PRACTICE SET 1

INSTRUCTIONS

- **This practice set consists of two sections. Quantitative Aptitude (Qs. 1-40) & Reasoning Ability (Qs. 41-80).**
- **All the questions are compulsory.**
- **Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.**
- **There is negative marking equivalent to $1/4^{th}$ of the mark allotted to the specific question for wrong answer.**

Time : 45 Min. **Max. Marks : 80**

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-5): Find out the approximate value which should come in place of the question mark in the following questions. (You are not expected to find the exact value.)

1. $\sqrt{45689} = ?$

(a) 180 (b) 415
(c) 150 (d) 210
(e) 300

2. $\frac{(10008.99)^2}{10009.001} \times \sqrt{3589} \times 0.4987 = ?$

(a) 3000 (b) 300000
(c) 3000000 (d) 5000
(e) 9000000

3. $399.9 + 206 \times 11.009 = ?$

(a) 2800 (b) 6666
(c) 4666 (d) 2400
(e) 2670

4. $\frac{2}{5} + \frac{7}{8} \times \frac{17}{19} \div \frac{6}{5} = ?$

(a) 1 (b) $\frac{1}{2}$
(c) $2\frac{1}{2}$ (d) $\frac{3}{4}$
(e) $\frac{9}{11}$

5. $(299.99999)^3 = ?$

(a) 27000000 (b) 9000000000
(c) 180000 (d) 2.7×10^9
(e) 2700000

DIRECTIONS (Qs. 6-10) : What will come in place of the question mark (?) in the following equations ?

6. $\frac{117 \times 117 \times 117 - 98 \times 98 \times 98}{117 \times 117 + 117 \times 98 + 98 \times 98} = ?$

(a) 215 (b) 311 (c) 19 (d) 29
(e) None of these

7. If $\frac{a}{b} = \frac{4}{3}$, then $\frac{3a + 2b}{3a - 2b} = ?$

(a) 6 (b) 3 (c) 5 (d) –1
(e) None of these

8. $\frac{(3.537 - 0.948)^2 + (3.537 + 0.948)^2}{(3.537)^2 + (0.948)^2} = ?$

(a) 4.485 (b) 2.589 (c) 4 (d) 2
(e) None of these

9. $\frac{112}{\sqrt{196}} \times \frac{\sqrt{576}}{12} \times \frac{\sqrt{256}}{8} = ?$

(a) 8 (b) 12 (c) 16 (d) 32
(e) None of these

10. $\frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}} = ?$

(a) $4 + \sqrt{15}$ (b) $4 - \sqrt{15}$
(c) $\frac{1}{2}$ (d) 1
(e) None of these

DIRECTIONS (Qs. 11-15) : Identify which number is wrong in the given series.

11. 2, 3, 4, 4, 6, 8, 9, 12, 16.
(a) 3 (b) 9
(c) 6 (d) 12
(e) None of these

12. 3, 4, 10, 32, 136, 685, 41
(a) 136 (b) 10
(c) 4116 (d) 32
(e) None of these

13. 69, 55, 26, 13, 5
(a) 26 (b) 13
(c) 5 (d) 55
(e) None of these

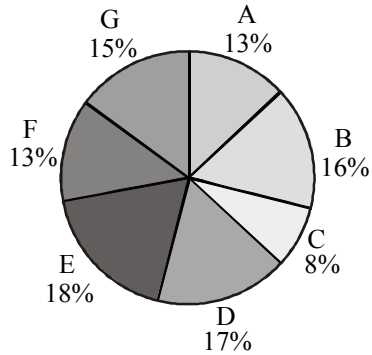
14. 24576, 6144, 1536, 386, 96, 4
(a) 386 (b) 6144
(c) 96 (d) 1536
(e) None of these

15. 11, 5, 20, 12, 40, 26, 74, 54
(a) 5 (b) 20
(c) 40 (d) 26
(e) None of these

DIRECTIONS (Qs. 16-20) : Study the following chart to answer the questions given below.

Villages	% population below poverty line
A	45
B	52
C	38
D	58
E	46
F	49
G	51

Proportion of population of seven villages in 2014



16. In 2015, the population of villages A as well as B is increased by 10% from the year 2014. If the population of village A in 2014 was 5000 and the percentage of population below poverty line in 2015 remains same as in 2014, find approximately the population of village B below poverty line in 2015.
(a) 4000 (b) 45000
(c) 2500 (d) 3500
(e) None of these

17. If in 2016 the population of village D is increased by 10% and the population of village G is reduced by 5% from 2014 and the population of village G in 2014 was 9000, what is the total population of villages D and G in 2016?
(a) 19770 (b) 19200
(c) 18770 (d) 19870
(e) None of these

18. If in 2014 the total population of the seven villages together was 55,000 approximately, what will be population of village F in that year below poverty line ?
(a) 3000 (b) 2500
(c) 4000 (d) 3500
(e) None of these

19. If the population of village C below poverty line in 2014 was 1520, what was the population of village F in 2014?
(a) 4000 (b) 6000
(c) 6500 (d) 4800
(e) None of these

20. The population of village C is 2000 in 2014. What will be the ratio of population of village C below poverty line to that of the village E below poverty line in that year ?
(a) 207 : 76 (b) 76 : 207
(c) 152 : 207 (d) Data inadequate
(e) None of these

DIRECTIONS (Qs. 21-25): These questions are based on the table and information given below.

