Practice Set 1

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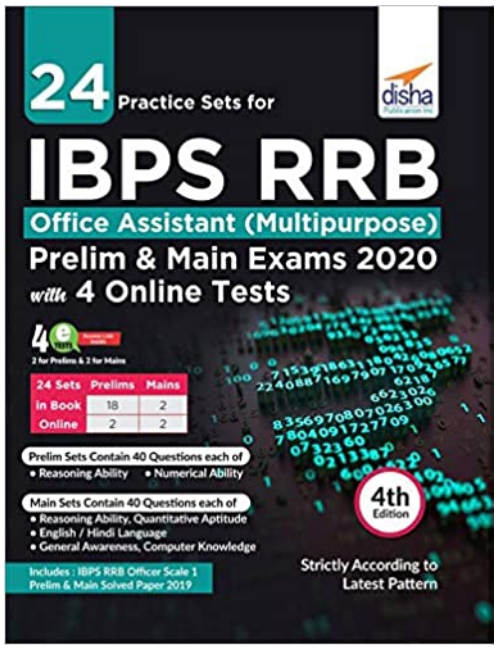

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PRACTICE SET 1

INSTRUCTIONS

- **This Preliminary Exam practice set consists of two sections. Numerical Ability (Qs. 1-40) and Reasoning (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 1/4th of the mark allotted to the specific question for wrong answer.**

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

NUMERICAL ABILITY

DIRECTIONS (Qs. 1-15) : *What should come in place of the question mark (?) in the following questions?*

1. $16\%\text{ of }450 \div ?\,\%\text{ of }250 = 4.8$
   (a) 12 (b) 6
   (c) 4 (d) 10
   (e) None of these

2. $\sqrt{?} - 11 = \sqrt{1521}$
   (a) $\sqrt{2500}$ (b) $(28)^2$
   (c) $\sqrt{28}$ (d) 50
   (e) None of these

3. $700 \div 70 \div 0.5 = ?$
   (a) 10 (b) 2.5
   (c) 1.5 (d) 20
   (e) None of these

4. $12.8 \times 4.5 \times 2.2 = ?$
   (a) 168.72 (b) 126.72
   (c) 128.27 (d) 162.72
   (e) None of these

5. $(5\times5\times5\times5\times5\times5)^4 \times (5\times5)^6 \div (5)^2 = (25)^?$
   (a) 10 (b) 17
   (c) 19 (d) 12
   (e) None of these

6. $4 \times ? = 4062 \div 5$
   (a) 203.1 (b) 213.1
   (c) 205.1 (d) 215.1
   (e) None of these

7. $5\frac{1}{5} + 2\frac{3}{5} + 1\frac{2}{5} = ?$
   (a) $7\frac{4}{5}$ (b) $8\frac{3}{5}$
   (c) $6\frac{2}{5}$ (d) $9\frac{1}{5}$
   (e) None of these

8. $13\%\text{ of }258 - ? = 10$
   (a) 23.45 (b) 24.53
   (c) 23.54 (d) 24.35
   (e) None of these

9. $\frac{4}{5} \times 2\frac{3}{4} \div \frac{5}{8} = ?$
   (a) $4\frac{12}{35}$ (b) $1\frac{12}{35}$
   (c) $2\frac{11}{35}$ (d) $3\frac{13}{25}$
   (e) None of these

10. $5437 - 3153 + 2284 = ? \times 50$
    (a) 96.66 (b) 91.36
    (c) 96.13 (d) 93. 16
    (e) None of these

11. $\frac{117\times117\times117 - 98\times98\times98}{117\times117 + 117\times98 + 98\times98} = ?$
    (a) 215 (b) 311 (c) 19 (d) 29
    (e) None of these

12. 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

13. $\sqrt{\frac{?}{196}}=\frac{72}{56}$

(a) 18 (b) 14 (c) 324 (d) 212
(e) None of these

14. $\frac{17.28\div ?}{3.6\times 0.2}=200$

(a) 120 (b) 1.20 (c) 12 (d) 0.12
(e) None of these

15. $\frac{(3.537-0.948)^2+(3.537+0.948)^2}{(3.537)^2+(.948)^2}=?$

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

DIRECTIONS (Qs. 16-20) : *What should come in place of the question mark (?) in the following number series?*

16. 2 16 112 672 3360 13440 ?
(a) 3430 (b) 3340
(c) 40320 (d) 43240
(e) None of these

17. 4 9 19 ? 79 159 319
(a) 59 (b) 39
(c) 49 (d) 29
(e) None of these

18. 4000 2000 1000 500 250 125 ?
(a) 80 (b) 65
(c) 62.5 (d) 83.5
(e) None of these

19. 588 563 540 519 ? 483 468
(a) 500 (b) 496
(c) 494 (d) 490
(e) None of these

20. 121 ? 81 64 49 36 25
(a) 92 (b) 114
(c) 98 (d) 100
(e) None of these

21. The sum of 15% of a positive number and 10% of the same number is 70. What is twice of that number?
(a) 440 (b) 280
(c) 560 (d) 140
(e) None of these

