent of the number of girls enrolled in the same. The remaining boys are enrolled in only Painting classes.

11. What is the total number of boys who are enrolled in Dancing?
(1) 318 (2) 364 (3) 292 (4) 434 (5) None of these

12. Total number of girls enrolled in Singing is approximately what per cent of the total number of students in the school?
(1) 37 (2) 19 (3) 32 (4) 14 (5) 26

13. What is the total number of students enrolled in all the three classes together?
(1) 135 (2) 164 (3) 187 (4) 142 (5) None of these

14. Number of girls enrolled in only Dancing classes is what percent of the boys enrolled in the same? (rounded off to two digits after decimal)
(1) 38.67 (2) 35.71 (3) 41.83 (4) 28.62 (5) None of these

15. What is the ratio of the number of girls enrolled in only Painting classes to the number of boys enrolled in the same?
(1) 77 : 26 (2) 21 : 73 (3) 26 : 77 (4) 73 : 21 (5) None of these

Q. 16-20 : Study the following information carefully to answer the questions that follow:

A company produces 4 different products, viz AC, fans, refrigerators and ovens, each product of two different qualities ie, Quality A and Quality B. The company produces a total of 500 products. One-fifth of total number of products are fans, out of which 35% are of Quality B. Fifteen percent of the total number of products are AC. Two-thirds of the ACs are of Quality A. Twentyfive per cent of the total number of products are refrigerators, out of which 40 are of quality B. Ten per cent of the number of ovens are of Quality B.

16. What is the total number of AC and ovens of Quality B and fans and refrigerators of Quality A together made by the company?
(1) 165 (2) 205 (3) 155 (4) 185 (5) None of these

17. What is the average number of products of Quality A made by the company?
(1) 90 (2) 75 (3) 80 (4) 95 (5) None of these

18. What is the ratio of the number of ovens of Quality B to the number of fans of Quality A?
(1) 5 : 2 (2) 4 : 13 (3) 5 : 13 (4) 4 : 9 (5) None of these

19. What is the difference between the number of ACs of Quality A and Quality B?
(1) 25 (2) 50 (3) 35 (4) 40 (5) None of these

20. The number of refrigerators of Quality A is **approximately** what percentage of the total number of ovens (both Quality A and B together)?
(1) 39 (2) 31 (3) 35 (4) 43 (5) 49

Q. 21-25: Study the information carefully to answer the questions that follow:

On the occasion of an opening ceremony of a Sports events, in a stadium there are total of 600 players who are participating in four different events viz. Athletics, Table tennis, Kho-Kho and Lawn Tennis. The ratio between male to female players is 11: 4 respectively. 30% of the female players out of total female players are participating in athletics. 10% of female players out of total female players are participating in table tennis. The remaining female players are participating in kho-kho and lawn tennis in the ratio of 1 : 3 respectively. Also, the ratio of male players who are participating in athletics and other events together is 3 : 5 respectively. 4% of those male players who are not participating in athletics are participating in lawn tennis. Remaining male players are participating in table tennis and kho-kho in the ratio of 5 : 3 respectively.

21. What is the total number of female players who are participating in athletics and kho-kho together?
(1) 68 (2) 72 (3) 58 (4) 67 (5) None of these

22. What is the ratio between the male players participating in Lawn tennis and female players participating in table tennis respectively?
(1) 11 : 72 (2) 11 : 38 (3) 11 : 16 (4) 16 : 13 (5) None of these

23. What is the difference between male players participating in kho-kho and female players participating in lawn tennis ?
(1) 27 (2) 31 (3) 83 (4) 76 (5) None of these

24. What is the total number of players (both males and females together) participating in table tennis and athletics together?

(1) 360 (2) 358 (3) 374 (4) 396 (5) None of these

25. What is the ratio between the female players participating in lawn tennis to table tennis respectively?
(1) 9 : 5 (2) 4 : 7 (3) 7 : 4 (4) 9 : 2 (5) None of these

Q. 26-30: Study the information carefully to answer the questions that follow:
There are two companies A and B. Both companies produce all the four different products, viz Computers, Phones, Pen drives and Compact Discs (CDs). Company A produces a total of 800 products. The ratio of the total products produced by Company A to that by Company B is 4 : 5. 20% of the total products produced by Company B are Pen Drives and 40% of them are CDs. Two-fifths of the remaining products produced by Company B are Phones. The total number of Computers produced by both the companies together is 340. 20% of the total products produced by Company A are CDs. Company A produces equal number of Pen Drives and Phones.

26. What is the ratio of the number of Pen Drives produced by Company A to the number of Computers produced by Company B?
(1) 8 : 9 (2) 9 : 7 (3) 7 : 9 (4) 4 : 9 (5) None of these

27. What is the total number of Phones produced by both the companies together?
(1) 430 (2) 420 (3) 390 (4) 530 (5) None of these

28. The number of Phones produced by Company A is what percentage of the total number of products produced by Company B?
(1) 25 (2) 29 (3) 33 (4) 37 (5) None of these

29. What is the average of the number of Pen Drives, CDs and Computers produced by Company B?
(1) 840 (2) 280 (3) 270 (4) 860 (5) None of these

30. What is the difference between the number of CDs produced by Company B and the number of Computers produced by Company A?
(1) 200 (2) 250 (3) 300 (4) 350 (5) None of these

Q. 31-35: Study the following information carefully to answer these questions.
An Institute having 450 employees has sent all its employees for training in one or more areas out of HRM, Computer Skills and Financial Skills. The employees are classified into two categories — Officers and Clerks, who are in the ratio of 4 : 5. 10% of the Officers take training only in Computer skills, 16% of the Clerks take training only in HRM which is equal to the number of Officers taking training only in Financial Skills and 40% of the number of Officers taking training in HRM and Financial Skills both. 6% of the total employees take training in all the three, of which two-thirds are officers. 10% of the total employees take training in HRM and Computer Skills both, which is five times the number of Clerks taking training in Computer Skills and Financial Skills. 10% of the Clerks take training in HRM and Computer Skills both. The number of officers taking training only in HRM is 25% of the number of Clerks taking training only in HRM. 20% of the total number of employees take training only in Computer Skills. Number of clerks taking training in HRM and Financial skills both is 20% of the total number of Clerks.