There are 6 refineries, 7 depots and 9 districts. The refineries are BB, BC, BD, BE, BF and BG. The depots are AA, AB, AC, AD, AE, AF and AG. The districts are AAA, AAB, AAC, AAD, AAE, AAF, AAG, AAH ad AAI. Table A gives the cost of transporting one unit from refinery to depot. Table B gives the cost of transporting one unit from depot to a district.

Table A

	BB	BC	BD	BE	BF	BG
AA	928.2	537.2	567.8	589.9	589.9	800.1
AB	311.1	596.7	885.7	759.9	759.9	793.9
AC	451.1	0	320.1	780.1	720.7	1000
AD	371.1	150.1	350.1	750.1	650.4	980.1
AE	1137.3	314.5	0	1158	1158	1023
AF	617.1	516.8	756.5	1066	1066	406.3
AG	644.3	299.2	537.2	1093	1093	623.9

Table B

	AA	AB	AC	AD	AE	AF	AG
AAA	562.7	843.2	314.5	889.1	0	754.8	537.2
AAB	532.7	803.2	284.5	790.5	95.2	659.6	442
AAC	500.7	780.2	0	457.3	205.7	549.1	331.5
AAD	232.9	362.1	286.2	275.4	523.6	525.3	673.2
AAE	345.1	268.6	316.2	163.2	555.9	413.1	227.8
AAF	450.1	644.3	346.2	372.3	933.3	402.9	379.1
AAG	654.5	0	596.7	222.7	885.7	387.6	348.5
AAH	804.1	149.6	627.2	360.4	1035.3	537.2	498.1
AAI	646	255	433.5	137.7	698.7	112.2	161.5

21. What is the least cost of sending one unit from any refinery to any district?
(a) 95.2 (b) 0
(c) 205.7 (d) 284.5
(e) None of these

22. What is the least cost of sending one unit from any refinery to the district AAB?
(a) 0 (b) 284.5
(c) 95.2 (d) 294.8
(e) None of these

23. What is the least cost of sending one unit from refinery BB to any district?
(a) 284.5 (b) 311.1
(c) 451.1 (d) 297.5
(e) None of these

24. What is the least cost of sending petrol from refinery BB to district AAA?
(a) 765.6 (b) 1137.3
(c) 1154.3 (d) 1174.8
(e) None of these

25. How many possible ways are there for sending petrol from any refinery to any district?
(a) 63 (b) 42
(c) 54 (d) 378
(e) None of these

DIRECTIONS (Qs. 26-30) : In the following questions, two equations I and II are given. You have to solve both the equations and give answer.

Give answer (a) if $x > y$
Give answer (b) if $x \geq y$
Give answer (c) if $x < y$
Give answer (d) if $x \leq y$
Give answer (e) if $x = y$ or the relationship cannot be established

26. I. $\sqrt{289x}+\sqrt{25}=0$
II. $\sqrt{676y}+10=0$

27. I. $8x^2-78x+169=0$
II. $20y^2-117y+169=0$

28. I. $\frac{15}{\sqrt{x}}+\frac{9}{\sqrt{x}}=11\sqrt{x}$
II. $\frac{\sqrt{y}}{4}+\frac{5\sqrt{y}}{12}=\frac{1}{\sqrt{y}}$

29. I. $\frac{8}{\sqrt{x}}+\frac{6}{\sqrt{x}}=\sqrt{x}$
II. $y^3-\frac{(14)^2}{\sqrt{y}}=0$

30. I. $x^2-208=233$
II. $y^2-47+371=0$

31. A reduction of 20% in the price of sugar enables a purchaser to obtain $2\frac{1}{2}$ kg more for ₹ 160. Find the original price per kg of sugar.
(a) ₹ 12 (b) ₹ 20 (c) ₹ 16 (d) ₹ 18
(e) None of these

32. Mrs. X spends ₹ 535 in purchasing some shirts and ties for her husband. If shirts cost ₹ 43 each and the ties cost ₹ 21 each, then what is the ratio of the shirts to the ties, that are purchased ?
(a) 1 : 2 (b) 2 : 1
(c) 2 : 3 (d) 3 : 4
(e) None of these

33. Anish spends 25% of his salary on house rent, 5% on food, 15% on travel, 10% on clothes and the remaining amount of ₹ 22,500 is saved. What is Anish's salary ?
(a) ₹ 40,000 (b) ₹ 40,500
(c) ₹ 45,500 (d) ₹ 50,000
(e) None of these

34. $\frac{2}{5}$ th of Anil's salary is equal to Bhuvan's salary and seven-ninth of Bhuvan's salary is equal to Chandra's salary. If the sum of the salary of all of them is ₹ 77,000, then, how much is Bhuvan's salary?
(a) ₹ 45,000 (b) ₹ 18,000
(c) ₹ 15,000 (d) ₹ 28,000
(e) None of these

35. A tap can fill an empty tank in 12 hours and a leakage can empty the whole tank in 20 hours. If the tap and the leakage are working simultaneously, how long will it take to fill the whole tank?
(a) 25 hours (b) 40 hours
(c) 30 hours (d) 35 hours
(e) None of these