22. Vikram scored 72 per cent marks in five subjects together, viz. Hindi, Science, Maths, English and Sanskrit together, where in the maximum marks of each subject were 100. How many marks did Vikram score in Science if he scored 80 marks in Hindi, 70 marks in Sanskrit, 76 marks in Maths and 65 marks in English?
(a) 72 (b) 69
(c) 59 (d) 71
(e) None of these

23. The respective ratio between Pooja's, Prarthana's and Falguni's monthly income is 53:70: 57. If Prarthana's annual income is ₹4,20,000, what is the sum of Pooja's and Falguni's annual incomes? (In some cases monthly income and in some cases annual income is used.)
(a) ₹5,92,500 (b) ₹6,83,500
(c) ₹6,60,000 (d) ₹7,79,200
(e) None of these

24. Manhar sold an item for ₹8,400 and incurred a loss of 25%. At what price should he have sold the item to have gained a profit of 40%?
(a) ₹15,680
(b) ₹16,220
(c) ₹14,540
(d) Cannot be determined
(e) None of these

25. What will come in place of both the question marks (?) in the following question?

$\frac{(?)^{2.3}}{8}=\frac{2}{(?)^{1.7}}$

(a) 8 (b) 1
(c) 4 (d) 16
(e) 2

26. A box contains 4 blue, 6 green and 5 red balls. If two balls are drawn at random, what is the probability that no ball is red in color?
(a) $\frac{3}{10}$ (b) $\frac{1}{5}$
(c) $\frac{3}{7}$ (d) $\frac{4}{11}$
(e) $\frac{2}{9}$

27. A truck covers a distance of 360 km in 8 hours. A car covers the same distance in 6 hours. What is the respective ratio between the speed of the truck and the car?
(a) 3 : 5 (b) 3 : 4
(c) 1 : 2 (d) 4 : 5
(e) None of these

28. In order to pass in an exam a student is required to get 975 marks out of the aggregate marks. Priya got 870 marks and was declared failed by 7 per cent. What are the maximum aggregate marks a student can get in the examination?
(a) 1500 (b) 1000
(c) 1200 (d) Cannot be determined
(e) None of these

29. A group of men were assigned a work. After half of the work completed, double the number of men joined the original group. Now the work gets completed 6 days earlier than the scheduled number of days. What is the total number of days the initial group of men would have taken to complete the work?
(a) 18 days (b) 16 days
(c) 12 days (d) 15 days
(e) None of these

30. A person travels from A to B at 30 km/hr and back from B to A at 34 km/hr. If the total time taken for the journey is 48 minutes, find the total distance travelled by the man.
(a) 27.5 km (b) 25.5 km
(c) 20 km (d) 30.25 km
(e) 36 km

31. On children's day sweets were to be equally distributed amongst 200 children. But on that particular day 40 children remained absent; hence each child got 2 sweets extra. How many sweets were distributed?
(a) 3000 (b) 1500
(c) 2000 (d) 1600
(e) Cannot be determined

32. The sum of the present ages of A and B is 66. The ratio of ages of A after 4 years and B 6 years ago is 5 : 3. What is B's present age(in years)?
(a) 32 (b) 37
(c) 42 (d) 30
(e) 36

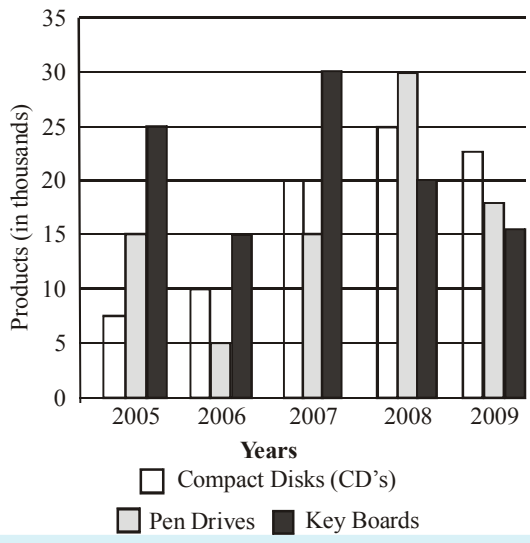
33. What is the difference between the compound interest and simple interest accrued on an amount of ₹12,000 at the end of three years at the rate of 12%?
(a) ₹ 539.136 (b) ₹ 602.242
(c) ₹ 495.248 (d) ₹ 488.322
(e) None of these

34. The area of a rectangle is equal to the area of a circle with circumference equal to 220 metres. What is the length of the rectangle if its breadth is 50 metres?
(a) 56 metres (b) 83 metres
(c) 77 metres (d) 69 metres
(e) None of these

35. Radhika got two successive discounts of 20% each on article marked at ₹ 30,000. She spent ₹ 2,800 on its repairs and then sold the same for ₹ 26,000. What is her profit percent in the whole transaction?
(a) 103/10% (b) 82/5%
(c) 10% (d) 5%
(e) 200/11%

DIRECTIONS (Qs. 36-40) : *Study the following graph carefully and answer the questions that follow.*