31. Total how many officers take training in HRM?
(1) 110 (2) 128 (3) 118 (4) 98 (5) None of these

32. Total how many Clerks take training in Computer Skills but not in HRM?
(1) 113 (2) 104 (3) 88 (4) 79 (5) None of these

33. Total how many employees take training, in Financial Skills but not in HRM?
(1) 106 (2) 135 (3) 127 (4) 134 (5) None of these

34. Total how many Clerks take training in Financial Skills?
(1) 115 (2) 106 (3) 47 (4) 97 (5) None of these

35. What percent of the total number of Officers take training in Computer Skills but not in Financial Skills?
(1) 25 (2) 40 (3) 20 (4) 15 (5) None of these

Q. 36-40: Study the information carefully to answer the questions that follows.
In an annual function, 504 children participated. The ratio of number of girls to the number of boys is 5 : 3 respectively. Out of the total girls, 20% participated in dance and remaining girls participated in solo song, group song and drama in the ratio of 2 : 3 : 4 respectively. Two-third of the total boys participated in group song and remaining boys participated in solo song and dance in the ratio of 4 : 5 respectively.

36. What is the approximate percentage of the boys who have participated in dance out of the total number of boys?

(1) 19% (2) 23% (3) 16% (4) 27% (5) 14%

37. What is the approximate percentage of the girls participated in solo song out of all the total participants?
(1) 11% (2) 15% (3) 6% (4) 20% (5) 18%

38. What is the total number of girls who have participated in group song and drama together?
(1) 192 (2) 196 (3) 184 (4) 168 (5) 175

39. What is the ratio between number of boys to the number of girls respectively who have participated in solo song?
(1) 1 : 2 (2) 2 : 1 (3) 4 : 3 (4) 3 : 2 (5) None of these

40. What is the difference between the number of boys and girls who have participated in dance?
(1) 63 (2) 35 (3) 28 (4) 126 (5) None of these

Q. 41-45: Study the following information carefully and answer the questions that follow:
An office consists of 520 employees working in different departments, viz HR, IT, Production and Marketing. The ratio of men to women in the organisation is 5 : 3. 20 per cent of the men work in the IT department. 40 per cent of the women work in the HR department. The total number of employees in the Production department is 135. Two-fifths of the women work in the IT department and the remaining work in the Marketing department. 40 per cent of the men work in the Production department. Four percent of the men work in the HR department and the remaining work in the Marketing department.

41. The number of men working in the Marketing department forms what per cent of the total number of employees in the organisation?
(1) 22.5 (2) 34.5 (3) 19.5 (4) 38.5 (5) None of these

42. What is the ratio of the number of men working in the HR department to that of the women working in the same?
(1) 1 : 5 (2) 2 : 3 (3) 4 : 7 (4) 9 : 11 (5) None of these

43. What is the number of women working in the Marketing department?
(1) 41 (2) 34 (3) 46 (4) 39 (5) None of these

44. Total number of employees working in the Production department forms approximately what per cent of the total number of employees working in the organisation?
(1) 12 (2) 17 (3) 21 (4) 26 (5) 38

45. What is the total number of employees working in the IT department?
(1) 130 (2) 124 (3) 143 (4) 101 (5) None of these

Q. 46-50: Study the information carefully to answer the following questions:
A management institute offers MBA with specialisation in Marketing, Finance and HR. Among the total number of students in the Institute 45% are girls. Number of boys studying Marketing is 30% of the total number of boys in the institution which is 297. 40% of the girls are studying HR. Number of boys and girls studying Marketing are in the ratio of 3 : 2. 50% of boys are studying Finance.

46. How many girls are studying Finance?
(1) 288 (2) 198 (3) 324 (4) 495 (5) None of these

47. Number of girls studying Marketing is what per cent of the number of boys studying Finance?
(1) 20 (2) 35 (3) 50 (4) 65 (5) None of these

48. Number of boys studying Finance is what percent of the total number of students in the institution?
(1) 33.33 (2) 27.5 (3) 47.8 (4) 13.98 (5) None of these

49. What is the respective ratio between number of boys and girls studying HR?
(1) 5 : 9 (2) 15 : 34 (3) 99 : 161 (4) 11 : 18 (5) None of these

50. What is the total number of students in the institute?
(1) 1000 (2) 1500 (3) 1800 (4) 900 (5) None of these

ANSWER

MATHEMATICAL PUZZLE - II

1.2	2.3	3.1	4.5	5.1	6.2	7.5	8.2	9.1	10.4	11.4	12.5	13.1
14.2	15.3	16.5	17.4	18.2	19.1	20.4	21.2	22.3	23.1	24.5	25.4	26.5
27.1	28.5	29.2	30.3	31.5	32.5	33.5	34.5	35.5	36.1	37.1	38.2	39.1
40.3	41.1	42.5	43.2	44.4	45.3	46.1	47.5	48.2	49.4	50.3		

ANSWERS WITH EXPLANATION

MATHEMATICAL PUZZLE-II

Q.1-5: Total number of students:1200

Total number of boys : 45% of 1200 = 540

Total number of girls : 55% of 1200 = 660

CITIES	BOYS (540)	GIRLS (660)
DELHI	108	264
KOLKATA	57	44
VARANASI	57	22
MUMBAI	102	198
JODHPUR	216	132

1. 2; Required number of girls
= 264 + 198 + 22 = 484

2. 3; Required percentage

$$= \frac{216+132}{264} \times 100 = 131\frac{9}{11}$$

3. 1; Required average

$$= \frac{57+57+216}{3} = \frac{330}{3} = 110$$

4. 5; Required number of students
= 57 + 22 = 79

5. 1; Required ratio = 44 : 102 = 22 : 51

Q.6-10: Total number of employees: 2400

Total number of males: $\frac{5}{8} \times 2400 = 1500$

Total number of females: 55% of 1200 = 640

DEPARTMENT	MALE	FEMALE
HR	180	330
MARKETING	330	191
IT	185	100
PRODUCTION	630	63
ACCOUNTS	175	216
	1500	900

6. 2; Required percent = $\frac{185 \times 100}{1500} = 12\frac{1}{3} \approx 12\%$

7. 5; Look at the table shown above.