36. A train is moving at a speed of 132 km/h. If the length of the train is 110 metres, how long will it take to cross a railway platform, 165 metres long ?
(a) 5s (b) 7.5 s
(c) 10 s (d) 15 s
(e) None of these

37. If 15 women or 10 men can complete a project in 55 days, in how many days will 5 women and 4 men working together complete the same project ?
(a) 75 (b) 8
(c) 9 (d) 85
(e) None of these

38. Ashu's mother was three times as old as Ashu, 5 years ago. After 5 years, she will be twice as old as Ashu. How old is Ashu at present?
(a) 15 (b) 20
(c) 10 (d) 5
(e) None of these

39. A conical flask has base radius 'a' cm and height 'h' cm. It is completely filled with milk. The milk is poured into a cylindrical thermos flask whose base radius is 'p' cm. What will be the height of the solution level in the flask ?
(a) $\frac{a^2h}{3p^2}$cm (b) $\frac{3hp^2}{a^2}$cm (c) $\frac{p^2}{3h^2}$cm (d) $\frac{3a^2}{hp^2}$cm
(e) None of these

40. A sum was put at simple interest at a certain rate for 2 years. Had it been put at 3% higher rate, it would have fetched ₹ 300 more. Find the sum.
(a) ₹ 6000 (b) ₹ 8230
(c) ₹ 5000 (d) ₹ 4600
(e) None of these

REASONING

41. Which is the third number to the left of the number which is exactly in the middle of the following sequence of numbers?
1 2 3 4 5 6 7 8 9 2 4 6 8 9 7 5 3 9 8 7 6 4 3 2 1
(a) 3 (b) 2
(c) 5 (d) 6
(e) None of these

42. In a certain code IDEAS is written as HEDBR and WOULD is written as VPTMC. How will RIGHT be written in the same code ?
(a) QJHIS (b) QJFGS
(c) SHHGU (d) QJFIU
(e) QJFIS

43. If the alphabet is written in the reverse order and every alternate letter starting with Y is dropped, which letter will be exactly in the middle of the remaining letters of the alphabet.
(a) M (b) N
(c) O (d) M or O
(e) None of these

44. In a row of girls, Rita and Monika occupy the ninth place from the right end and tenth place from the left end, respectively. If they interchange their places, then Rita and Monika occupy seventeenth place from the right and eighteenth place form the left respectively. How many girls are there in the row?
(a) 25 (b) 26
(c) 27 (d) Data inadequate
(e) None of these

45. In a certain code language 'Ka Bi Pu Ya' means 'You are very intelligent' 'Ya Lo Ka Wo' means 'They seem very intelligent' 'La Pu Le' means 'You can see' and 'Sun Pun Yun Ya' means 'how intelligent she is', In that language, which of the following words means 'are'?
(a) Ka (b) Bi
(c) Ya (d) Pu
(e) None of these

46. Ankit is related to Binny and Chinky, Daizy is Chinky's mother. Also Daizy is Binny's sister and Aruna is Binny's sister. How is Chinky related to Aruna?
(a) Niece (b) Sister
(c) Cousin (d) Aunt
(e) None of these

47. Rama remembers that she met her brother on Saturday, which was after the 20th day of a particular month. If the 1st day of that month was Tuesday, then on which date did Rama meet her brother ?
(a) 24th (b) 23rd
(c) 25th (d) 26th
(e) None of these

48. If it is possible to make only one such number with the first, the fourth and the sixth digits of the number 531697 which is the perfect square of a two digit even number, which of the following will be the second digit of the two digit even number. If no such number can be made, give '@' as the answer and if more than one such number can be made, give '©' as the answer.
(a) 4 (b) 2
(c) 6 (d) @
(e) ©

49. In a certain code JOURNEY is written as TNISZFO. How is MEDICAL written in that code?
(a) CDLJMBD (b) CDWDBM
(c) LDCJMBD (d) EFNJMBD
(e) None of these

50. If 'K' denotes '×', 'B' denotes '÷', 'T' denotes '–' and 'M' denotes '+', then –
40 B 8 T 6 M 3 K 4 = ?
(a) 19 (b) 11
(c) –31 (d) 23
(e) None of these

DIRECTIONS (Qs. 51-55) : Study the following information to answer the given questions:

In a certain code 'support the other group' is written as 'ja pe la no' 'the mission gains support' is written as' ke ja zi la', 'gains other than money' is written as 'fu no ho zi' and 'more support and money' is written as ' re qi fuja' .

51. What is the code for 'group' ?
(a) ja (b) pe
(c) la (d) no
(e) Cannot be determined

52. What does 'zi' stand for ?
(a) mission (b) than
(c) other (d) the
(e) gains

53. Which of the following may represent 'more than the group'?
(a) la qi ho pe (b) re la qi ho
(c) re no la pe (d) pe ke qi la
(e) qi ho la fu

54. What is the code for 'mission'?
(a) la (b) zi
(c) ke (d) ja
(e) ke or la

55. Which of the following may represent 'money matters more'?
(a) fu bu (b) re bu qi
(c) zi qi yo (d) yo fu no
(e) la fu bu

DIRECTIONS (Qs. 56-60): In each question below are three statements followed by three conclusions numbered I, II and III. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the answers (a), (b), (c), (d) and (e) is the correct answer and indicate it on the answer sheet.

