5 Practice Set

ARITHMETIC

1. $\frac{1}{\sqrt{9}-\sqrt{8}}-\frac{1}{\sqrt{8}-\sqrt{7}}+\frac{1}{\sqrt{7}-\sqrt{6}}-\frac{1}{\sqrt{6}-\sqrt{5}}$

$\frac{1}{\sqrt{5}-\sqrt{4}}$ equal to

(a) 0 (b) 1 (c) 5 (d) $\frac{1}{3}$

2. What is the sum of the digits of the least number which when divided by 52, leaves 33 as remainder, when divided by 78 leaves 59 and when divided by 117, leaves 98 as remainder ?

(a) 17 (b) 18 (c) 19 (d) 21

3. If 1 is subtracted from the numerator of a fraction it becomes (1/3) and if 5 is added to the denominator the fraction becomes (1/4). Which fraction shall result, if 1 is subtracted from the numerator and 5 is added to the denominator ?

(a) $\frac{5}{12}$ (b) $\frac{7}{23}$ (c) $\frac{1}{8}$ (d) $\frac{2}{3}$

4. 38L of milk was poured into a tub and the tub was found to be 5% empty. To completely fill the tub, what amount of additional milk must be poured?

(a) $1L$ (b) $2L$ (c) $3L$ (d) $4L$

5. Prakash, Sunil and Anil started a business jointly investing ₹11 lakhs, ₹ 16.5 lakhs and ₹ 8.25 lakhs respectively. The profit earned by them in the business at the end of three years was ₹ 19.5 lakhs. What will be the 50% of Anil's share in the profit?

(a) ₹4.5 lakhs (b) ₹2.25 lakhs
(c) ₹2.5 lakhs (d) ₹3.75 lakhs

6. A ball is dropped from a height 64 m above the ground and every time it hits the ground it rises to a height equal to half of the previous. What is the height attained after it hits the ground for the 16th time?

(a) 2^{-12} m (b) 2^{-11} m
(c) 2^{-10} m (d) 2^{-9} m

7. If ₹ 8400 is divided among A, B and C in the ratio $\frac{1}{5}:\frac{1}{6}:\frac{1}{10}$, what is the share of A?

(a) ₹ 3200 (b) ₹ 3400
(c) ₹ 3600 (d) ₹ 3800

8. There are 45 male and 15 female employees in an office. If the mean salary of the 60 employees is ₹ 4800 and the mean salary of the male employees is ₹ 5000, then the mean salary of the female employees is

(a) ₹ 4200 (b) ₹ 4500
(c) ₹ 5600 (d) ₹ 6000

9. A train started from a station with a certain number of passengers. At the first halt, $\frac{1}{3}$rd of its passengers got down and 120 passengers got in. At the second halt, half of the passengers got down and 100 persons got in. Then, the train left for its destination with 240 passengers. How many passengers were there in the train when it started ?

(a) 540 (b) 480 (c) 360 (d) 240

10. An equilateral triangle and a regular hexagon are inscribed in a given circle. If a and b are the lengths of their sides respectively, then which one of the following is correct.

(a) $a^2 = 2b^2$ (b) $b^2 = 3a^3$
(c) $b^2 = 2a^2$ (d) $a^2 = 3b^2$

11. The sides of a parallelogram are 12 cm and 8 cm long and one of the diagonals is 10 cm long. If d is the length of other diagonal, then which one of the following is correct?

(a) $d < 8$ cm (b) 8 cm < d < 10 cm
(c) 10 cm $< d <$ 12 cm (d) $d >$ 12 cm

12. ABC is an equilateral triangle inscribed in a circle. D is any point on the arc BC. What is $\angle ADB$ equal to?

(a) 90° (b) 60°
(c) 45° (d) None of the above

13. Which one of the following relations for the numbers 10, 7, 8, 5, 6, 8, 5, 8 and 6 is correct?
(a) Mean = Median (b) Mean = Mode
(c) Mean > Median (d) Mean > Mode

14. A round balloon of unit radius subtends an angle of 90° at the eye of an observer standing at a point, say A. What is the distance of the centre of the balloon from the point A?
(a) $1/\sqrt{2}$ (b) $\sqrt{2}$
(c) 2 (d) 1/2

15. What is one of the value of x in the equation $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = \frac{13}{6}$?
(a) $\frac{5}{13}$ (b) $\frac{7}{13}$ (c) $\frac{9}{13}$ (d) $\frac{11}{3}$

16. If pqr = 1, what is the value of the expression $\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$?
(a) 1 (b) –1
(c) 0 (d) 1/3

17. What should be subtracted from $27x^3 - 9x^2 - 6x - 5$ to make it exactly divisible by $(3x - 1)$?
(a) –5 (b) –7
(c) 5 (d) 7

18. If $1 + \tan\theta = \sqrt{2}$, then what is the value of $\cot\theta - 1$?
(a) $\frac{1}{\sqrt{2}}$ (b) $\sqrt{2}$ (c) 2 (d) $\frac{1}{2}$

19. If $x + \left(\frac{1}{x}\right) = 2\cos\alpha$, then what is the value of $x^2 + \left(\frac{1}{x^2}\right)$?
(a) $4\cos^2 a$
(b) $4\cos^2 a - 1$
(c) $2\cos^2 a - 2\sin^2 a$
(d) $\cos^2 a - \sin^2 a$

20. The angle of elevation of the top of an unfinished pillar at a point 150 m from its base is 30°. If the angle of elevation at the same point is to be 45°, then the pillar has to be raised to a height of how many metres?
(a) 59.4 m (b) 61.4 m
(c) 62.4 m (d) 63.4 m

DIRECTIONS (Q. 21-22): *Study the following table carefully in answer the questions that follow :*

Number of Executives recruited by Six different organisations over the years

Organisation	P	Q	R	S	T	U
2004	458	512	418	502	476	492
2005	522	536	472	500	482	523
2006	480	495	464	508	488	518
2007	506	505	428	444	490	534
2008	427	485	422	512	510	498
2009	492	488	444	499	512	510

21. What is the per cent increase in the number of Executives recruited by organisation R in 2005 from the previous year? (rounded off to two digits after decimal)
(a) 18.67 (b) 12.92
(c) 16.48 (d) 13.21

22. The number of Executives recruited by organisation T in the year 2008 forms approximately what percent of the total number of Executives recruited by all the organisations together in that year?
(a) 11 (b) 31 (c) 18 (d) 26

23. If the area of a circle, inscribed in an equilateral triangle is 4π cm^2, then what is the area of the triangle?
(a) $12\sqrt{3}$ cm^2 (b) $9\sqrt{3}$ cm^2
(c) $8\sqrt{3}$ cm^2 (d) 18 cm^2

24. The HCF of $X^4 - 1$ and $X^4 - 2X^3 - 2X^2 - 2X - 3$ is
(a) $(x^2+1)(x-1)$ (b) (x^2+1)
(c) $(x^2+1)(x+1)$ (d) $(x+1)$

25. A cone is inscribed in a hemisphere such that their bases are common. If C is the volume of the cone and H that of the hemisphere, then what is the value of C : H?
(a) 1 : 2 (b) 2 : 3
(c) 3 : 4 (d) 4 : 5

26. If $x : y = 3 : 1$, then $x^3 - y^3 : x^3 + y^3 = ?$
(a) 13 : 14 (b) 14 : 13
(c) 10 : 11 (d) 11 : 10

27. $\sqrt{\sqrt{17956} + \sqrt{24025}} = ?$
(a) 256 (b) 289
(c) 155 (d) None of these

28. Three bells toll at intervals of 9, 12 and 15 minutes respectively. All the three begin to toll at 8 a.m. At what time will they toll together again?
(a) 8.45 a.m. (b) 10. 30 a.m.
(c) 11.00 a.m. (d) 1. 30 p.m.