8. 2; Required percent = $\frac{(175+216)}{2400} \times 100$
= 16.29%

9. 1; Required percent = $\frac{63}{900} \times 100 = 7\%$

10. 4; Required number: 330 + 191 = 521

11-15:Total number of students: 1560

Total number of boys : $\frac{7}{12} \times 1560 = 910$

Total number of girls: $\frac{5}{12} \times 1560 = 650$

HOBBY CLASSES	BOYS (910)	GIRLS (650)
DANCING	182	65
SINGING	91	182
PAINTING	385	130
DANCING & PAINTING	104	52
SINGING & DANCING	78	156
PAINTING, SINGING & DANCING	70	65

11. 4; Total number of boys who are enrolled in dancing
= 182 + 104 + 78 + 70 = 434

12. 5; Required percent = $\frac{(156+182+65)}{1560} \times 100$

$= \frac{403}{1560} \times 100 = 25\frac{5}{6} \approx 26\%$

13. 1; 70 + 65 =135

14. 2; Required percent = $\frac{65}{182} \times 100 = 35.71$

15. 3; Required ratio = $\frac{130}{385} = 26:77$

16-20: On the basis of the given clues we get the following information as tabulated below :

PRODUCT	QUALITY-A	QUALITY-B	TOTAL
AC	50	25	75
FANS	65	35	100
REFRIGERATORS	85	40	125
OVENS	180	20	200
TOTAL	380	120	500

Now answer the given questions with the help of the table shown.

16. 5; Required total of Fans, ACs, Ovens and Refrigerators
= 25 + 20 + 65 + 85 = 195

17. 4; Required average no. of products

$$= \frac{(50+65+85+180)}{4} = \frac{380}{4} = 95$$

18. 2 ; Required ratio: 20 : 65 = 4 : 13

19. 1; Required difference = 50 - 25 = 25

20. 4; Required percentage $= \frac{85}{(180+20)} \times 100 = 42.5$

Q.21-25 :Total number of players: 600

Total number of males: $\frac{11}{15} \times 600 = 440$

Total number of females: $\frac{4}{15} \times 600 = 160$

SPORTS	MALES	FEMALES	TOTAL
ATHELETICS	165	48	213
TABLE TENNIS	165	16	181
KHO-KHO	99	24	123
LAWN TENNIS	11	72	83
TOTAL	440	160	600

21. 2 22. 3 23. 1 24. 5 25. 4

26-30:

Company A produces total 800 items.

Company B produces $\frac{5}{4} \times 800 = 1000$

PRODUCT	COMPANY-A	COMPANY-B	TOTAL
COMPUTERS	100	240	340
PHONES	270	160	430
PEN DRIVES	270	200	470
COMPACT DISCS	160	400	560
TOTAL	800	1000	1800

26. 5; Required ratio = 270 : 240 = 9 : 8

27. 1

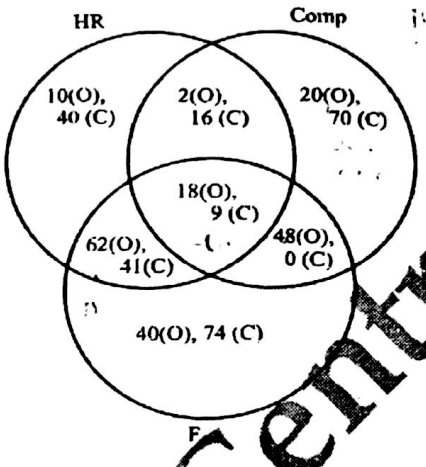
28. 5; Required % = $\frac{270}{1000} \times 100 = 27\%$

29. 2 30. 3

31-35: Total number of employees : 450

Total number of officers : $\frac{4}{9} \times 450 = 200$

Total number of clerks : 450 - 200 = 250



31. 5; Required number of officers = 62 + 30 = 92

32. 5; Required number of Clerks = 70

33. 5;Required number of employees = 74 + 40 + 48 = 162

34. 5; Required number of Clerks = 74 + 41 + 9 = 124

35. 5; Required percentage $= \frac{22}{200} \times 100 = 11\%$

36 - 40:

Total number of children : 504

Total number of girls : $\frac{5}{8} \times 504 = 315$

Total number of boys : 504 - 315 = 189

CATEGORY	GIRLS	BOYS
DANCE	63	35
SOLO SONG	56	28
GROUP SONG	84	126
DRAMA	112	NONE

36. 1; Required percentage = $\frac{35}{189} \times 100 = 18\frac{14}{27}$

37. 1; Required percentage = $\frac{56}{504} \times 100 = 11\frac{1}{9}$

38. 2; Number of such girls = 84 + 112 = 196

39. 1; Required ratio = 28 : 56 = 1 : 2

40. 3; Required difference = 63 - 35 = 28

41-45): Total number of employees = 520

Total number of men = $\frac{5}{8} \times 520 = 325$

Total number of women = 520 - 325 = 195

DEPARTMENT	MEN	WOMEN
HR	13	78
IT	65	78
PRODUCTION	130	5
MARKETING	117	34

41. 1; Required percentage = $\frac{117}{520} \times 100 = 22.5$

42. 5; Required ratio = 13 : 78 = 1 : 6

43. 2; 34 only

44. 4; Required percentage = $\frac{135}{520} \times 100 = 25\frac{25}{26}$

45. 3; Required number of employees = 65+ 78 =143

46-50: Total number of boys = $\frac{297}{30} \times 100 = 990$

Total number of girls = $\frac{990}{55} \times 45 = 810$

Total number of students = 990 + 810
= 1800

DEPARTMENTS	BOYS (990)	GIRLS (810)
MARKETING	297	198
FINANCE	495	288
HR	198	324

46. 1; Required number of girls = 310 - (198 + 324) = 288

47. 5; Required per cent = $\frac{198}{495} \times 100 = 40$

48. 2; Required per cent = $\frac{495}{1800} \times 100 = 27.5$

49. 4; Required ratio = 198 : 324 = 11 : 18

50. 3; Required number of students = 990 + 810
= 1800

PERCENTAGE

1. What percentage is equivalent to $\frac{3}{4}$?

(1) 25% (2) 75% (3) 50% (4) 125% (5) None of these

2. What fraction is 15 per cent?

(1) $\frac{9}{20}$ (2) $\frac{7}{20}$ (3) $\frac{3}{20}$ (4) $\frac{3}{10}$ (5) None of these

3. Find 4% of ₹3125.

(1) ₹ 250 (2) ₹ 125 (3) ₹ 150 (4) ₹ 75 (5) None of these

4. 60% of what number is 30?

(1) 50 (2) 25 (3) 60 (4) 75 (5) None of these

5. ₹ $12\frac{1}{2}$ is what per cent of ₹ $16\frac{2}{3}$?

(1) 50% (2) 25% (3) 75% (4) 45% (5) None of these

6. 44% of a number is 275, what is 64% of that number?

(1) 450 (2) 400 (3) 375 (4) 500 (5) None of these

7. Two numbers are respectively 26% and 5% more than a third. What percentage is the first of the second?

(1) 120% (2) 100% (3) 80% (4) 125% (5) None of these

8. If A's salary is 20% more than that of B, then how much per cent is B's salary less than that of A?

(1) $16\frac{2}{3}$% (2) 20% (3) 40% (4) 10% (5) None of these

9. If the numerator of a fraction is increased by 200%. and the denominator is increased by 300%, the resultant fraction is $\frac{11}{12}$. What was the original fraction?

(1) $\frac{4}{7}$ (2) $\frac{13}{12}$ (3) $\frac{11}{12}$ (4) $\frac{6}{5}$ (5) None of these

10. If the price of one kg of rice is increased by 25%, the increased amount is ` 12. Find the new price of rice per kg.

(1) ₹ 48 (2) ₹ 60 (3) ₹ 72 (4) ₹ 36 (5) None of these

11. Rahul spends 50% of his monthly income on household items, 20% of his monthly income on buying clothes, 5% of his monthly income on medicines and the remaining amount of ` 11,250 he saves. What is Rahul's monthly income?

(1) ₹ 38,200 (2) ₹ 34,000 (3) ₹ 41,600 (4) ₹ 45,000 (5) None of these

12. A man spends 50% of his income in board and lodging, 20% of the remainder in other personal necessities and 25% of the rest in charity, find his income, if he is left with ` 4200.

(1) ₹ 14000 (2) ₹ 8000 (3) ₹ 12000 (4) ₹ 18000 (5) None of these

13. In a library, 8% of the books are in Hindi, 12% of the remaining are in English and 72% of the remaining are in French. The remaining 3542 books are in regional languages. What is the total number of books in the library?

(1) 16525 (2) 15625 (3) 12655 (4) 16625 (5) None of these

14. A man deposited 30% of the initial amount to his locker. And again after some time he deposited 25% of the increased amount. Now the amount becomes ` 13,000. How much was the initial amount?

(1) ₹ 8000 (2) ₹ 10000 (3) ₹ 12000 (4) ₹ 9000 (5) None of these

15. The population of a town is 15625. It increases 8 per cent annually. What will it be in the end of 3 years?

(1) 16983 (2) 18693 (3) 19683 (4) 19638 (5) None of these

16. The population of a town is 64000. It increases by 10% during the first year. During the second year, it decreases by 25% and increased by 5% during the third year. What is the population after 3 years?

(1) 654400 (2) 56440 (3) 55450 (4) 55440 (5) None of these

17. The population of a town increases by 12% during first year and decreases by 10% during second year. If the present population is 50400, what it was 2 years ago?
(1) 40000 (2) 50000 (3) 42000 (4) 40400 (5) None of these

18. A man spends 60% of his income. His income increases by 15% and his expenditure also increases by 5%. Find the percentage increase in his savings.
(1) 30% (2) 15% (3) 20% (4) 25% (5) None of these

19. A man spends 70% of his income. His income increases by 24% and his expenditure also increases by 15%. Find the percentage increase in his savings.
(1) 35% (2) 24% (3) 45% (4) 55% (5) None of these

20. In a certain year, the population of a certain village was 9000. If the next year the population of males increases by 5% and that of the females by 8% and the total population increases to 9600, then what was the ratio of population of males and females in that given year?
(1) 4 : 5 (2) 5 : 4 (3) 2 : 3 (4) Data inadequate (5) None of these

21. The population of a town is 8000. If the males increase by 9% and the females by 16%, the population will be 9000. Find the number of females in the town.
(1) 2000 (2) 4500 (3) 3000 (4) 4000 (5) None of these

22. Find a single equivalent increase, if a number is successively increased by 20%, 25% and 30%.
(1) 90% (2) 75% (3) 95% (4) 85% (5) None of these

23. Find a single discount equivalent to a discount series of 10%, 15% and 20%.
(1) 45% (2) 38.8% (3) 43.8% (4) 39.8% (5) None of these

24. The salary of a worker was first increased by 10% and thereafter, decreased by 15%. What was the percentage change in his salary?
(1) increase, 6.5% (2) decrease, 6.5% (3) increase 5.5% (4) decrease 5.5% (5) None of these