Three different products (in Thousands) produced by a company in five different years



36. What was the total number of all the products produced by the company in the year 2006 and 2008 together ?
(a) 105000 (b) 107 lacs
(c) 105700 (d) 10570
(e) None of these

37. What was the average number of Pen-drives produced by the company over all the years together ?
(a) 1700 (b) 16500
(c) 17000 (d) 85000
(e) None of these

38. What is the difference between the total number of Pen-drives and CDs produced by the company together in the year 2008 and the number of Key boards produced by the company in the year 2006 ?
(a) 40000 (b) 4000
(c) 35000 (d) 3500
(e) None of these

39. What was the respective ratio between the number of Key boards produced by the company in the year 2006, 2007 and 2009 ?
(a) 1 : 2 : 3 (b) 1 : 2 : 2
(c) 2 : 1 : 3 (d) 1 : 2 : 1
(e) None of these

40. What was the respective ratio between the number of CDs produced by the company in the year 2009 and the number of Keyboards produced by the company in the year 2005 ?
(a) 9 : 10 (b) 11 : 10
(c) 10 : 9 (d) 10 : 11
(e) None of these

REASONING

41. Nishu starting from a fixed point goes 15 km towards North and then after turning to his right he goes 15 km. Then he goes 10, 15 and 15 metres after turning to his left each time. How far is he from his starting point?
(a) 5 metres (b) 10 metres
(c) 20 metres (d) 15 metres
(e) Can not be determined

42. In a class of 90, where girls are twice that of boys, Shridar ranked fourteenth from the top, if there are 10 girls ahead of Shridar, how many boys are after him in rank?
(a) 23 (b) 26
(c) 25 (d) 22
(e) None of the above

DIRECTIONS (Qs. 43-45) : *These questions are based on the following information.*

Six students P, Q, R, S, T and V are the top six rankers of the class. No two persons got the same rank. The student who got the highest marks is given rank 1 and the student who got the least marks is given rank 6. Q got less marks than both R and U. P got more marks than T but less than S. Q got the second least rank and U got the second highest rank, R got less marks than P.

43. _____ got the 3rd rank.
(a) S (b) P
(c) R (d) T
(e) Cannot be determined

44. _____ got the 6th rank.
(a) T (b) P
(c) R (d) S
(e) Cannot be determined

45. In a certain code, a number 13479 is written as AQFJL and 2568 is written as DMPN. How is 396824 written in that code?
(a) QLPNMJ (b) QLPNMF
(c) QLPMNF (d) QLPNDE
(e) None of these

DIRECTIONS (Qs. 46-48) : *Study the following information to answer the given questions:*

In a certain code, 'he was singing good' is written as 'la pa ho ta', 'good was the aim' is written as 'zo ho ji la', 'singing at the stadium' is written as 'ma ta ku ji' and 'was this a stadium' is written as 'ku bi ho vi'.

46. Which of the following represents 'the aim stadium'?
(a) ma pa ji (b) ku zo pa
(c) ku ji zo (d) ji zo ma
(e) ji la ku

47. Which of the following may be the code for 'she was singing'?
(a) ro ta zo (b) ta ji ku
(c) ho bo ji (d) ho ta bo
(e) ho ma ta

48. What is the code for 'at'?
(a) ku (b) ji
(c) ma (d) zo
(e) Cannot be determined

DIRECTIONS (Qs. 49-53) : *In each of the following questions there are three items. These three items may or may not be related with one another. Each group of items may fit into one of the diagrams (a), (b), (c), (d) and (e). You have to decide in which of the following diagrams and groups of items may fit. The number of that diagram is the answer.*

Give answer (a) if only conclusion I follows.
Give answer (b) if only conclusion II follows.
Give answer (c) if either I or II follows.
Give answer (d) if neither I nor II follows.
Give answer (e) if both I and II follow.

49. **Statements:**
All leaders are good team workers.
All good team workers are good orators.
Conclusions:
I. Some good team workers are leaders.
II. All good orators are leaders.

50. **Statements:**
All terrorists are human.
All humans are bad.
Conclusions:
I. All terrorists are bad.
II. No human can be a terrorist.

51. **Statements:**
Some teachers are followers.
Some followers are famous.
Conclusions:
I. Some teachers are famous.
II. Some followers are teachers.

52. **Statements:**
Some books are pens.
No pen is pencil.
Conclusions:
I. Some books are pencils.
II. No book is pencil.

53. **Statements:**
Some dedicated souls are angles
All social workers are angles.
Conclusions:
I. Some dedicated souls are social workers
II. Some social workers are dedicated souls

DIRECTIONS (Qs. 54-55) : *Study the information given below and answer the questions following it:*

Mohan is son of Arun's father's sister. Prakash is son of Reva, who is mother of Vikash and grandmother of Arun. Pranab is father of Neela and grandfather of Mohan. Reva is wife of Pranab.