29. The sum of five numbers is 924. The average of first two numbers is 201.5 and the average of last two number is 196. What is the third number ?
(a) 133
(b) 129
(c) 122
(d) Cannot be determined

30. If the cost price is 96% of the selling price, then what is the profit percent?
(a) 4.5% (b) 4.2%
(c) 4% (d) 3.8%

31. If A : B = 3 : 4, B : C = 8 : 10 nad C : D = 15 : 17 Then find A : B : C : D.
(a) 9 : 12 : 13 : 11 (b) 4 : 5 : 6 : 7
(c) 9 : 12 : 15 : 17 (d) None of these

32. X and Y can do job in 25 days and 30 days respectively. They work together for 5 days and then X leaves. Y will finish the rest of the work in how many days?
(a) 18 days (b) 19 days
(c) 20 days (d) 21 days

33. On a journey across Bombay, a tourist bus averages 10 km/h for 20% of the distance, 30 km/h for 60% of it and 20 km/h for the remainder. The average speed for the whole journey was
(a) 10 km/h (b) 30 km/h
(c) 5 km/h (d) 20 km/h

34. The area of a square field is 576 km^2. How long will it take for a horse to run around at the speed of 12 km/h ?
(a) 12 h (b) 10 h
(c) 8 h (d) 6 h

35. A single discount equal to a discount series of 10% and 20% is
(a) 25% (b) 28%
(c) 30% (d) 35%

36. Three pipes A, B and C can fill a tank in 6 minutes, 8 minutes and 12 minutes, respectively. The pipe C is closed 6 minutes before the tank is filled. In what time will the tank be full ?
(a) 4 min (b) 6 min
(c) 5 min (d) Data inadequate

37. A thief is noticed by a policeman from a distance of 200 m. The thief starts running and the policeman chases him. The thief and the policeman run at the rate of 10 km and 11 km per hour respectively. What is the distance between them after 6 minutes?
(a) 100 m (b) 150 m
(c) 190 m (d) 200 m

38. If $\frac{a}{b}\ \frac{4}{5}$ and $\frac{b}{c}\ \frac{15}{16}$, then $\frac{c^2 - a^2}{c^2\ \ a^2}$ is
(a) $\frac{1}{7}$ (b) $\frac{7}{25}$
(c) $\frac{3}{4}$ (d) None of these

39. If $x + \frac{1}{x} = 2$ and x is real, then the value of $x^{17} + \frac{1}{x^{19}}$ is
(a) 1 (b) 0 (c) 2 (d) -2

40. If $0 \le \alpha \le \frac{\pi}{2}$ and $2 \sin \alpha + 15\cos^2 \alpha = 7$, then the value of $\sin \alpha$ is
(a) $\frac{5}{4}$ (b) $\frac{4}{5}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

GENERAL INTELLIGENCE & REASONING

DIRECTIONS (Qs. 41-42) : *In questions below, select the related word/letters/number from the given alternatives.*

41. 9 : 24 :: ? : 6
(a) 3 (b) 2
(c) 1 (d) 5

42. STAR : SBUT :: WARD : ?
(a) XBAW (b) ESBX
(c) FAME (d) DRAW

DIRECTIONS (Qs. 43-44) : *In questions find the odd word/letters//numbers pair from the given alternatives:*

43. (a) (25, 49) (b) (121, 169)
(c) (7, 169) (d) (9, 25)

44. (a) HEAT (b) MEAT
(c) MEET (d) BEAT

DIRECTION : (Qs. 45-46) *a series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.*

45. BDFH, IKMO, PRTV, _
(a) WYAC (b) WXYA
(c) WXYZ (d) WYZA

46. 2, 65, 7, 59, 12, 53, _ , _
(a) 15, 42 (b) 17, 45
(c) 17, 47 (d) 18, 48

47. How Many triangles are there in the given figure ?

(a) 5 (b) 12
(c) 9 (d) 10

48. Arrange the words given below in a meaningful sequence.
1. Elephant 2. Cat
3. Mosquito 4. Tiger
5. Whale
(a) 5, 3, 1, 2, 4 (b) 3, 2, 4, 1, 5
(c) 1, 3, 5, 4, 2 (d) 2, 5, 1, 4, 3

49. If GOODNESS is coded as HNPCODTR, how can GREATNESS be written in that code?
(a) HQFZSMFRT (b) HQFZUFRTM
(c) HQFZUODTR (d) HQFZUMFRT

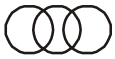
50. From the given alternatives select the word which cannot be formed using the letters of the given word.
LEGALIZATION
(a) ALERT (b) ALEGATION
(c) GALLANT (d) NATAL

51. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?
B_CCABB_CABBC_AB_CCA
(a) BCBC (b) BCCB
(c) BBCC (d) BBBC

52. Seema walks 30 m North. Then she turns right and walks 30 m then she turns right and walks 55 m. Then she turns left and walks 20 m. Then she again turns left and walks 25m. How many metres away is she from her Original position?
(a) 45 m (b) 50 m
(c) 66 m (d) 55 m

53. A family consisted of a man, his wife, his three sons, their wives and three children in each son's family. How many members are there in the family?
(a) 12 (b) 13
(c) 15 (d) 17

54. If the 5th date of a month is Tuesday, what date will be 3 days after the 3rd Friday in the month?
(a) 17 (b) 22
(c) 19 (d) 18

55. Which of the following states the relationship between Manager, Labour Union and Worker?
(a)  (b) 
(c)  (d) 

56. 12 year old Rahul is three times as old as his brother Raras. How old will Rahul be when be is twice as old as Paras?
(a) 14 years (b) 20 years
(c) 16 years (d) 18 years

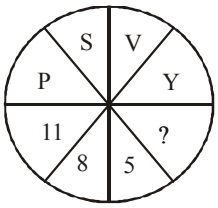
DIRECTIONS (57-58) : *In each of the following questions, select the missing number from the given responses.*

57.

5	4	7	8
6	9	5	?
3	7	2	6

(a) 6 (b) 4 (c) 10 (d) 8

58.



(a) 6 (b) 7 (c) 3 (d) 2

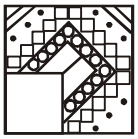
DIRECTIONS (Qs. 59) : *In question below, some statements are given followed by three conclusions respectively. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given conclusions if any, follow from the given statements.*

59. **Statement :** Pictures can tell a story. All story books have pictures. Some story books have words.
Conclusions: I. Pictures can tell a story better than words can.
II. The stories in story books are very simple.
III. Some story books have both words and pictures.
(a) Only conclusion I follows
(b) Only conclusion II follows
(c) Only conclusion III follows
(d) Both conclusions I and II follow

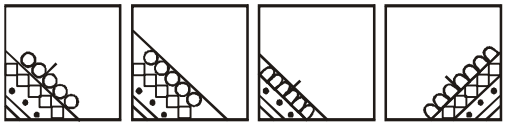
60. There are five houses P, Q, R, S and T. P is right of Q and T is left of R and right of P. Q is right of S. Which house is in the middle ?
(a) P (b) Q (c) T (d) R

DIRECTION (Qs. 61) : *In question below, which anwser figure will complete the pattern in the question figure ?*

61. Question figure :



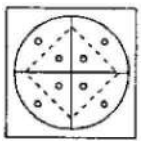
Answer figures :



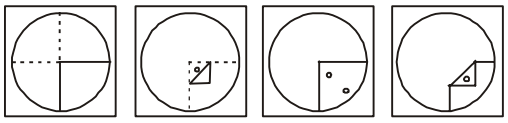
(a) (b) (c) (d)

62. A Circular sheet of paper is folded in particular manner, punched once and then unfolded. Find Out the manner in which the paper was folded and punched from amongst the answer figures.