25. A shopkeeper marks the prices of his goods at 26% higher than the original price. Due to increase in demand he again increases by 26%. What profit (in percent) did he get?
(1) 52% (2) 58% (3) 60% (4) 58.76% (5) None of these

26. The tax on commodity is diminished by 15% and its consumption increases by 10%. Find the effect on revenue.
(1) decrease of 6% (2) decrease of 5% (3) increase of 6.5% (4) decrease of 6.5% (5) None of these

27. If one of the sides of a rectangle is increased by 20% and the other is increased by 10%, find the per cent value by which the area changes.
(1) 32% (2) 30% (3) 36% (4) 34% (5) None of these

28. In measuring the sides of a rectangle, one side is taken 10% in excess and the other 20% in deficit. Find the error per cent in area calculated from the measurement.
(1) 8% excess (2) 8% deficit (3) 12% excess (4) 12% deficit (5) None of these

29. If the duty on imported sugar be increased by 25 per cent. By how much per cent must a man reduce his consumption of that article so as not to change his expenditure?
(1) 20% (2) 25% (3) 16% (4) 10% (5) None of these

30. If the price of sugar falls down by 20%, by how much per cent must a householder increase its consumption, so as not to change expenditure on this item?
(1) 25% (2) 20% (3) 30% (4) 15% (5) None of these

31. Due to fall in manpower, the production in a factory decreases by 20%. By what per cent should the working hour be increased to restore the original production?
(1) 24% (2) 25% (3) 20% (4) 35% (5) None of these

32. A student has to secure 30% marks to get through. If he gets 40 marks and fails by 20 marks, find the maximum marks set for the examination.
(1) 600 (2) 200 (3) 100 (4) 300 (5) None of these

33. A student has to secure 35% marks to get through. If he gets 80 marks and fails by 60 marks, find the maximum marks set for the examination.
(1) 400 (2) 1000 (3) 500 (4) 900 (5) None of these

34. A candidate scores 35% and fails by 40 marks, while another candidate who scores 60% marks, gets 35 marks more than the minimum required marks to pass the examination. Find the maximum marks for the examination.
(1) 300 (2) 200 (3) 350 (4) 450 (5) None of these

35. A candidate scores 36% and fails by 55 marks, while another candidate who scores 71% marks, gets 15 marks more than the minimum required marks to pass the examination. Find the maximum marks for the examination.
(1) 350 (2) 100 (3) 150 (4) 200 (5) None of these

36. In an examination, 10% of the students failed in Maths, 20% failed in English and 5% failed in both. What is the percentage of students who failed in atleast one subject?
(1) 75% (2) 25% (3) 35% (4) 40% (5) None of these

37. In an examination, 45% of the students failed in Maths, 30% failed in English and 15% failed in both. What is the percentage of students who passed in both the subjects?
(1) 70% (2) 40% (3) 25% (4) 75% (5) None of these

38. What quantity of water should be added to reduce 16 litres of 25% acidic liquid to 20% acidic liquid?
(1) 5 litres (2) 4 litres (3) 12 litres (4) 8 litres (5) None of these

39. What quantity of water should be added to reduce 6 litres of 50% acidic liquid to 20% acidic liquid?
(1) 8 litres (2) 9 litres (3) 12 litres (4) 9.5 litres (5) None of these

40. What quantity of water should be taken out to concentrate 12 litres of 30% acidic liquid to 40% acidic liquid.
(1) 4 litres (2) 6 litres (3) 3 litres (4) 8 litres (5) None of these

41. What quantity of water should be taken out to concentrate 21 litres of 25% acidic liquid to 35% acidic liquid.
(1) 6 litres (2) 8.4 litres (3) 6.4 litres (4) 8 litres (5) None of these

42. In 50 kg mixture of sand and cement 45% is cement. How much sand should be added so that the proportion of cement becomes 10%?
(1) 175 kg (2) 225 kg (3) 200 kg (4) 150 kg (5) None of these

43. A solution of salt and water contains 5% salt by weight. If it 20 kg water evaporates and the solution now contains 15% of salt. Find the original quantity of solution.
(1) 15 kg (2) 30 kg (3) 18 kg (4) 24 kg (5) None of these

44. In an examination the percentage of students qualified to the number of students appeared from school 'A' is 80%. In school 'B' the number of students appeared is 25% more than the students appeared from school 'A' and the number of students qualified from school 'B' is 40% more than the students qualified from school 'A'. What is the percentage of students qualified to the number of students appeared from school 'B'?
(1) 45% (2) 90% (3) 89.5% (4) 89.6% (5) None of these

45. Rice is now being sold at ₹ 20 per kg. During last month its cost was ₹ 18 per kg. Find by how much per cent a family should reduce its consumption, so as to keep the expenditure the same.
(1) 10% (2) 20% (3) 15% (4) 5% (5) None of these

46. An increase of 25 per cent in the price of rice would enable a purchaser to obtain 4 kg less for ₹ 400, what is the increased price, and original price respectively?
(1) ₹ 25, ₹ 20 (2) ₹ 20, ₹ 25 (3) ₹ 24, ₹ 21 (4) ₹ 21, ₹ 24 (5) None of these

47. A reduction of 20 per cent in the price of rice would enable a purchaser to obtain 4 kg more for ₹ 400, what is the reduced price, and original price respectively?
(1) ₹ 25, ₹ 20 (2) ₹ 20, ₹ 25 (3) ₹ 24, ₹ 21 (4) ₹ 21, ₹ 24 (5) None of these

48. The price of wheat is increased by 25% and its consumption increases by 25%. Find the new expenditure as a ratio of initial expenditure.
(1) 3 : 4 (2) 5 : 4 (3) 16 : 15 (4) 15 : 16 (5) None of these