54. How is Mohan related to Reva ?
(a) Grandson (b) Son
(c) Nephew (d) Data inadaequate
(e) None of these

55. How is Vikash's wife related to Neela ?
(a) Sister (b) Niece
(c) Sister-in-law (d) Data inadaequate
(e) None of these

DIRECTIONS (Qs. 56-60) : *Read the following information carefully to answer the questions that follow.*

There are six teachers A, B, C, D, E and F in a school. Each of the teachers teaches two subjects, one compulsory subject and the other optional subject. D's optional subject is History while three others have it as compulsory subject. E and F have Physics as one of their subjects. F's compulsory subject is Mathematics which is an optional subject of both C and E. History and English are A's subjects but in terms of compulsory and optional subjects, they are reverse of those of D's. Chemistry is an optional subject of any one of them. There is only one female teacher in the school who has English as her compulsory subject.

56. What is C's compulsory subject ?
(a) History (b) Physics
(c) Chemistry (d) English
(e) None of these

57. Who is a female member in the group ?
(a) A (b) B
(c) C (d) D
(e) None of these

58. Who among the following has same optional subjects as that of the compulsory subject of F ?
(a) D (b) B
(c) A (d) C
(e) None of these

59. Disregarding which is compulsory and which is the optional subject, who has the same two subjects combination as F ?
(a) A (b) B
(c) E (d) D
(e) None of these

60. Which of the following groups of teachers has History as the compulsory subject ?
(a) A, C and D (b) B, C and D
(c) C and D (d) A, B and C
(e) None of these

DIRECTIONS (Qs. 61-65) : *In each of the questions below a group of letters are given followed by four groups of digits/ symbol combinations numbered (a) (b), (c) and (d). Letters are to be coded as per the codes and conditions given below. You have to find out which of the combinations (a), (b) , (c) and (d) is correct and indicate your answer accordingly. If none of the four represents the correct code, mark (e) i.e. 'None of these' as your answer.*

Letter	B	H	S	N	T	O	A	K	R	I	E	U	G
Digit/ Symbol Code	6	8	1	#	5	2	$	3	9	@	4	7	%

Conditions :
(i) If the first as well as last letter is vowel, both are to be coded as 'O'.
(ii) If the first letter is a vowel and the last letter is consonant, both are to be coded as 'Z'.
(iii) If the first letter is a consonant and the last letter is vowel, both are to be coded as '*'.

61. **ONSIRT**
(a) 2#1@95 (b) Z#@195
(c) Z#1@9Z (d) Z#1@95
(e) None of these

62. **KIUBSR**
(a) O@76129 (b) O@7610
(c) 3@7691 (d) 3@6719
(e) None of these

63. **BKAEUG**
(a) 03$470 (b) 63$470
(c) 03$47% (d) 63$47%
(e) None of these

64. **STOKGA**
(a) 1523%$ (b) 1523%*
(c) *523%* (d) *523%$
(e) None of these

65. **ORHSNU**
(a) O98#17 (b) O981#O
(c) 298#10 (d) 2981#7
(e) None of these

DIRECTIONS (Qs. 66-70) : *In the following questions, the symbols @, #, $, % and © are used with the following meaning as illustrated below:*

'P $ Q' means 'P is not greater than Q'
'P @ Q' means 'P is neither smaller than nor equal to Q'.
'P % Q' means 'P is neither greater than nor equal to Q'.
'P © Q' means 'P is not smaller than Q'.
'P # Q' means 'P is neither greater than nor smaller than Q'.

Now in each of the following questions assuming the given statements to be true, find which of the three conclusions I, II and III given below them is/are definitely true.

66. **Statements :** M @ R, R © K, J % K
Conclusions : I. M @ J
II. J % R
III. K % M
(a) Only I follows (b) Only I and II follow
(c) Only II and III follow (d) All follow
(e) None of these

67. **Statements :** D © N, N # V, W $ V
Conclusions : I. D # W
II. W % D
III. V # D
(a) Only III follows
(b) Only either I or II follows
(c) Only either II or III follows
(d) Only either I or III follows
(e) None of these

68. **Statements :** H % B, M © B, K # M
Conclusions : I. K @ H
II. B # K
III. K @ B
(a) All follow
(b) Only I follows
(c) Only either II or III follows
(d) Only either II or III and I follow
(e) None of these

69. **Statement :** V © M, N $ V, J @ N
Conclusions : I. J @ M
II. M @ N
III. V @ J
(a) Only II follows
(b) Only I follows
(c) Only either I or II follows
(d) Only III follows
(e) None of these

70. **Statements :** A @ B, B©E, F % E
Conclusions : I. A @ F
II. F % B
III. E % A
(a) Only I follows (b) Only I and II follow
(c) Only I and III follow (d) I, II and III follow
(e) None of these

DIRECTIONS (Qs. 71-75) : *Study the following information carefully and answer the given questions.*

A, B, C, D, E, F and G are sitting in around a circle and are facing the centre. G is the second to the left of C, who is to the immediate left of F. A is third to the left of E. B is between D and E.