56. **Statements:** Some chairs are tables.
Some tables are drawers.
All drawers are shelves.
Conclusions: **I.** Some shelves are tables.
II. Some drawers are chairs.
III. Some shelves are drawers.
(a) Only I and III follow
(b) Only I and either II or III follow
(c) Only II and either I or III follow
(d) All I, II and III follow
(e) None of the above

57. **Statements:** All trees are flowers.
Some flowers are leaves.
No leaf is bud
Conclusions: **I.** No bud is a flower.
II. Some buds are flowers.
III. Some leaves are trees.

(a) Only II and III follow
(b) Only III follows
(c) Only either I or II follows
(d) Either I or II and III follow
(e) None of the above

58. **Statements:** All stones are rocks.
Some rocks are bricks.
Some bricks are cement.
Conclusions: **I.** Some cements are rocks.
II. Some bricks are stone
III. Some stones are cement.
(a) Only I and either II or III follow
(b) Only either II or III follows
(c) Only I and II follow
(d) All follow
(e) None of the above

59. **Statements:** All flats are buildings.
All buildings are bungalows.
All bungalows are apartments.
Conclusions: **I.** Some apartments are flats.
II. All flats are bungalows.
III. Some bungalows are flats.
(a) None follows
(b) Only I and II follow
(c) Only II and III follow
(d) Only I and III follow
(e) All I, II and III follow

60. **Statements:** Some spectacles are lenses.
Some lenses are frames.
All frames are metals.
Conclusions: **I.** Some lenses are metals
II. Some metals are spectacles.
III. Some frames are spectacles.
(a) Only III follows
(b) Only I follows
(c) Only I and either II or III follow
(d) Only I and II follow
(e) None of the above

DIRECTIONS (Qs. 61-65) : Study the following information and answer the questions given below it.

Seven people—A, B, C, D, E, F and G are sitting in a circle. Five of them are facing the centre while two of them are facing opposite to the centre. C sits third to the left of D and both are facing the centre. E is neither on immediate neighbour of D nor of C. The one sitting exactly between D and F is facing opposite to centre. G sits third to the right of A and G is facing the centre. One of B's neighbour is facing opposite to the centre.

61. Which of the following pairs represents persons facing opposite to the centre?
(a) A and F (b) E and F
(c) A and E (d) Cannot be determined
(e) None of these

62. Who is sitting second to the left of A?
(a) C (b) G
(c) E (d) B
(e) None of these

63. Who is sitting to the immediate left of E?
(a) C (b) G
(c) B (d) A
(e) None of these

64. What is the position of F with respect to B?
(a) Fourth to the left (b) Second to the right
(c) Third to the right (d) Second to the left
(e) None of these

65. If all the persons are asked to sit in a clockwise direction in an alphabetical order starting from A, the position of how many will remain unchanged, excluding A?
(a) Three (b) One
(c) Two (d) None
(e) Four

DIRECTIONS (Qs. 66-70): In the questions given below, certain symbols are used with the following meanings:

A @ B means A is greater than B.
A * B means A is either greater than or equal to B.
A # B means A is equal to B.
A $ B means A is either smaller than or equal to B.
A + B means A is smaller than B.
Now in each of the following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true?
(a) If only conclusion I is true
(b) If only conclusion II is true
(c) If either conclusion I or II is true
(d) If neither conclusion I nor II is true
(e) If both conclusions I and II are true

66. **Statements** : B + D; E$T; T * P; P@B
Conclusions : **I.** P$D
II. P@D

67. **Statements** : E*F; G$H; H#E; G@K
Conclusions : **I.** H@K
II. H*F

68. **Statements** : P$Q; N#M; M@R; R*P
Conclusions : **I.** P + N
II. Q$M

69. **Statements** : D + T; E $V; F *T; E@D
Conclusions : **I.** D$ V
II. D + F

70. **Statements** : T*U; U$W; V @L; W + V
Conclusions : **I.** V@T
II. L #W

DIRECTIONS (Qs. 71-75) : In each question below, is given a group of letters followed by found combinations of digits/symbols numbered (a), (b), (c) and (d). You have to find out which of the four combinations correctly represents combination as your answer. If none of the combinations correctly represents the group of letters, mark (e) 'None of these', as your answer.

Letter	R	E	A	U	M	D	F	P	Q	I	O	H	N	W	Z	B
Digit/Symbol code	7	#	$	6	%	8	5	★	4	9	@	©	3	D	1	2

(i) If the first letter is a consonant and the third letter is a vowel, their codes are to be interchanged.
(ii) If the first letter is a vowel and the fourth letter is a consonant, both are to be coded as the code for the vowel.
(iii) If the second and the third letters are consonants, both are to be coded as the code for the third letter.

71. NABAQE
(a) 263$4# (b) 326$4#
(c) 362$4# (d) 362$3#
(e) None of these

72. FWZERA
(a) 5D#7$ (b) 5DD#7$
(c) D17#$ (d) 511#7$
(e) None of these

73. HUBDIN
(a) ©62893 (b) ©2689%
(c) ©6289© (d) ©62©9%
(e) None of these

74. EMIRDP
(a) #%978★ (b) #%9#8★
(c) 7%9#8★ (d) #9%78★
(e) None of these

75. OREDHM
(a) @7#8©% (b) #7#8©%
(c) @78#©% (d) @7#@©%
(e) None of these

DIRECTIONS (Qs. 76-80) : Study the following information carefully and answer the given quesions following it.