Question figure :



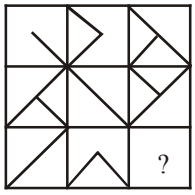
Answer figure:



(a) (b) (c) (d)

63. Select a suitable figure from the four alternatives that would complete the figure matrix.

Question figure:

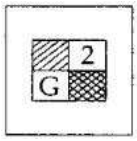


Answer figures:

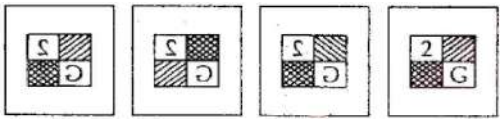
(a) (b) (c) (d)

64. Which is the correct image if the picture is held in front of a mirror?

Question figure:



Answer figures:



(a) (b) (c) (d)

DIRECTIONS (Qs. 65) : *A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in two matrices given below. The columns and rows of Matrix I are numbered from 0 to 4 and that of Matrix II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column e.g., 'E' can be represented by 01, 13 etc., and 'L' can be represented by 56, 77 etc. Similarly, you have to identify the set for the word given in each question.*

65. **Matrix I**

	0	1	2	3	4
0	A	E	M	N	P
1	N	P	A	E	M
2	E	M	N	P	A
3	P	A	E	M	N
4	M	N	P	A	E

Matrix II

	5	6	7	8	9
5	I	L	R	S	T
6	R	S	T	I	L
7	T	I	L	R	S
8	L	R	S	T	I
9	S	T	I	L	R

AIRS

(a) 12, 76, 99, 78 (b) 43, 55, 86, 95

(c) 00, 68, 78, 88 (d) 24, 69, 56, 78

66. B is the father of Q. B has only two children. Q is the brother of R. R is the daughter of P. A is the granddaughter of P and S is the father of A. How is S related to Q?
(a) Son (b) Son-in-law
(c) Brother (d) Brother-in-law

67. Unscramble the letters in the given words and find the odd one out.
(a) UMRSME (b) EIWNTR
(c) PIGRSN (d) LCUOD

68. If the first and second letters in the word DEPRESSION were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?
(a) R (b) O (c) S (d) P

69. In P, Q, R, S, T and U, R is taller than only P and U. S is shorter than only T and Q. If each has different heights. then who will be at the third place when they are standing in descending order of their height and the counting is done in the same order (tallest to shortest)?
(a) R (b) P (c) S (d) Q

DIRECTIONS (Qs. 70-71) : *Read the following information carefully to answer the given questions.*

V, U and T are sitting around a circle. A, B and C are also sitting around the same circle but two of them are not facing centre (they are facing the direction opposite to centre). Y is second to the left of C. U is second to the right of A. B is third to the left of T. C is second to the right of T. A is seated next to V.

70. Which of the following are not facing centre?
(a) BA (b) CA
(c) BC (c) Cannot be determined

71. Which of the following is the position of T in respect of B?
(a) Third to the right
(b) Second to the right
(c) Third to the left
(d) Third to the left or right

DIRECTIONS (Qs. 72-74): *Answer these questions referring to the letter sequence given below:*

NOPQYBZARSHIJKILMTUVGEFWXDC

72. If letters of the above given series are written in reverse order then which letter will be third to the left of eighteenth letter from your right?
(a) Z (b) G
(c) I (d) L

73. What will come in place of question mark (?) in the following series ?
NDP, QWB, ZER, ?
(a) SVJ (b) AFS
(c) IVS (d) None of these

74. Which of the following is the fifth to the right of thirteenth letter from you left ?
(a) T (b) J
(c) S (d) Z

75. How many meaningful three letter English words can be formed with the letters AER, using each letter only once in each word ?
(a) None (b) One
(c) Three (d) Two

76. Each vowel of the word ADJECTIVE is substituted with the next letter of the English alphabetical series, and each consonant is substituted with the letter preceding it. How many vowels are present in the new arrangement ?
(a) Four (b) One
(c) Two (d) Three

77. In a certain code '*na pa ka so*' means 'birds fly very high', '*ri so la pa*' means 'birds are very beautiful' and '*ti me ka bo*' means 'the parrots could fly'. Which of the following is the code for 'high' in that language ?
(a) *na* (b) *ka*
(c) *bo* (d) *so*

78. If the digits in the number 86435192 are arranged in ascending order, what will be the difference between the digits which are second from the right and fourth from the left in the new arrangement ?
(a) One (b) Two
(c) Three (d) Four

79. If it is possible to make only one meaningful word with the Third, Seventh, Eighth and Tenth letters of the word COMPATIBILITY, which of the following would be the last letter of that word ? If no such word can be made, give 'X' as your answer and if more than one such word can be formed, give your answer as 'Y'.
(a) I (b) B
(c) L (d) X

80. In a certain code FINE is written HGPC. How is SLIT written in that code ?
(a) UTGR (b) UTKR
(c) TUGR (d) None of these

GENERAL AWARENESS

81. When had Muslim league passed the resolution "Divide and Quit" movement ?
(a) 1945 (b) 1943
(c) 1944 (d) None of these

82. What is the ratio of money held by the public in currency to that they held in deposit ?
(a) The currency deposit ratio
(b) The reserve deposit ratio
(c) Cash reserve ratio
(d) Cash deposit ratio

83. The chemical behavior of an atom depends upon –
(a) the number of Neutrons in the nucleus
(b) the number of Nucleons in the nucleus
(c) the number of Protons in its nucleus
(d) the number of Electrons orbiting around the nucleus

84. 88th amendement of the Indian Constitution is related to –
(a) The demarcation of new boundaries between states
(b) The Constitution of the National Judicial Commission
(c) Empowering the Centre to levy and appropriate Service tax
(d) Readjustment of electroal constituencies on the basis of the population census 2001

85. The joint sitting of both Houses of Indian Parliament is held in connection with –
(a) Constitutional amendment bill
(b) Ordinary bill
(c) Money bill
(d) Election of the Vice – President of India

86. Many Fungi belonging to the genera Microporum Trichophyton and Epidermophyton are responsible for –
(a) Filarial (b) Cancer /
(c) Ringworms (d) AIDS

87. A boat will submerge when it displaces water equal to its own –
(a) volume (b) weight
(c) surface area (d) density

88. Which organ of Human body is affected by Alzheimer disease ?
(a) Brain (b) Bone Marrow
(c) Lung (d) Intestine

89. What is the chemical name of vitamin E ?
(a) Calciferol (b) Tocopherol
(c) Riboflavin (d) Phylloquinone

90. According to the Constitution of India, the Right to Property is a –
(a) Fundamental Right
(b) Directive Principle
(c) Legal Right
(d) Social Right

91. Babar declared himself as an emperor first at –
(a) Samarqand (b) Farghana
(c) Kabul (d) Panipat

92. How many times has financial emergency been declared in India, so far?
(a) Five times (b) Four times
(c) Once (d) Never

93. Economy is in the "Liquidity Trap" when –
(a) Rate of interest on bonds is minimum
(b) Rate of interest on bonds is maximum
(c) Transaction demand for money is maximum
(d) None of the above

94. Who is the author of "The Unseen Indira Gandhi"?
(a) K.P. Mathur
(b) Bilal Siddique
(c) Anurag Mathur
(d) N.R. Narayana Murthy

95. What is 'biomagnification'?
(a) blowing up of environmental issues by man
(b) growth of organisms due to food consumption
(c) reduction of dissolved O2 caused by microbial organisms
(d) increase in the concentration of nondegradable pollutants as they pass through food chain

96. Subhash Chandra Bose formed the government for independent India in Singapore, on –
(a) 22nd September, 1943
(b) 20th October, 1943
(c) 21st October, 1943
(d) 22nd October, 1943