71. Which of the following is false?
(a) A is fourth to the right of E.
(b) G is to immediate right of D
(c) F is third to the right of D
(d) B is to immediate left of D
(e) None of these

72. Which of the following is true?
(a) C is fourth to the left of B
(b) A is to immediate right of G
(c) D is second to the left of E
(d) B is second to the right of G
(e) None of these

73. Which of the following pair has the first person sitting to the immediate left of the second person?
(a) BE (b) C A
(c) GD (d) DG
(e) None of these

74. Which of the following has the middle person sitting between the remaining two ?
(a) FCE (b) EFB
(c) DEB (d) GDA
(e) None of these

75. Which of the following is the position of F?
(a) Fourth to the right of D
(b) To the immediate left of C
(c) Between A and E
(d) To the immediate right of A
(e) None of these

DIRECTIONS (Q. 76-80): *Study the following arrangement carefully and answer the questions given below:*

F 4 @ H 2 E % M P 5 W 9 @ I Q R 6 U H 3 Z 7 A T B 8 V # G $ Y D

76. How many such consonants are there in the above arrangement, each of the which is immediately preceded by a number but not immediately followed by a number?
(a) None (b) One
(c) Two (d) Three
(e) More than three

77. Which of the following is the 10th to the right of the 19th from the right end of the above arrangement?
(a) M (b) T
(c) # (d) 2
(e) None of these

78. If all the symbols are dropped from the above arrangement, which of the following will be the 14th from the left end?
(a) R (b) Q
(c) U (d) 3
(e) None of these

79. What should come in place of the question mark (?) in the following series based on the above arrangement?
HEM, 59I, RU3, ?
(a) 7AB (b) 7AT
(c) ★78 (d) ABV
(e) None of these

80. How many such symbols are there in the above arrangment, each of which is immediately preceded by a number and immediately followed by a letter?
(a) None (b) One
(c) Two (d) Three
(e) More than three

Answer Key

1	(b)	11	(c)	21	(c)	31	(d)	41	(b)	51	(b)	61	(c)	71	(c)
2	(e)	12	(b)	22	(b)	32	(d)	42	(b)	52	(c)	62	(e)	72	(b)
3	(d)	13	(c)	23	(c)	33	(a)	43	(b)	53	(d)	63	(d)	73	(d)
4	(b)	14	(d)	24	(a)	34	(c)	44	(a)	54	(a)	64	(c)	74	(e)
5	(b)	15	(d)	25	(e)	35	(e)	45	(b)	55	(c)	65	(b)	75	(a)
6	(a)	16	(c)	26	(c)	36	(a)	46	(c)	56	(a)	66	(d)	76	(b)
7	(d)	17	(b)	27	(b)	37	(b)	47	(d)	57	(d)	67	(b)	77	(b)
8	(c)	18	(c)	28	(a)	38	(a)	48	(c)	58	(d)	68	(d)	78	(e)
9	(d)	19	(a)	29	(a)	39	(d)	49	(a)	59	(c)	69	(e)	79	(a)
10	(b)	20	(d)	30	(b)	40	(a)	50	(a)	60	(d)	70	(d)	80	(d)

HINTS & EXPLANATIONS

1. (b) $16\%\text{ of }450 \div ?\%\text{ of }250 = 4.8$

$\Rightarrow \quad 450 \times \frac{16}{100} \div 250 \times \frac{?}{100} = 4.8$

$\Rightarrow \quad 72 \div 2.5 \times ? = 4.8$

$\Rightarrow \quad 2.5 \times ? = \frac{72}{4.8}$

$\therefore \quad ? = \frac{72}{4.8 \times 2.5} = 6$

2. (e) $\sqrt{?} - 11 = \sqrt{1521}$

$\Rightarrow \sqrt{?} - 11 = 39$

$\Rightarrow \quad \sqrt{?} = 39 + 11 = 50$

$\therefore \quad ? = (50)^2 = 2500$

3. (d) $? = 700 \div 70 \div 0.5 = 700 \times \frac{1}{70} \times \frac{1}{0.5} = 20$

4. (b) $? = 12.8 \times 4.5 \times 2.2 = 126.72$

5. (b) $(25)^{?} = (5 \times 5 \times 5 \times 5 \times 5 \times 5)^4 \times (5 \times 5)^6 \div (5)^2$

$= (25 \times 25 \times 25)^4 \times (25)^6 \div (25)^1$

$= (25^3)^4 \times (25)^6 \div 25^1 = (25)^{12} \times (25)^6 \div (25)^1$

$= (25)^{12+6-1} = (25)^{17}$

$\therefore \quad ? = 17$

6. (a) $4 \times ? = 4062 \div 5 = 4062 \times \frac{1}{5} = 812.4$

$\therefore \quad ? = \frac{812.4}{4} = 203.1$

7. (d) $? = 5\frac{1}{5} + 2\frac{3}{5} + 1\frac{2}{5} = \frac{26}{5} + \frac{13}{5} + \frac{7}{5}$

$= \frac{26+13+7}{5} = \frac{46}{5} = 9\frac{1}{5}$

8. (c) $13\%\text{ of }258 - ? = 10$

$\therefore \quad ? = 13\%\text{ of }258 - 10$

$= 258 \times \frac{13}{100} - 10 = 33.54 - 10 = 23.54$

9. (d) $? = \frac{4}{5} \times 2\frac{3}{4} \div \frac{5}{8} = \frac{4}{5} \times \frac{11}{4} \div \frac{5}{8}$

$= \frac{4}{5} \times \frac{11}{4} \times \frac{8}{5} = \frac{88}{25} = 3\frac{13}{25}$

10. (b) $? \times 50 = 5437 - 3153 + 2284 = 7721 - 3153 = 4568$

$\therefore \quad ? = \frac{4568}{50} = 91.36$

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

where $a = 117, b = 98$

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

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

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

13. (c) Let $\sqrt{\frac{x}{196}} = \frac{72}{56} = \frac{9}{7}$.