(i) Eleven students A, B, C, D, E, F, G, H, I, J and K are sitting in the first row of a class facing the teacher.
(ii) D, who is on the immediate left of F, is second to the right of C.
(iii) A is second to the right of E, who is at one of the ends.
(iv) J is the immediate neighbour of A and B and third to the left of G.
(v) H is on the immediate left of D and third to the right of I.

76. Who is sitting midway between E and H?
(a) J (b) B
(c) I (d) G
(e) None of these

77. Which of the following statements is not ture in the context of the above sitting arrangement?
(a) There are seen students sitting between K and D
(b) G is the immediate neighbour of I and C
(c) H is the immediate neighbour of D and F
(d) K is between E and A
(e) F is third to the right of C

78. To obtain the respective seats of all the persons which statement given above is not required?
(a) I (b) II
(c) III (d) IV
(e) None of these

79. Besides 'E', who among the following is at the extreme end?
(a) K (b) F
(c) B (d) Can't say
(e) None of these

80. Which of the following gropus is at the left of I?
(a) AJB (b) GCH
(c) HDF (d) GCH
(e) None of these

HINTS & EXPLANATIONS

1. (d) $? = \sqrt{45689} = 213.75 \approx 210$

2. (b) $? = \frac{(10008.99)^2}{10009.001} \times \sqrt{3589} \times 0.4987$

$= \frac{(10009)^2 \times \sqrt{3600}}{10009} \times 0.50 = 10009 \times 60 \times 0.50 \approx 300000$

3. (e) $? = 399.9 + 206 \times 11.009$
$= 400 + (200 + 6) \times 11 = 400 + 2200 + 66 = 2670$

4. (a) $? = \frac{2}{5} + \frac{7}{8} \times \frac{17}{19} \div \frac{6}{5} = \frac{2}{5} + \frac{7}{8} \times \frac{17}{19} \times \frac{5}{6}$

$= \frac{2}{5} + \frac{595}{912} = 0.40 + 0.65 \approx 1.05 \approx 1$

5. (a) $? = (299.99999)^3 \approx (300)^3 = 27000000$

6. (c) Given Expression $= \frac{(a^3 - b^3)}{(a^2 + ab + b^2)}$,

where $a = 117, b = 98$

$= \frac{(a-b)(a^2 + ab + b^2)}{(a^2 + ab + b^2)} = (a - b) = (117 - 98) = 19.$

7. (b) Dividing numerator as well as denominator by b, we get:

$$\frac{3a + 2b}{3a - 2b} = \frac{3 \times \frac{a}{b} + 2}{3 \times \frac{a}{b} - 2} = \frac{3 \times \frac{4}{3} + 2}{3 \times \frac{4}{3} - 2} = \frac{4 + 2}{4 - 2} = 3$$

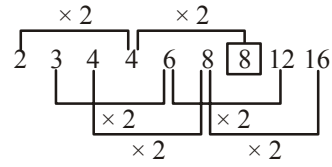
8. (d) Given Expression $= \frac{(a-b)^2 + (a+b)^2}{(a^2 + b^2)} = \frac{2(a^2 + b^2)}{(a^2 + b^2)} = 2$

9. (d) Given Expression $= \left(\frac{112}{14} \times \frac{24}{12} \times \frac{16}{8}\right) = 32$

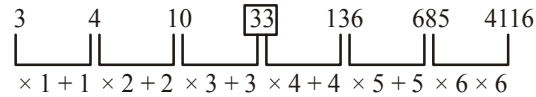
10. (b) $\frac{(\sqrt{5} - \sqrt{3})}{(\sqrt{5} + \sqrt{3})} = \frac{(\sqrt{5} - \sqrt{3})}{(\sqrt{5} + \sqrt{3})} \times \frac{(\sqrt{5} - \sqrt{3})}{(\sqrt{5} - \sqrt{3})} = \frac{(\sqrt{5} - \sqrt{3})^2}{(5 - 3)}$

$= \frac{5 + 3 - 2\sqrt{15}}{2} = \frac{2(4 - \sqrt{15})}{2} = (4 - \sqrt{15})$

11. (b)

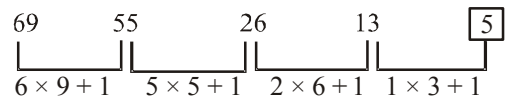


12. (d)



Thus, 32 is out of place and must be replaced by 33.

13. (c)



Thus, 5 does not fit in the series and should be replaced by 4.

14. (a) The succeeding numbers are obtained by dividing the preceding numbers by 4. Therefore, the number 386 does not fit in the series and must be replaced by 384.

15. (c) There are two series in the given series :

I. 5 12 26 54
$\times 2+2$ $\times 2+2$ $\times 2+2$

II. 11 20 [40] 74
$\times 2-2$ $\times 2-2$ $\times 2-2$

Hence the wrong term is 40.