97. 'Laffer Curve" shows the relationship between –
(a) Government Revenue and Government Expenditure.
(b) Tax Rates and Tax Revenue.
(c) Direct Taxes and GDP.
(d) None of the above

98. 'Cerebral palsy' is a brain disorder found generally in –
(a) Old people (b) Drug addicts
(c) Small children (d) Only in ladies

99. India is not a member of which of the following constituent organizations of the World Bank Group?

(a) International Centre for Settlement of Investment Disputes (ICSID)
(b) International Development Association (IDA)
(c) International Finance Corporation (IFC)
(d) Multilateral Investment Guarantee Agency (MIGA)

100. The mirror used in search light is –
(a) Concave Mirror (b) Convex Mirror
(c) Plane Mirror (d) None of these

101. A.T.F. is related to –
(a) Civil Aviation (b) Railways
(c) Road transport (d) None of these

102. A hybrid computer is the one having the combined properties of
(a) Super and micro computers
(b) Mini and micro computers
(c) Analog and digital computers
(d) Super and mini computers

103. Which of the following statements are NOT correct?
(a) Prithvi-II is a Surface-to-Surface Missile
(b) Prithvi-IIcan carry a 500 kg nuclear warhead
(c) Prithvi-IIhas a range of 350 KM
(d) Akash is the naval variant of the Prithvi missile

104. The 2016 Copa America Football tournament has been won by which of the following countries ?
(a) Argentina (b) Colombia
(c) Chile (d) Peru

105. Which historical site has been declared as the SARRC cultural capital for 2016-17?
(a) Bamiyan (b) Maynamati
(c) Shilaidah (d) Mahashangarh

106. What is called as the main folder on a storage device?
(a) Platform (b) Interface
(c) Root Directory (d) Home Page

107. RAM is ..... and ..... .
(a) volatile, temporary
(b) nonvolatile, permanent
(c) nonvolatile, temporary
(d) volatile, permanent

108. Which is not an item of hardware?
(a) An MP3 file (b) A keyboard
(c) A monitor (d) A mouse

109. The box that contains the central electronic components of the computer is the .....
(a) motherboard (b) system unit
(c) peripheral (d) input device

110. Which type of device is computer monitor?
(a) Input (b) Output
(c) Processing (d) Software

111. What is the rank of India in the world in terms of length of railroad network?
(a) First (b) Second
(c) Third (d) Fourth

112. Which of the following ran the first train from Bori Bunder to Thane in 1853?
(a) Bombay Baroda Railway
(b) The Scindia Railway
(c) Central India Railway
(d) Great Indian Peninsula Railway

113. The Maitree Express connects India with which of the following countries?
(a) Myanmar (b) Pakistan
(c) Bangladesh (d) Nepal

114. Which of the following is the largest zone in terms of route kilometers?
(a) Western Railways (b) Eastern Railways
(c) Northern Railways (d) Southern Railways

115. Which of the following is the largest marshalling yard in India (also the longest in Asia)?
(a) Mughalsarai (b) Mathura
(c) Itarasi (d) Guntakal

116. Name the Chancellor of Nalanda University who has resigned from his post on 25 November 2016.
(a) A.Goh Chok Tong (b) Vivian Balakrishna
(c) George Yeo (d) Lee Hsien Loong

117. The Cabinet Committee on Economic Affairs recently approved the setting up of Jawahar Navodaya Vidyalaya (JNV) in how many districts?
(a) 34 (b) 48
(c) 57 (d) 62

118. Which of the following countries will chair the 2017 Energy Club of Shanghai Cooperation Organization?
(a) Uzbekistan (b) Mongolia
(c) Turkey (d) China

119. Who will be the Chief Guest at the 14th Pravasi Bharatiya Divas (PBD) Convention which will be held in Bengaluru from January 7 to 9, 2017 ?
(a) Mohammed bin Zayed Al Nahyan
(b) Marcelo Rebelo de Sousa
(c) Rodrigo Duterte
(d) Antonio Costa

120. Who is the author of the book "Gita Press and the Making of Hindu India" that won the Bhatt First Book Prize 2016?
(a) Manu S. Pillai (b) Akshaya Mukul
(c) Madhu Gurung (d) Sophia Khan

Hints & Explanations

1. (c) $\frac{1}{\sqrt{9}-\sqrt{8}}-\frac{1}{\sqrt{8}-\sqrt{7}}+\frac{1}{\sqrt{7}-\sqrt{6}}$

$-\frac{1}{\sqrt{6}-\sqrt{5}}+\frac{1}{\sqrt{5}-\sqrt{4}}$ (on rationalisation)

$=\left(\sqrt{9}+\sqrt{8}\right)-\left(\sqrt{8}+\sqrt{7}\right)+\left(\sqrt{7}+\sqrt{6}\right)$

$-\left(\sqrt{6}+\sqrt{5}\right)+\left(\sqrt{5}+\sqrt{4}\right)$

$=\sqrt{9}+\sqrt{4}=3+2=5$

2. (a) Here, $52-33=78-59=117-98=19$
Now, $52=13\times2\times2$
$78=13\times2\times3$
$117=13\times3\times3$
$\therefore$ LCM $=13\times2\times2\times3\times3=468$
$\therefore$ Required number $=468-19=449$
Hence, the sum of digits is 17.

3. (c) Let the numerator and denominator of a fraction are x and y, respectively,
According to question,

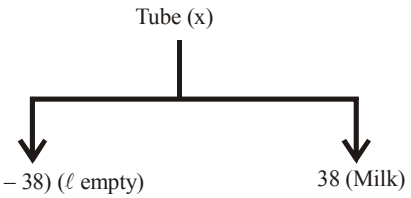
$\frac{x-1}{y}=\frac{1}{3}\Rightarrow 3x-3=y\Rightarrow 3x-y=3\ldots(i)$

and $\frac{x}{y+5}=\frac{1}{4}\Rightarrow 4x-y=5 \quad \ldots(ii)$

On solving eqs. (i) and (ii), we get
$x=2$ and $y=3$
$\therefore$ Required fraction

$=\frac{x-1}{y+5}=\frac{2-1}{3+5}=\frac{1}{8}$

4. (b) Let tub capacity x L.



Now, $x\times\frac{95}{100}=38$

x = 40 L,
Additional milk = 40 L – 38 L = 2L.

5. (b) Profit will be shared in the ratio of
$11\times3:16.5\times3:8.25\times3$
$=11:16.5:8.25=44:66:33$
Anil's share in the profit

$=\frac{33}{143}\times19.5=14.5$ lakh

50% of Anil's share = 2.25 lakh

6. (c) After 1st hit ball height will be $=\frac{1}{2}(64)$
After 2nd hit ball height will be $=\left(\frac{1}{2}\right)^2(64)$
.....
.....
.....
After 16th hit ball height will be

$=\left(\frac{1}{2}\right)^{16}(64)=\frac{1}{2^{16}}\left(2^6\right)=2^{-10}\text{m}$

7. (c) Given, $A:B:C=\frac{1}{5}:\frac{1}{6}:\frac{1}{10}=6:5:3$
$\therefore$ Share of A

$=\frac{6}{6+5+3}\times8400=\frac{6}{14}\times8400=₹3600$

8. (a) Given that,
Number of male employees (M) = 45
Number of female employees (F) = 15
Mean salary of male employee $\left(\bar{x}_M\right)$
= ₹ 5000
Total number of employees = (M + F)
= 45 + 15 = 60
Mean salary of employees $\left(\bar{x}_{MF}\right)$ = ₹ 4800
Let mean salary of female employee is $\bar{x}_F$
By formula,