Then, $\frac{x}{196} = \frac{9}{7} \times \frac{9}{7} = \frac{81}{49}$. So, $x = \frac{81 \times 196}{49} = 324.$

14. (d) Let $\frac{17.28 \div x}{3.6 \times 0.2} = 200$. Then, $\frac{17.28}{x} = 200 \times 3.6 \times 0.2$

$\therefore x = \frac{17.28}{200 \times 3.6 \times 0.2} = \frac{1728}{200 \times 36 \times 2} = 0.12$

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

16. (c) Given series.

2 16 112 672 3360 13440 **40320**

×8 ×7 ×6 ×5 ×4 ×3

$\therefore \quad ? = 40320$

17. (b) Given series.

4 9 19 **39** 79 159 319

×2+1 ×2+1 ×2+1 ×2+1 ×2+1 ×2+1

$\therefore \quad ? = 39$

18. (c) Given series

4000 2000 1000 500 250 125 **62.5**

÷ 2 ÷ 2 ÷ 2 ÷ 2 ÷ 2 ÷ 2

$\therefore \quad ? = 62.5$

19. (a) Given series.

588 563 540 519 **500** 483 468

– 25 – 23 – 21 – 19 – 17 – 15

$\therefore \quad ? = 500$

20. (d) Given series.

121	100	81	64	49	36	25
↑	↑	↑	↑	↑	↑	↑
$(11)^2$	$(10)^2$	$(9)^2$	$(8)^2$	$(7)^2$	$(6)^2$	$(5)^2$

$\therefore$? = 100

21. (c) Let the positive no. be x.
According to question, 15% of x + 10% of x = 70

$$\Rightarrow \quad x\times\frac{15}{100}+x\times\frac{10}{100}=70$$

$$\Rightarrow \quad \frac{15x}{100}+\frac{10x}{100}=70$$

$$\Rightarrow \quad \frac{25x}{100}=70$$

$$\therefore \quad x=\frac{70\times100}{25}=280$$

$\therefore$ Double of given no. = 280 × 2 = 560

22. (b) Total number obtained by Vikram

$$=(100\times5)\times\frac{72}{100}=500\times\frac{72}{100}=360$$

$\therefore$ Number in science
= 360 – (80 + 70 + 76 + 65) = 360 – 291 = 69

23. (c) Monthly income of Prarthana $=\frac{4,20,000}{12}=₹\ 35,000$

Monthly income of Pooja and Falguni

$$=35,000\times\frac{53+57}{70}=35,000\times\frac{110}{70}=₹\ 55,000$$

$\therefore$ Annual income of Pooja and Falguni
= 55,000 × 12 = ₹ 6,60,000

24. (a) Cost price of item $=8400\times\frac{100}{100-25}$

$$=8400\times\frac{100}{75}=₹\ 11200$$

SP of item

$$=11200\times\frac{100+40}{100}=11200\times\frac{140}{100}=₹\ 15680$$

25. (e) $\frac{(?)^{2.3}}{8}=\frac{2}{(?)^{1.7}}$

$$\Rightarrow \quad (?)^{2.3+1.7}=16 \quad \Rightarrow \quad (?)^4=16=(2)^4$$

$\therefore$? = 2

26. (c) Total balls = 15
Not red ball means 2 balls from blue or green color i.e. any of (4 + 6) = 10 balls
So required probability = $^{10}C_2 / {}^{15}C_2 = 3/7$

27. (b) Speed of truck $=\frac{\text{distance}}{\text{time}}=\frac{360}{8}=45$ km/hr

Speed of car $=\frac{\text{distance}}{\text{time}}=\frac{360}{6}=60$ km/hr

$\therefore$ Required Ratio = 45 : 60 = 3 : 4

28. (a) Minimum marks to pass = 975
Priya failed by 975 – 870 = 105 marks

$\therefore$ Maximum marks $=\frac{105}{7}\times100=1500$

29. (a) Let initially x men are there to complete work in 2y days.
Now after half of work completed, i.e. after 'y' days, double men as before joined the group.
This means now there are 3x men working.
So after y days
M1 × D1 = M2 × D2
x × y = 3x × (y – 6) $\Rightarrow$ y = 9
So total days x men would have taken = 2y = 18 days