49. In a recent survey 40% houses contained two or more people. Of those houses containing only one person 25% were having only a male. What is the percentage of all houses which contain exactly one female and no males(Assume that each house contains atleast one person.)?
(1) 75 (2) 40 (3) 15 (4) 45 (5) None of these

50. When the price of rice was increased by 32%, a family reduced its consumption in such a way that the expenditure on rice was only 10% more than before. If 30 kg were consumed per month before, find the new monthly consumption.
(1) 25 kg (2) 24 kg (3) 20 kg (4) 18 kg (5) None of these

ANSWER

PERCENTAGE

1.2	2.3	3.2	4.1	5.3	6.2	7.1	8.1	9.5	10.2	11.4	12.1	13.2	14.1
15.3	16.4	17.2	18.1	19.3	20.1	21.4	22.3	23.2	24.2	25.4	26.4	27.1	28.4
29.1	30.1	31.2	32.2	33.1	34.1	35.4	36.2	37.2	38.2	39.2	40.3	41.1	42.1
43.2	44.4	45.1	46.1	47.2	48.4	49.4	50.1						

PROFIT AND LOSS

A shopkeeper purchased a radio for ₹ 600. He sold the radio for ₹ 720. What is the per cent profit he earned in the transaction?
(1) 20% (2) 25% (3) 30% (4) 35% (5) None of these

2. A shopkeeper purchased a radio for ₹ 800. He sold the radio for ₹ 600. What is the per cent loss he incurred in the transacation?
(1) 20% (2) 25% (3) 30% (4) 35% (5) None of these

3. Ramesh purchased a scooter for ₹ 20000. He sold the scooter and earned 12% profit in the transaction. At what price did Ramesh sell the scooter?
(1) ₹ 22200 (2) ₹ 22300 (3) ₹ 22400 (4) ₹ 22500 (5) None of these

4. Suresh purchased a bike for ₹ 26000. He sold the bike and incurred 18% loss in the transaction. At what price did Suresh sell the article?
(1) ₹ 21120 (2) ₹ 21420 (3) ₹ 21230 (4) ₹ 21320 (5) None of these

5. Rita sold her watch for ₹ 700 and got 40% profit. At what price did Rita purchase the watch?
(1) ₹ 600 (2) ₹ 640 (3) ₹ 540 (4) ₹ 500 (5) None of these

6. Sita sold her watch for ₹ 900 and incurred 40% loss. At what price did Sita purchase the watch?
(1) ₹ 1600 (2) ₹ 1640 (3) ₹ 1540 (4) ₹ 1500 (5) None of these

7. Alka sold her watch for ₹ 480 and incurred 40% loss. In order to obtain a profit of 30%,what should be the selling price?
(1) ₹ 1140 (2) ₹ 940 (3) ₹ 1040 (4) ₹ 1060 (5) None of these

8. Renu sold her watch for ₹ 960 and earned 20%profit. In order to obtain a profit of 60%,what should be the selling price?
(1) ₹ 1280 (2) ₹ 1380 (3) ₹ 1080 (4) ₹ 1180 (5) None of these

9. Annu sold her watch for ₹ 520 and earned 30% profit. If she sells the watch and incurs loss of 45% then what would be the selling price?
(1) ₹ 300 (2) ₹ 400 (3) ₹ 340 (4) ₹ 220 (5) None of these

10. Minu sold her watch for ₹ 540 and incurred 40% loss. If she sells the watch and incurs loss of 15% then what would be the selling price?
(1) ₹ 900 (2) ₹ 756 (3) ₹ 657 (4) ₹ 567 (5) None of these

11. Dinesh purchased some lemons. He purchased 3 lemons for ₹ 2. He sold all the lemons and earned 25% profit. At what rate did he sell all the lemons?
(1) 4 for ₹ 3 (2) 3 for ₹ 4 (3) 6 for ₹ 5 (4) 7 for ₹ 8 (5) None of these

12. Ritesh purchased some lemons. He purchased 7 lemons for ₹ 10. He sold all the lemons and incurred 20% loss. At what rate did he sell all the lemons?
(1) 35 for ₹ 3 (2) 35 for ₹ 4 (3) 35 for ₹ 6 (4) 35 for ₹ 8 (5) None of these

13. Rajesh purchased some lemons. He sold all the lemons. He sold 8 lemons for ₹ 7 and earned 40% profit. In order to obtain 50% profit what should be the selling rate?
(1) 15 for ₹ 13 (2) 15 for ₹ 16 (3) 16 for ₹ 15 (4) 17 for ₹ 16 (5) None of these

14. Mahendra purchased some lemons. He sold all the lemons. He sold 11 lemons for ₹ 10 and incurred 30% loss. In order to obtain 40% profit what should be the selling rate?
(1) 11 for ₹ 20 (2) 20 for ₹ 11 (3) 11 for ₹ 10 (4) 21 for ₹ 25 (5) None of these

15. Keshav purchased some lemons. He sold all the lemons. He sold 11 lemons for ₹ 10 and incurred 30% loss. What should be the selling rate if he incurs 20% loss ?
(1) 77 for ₹ 80 (2) 66 for ₹ 70 (3) 11 for ₹ 10 (4) 80 for ₹ 77 (5) None of these

16. Deepak purchased some lemons. He purchased 5 lemons for ₹ 7. He sold all the lemons. If he sold 2 lemons for ₹ 3. What is the per cent profit in the whole transaction?
(1) 5% (2) 6% (3) 7% (4) 8% (5) None of these

17. Mukesh purchased some lemons. He purchased 7 lemons for ₹ 9 . He sold all the lemons. If he sold 11 lemons for ₹ 13. What is the per cent loss in the whole transaction?
(1) 5% (2) 6% (3) 7% (4) 8% (5) None of these

18. A person buys 100 toffees at 10 a rupee and 200 toffees at 5 a rupee. He mixes them together and sells at 4 a rupee. Find his per cent profit.
(1) 20% (2) 25% (3) 40% (4) 50% (5) None of these