$\bar{x}_{MF}=\frac{M\,\bar{x}_M+F\,\bar{x}_F}{(M+F)}$

$\Rightarrow 4800=\frac{45\times5000+15\times\bar{x}_F}{60}$

$\Rightarrow 4800\times60-45\times5000=15\times\bar{x}_F$

$\therefore \bar{x}_F=4800\times4-3\times5000$
$=300(16\times4-50)=300\times14=4200.$

9. (d) Suppose number of passengers be x in the starting.
Number of passengers after 1st halt

$$= \left(x - \frac{x}{3}\right) + 120 = \frac{2x}{3} + 120$$

Number of passengers after 2nd halt

$$= \frac{1}{2}\left(\frac{2x}{3} + 120\right) + 100$$

According to question,
Number of passengers after 2nd halt

$$= \frac{1}{2}\left(\frac{2x}{3} + 120\right) + 100 = 240$$

$$\Rightarrow \frac{2x}{3} + 120 = (240 - 100) \times 2$$

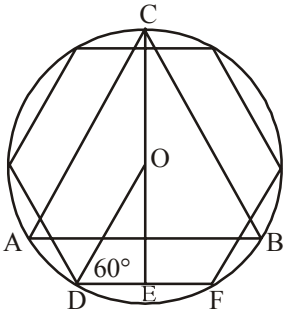
$$\Rightarrow \frac{2x}{3} = 280 - 120$$

$$\frac{2x}{3} = 160$$

$$x = \frac{\overset{80}{\cancel{160}} \times 3}{\underset{1}{\cancel{2}}}$$

$$x = 240$$

10. (d) We know altitude of equilateral ΔABC is $\frac{\sqrt{3}}{2}a$.



$\therefore$ Length of $OC = \frac{\sqrt{3}}{2}a \times \frac{2}{3} = \frac{a}{\sqrt{3}} =$ radius

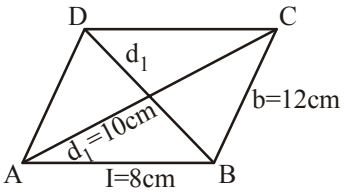
Also, $DF = b \Rightarrow DE = \frac{b}{2}$

In ΔODE, $\cos 60° = \frac{DE}{OD} = \frac{b/2}{a/\sqrt{3}}$

$$\Rightarrow \frac{1}{2} = \frac{\sqrt{3}b}{2a} \Rightarrow a = \sqrt{3}b$$

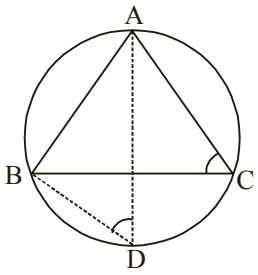
$$\therefore \quad a^2 = 3b^2$$

11. (d) In parallelogram, $d^2 + d_2^2 = 2(l^2 + b^2)$



$$\therefore \quad d^2 + (10)^2 = 2(64 + 144)$$
$$\Rightarrow \quad d^2 = 2 \times 208 - 100$$
$$\Rightarrow \quad d^2 = 416 - 100 = 316$$
$$\Rightarrow \quad d = \sqrt{316}$$
$$\Rightarrow \quad d = 17.76 \text{ cm}$$
$$d > 12$$

12. (b)



$\angle ADB = \angle ACB = 60°$
(angles in the same segment are equal)

13. (a) Given numbers are 10, 7, 8, 5, 6, 8, 5, 8 and 6
Arrange in ascending order
5, 5, 6, 6, 7, 8, 8, 8, 10
Total term, n = 9 (odd)
Now,

(i) Mean $= \frac{5+5+6+6+7+8+8+8+10}{9}$

$$= \frac{63}{9} = 7$$

(ii) Median $= \left(\frac{n+1}{2}\right)$th term

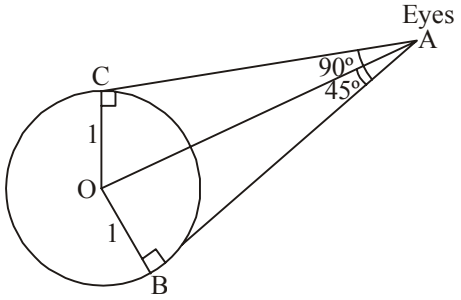
$$= \left(\frac{9+1}{2}\right)\text{th term}$$

= 5th term = 7

(iii) Mode = 8 because of higher frequency term

$\therefore$ Mean = Median

14. (b) Let O = Centre of the balloon
OB = OC = Radii of the balloon



In ΔOBA, $\sin 45^\circ$

$$= \frac{OB}{OA} \Rightarrow \frac{1}{\sqrt{2}} = \frac{1}{OA} \Rightarrow OA = \sqrt{2}$$

15. (c) Let $\sqrt{\frac{x}{1-x}} = y$

$$\therefore \quad y + \frac{1}{y} = \frac{13}{6} \Rightarrow (y^2 + 1)\,6 = 13y$$

$$\Rightarrow \quad 6y^2 - 13y + 6 = 0 \Rightarrow 6y^2 - 9y - 4y + 6 = 0$$
$$\Rightarrow \quad 3y(2y-3) - 2(2y-3) = 0$$
$$\Rightarrow \quad (3y-2)(2y-3) = 0$$
$$\therefore \quad y = \frac{2}{3} \text{ and } \frac{3}{2}$$

When, we put $y = \frac{2}{3} \Rightarrow \frac{x}{1-x} = \frac{4}{9}$

$$\Rightarrow \quad 9x = 4 - 4x \Rightarrow x = \frac{4}{13}$$

When we put $y = \frac{3}{2}$

$$\Rightarrow \quad \frac{x}{1-x} = \frac{9}{4} \Rightarrow 4x = 9 - 9x$$
$$\therefore \quad x = \frac{9}{13}$$

16. (a) $\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$

$$= \frac{1}{1+p+\frac{1}{q}} + \frac{1}{1+q+\frac{1}{r}} + \frac{1}{1+r+\frac{1}{p}}$$

$$= \frac{q}{1+pq+q} + \frac{r}{r+rq+1} + \frac{p}{p+rp+1}$$

$$= \frac{q}{1+pq+q} + \frac{r}{\frac{1}{pq}+\frac{1}{p}+1} + \frac{p}{p+\frac{1}{q}+1}$$

$(\because\ pqr = 1)$

$$= \frac{q}{1+pq+q} + \frac{rpq}{1+q+pq} + \frac{pq}{pq+1+q}$$

$$= \frac{q+rpq+pq}{1+pq+q} \qquad (\because\ pqr = 1)$$

$$= \frac{q+1+pq}{1+pq+q} = 1$$

17. (b)

$$3x-1 \overline{)\,27x^3 - 9x^2 - 6x - 5\,(\,9x^2 - 2}$$
$$\underline{27x^3 - 9x^2}$$
$$-6x - 5$$
$$\underline{-6x + 2}$$
$$-7$$

18. (b) $1 + \tan\theta = \sqrt{2}$

$$\Rightarrow \quad \tan\theta = \sqrt{2} - 1$$

$$\therefore \quad \cot\theta - 1 = \frac{1}{\sqrt{2}-1} - 1 = \frac{\sqrt{2}+1}{2-1} - 1 = \sqrt{2}$$

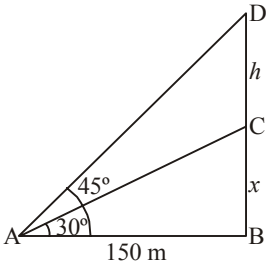
19. (c) $x + \frac{1}{x} = 2\cos\alpha$

Squaring both sides, then we get

$$x^2 + \frac{1}{x^2} + 2 = 4\cos^2\alpha$$

$$\Rightarrow x^2 + \frac{1}{x^2} = 2\,(2\cos^2\alpha - 1)$$
$$= 2(2\cos^2\alpha - \sin^2\alpha - \cos^2\alpha)$$
$$= 2\cos^2\alpha - 2\sin^2\alpha$$