30. (b) When we are given total time for 2 journeys of equal distance,
One way distance = (multiplication of speeds/addition of speeds) × total time
So here distance from A to B
= [(30 × 34)/(30 + 34)] × 48/60 = 51/4
So total distance travelled = 2 × (51/4) = 51/2 = 25.5 km

31. (d) Let x sweets is distributed to each children
According to question,
$(200-40)\times(x+2)=200\times x$

$$\Rightarrow \quad (160)\times(x+2)=200x \quad \Rightarrow \quad 160x+320=200x$$

$$\Rightarrow \quad 200x-160x=320 \quad \Rightarrow \quad 40x=320$$

$$\therefore \quad x=\frac{320}{40}=8$$

$\therefore$ Total no. of sweets $=200\times x=200\times8=1600$

32. (d) Let the present ages of A & B be x years and y years respectively.
x + y = 66 …(i)
(x + 4)/(y – 6) = 5/3 …(ii)
Solving equations (i) and (ii), we get x = 36, y = 30
So, the present age of B is 30 years.

33. (a) $\text{S.I.}=\frac{\text{principal}\times\text{time}\times\text{rate}}{100}$

$$=\frac{12000\times3\times12}{100}=₹\ 4320$$

$$\text{C.I.}=P\left[\left(1+\frac{\text{rate}}{100}\right)^{\text{time}}-1\right]$$

$$=12000\left[\left(1+\frac{12}{100}\right)^3-1\right]$$

$$=12000\left[\left(\frac{28}{25}\right)^3-1\right]$$

$$=12000\left[\frac{21952}{15625}-1\right]=12000\times\frac{6327}{15625}$$

$$=₹\ 4859.136$$

$\therefore$ Required difference = 4859.136 – 4320 = ₹ 539.136

34. (c) Radius of circle $(r) = \frac{\text{circumference}}{2\pi} = \frac{220 \times 7}{2 \times 22} = 35$ m.

$$\text{area of circle} = \pi r^2 = \frac{22}{7} \times (35)^2 = \frac{22}{7} \times 35 \times 35$$

$$= 3850 \text{ m}^2 = \text{area of rectangle}$$

$$\therefore \quad \text{Length of rectangle} = \frac{\text{area of rectangle}}{\text{width}}$$

$$= \frac{3850}{50} = 77 \text{ m}$$

35. (e) Successive discounts of 20% and 20% makes overall discount of
$(-20) + (-20) + (-20)(-20)/100 = -40 + 4 = -36\%$
So she buys the article for
$[(100-36)/100] \times 30000 = ₹ 19,200$
Radhika spends 2800 on repairs, so total CP
$= 2800 + 19200 = ₹ 22,000$
SP = ₹ 26,000
So profit% $= (4000/22000) \times 100 = 200/11\%$

36. (a) Required number of all products
$= (10 + 5 + 15 + 25 + 30 + 20)$ thousand
$= 105000$

37. (b) Average number of produced pen-drives

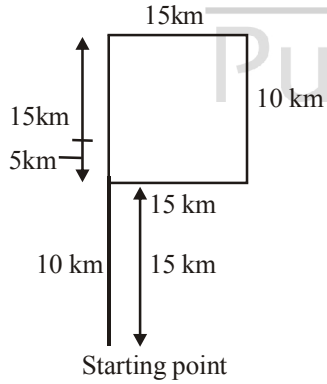
$$= \left(\frac{15+5+15+30+17.5}{5}\right) \text{ thousand} = 16500$$

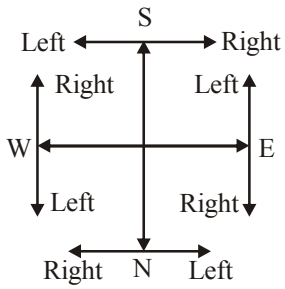
38. (a) Required difference
$= (30 + 25 - 15)$ thousand $= 40000$

39. (d) Required ratio $= 15 : 30 : 15 = 1 : 2 : 1$

40. (a) Required ratio $= 22.5 : 25 = 225 : 250 = 9 : 10$

41. (b)





So, he is 10 metres from his starting point.

42. (b) No of boys = x; No of girls = 2x;
$x + 2x = 90 \Rightarrow 3x = 90$
x (Boys) = 30 ; 2x (Girls) = 60
Number of student behind Shridar = 90 – 14 = 76
No of girls behind Shridar = 60 – 10 = 50
No of boys behind Shridar = 76 – 50 = 26

43. (b) Given that,
Q < R and U
also T > P > S and R > P
Q got the second least rank and U got the second highest rank.
So, T should have got least and S should have got the highest ranks.
T Q _ _ U S
Since R > P the final arrangement is as follows.

Student	T	Q	R	P	U	S
Rank	6	5	4	3	2	1

44. (a) T

45. (b)

46. (c) The - ji from 2nd and 3rd code, aim and zo only present in 2nd code.
From 3rd and 4th code, stadium - ku

47. (d) From 1st and 4th, was - ho,
from 1st and 3rd - singing - ta
bo and she not present anywhere.