19. The profit earned by selling an article for ₹ 832 is equal to the loss incurred when the samearticle is sold for ₹ 448. What should be the sale price of the article for making 50 per cent profit? (1) ₹ 960 (2) ₹ 1060 (3) ₹ 1200 (4) ₹ 920 (5) None of these

20. The profit earned by selling an article for ₹ 900 is double the loss incurred when the same article is sold for ₹ 600. What should be the sale price of the article for making 40 per cent profit? (1) ₹ 980 (2) ₹ 1080 (3) ₹ 1200 (4) ₹ 700 (5) None of these

21. A dishonest fruit vendor professes to sell his goods at cost price but he uses a weight of 800 g for the kg weight. Find his gain per cent.
(1) 20% (2) 40% (3) 25% (4) 50% (5) None of these

22. A dishonest fruit vendor professes to sell his goods at a profit of 10% but he uses a weight of 16 gram for 20 gram. Find his gain per cent.
(1) 14% (2) 24% (3) 35% (4) 37.5% (5) None of these

23. A grocer sells rice at a profit of 20% and uses a weight which is 25% less. Find his total per cent gain.
(1) 50% (2) 55% (3) 60% (4) 65% (5) None of these

24. A cloth dealer professes to lose 20 % on a certain garments, but he uses a metre having a length of 90 cm only and charges for the metre. Find his gain or loss per cent.
(1) $11\frac{1}{9}$% gain (2) $11\frac{1}{9}$% loss (3) 12.5% loss (4) 12.5% gain (5) None of these

25. A tradesman defrauds to the extent of 10% in buying goods and also defrauds to the extent of 10% in selling. His gain per cent is
(1) 21% gain (2) 19% gain (3) 20% gain (4) $22\frac{2}{9}$% gain (5) None of these

26. A tradesman by means of false balance defrauds to the extent of 10% in buying goods and also by means of false balance defrauds to the extent of 10% in selling. If the purchasing rate and the selling rate are same then his gain per cent is
(1) 21% gain (2) 19% gain (3) 20% gain (4) $22\frac{2}{9}$% gain (5) None of these

27. A tradesman marks his goods 20% above the cost price. He offers 10% discount to customers. What is his gain in per cent ?
(1) 10% gain (2) 8% gain (3) 12% gain (4) 32% gain (5) None of these

28. Rishav marks his goods 30% above the cost price but allows 30% discount for cash payment. If he sells the article for ₹ 2730, find his cost price.
(1) ₹ 3500 (2) ₹ 2800 (3) ₹ 2950 (4) ₹ 3000 (5) None of these

29. A dealer wants to earn 20% profit on an article after offering 25% discount to the customer. If the cost price of an item is ₹ 300, then the markprice (label price) of the article would be
(1) ₹ 480 (2) ₹ 435 (3) ₹ 580 (4) ₹ 600 (5) None of these

30. A dealer wants to earn 25% profit on an article after offering 50% discount to the customer. If the markprice (label price) of the article is ₹ 500, then the cost price of of the article must be
(1) ₹ 200 (2) ₹ 300 (3) ₹ 400 (4) ₹ 250 (5) None of these

31. If a discount of 20% is given on the marked price of an article, the shopkeeper gets a profit of 60 %. Find his per cent profit if he offers a discount of 25% on the same article.
(1) 20% (2) 30% (3) 50% (4) 75% (5) None of these

32. If a discount of 30% is given on the marked price of an article, the shopkeeper gets a profit of 5 %. Find his per cent loss if he offers a discount of 50 % on the same article.
(1) 20% (2) 25% (3) 30% (4) 15% (5) None of these

33. What will be the percentage profit after selling an article at a certain price if there is a loss of 40% when the article is sold at 1/3rd of the previous selling price?
(1) 20% (2) 80% (3) 75% (4) 60% (5) None of these

34. What will be the percentage profit after selling an article at label price if there is a loss of 20% when the article is sold at one third of the label price?
(1) 20% (2) 80% (3) 75% (4) 60% (5) None of these

35. If a merchant estimates his profit as 20% of the selling price, what is his actual profit per cent?
(1) 20% (2) 25% (3) 30 (4) 44% (5) None of these

36. If a merchant estimates his loss as 25% of the selling price, what is his actual loss per cent?
(1) 20% (2) 25% (3) 30 (4) 44% (5) None of these

37. I sell 9 articles for the same money as I paid for 12. What is my gain in per cent?
(1) 24% (2) 25% (3) 30% (4) 33% (5) None of these

38. I sell 12 articles for the same money as I paid for 10. What is my loss in per cent?
(1) 20% (2) 25% (3) 30% (4) 35% (5) None of these

39. By selling 75 metres of cloth, I gain the selling price of 25 metres. Find the gain per cent.
(1) $33\frac{1}{3}\%$ (2) 50% (3) 25% (4) 45% (5) None of these

40. By selling 85 metres of cloth, I lose the selling price of 15 metres. Find the loss per cent.
(1) 12% (2) 15% (3) 18% (4) 20% (5) None of these

41. By selling 48 metres of cloth a person gains the cost price of 12 metres. Find the gain per cent.
(1) 25% (2) 20% (3) 28% (4) 30% (5) None of these

42. A chair was sold at a loss of 10 per cent. If it was sold for ₹ 84 more, there would have been a gain of 4 per cent. For how much was the chair sold?
(1) ₹ 600 (2) ₹ 640 (3) ₹ 540 (4) ₹ 500 (5) None of these

43. An article is sold at 50% profit. If its CP and SP are increased by ₹ 32 and ₹ 12 respectively, the percentage of profit becomes 10%. Find the cost price.
(1) ₹ 58 (2) ₹ 60 (3) ₹ 68 (4) ₹ 54 (5) None of these