20. (d) Let BC = x m height of unfinished pillar
and CD = h m = Raised height of pillar



In ΔABC,

$$\tan 30^\circ = \frac{x}{150} \Rightarrow x = \frac{150}{\sqrt{3}}$$

and in ΔABD,

$$\tan 45^\circ = \frac{h}{150} \Rightarrow 1 \quad \frac{h}{150}$$

$$\Rightarrow \quad 150 = h + \frac{150}{\sqrt{3}} \qquad \text{[from Eq. (}i\text{)]}$$

$$\Rightarrow \quad \frac{150(\sqrt{3}-1)}{\sqrt{3}} = \Rightarrow$$

$$h = 150 \times \frac{(1.732-1)}{1.732}$$

$$= \frac{150 \times 0.732}{1.732} = 63.39 \approx 63.4 \text{ m}$$

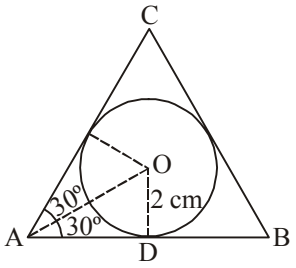
21. (b) Required % increase

$$= \frac{54}{418} \times 100 = 12.919 \approx 12.92\%$$

22. (c) Required % $= \frac{510}{2854} \times 100 \approx 18\%$

23. (a) Since, area of circle = 4p cm^2 (given)

$\Rightarrow \quad \pi r^2 = 4\pi \Rightarrow r = 2$ cm



In ΔOAD, $\tan 30^\circ = \frac{OD}{AD} \Rightarrow AD = 2\sqrt{3}$ cm

Now, AB = 2 AD = $4\sqrt{3}$ cm

∴ Area of equilateral ΔABC

$$= \frac{\sqrt{3}}{4}(AB)^2 \quad \frac{\sqrt{3}}{4}(4\sqrt{3})^2$$

$$= 12\sqrt{3} \text{ cm}^2$$

24. (c) $x^4 - 1 = (x^2 - 1)(x^2 + 1) = (x - 1)(x + 1)(x^2 + 1)$ Now $x^4 - 2x^3 - 2x^2 - 2x - 3$

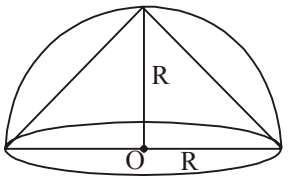
Putting x = -1 in this equation gives 0, so (x+1) is a factor, divide $x^4 - 2x^3 - 2x^2 - 2x - 3$ by (x+1) gives $x^3 - 3x^2 + x - 3$

Now put x = 3, gives 0, so another factor is (x–3), divide (x–3) gives $x^2 + 1$ which cannot be further divided

So $x^4 - 2x^3 - 2x^2 - 2x - 3 = (x^2 + 1)(x+1)(x-3)$

Now common factors in both expressions are $(x^2 + 1)(x+1)$ which is the HCF.

25. (a) Volume of cone, $C = \frac{1}{3}\pi R^2 H$



$$= \frac{1}{3}\pi R^3 \qquad (\because H = R)$$

Volume of hemisphere, $H = \frac{2}{3}\pi R^3$

$$\therefore \quad C : H = \frac{1}{3}\pi R^3 : \frac{2}{3}\pi R^3 \quad 1:2$$

26. (a) $\frac{x}{y} = \frac{3}{1} \Rightarrow \frac{x^3}{y^3} \quad \frac{27}{1} \Rightarrow \frac{x^3 - y^3}{x^3 - y^3} \quad \frac{27-1}{27 \quad 1}$

[By componendo and dividendo]

$$= \frac{26}{28} \quad \frac{13}{14}$$

27. (d) $\sqrt{\sqrt{17956} \quad \sqrt{24025}} \quad ?$

$\sqrt{17956} = \sqrt{2^2 \times 67^2} = 2 \times 67 \quad 134$

$\sqrt{24025} = \sqrt{5^2 \times 31^2} = 5 \times 31 \quad 155$

Hence, $? = \sqrt{134 - 155} \quad \sqrt{289} \quad \sqrt{17 \times 17} \quad 17$

28. (c) Bells will toll together again at a time, which is obtained by taking L.C.M. of their individual tolling intervals.

L.C.M. of 9, 12 and 15 = 180 min

They will toll together again after 180 min, i.e. 3 hours.

Time = 8 + 3 = 11 a.m.

29. (b) Third number

= 924 – (2 × 2015 + 2 × 196) = 924 – (403 + 392)

= 924 – 795 = 129

30. (b) Let S.P. = ₹ 100. Then, C.P. = ₹ 96; Profit = ₹ 4.

∴ Profit %

$$= \left(\frac{4}{96} \times 100\right)\% \quad \frac{25}{6}\%$$

$= 4.17\% \approx 4.2\%$

31. (c) $A : B = 3 : 4$
$B : C = 8 : 10$
$C : D = 15 : 17$
$A:B:C:D = 3\times8\times15 : 4\times8\times15 : 4\times10\times15 : 4\times10\times17$
$= 9 : 12 : 15 : 17$

32. (b) X's one day's work = $\frac{1}{25}$th part of whole work.

Y's one day's work $\frac{1}{30}$th part of whole work.

Their one day's work = $\frac{1}{25}\ \frac{1}{30}\ \frac{1}{150}$th part of whole work.

Now, work is done in 5 days $= \frac{11}{150}\times5\ \frac{11}{30}$th of whole work

$\therefore$ Remaining work $= 1-\frac{11}{30}\ \frac{19}{30}$th of whole work

Now, $\frac{1}{30}$th work is done by Y in one day.

$\therefore\ \frac{19}{30}$th work is done by Y in $\frac{1}{1/30}\times\frac{19}{30}\ 19$ days

33. (d) Let the average speed be x km/h.
and Total distance = y km. Then,

$\frac{0.2}{10}y\ \frac{0.6}{30}y\ \frac{0.2}{20}y\ \frac{y}{x}$

$\Rightarrow x\ \frac{1}{0.05}\ 20\text{km/h}$

34. (c) Area of field = 576 km^2.

Then, each side of field = $\sqrt{576}\ 24$ km
Distance covered by the horse
= Perimeter of square field
$= 24\times4 = 96$ km

$\therefore$ Time taken by horse = $\frac{\text{distance}}{\text{speed}}\ \frac{96}{12}$
$= 8$ h

35. (b) Equivalent discount $= 10 + 20 - \frac{10\times20}{100}$
$= 30 - 2 = 28\%$

36. (a) Let it takes t minutes to completely fill the tank.

Now, $\frac{t}{6}\ \frac{t}{8}\ \frac{t-6}{12}\ 1$

or $\frac{4t\ \ 3t\ \ 2t-12}{24}\ 1$

or $9t - 12 = 24$
or $9t = 36 \Rightarrow t = 4$ min.

37. (a) Relative speed of the thief and policeman
$= (11 - 10)$ km/h $= 1$ km/h.
Distance covered in 6 minutes

$= \left(\frac{1}{60}\times6\right)$km $\frac{1}{10}$ km 100 m.

$\therefore$ Distance between the thief and policeman
$= (200 - 100)$ m $= 100$ m.