16. (d) Population of village B in 2014 $= 5000 \times \frac{16}{13} \approx 6150$

Population of village B in 2015 $= 6150 \times \frac{110}{100} = 6750$

Population below poverty line = 52% of 6750 ≈ 3500

17. (a) Population of village D in 2014 $= 9{,}000 \times \frac{17}{15} = 10{,}200$

Population of village D in 2016 $= 10{,}200 \times \frac{110}{100}$

$= 11{,}220$

Population of village G in 2016 $= 9{,}000 \times \frac{95}{100} = 8{,}550$

$\therefore$ Total population of village D and G in 2016
$= 11{,}220 + 8{,}550 = 19{,}770$

18. (d) Population of village F below poverty line

$$= 55000 \times \frac{13}{100} \times \frac{49}{100} \approx 3500$$

19. (c) Population of village F in 2014

$$= 1520 \times \frac{100}{38} \times \frac{13}{8} = 6500$$

20. (b) Population of village C below poverty line

$$= 2000 \times \frac{38}{100} = 760$$

Population of village E below poverty line

$$= \frac{2000}{8} \times 18 \times \left(\frac{46}{100}\right) = 2070$$

$\therefore$ Required ratio $= \frac{760}{2070} = 76:207$

21. (b) The least cost of sending one unit is 0 as it is obvious from table A & B that

$$BC \xrightarrow[\text{cost}=0]{} AC \xrightarrow[\text{cost}=0]{} AAC$$

or $BD \xrightarrow[\text{cost}=0]{} AE \xrightarrow[\text{cost}=0]{} AAA$

22. (c) From table A & table B

$BC \rightarrow AC$, Cost = 0 which is minimum &

$AC \rightarrow AAB$, Cost = 284.5

$BC \rightarrow AAB$, Cost = 0 + 284.5 = 284.5

Also we have

$BD \rightarrow AE$, Cost = 0 which is minimum

$AE \rightarrow AAB$, Cost = 95.2 which is least

$BD \rightarrow AAB$, Cost = 0 + 95.2 = 95.2

Hence least cost from any refinery to AAB = 95.2

23. (b) Cost from $BB \rightarrow AB = 311.1$ which is least

Cost from $AB \rightarrow AAG = 0$ which is also least

so least cost from $BB \rightarrow AAG = 311.1 + 0 = 311.1$

24. (a) Least cost from BB to AAA would be on the route BB $\rightarrow AC \rightarrow AAA = 451.1 + 314.5 = 765.6$

25. (d) There are 6 refineries, 7 depot, 9 districts. So total ways from refinery to district $= 6 \times 7 \times 9 = 378$

26. (a) I. $\sqrt{289x} + \sqrt{25} = 0$

or, $\sqrt{289x} = -\sqrt{25}$

Squaring both sides, we get

$289x = 25$

$x = \frac{25}{289}$

II. $\sqrt{676y} + 10 = 0$

or, $\sqrt{676y} = -10$

Squaring both sides, we get

$676y = 100$

$y = \frac{100}{676}$ $\therefore$ $y > x$

27. (b) I. $8x^2 - 78x + 169 = 0$

$8x^2 - 52x - 26x + 169 = 0$

$4x(2x-13) - 13(2x-13) = 0$

$(2x-13)(4x-13) = 0$

$\therefore$ $x = \frac{13}{2}$ or $\frac{13}{4} = 6.5$ or 3.25

II. $20y^2 - 117y + 169 = 0$

$\Rightarrow 20y^2 - 152y - 65y + 169 = 0$

$\Rightarrow 4y(5y-3) - 13(5y-13) = 0$

$\Rightarrow (5y-13)(4y-13) = 0$

$\therefore$ $y = \frac{13}{5}$ or $\frac{13}{4} = 2.6$ or 3.25 $\therefore$ $x \geq y$

28. (a) I. $\frac{15}{\sqrt{x}} + \frac{9}{\sqrt{x}} = 11\sqrt{x}$

$\frac{15+9}{\sqrt{5}} = 11\sqrt{x}$

$24 = 11x$

$\therefore$ $x = \frac{24}{11}$

$= 2.18$

II. $\frac{\sqrt{y}}{4} + \frac{5\sqrt{y}}{12} = \frac{1}{\sqrt{y}}$

$\frac{3\sqrt{y} + 5\sqrt{y}}{12} = \frac{1}{\sqrt{y}}$

or, $8y = 12$

$y = 1.5 \therefore x > y$

29. (a) I. $\frac{8}{\sqrt{x}}+\frac{6}{\sqrt{x}}=\sqrt{x}$

$\frac{14}{\sqrt{x}}=\sqrt{x}$

$x=14$

II. $y^3-\frac{(14)^2}{\sqrt{y}}=0$

or, $y^3=\frac{(14)^2}{\sqrt{y}}$

$y^{3+\frac{1}{2}}=(14)^2$

$y^{7/2}=(14)^2 \therefore x>y$

30. (e) I. $x^2-208=233$

$x^2=233-208$

$x=\sqrt{25}$

$=\pm 5$

II. $y^2-47+371=0$

$y^2+324=0$

$y^2=-324$

$y=\sqrt{-324}$

Relationship cannot be established.

31. (c) Total amount used for purchasing = ₹ 160. A reduction of 20% in the price means, now a person gets 5/2 kg for ₹ 32 and this is the present price of the sugar.

$\therefore$ Present price per kg = $\frac{32}{5}\times 2 =$ ₹ 12.8

Let the original price be ₹ x. Then new price is arrived after reduction of 20% on it.

$\Rightarrow$ $x \times 0.8 = 12.8$ or $x =$ ₹ 16.