48. (c) From 3rd, at - ma

49. (a) Conclusion I is the conversion of first statement, hence I follows. But II does not follow because A + A = A i.e. All leaders are good orators but not *vice versa*.

50. (a) A + A = A; i.e. All terrorists are human.

51. (b) I does not follow. But II follows because it is conversion of the first statement.

(54-55) : Pranab ⇔ Reva
(+) (−)
↓ ↓ ↓
Neela (−) Prakash (+) Vikash
↓
Mohan (+) Arun

(Qs. 56 - 60)
The given information is summarised in a table as follows :

Teachers	Subjects	
	Compulsory	Optional
A	History	English
B	History	Chemistry
C	History	Mathematics
D	(Female) English	History
E	Physics	Mathematics
F	Mathematics	Physics

56. (a) History is the compulsory subject of C.
57. (d) D is a female member in the group.
58. (d) The compulsory subject of F (Mathematics) is the optional subject of C.
59. (c) E has physics and Mathematics as his two subjects.
60. (d) A, B and C all have History as the compulsory subjects.
61. (c)

Letter	O	N	S	I	R	T
Code	Z	#	1	@	9	Z

Condition (ii) is applied.

62. (e)

Letter	K	I	U	B	S	R
Code	3	@	7	6	1	9

63. (d)

Letter	B	K	A	E	U	G
Code	6	3	$	4	7	%

64. (c)

Letter	S	T	O	K	G	A
Code	*	5	2	3	%	*

Condition (iii) is applied.

65. (b)

Letter	O	R	H	S	N	U
Code	O	9	8	1	#	O

Condition (i) is applied.

66. (d) $M > R$ ...(i)
$R \geq K$ ...(ii)
$J < K$ ...(iii)
Combining (i), (ii) and (iii), we get
$M > R \geq K > J \Rightarrow$ $M > J$ (conclusion I)
$R > J$ (conclusion II)
$M > K$ (conclusion III)
Hence, conclusion I ($M > J$), conclusion II ($J < R$) and conclusion III ($K < M$) are true.

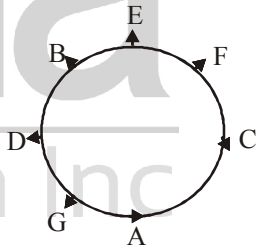
67. (b) $D \geq N$ ...(i)
$N = V$ ...(ii)
$W \leq V$ ...(iii)
Combining (i) and (ii), we get
$D \geq N = V \Rightarrow D \geq V$. Hence, conclusion III ($V = D$) is not necessary true.
Again, combining all (i), (ii) and (iii), we get
$D \geq N = V \geq W \Rightarrow D \geq W$.
Hence, neither conclusion I ($D = W$) nor conclusion II ($W < D$) is true. But both conclusion I ($D = W$) and conclusion II ($W < D$) together make a complementary pair. Hence, either conclusion I or conclusion II is true.

68. (d) $H < B$ ...(i)
$M \geq B$ ...(ii)
$K = M$ ...(iii)
Combining (ii) and (iii), we get
$K = M \geq B \Rightarrow K \geq B$. Hence, neither conclusion II ($B = K$) nor conclusion III ($K > B$) is true. But, both conclusion I and conclusion II together make a complementary pair. Hence, either conclusion II ($B = K$) or conclusion III ($K > B$) is true.
Again, combining all (i), (ii) and (iii), we get
$K = M \geq B > H \Rightarrow K > H$ (conclusion I). Hence, conclusion I ($K > H$) is true.

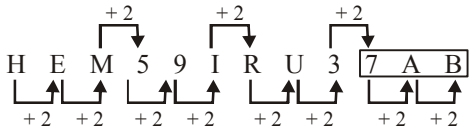
69. (e) $V \geq M$ ...(i)
$N < V$ ...(ii)
$J > N$ ...(iii)
From (i) and (ii), no specific relation between M and N can be established. Hence, conclusion II ($M > N$) is not necessarily true.
Again, from all (i), (ii) and (iii), no specific relation between J and M can be established. Hence, conclusion I ($J > M$) is not necessarily true. Again, from (ii) and (iii), no specific relation between V and J can be established. Hence, conclusion III ($V > J$) is not necessarily true.

70. (d) $A > B$ ....(i)
$B \geq E$ ....(ii)
$F < E$ ....(iii)
Combining (i), (ii) and (iii), we get
$A > B \geq E > F$
Hence, Conclusion I ($A > F$)
Conclusion II ($F < B$)
and Conclusion III ($E < A$) are true.

71. (c) F is third to the right of D.



72 (b) A is to immediate right of G
73 (d) DG
74 (e) None of these
75 (a) Fourth to the right of D
76. (b) Required consonant in the arrangement = 8 ∨ #
77. (b) From right 19th element is Q and from Q, rightward 10th element is T.
78. (e) After eliminating all symbols arrangement will be F 4 H 2 E M P 5 W 9 I Q R 6 U H 3 Z 7 A T B 8 V G Y D. 14th element from leftward is '6'.
79. (a)



80. (d) Required symbol in the arrangement = 4 @ H, 9 @ 1, 7 ★ A