38. (b)
$\frac{a}{b}\ \frac{4}{5}$ and $\frac{b}{c}\ \frac{15}{16} \Rightarrow \left(\frac{a}{b}\times\frac{b}{c}\right) = \left(\frac{4}{5}\times\frac{15}{16}\right) \Rightarrow \frac{a}{c}\ \frac{3}{4}$

$\therefore\ \frac{c^2-a^2}{c^2\ \ a^2}\ \frac{1-\left(\frac{a^2}{c^2}\right)}{1\ \left(\frac{a^2}{c^2}\right)}\ \frac{1-\left(\frac{a}{c}\right)^2}{1\ \left(\frac{a}{c}\right)^2}\ \frac{1-\frac{9}{16}}{1\ \frac{9}{16}}$

$\frac{(7/16)}{(25/16)}\ \frac{7}{25}$

39. (c) $x + \frac{1}{x} = 2$
$\Rightarrow\ x^2 - 2x + 1 = 0$
$\Rightarrow\ (x-1)^2 = 0 \Rightarrow x = 1$

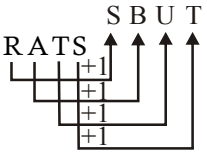
$\therefore\ x^{17} + \frac{1}{x^{19}} = 1 + 1 = 2$

40. (b) $2\sin\alpha + 15\cos^2\alpha = 7$
$2\sin\alpha + 15(1 - \sin^2\alpha)$
$2\sin\alpha + 15 - 15\sin^2\alpha = 7$
$-15\sin^2\alpha + 2\sin\alpha + 8 = 0$
$(5\sin\alpha - 4)(3\sin\alpha + 2) = 0$

$\sin\alpha = \frac{4}{5}\text{or}\frac{-2}{3}$

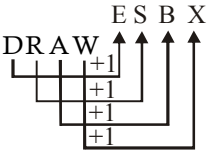
41. (a) As, $9 \times 3 - 3 = 24$
$3 \times 3 - 3 = 6$

42. (b) S T A R $\xrightarrow{\text{Reverse}}$ R A T S



Similarly,

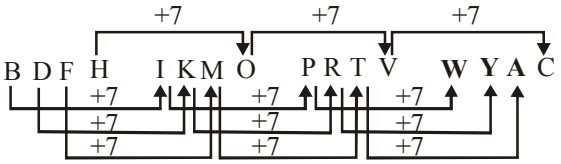
W A R D $\xrightarrow{\text{Reverse}}$ D R A W



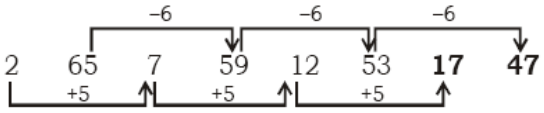
43. (c) Except in the number pair (7, 169) in all other number pairs both the numbers are perfect squares.
$(25, 49) \Rightarrow [(5)^2, (7)^2]$
$(121, 169) \Rightarrow [(11)^2, (13)^2]$
$(9, 25) \Rightarrow [(3)^2, (5)^2]$

44. (c) In the word MEET, the second and the third letters are the same.

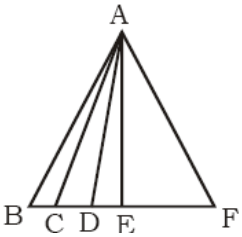
45. (a)



46. (c)



47. (d)



There are 10 triangles in the given figure – ABC, ABD, ABE, ABF, ACD, ACE, ACF, ADE, ADF, and AEF

48. (b) The correct order is:

3 2 4 1 5
Mosquito → Cat → Tiger → Elephant Whale

49. (d)

G	O	O	D	N	E	S	S
↓+1	↓−1	↓+1	↓−1	↓+1	↓−1	↓+1	↓−1
H	N	P	C	O	D	T	R

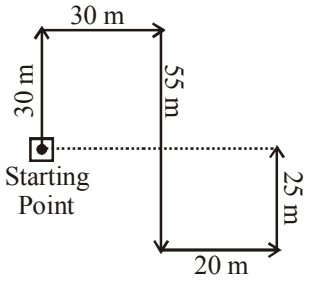
Similarly,

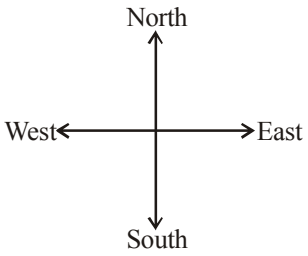
G	R	E	A	T	N	E	S	S
↓+1	↓−1	↓+1	↓−1	↓+1	↓−1	↓+1	↓−1	↓+1
H	Q	F	Z	U	M	F	R	T

50. (a) ALERT can not be formed as there is no 'R' in the word LEGALIZATION. Hence, (a) is the correct choice.

51. (b) The sequence BBCCA is repeated
B B C C A/B B C C A/B B C C A/B B C C A

52. (b)



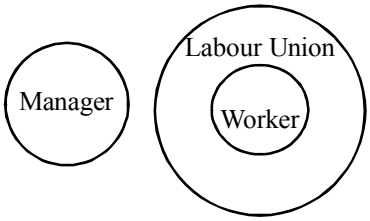


Required distance = 30m + 20 m = 50 m

53. (d) A man + his wife = 1 + 1 = 2
His three sons + their wives = 3 + 3 = 6
Three children in each one's family = 3 × 3 = 9
Total members = 2 + 6 + 9 = 17

54. (d) 5th date of a month is Tuesday
Friday will be on = 5 + 3
= 8th of a month
1st Friday is on 1st of a month
2nd Friday is on 8th of a month
3rd Friday will be on 15th of a month
3 days after 15th = 15 + 3 = 18

55. (a)

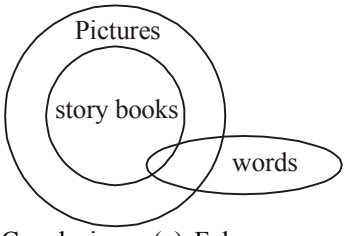


56. (c) Rahul's present age = 12 yrs,
Paras present age = 4 yrs
Let Rahul be twice as old as Paras after x yrs from now.
Then, $12 + x = 2(4 + x)$
$= 12 + x = 8 + 2x \Rightarrow x = 4$
Hence, Rahul's required age = $12 + x \Rightarrow 16$ yrs

57. (c) As, $(5 + 4 + 7)/2 = 8$
$(3 + 7 + 2)/2 = 6$
Similarly,
$(6 + 9 + 5)/2 = 10$.

58. (d) Putting the position of the letters in reverse order
P = 11, S = 8, V = 5 and Y = 2.

59. (c)



Conclusions : (a) False
(b) False
(c) True
(d) False

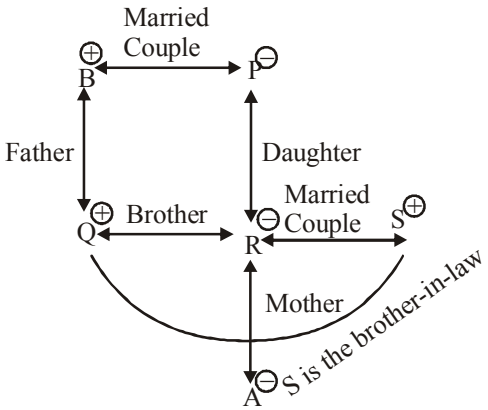
60. (a)

61. (a) 62. (c)

63. (b) The third figure in each row comprises of parts which are not common to the first two figures.

64. (c)
(b) A ↓ I ↓ R ↓ S ↓

66. (d) Let us draw the family diagram



Hence, S isthe brother-in-law of Q.

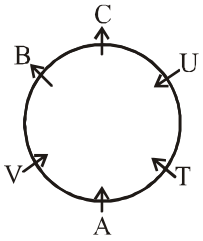
67. (d) (a) Summer (b) Winter (c) Spring (d) Cloud
All others are name of seasons.

68. (d) The new letter sequence is EDRPSEISNO.
The seventh letter from the right is P.

69. (c) According to the question, R > P/U: T/Q > S
$\therefore$ T/Q > (S) > R > P/U
$\therefore$ 3rd tallest = S

(Qs. 70-71):

Sitting Arrangement:



70. (c) B and C are not facing centre.