32. (b) Mrs. X spends = ₹ 535

$\therefore$ Total cost = 43 shirt + 21 ties = 535

By hit and trial, S = 10, T = 5

$\Rightarrow$ Total cost = $43 \times 10 + 21 \times 5 = 535$

Hence, Ratio of shirts to ties = 10 : 5 = 2 : 1

33. (d) Total expense percentage = (25 + 5 + 15 + 10)% = 55%

Savings % = 100 – 55 = 45%

$\because$ $45 \equiv 22500$

$\therefore$ $100\% \equiv \frac{22500}{45}\times 100 =$ ₹ 50000

34. (b) Let Anil's salary be ₹ x.

$\therefore$ Bhuvan's salary = ₹ $\frac{2x}{5}$

Chandra's salary = ₹ $\frac{2x}{5}\times\frac{7}{9}=\frac{14x}{45}$

$\therefore$ Anil : Bhuvan : Chandra = $x:\frac{2x}{5}:\frac{14x}{45}=45:18:14$

$\therefore$ Bhuvan's salary

$= ₹\left[\frac{18}{(45+18+14)}\times 77000\right] =$ ₹ 18000

35. (c) Part of the tank filled in an hour

$=\frac{1}{12}-\frac{1}{20}=\frac{5-3}{60}=\frac{1}{30}$

Hence, the tank will be filled in 30 hours

36. (b) Speed of the train = 132 km/h = $\frac{132\times 5}{18}$ m/s

Distance = (110 + 165) = 275 m

Time required to cross the railway platform

$=\frac{275\times 18}{132\times 5}=7.5$ s

37. (a) 15 W = 10 M

Now, $5W+4M=5W+\frac{4\times 15}{10}W=5W+6W=11$ W

Now, 15 women can complete the project in 55 days, then 11 women can complete the same project in

$\frac{55\times 15}{11}=75$ days

38. (a) Let the present ages of Ashu's mother and that of Ashu be x and y, respectively.

Then, $(x-5)=3(y-5)$ or $x-5=3y-15$

or $x-3y=-10$ ...(i)

and $(x+5)=2(y+5)$

And $x+5=2y+10$ or $x-2y=5$ ...(ii)

From (i) and (ii), we have $x = 35$ and $y = 15$

Hence, the present age of Ashu = 15 years

39. (a) Volume of the conical flask = Volume of the cylindrical flask upto the required height (x) cm

$\frac{1}{3}\pi a^2 h=\pi p^2\times x \Rightarrow x=\frac{ha^2}{3p^2}$ cm

40. (c) Let the sum = Rs. x and original rate = y % per annum then, New rate = $(y+3)$% per annum

$\therefore$ $\frac{x\times(y+3)\times 2}{100}-\frac{x\times y\times 2}{100}=300$

$xy+3x-xy=15000$

$\therefore$ $x=5000$ Thus, the sum = ₹ 5000

41. (b) There are 25 numbers in the given sequence.

So, middle number = 13^{th} number = 8.

Clearly, the third number to the left of this 8 is 2.

42. (e) Coding for:

I	D	E	A	S
–1↓	+1↓	–1↓	+1↓	–1↓
H	E	D	B	R

Coding for:

W	O	U	L	D
–1↓	+1↓	–1↓	+1↓	–1↓
V	P	T	M	C

Similarly,

R	I	G	H	T
–1↓	+1↓	–1↓	+1↓	–1↓
Q	J	F	I	S

43. (b) Cancelling every second letter after reversing the alphabet the series becomes.

Z X V T R P N L J H F D B

The middle letter is N.

44. (b) Total no. of girls = 17 + 10 – 1 or 18 + 9 – 1 = 26.

45. (b) From first 2 sentences 'Ka Ya' means 'very intelligent'.
From 1st and 3rd sentences 'Pu'means 'you'
∴ In first sentence 'are' means 'Bi'

46. (a) Daizy ← Sister — Binny → Aruna
(Binny's sister and Chinky's Mother) (Binny's sister)
↑
Chinky
It is cleraly shown from the above diagram that Chinky is niece to Aruna.

47. (d) 1st of month was Tuesday, hence the date on first Saturday was 5th.
Hence, the other Saturdays of the month are 12, 19, 26.
Rama met her brother on 26th.

48. (a) [5] 3 1 [6] 9 [7]
$576 = 24 \times 24$
∴ 4 will be the second digit of the two even number.

49. (a) As, J O U –1 T N I; R +1 S; N E Y +1 Z F O
Similarly, M E D –1 C D L; I +1 J; C A L +1 M B D

50. (b) 40 B 8 T 6 M 3 K 4 = ?
$\Rightarrow ? = 40 + 8 - 6 + 3 \times 4$
$\Rightarrow ? = 5 + 6 - 12 = 11$

(51-55) :

support the other group → ja pe la no
the mission gains support → ke ja zi la
gains other than money → fu no ho zi
more support and money → re qi fu ja

51. (b) The code for 'group' is 'pe'.
52. (e) 'zi' stands for 'gains'.
53. (a) more ⇒ re or qi
than ⇒ ho
the ⇒ la
group ⇒ pe
54. (c) The code for 'mission' is 'ke'.
55. (a) money ⇒ fu
more ⇒ re or ql
The code for 'matters' may be 'bu'.