44. Two chairs and three tables cost ₹ 1025 and three chairs and two tables cost ₹ 1100. What is the difference between the cost of one table and that of one chair?
(1) ₹ 75 (2) ₹ 35 (3) ₹ 125 (4) ₹100 (5) None of these

45. A man buys 20 pens and 16 books for ₹ 360. He sells pens at a profit of 40% and books with a gain of 25%. If his overall gain is ₹ 120, the CP of the pen is ____.
(1) ₹ 13 (2) ₹ 12 (3) ₹ 15 (4) ₹ 10 (5) None of these

46. A man buys two horses for ₹ 1550. He sells one so as to lose 23% and the other so as to gain 27%. On the whole he neither gains nor loses. What does each horse cost?
(1) ₹ 807, ₹ 743 (2) ₹ 817, ₹ 733 (3) ₹ 827, ₹ 723 (4) ₹ 837, ₹ 713 (5) None of these

47. A person bought two watches for ₹ 960. He sold one at a loss of 20% and the other at a gain of 60% and he found that each watch was sold at the same price. Find the cost price of two watches.
(1) ₹ 640, ₹ 320 (2) ₹ 540, ₹ 420 (3) ₹ 440, ₹ 520 (4) ₹ 650, ₹ 310 (5) None of these

48. A man sells two articles, each for the same price ₹ 550. He earns 20% profit on the first and incurs 20% loss on the second. What would be his approximate overall per cent profit or percent loss?
(1) 4% gain (2) 4% loss (3) 4.4% gain (4) 4.4% loss (5) None of these

49. A man purchases two articles, each for the same price ₹ 600. He earns 20% profit on the first and incurs 20% loss on the second. What would be his approximate overall per cent profit or percent loss?
(1) 4% gain (2) 4% loss (3) 4.4% gain (4) 4.4% loss (5) None of these

50. A man sells two horses for ₹ 11900. The cost price of the first is equal to the selling price of the second. If the first is sold at 30% loss and the second at 25% gain, what is his total gain or loss (in rupees)?
(1) ₹ 600 loss (2) ₹ 700 loss (3) ₹ 750 gain (4) ₹ 700 gain (5) None of these

51. Radha purchased 10 dozens pens at ₹ 70 per dozen. She sold 7 dozens pens at 7% profit and the remaining 3 dozens at 17% profit. What is her profit percentage in this transaction?
(1) 8% (2) 7% (3) 10% (4) 14% (5) None of these

52. A man bought a chair and sold it at a gain of 10%. If he had bought it at 20% less and sold it for ₹ 10 more, he would have gained 40%. Find the cost price of the chair.
(1) ₹ 500 (2) ₹ 600 (3) ₹ 550 (4) ₹ 650 (5) None of these

53. 20 kg of potato costs as much as 5 kg of tomato, 12 kg of tomato costs as much as 30 kg of onion, 15 kg of onion costs as much as 18 kg of cabbage. If 10 kg of cabbage costs ₹ 50. What would be the cost of 24 kg of potato?
(1) ₹ 90 (2) ₹ 72 (3) ₹ 108 (4) ₹ 96 (5) None of these

54. A reduction of 10% in the price of salt enables a person to buy 2 kg more for ₹ 180. Find the reduced and the original price per kg of salt respectively.
(1) ₹ 10, ₹ 9 (2) ₹ 9, ₹ 10 (3) ₹ 20, ₹ 18 (4) ₹ 18, ₹ 20 (5) None of these

55. A 25% hike in the price of potato forces a person to purchase 2 kg less for ₹ 75. Find the original price of the potato.
(1) ₹ 7 (2) ₹ 8 (3) ₹ 7.5 (4) ₹ 8.5 (5) None of these

56. Sunil calculates his profit percentage on the selling price whereas Sujeet calculates his profit on the cost price. They find that the difference of their profits is ₹ 900. If the selling price of both of them are the same, and Sunil gets 50% profit and Sujeet gets 40% profit, then find their selling price.
(1) ₹ 4200 (2) ₹ 4500 (3) ₹ 4000 (4) ₹ 4800 (5) None of these

57. Two third of a commodity is sold at 30% profit, one fourth is sold at 16% profit and the remaining at 12% profit. If a total profit of ₹ 100 is earned, then find the value of the commodity.
(1) ₹ 300 (2) ₹ 400 (3) ₹ 450 (4) ₹ 600 (5) None of these

58. A horse worth ₹ 8000 is sold by A to B at 20% loss. B sells the horse back to A at 20% gain. Find the value of loss amount.
(1) ₹ 1380 (2) ₹ 1480 (3) ₹ 1180 (4) ₹ 1280 (5) None of these

59. A person sells his table at a profit of 25% and the chair at a loss of 20% but on the whole he gains ₹ 18. On the other hand if he sells the table at a loss of 20% and the chair at a profit of 25% then he neither gains nor loses. Find the cost price of the table and the chair.
(1) ₹ 200, ₹ 160 (2) ₹ 160, ₹ 200 (3) ₹ 250, ₹ 180 (4) ₹ 210, ₹ 170 (5) None of these

60. A person sold his watch for ₹. 24. If the percentage of his loss was equal to the cost price, then the watch would have cost him
(1) ₹ 40 (2) ₹ 60 (3) ₹ 50 (4) ₹ 80 (5) ₹ 40 or ₹ 60

ANSWER

PROFIT AND LOSS

1.1	2.2	3.3	4.4	5.4	6.4	7.3	8.1	9.4	10.5	11.3	12.5	13.3	14.1
15.1	16.5	17.5	18.4	19.1	20.1	21.3	22.4	23.3	24.2	25.1	26.4	27.2	28.4
29.1	30.1	31.3	32.2	33.2	34.5	35.2	36.1	37.5	38.5	39.2	40.2	41.1	42.3
43.1	44.1	45.4	46.4	47.1	48.2	49.5	50.2	51.3	52.1	53.1	54.2	55.3	56.1
57.1	58.4	59.1	60.5										