71. (d) The position of T in respect of B is third to the left or right.

72. (b) 18 + 3 = 21st letter from the right in the reverse series or, 21st letter from the left in the original series.

73. (d) N + 3 = Q, Q + 3 = Z, Z + 3 = S
D – 2 = W, W – 2 = E, E – 2 = V
P + 3 = B, B + 3 = R, R + 3 = I Hence, ? = SVI

74. (a) 13 + 5 = 18th from you left

75. (c) Meaningful words : ARE, EAR, ERA

76. (c)

A	*D*	*J*	*E*	*C*	*T*	*I*	*V*	*E*
+1 ↓	–1 ↓	–1 ↓	+1 ↓	–1 ↓	–1 ↓	+1 ↓	– ↓	+ ↓
B	*C*	*I*	*F*	*B*	*S*	*J*	*U*	*F*

77. (a) na *pa* ka *so* → *birds* fly *very* high
ri *so* la *pa* → *birds* are *very* beautiful
ti me *ka* bo → the parrots could fly
Thus *high* is coded as *na*.

78. (d) 1 2 3 **4** 5 6 7 **8** 9
Difference = 8 – 4 = 4

79. (b) 1 2 **3** 4 5 6 **7** **8** 9 **10** 11 12 13
C O **M** P A T **I** **B** I **L** I T Y
Meaningful word ⇒ L I M [B]

80. (d) As $F \xrightarrow{2} H$

$I \xrightarrow{-2} G$

$N \xrightarrow{2} P$

$E \xrightarrow{-2} C$

Similarly,

$S \xrightarrow{2} U$

$L \xrightarrow{-2} J$

$I \xrightarrow{2} K$

$T \xrightarrow{-2} R$

81. (b) The communal question had become a baffling one as the Muslim League tightened its demand for Pakistan. Against the congress demand of "quit India", the Muslim League's new slogan was "Divide and quit". On March 21, 1943, Muslim League observed as Pakistan Day.

82. (a) The currency deposit ratio shows the amount of currency that people hold as a proportion of aggregate deposits. An increase in cash deposit ratio leads to a decrease in money multiplier. An increase in deposit rates will induce depositors to deposit more, thereby leading to a decrease in cash to Aggregate Deposit ratio.
This will in turn lead to a rise in Money Multiplier.

83. (d) The chemical behaviour of an atom depends upon the number of Electrons orbiting around the nucleus.

84. (c) 85. (b) 86. (c)

87. (b) A boat will float when the weight of the water displaces equals the weight of the boat and anything will float if it is shaped to displace its own weight of water before it reaches the point where it will submerge. Floating of the boat works on the principle of buoyancy force which is an upward force exerted by a liquid, gas or other fluid, that opposes the weight of an immersed object.

88. (a) Alzheimer's disease affects the brain. The disease causes degeneration of brain tissues and nerve cells.

89. (b) Chemical namee of Vitamin E is Tocopherols.

90. (c) The Indian Constitution does not recognize the property right as a fundamental right. In the year 1977, the 44th amendment eliminated the right to acquire, hold and dispose of property as a fundamental right. However, in another part of the Constitution, Article 300 (a) was inserted to affirm that no person shall be deprived of his property by the authority of law.

91. (d) Babur declared himself as the emperor at Panipat.

92. (d) Financial emergency in India has never been declared so far.

93. (a) A liquidity trap is a situation, described in the Keynesian Economics, in which injections of cash into the private banking system by a central bank fail to dec rease interest rates and hence make monetary policy ineffective. A liquidity trap is caused when people hoard cash because they expect an adverse event s uch as defl ati on, insufficient aggregate demand, or war. Common characteristics of a liquidity trap are interest rates that are close to zero and fluctuations in the money supply that fail to translate into fluctuations in price levels.

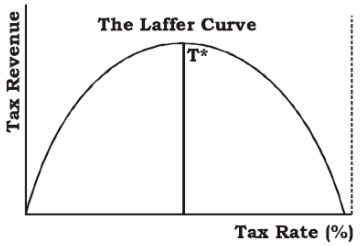
94. (a) The book "The Unseen Indira Gandhi" has been authored by Dr. KP Mathur, who was the personal physician of the former Prime Minister Indira Gandhi for nearly 20 years till her assassination in 1984. The foreword of the book was written by her granddaughter Priyanka Gandhi Vadra. The book provides some interesting peeps into the responses of Mrs. Gandhi's to challenges both personal and political.

95. (d) Biomagnification, also known as bioamplification or biological magnification, is the increasing concentration of a substance, such as a toxic chemical, in the tissues of organisms at successively higher levels in a food chain.

96. (c) On 21st October, 1943, Subhas Chandra Bose proclaimed the formation of the Provisional Government of Free India at the Cathay Cinema Hall. Two days later, he declared war on Britain and the United States. With help from the Japanese, he reorganised and rejuvenated the *Azad Hind Fauj* (also called the Indian National Army).

He lobbied aggressively for funds in Malaya and other parts of Southeast Asia and launched a recruitment drive for the *Azad Hind Fauj*.

97. (b) The Laffer curve, invented by Arthur Laffer, shows the relationship between tax rates and tax revenue collected by governments. The chart below shows the Laffer Curve:



98. (c) Cerebral palsy (CP) is a group of permanent movement disorders that appear in early childhood. Signs and symptoms vary between people. Often, symptoms include poor coordination, stif f muscles, weak muscles, and tremors. There may be problems with sensation, vision, hearing, swallowing, and speaking. Often babies with cerebral palsy do not roll over, sit, crawl, or walk as early as other children their age. Difficulty with the a bi lity to think or reason and seizures each occurs in about one third of people with CP.

99. (a) The World Bank Group consists of –

- International Bank for Reconstruction and Development (IBRD), established in 1945, which provides debt financing on the basis of sovereign guarantees; - International Finance Corporation (IFC), established in 1956, provides various forms of financing without sovereign guarantees, primarily to the private sector;

- International Development Association (IDA), established in 1960, provides concessional financing (interest-free loans or grants), usually with sovereign guarantees;

- International Centre for Settlement of Investment Disputes (CSID), established in 1965, which works with governments to reduce investment risk;

- Multilateral Investment Guarantee Agency (MIGA), established in 1988, which provides insurance against certain types of risk, including political risk, primarily to the private sector.

India is a member of four of the five constituents of the World Bank Group viz., International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA). India is not a member of ICSID (International Centre for Settlement of Investment Disputes).

100. (d) A search light produces an intense parallel beam of light. This requires a reflector of large aperture. When a source is placed at the focus of a large concave mirror only the paraxial rays (not the marginal rays)are reflected as parallel beam, but when a source is placed at the focus of parabolic mirror all the rays are reflected as an intense parallel beam.

101. (a) ATF is **Aviation Turbine Fuel** related to Civil Aviation.

102. (c)

103. (d) Dhanush is the naval variant of the Prithvi missile.

104. (c) 105. (d) 106. (c) 107. (a) 108. (a)
109. (a) 110. (b) 111. (d) 112. (d) 113. (c)
114. (c) 115. (a)

116. (c) The Chancellor of Nalanda University resigned his post on November 25, 2016. He was taken this decision because of autonomy in the university.

117. (d) 118. (c)

119. (d) Prime Minister of Portuguese, Antonio Costa will be the Chief Guest at the 14th Pravasi Bharatiya Divas (PBD) Convention which will be held in Bengaluru from January 7 to 9, 2017. The Prime Minister will attend the inaugural function of the convention on January 8, 2017 and address the delegates.

120. (b) Senior journalist at the Times of India Akshaya Mukul has been awarded the Shakti Bhatt First Book Prize 2016. He has been awarded for his book "Gita Press and the Making of Hindu India".