56. (a) Chairs, Tables, Drawers, Shelves

Hence, conclusions I. ✓ II. ✗ III. ✓

57. (c) Trees, Flowers, Leaves, Buds

Hence, conclusions I. × II. × III. ×
But I and II are complementary pairs.

58. (e) Stones, Rocks, Bricks, Cement

Hence, conclusions I. ✗ II. ✗ III. ✗

59. (e) Flats, Buildings, Bunglows, Apartments

Hence conclusions I. ✓ II. ✓ III. ✓

60. (b) Spectacles, lenses, Frames, Metals

Hence, conclusions I. ✓ II. ✗ III. ✗

Solutions : (Qs. 61-65)

E, P, B, G, D, G, C, A, F, B

A and E is not facing centre. Rest of all facing centre.

61. (c) A and E person facing opposite to centre.
62. (d) B, because A is facing opposite to centre.
63. (b) G, because E is facing opposite to centre.
64. (e) It is either third to left or fourth to right.
65. (c) Two (C and E) will remain unchanged.
66. (c) $B < D$ ...(i), $E \le T$ ...(ii), $T \ge P$ ....(iii), $P > B$...(iv) From (i) and (iv), we get, $P > B < D \Rightarrow$ no conclusion. But the exhaustive possibilities are $P > D, P = D$ and $P < D$. Hence either I or II is true.
67. (e) $E \ge F$ ...(i), $G \le H$ ...(ii), $H = E$ ...(iii), $G > K$ ...(iv) From (ii) and (iv), we get, $H \ge G > K \Rightarrow H > K$. Hence I is true.
From (i) and (iii), we get, $H = E \ge F \Rightarrow H \ge F$. Hence, II is true.
68. (a) $P \le Q$ ...(i), $N = M$ ....(ii), $M > R$ ...(iii), $R \ge P$ ...(iv)
From (ii), (iii) and (iv), we get, $N = M > R \ge P$
$\Rightarrow N > P$ or $P < N$. Hence I is true.
From (ii), (iv) and (i), we get, $M > R \ge P \le Q \Rightarrow$ No conclusion about the relationship between M and Q can be established.

Sol. (69 and 70) :

69. (b) $D < T$ ...(i), $E \le V$ ...(ii), $F \ge T$ ... (iii), $E < D$ ...(iv)
Therefore, $V \ge E < D < T \le F$
From conclusion I. $D \le V$ ... (False)
From conclusion II. $D < F$ ... (True)
Hence, only conclusion II is true.
70. (d) $T \ge U$ ...(i), $U \le W$ ...(ii), $V < L$ ...(iii), $W < V$ ...(iv)
Therefore, $T \ge U \le W < V > L$
From conclusion I. $V > T$ ...(False)
From conclusion II. $L = W$ ... (False)
Hence, neither conclusion I nor II is true.
71. (e) Here, none of the condition is applied, so the coding is done as follows.

N	A	B	A	Q	E
↓	↓	↓	↓	↓	↓
3	$	2	$	4	#

∴ Code for NABAQE ⇒ 3$2$4#

72. (d) When no condition is applied, the coding is done as follows.

F	W	Z	E	R	A
↓	↓	↓	↓	↓	↓
5	D	1	#	7	$

But here the second and third letters are consonants, therefore condition (iii) is applied here. As condition (iii) is applied here, both the seond and third letters are to be coded as the code for the third letter.

F	W	Z	E	R	A
↓	↓	↓	↓	↓	↓
5	1	1	#	7	$

∴ Code for FWZERA ⇒ 511#7$

73. (a) Here, none of the condition is applied, so the coding is done as follows.

H	U	B	D	I	N
↓	↓	↓	↓	↓	↓
©	6	2	8	9	3

74. (b) When no condition is applied, the coding is done as follows.

E	M	I	R	D	P
↓	↓	↓	↓	↓	↓
#	%	9	7	8	★

But here the first letter is a vowel and the fourth letter is a consonant, therefore condition (ii) is applied.
As condition (ii) is applied here, both the first and the fourth letters are to be coded as the code for the vowel.

E	M	I	R	D	P
↓	↓	↓	↓	↓	↓
#	%	9	#	8	★

∴ Code for EMIRDP ⇒ #%9#8 ★

75. (d) When no condition is applied, the conding is done as follows.

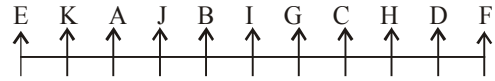
O	R	E	D	H	P
↓	↓	↓	↓	↓	↓
@	7	#	8	©	%

But here the first letter is a vowel and the fourth letter is a consonant, therefore condition (ii) is applied. As condition (ii) is applied here, both the first and fourth letters as to be coded as the code fr the vowel.

O	R	E	D	H	P
↓	↓	↓	↓	↓	↓
@	7	#	@	©	%

∴ Code for OREDHM ⇒ @7#@©%

(Qs. 76-80) : According to the given information the sitting arrangement of eleven students in a row of a class facing the teacher is as following :



76. (b) There are seven person which are sitting between E and H. B is in the midway of them.
77. (c) H is not the immediate neighbour of D and F.
78. (e) To get the final arrangement, we require all the statements.
79. (b) F is at the extreme end.
80. (a) A, J and B are at the left of I.