Food Corporation of India (FCI)

Assistant Grade III Exam (Paper – I)

Previous Paper (Completely Solved)
Held on – 05-02-2012

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FOOD CORPORATION OF INDIA

Assistants Grade III Exam - Previous Paper

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REASONING ABILITY

Directions (1-9) : In each of the following questioins, select the related word/letters/number from the given alternatives.

1. Student : Book :: Postman : ?
   (1) Delivery   (2) Bicycle
   (3) Uniform   (4) Mail

2. Illiteracy : Education :: Drought : ?
   (1) Well   (2) Rain
   (3) Dam   (4) River

3. Carpenter : Furniture :: ?
   (1) Book : Author
   (2) Magazine : Editor
   (3) Cook : Soup
   (4) Dam : Engineer

4. LOM : NMK :: PKI : ?
   (1) RIH   (2) SHG
   (3) RIG   (4) RHG

5. JTIS : HRGQ :: FPEO : ?
   (1) DNCM   (2) DCNQ
   (3) CNDM   (4) CNDQ

6. BAD : CBE :: ? : IVSU
   (1) GOOD   (2) HSPR
   (3) HALT   (4) HURT

7. 5 : 30 :: 8 : ?
   (1) 14   (2) 50
   (3) 69   (4) 80

8. 12 : 30 :: 20 : ?
   (1) 48   (2) 32
   (3) 35   (4) 42

9. 3 : 28 :: 5 : ?
   (1) 179   (2) 126
   (3) 124   (4) 125

Directions (10-14) : In each of the following questions, select the one which is different from the other three responses.

10. (1) Cement   (2) Glue
    (3) Gum   (4) Lock

11. (1) Biography
    (2) Photography
    (3) Lithography
    (4) Xerography

12. (1) Petrol – Car
    (2) Coal – Engine
    (3) Smoke – Fire
    (4) Oil – Lamp

13. (1) 23   (2) 25
    (3) 19   (4) 17

14. (1) 6121   (2) 7364
    (3) 1036   (4) 2710

15. (1) 21 – 98   (2) 45 – 210
    (3) 7 – 29   (4) 27 – 126

16. (1) EBD   (2) IFH
    (3) QNO   (4) YVX

17. (1) BQCR   (2) DSET
    (3) FUGV   (4) HWIY

18. (1) AEIU   (2) BCDF
    (3) AOIU   (4) OIAU

Directions (19-20) : In each of the following questions, which one of the given responses would be a meandingful order of the following words in ascending order ?

19. 1. Child   2. Profession
    3. Marriage   4. Infant
    5. Education
    (1) 1, 3, 5, 2, 4
    (2) 2, 1, 4, 3, 5
    (3) 4, 1, 5, 2, 3
    (4) 5, 4, 1, 3, 2

20. 1. Plastering   2. Painting
    3. Foundation   4. Walls
    5. Ceiling
    (1) 1, 2, 3, 4, 5
    (2) 3, 4, 1, 2, 5
    (3) 3, 4, 5, 1, 2
    (4) 5, 4, 3, 2, 1

21. If the following words are arranged according to English Dictionary, which word will be on third place ?
    (1) KNOW   (2) KNACK
    (3) KNIT   (4) KNOB

22. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it ?
    _bc c _ a abc _ ba ab _
    (1) acbc   (2) abac
    (3) abcc   (4) acac

Directions (23-26) : In each of the following questions, choose the correct alternative from the given ones that will complete the series :

23. ACE, BDF, CEG, ?
    (1) CED   (2) DFH
    (3) DEM   (4) HED

24. AZBY, CXDW, EVFU, ?
    (1) SHTG   (2) GXHW
    (3) GTHS   (4) STHO

25. 33, 48, 65, 84, ? , ?
    (1) 105, 128   (2) 99, 110
    (3) 101, 118   (4) 105, 126

26. 2, 10, 26, 50, ?
    (1) 74   (2) 50
    (3) 78   (4) 82

27. Find the wrong number in the given number series :
    2, 10, 30, 68, 120, 222
    (1) 68   (2) 120
    (3) 30   (4) 222

28. Savitha introduced a boy as the son of the only daughter of the father of her maternal uncle. How is boy related to Savitha ?
    (1) Brother   (2) Son
    (3) Nephew   (4) Son-in-law

29. A father is three times as old his son. Eight years ago, the father was five times as old as his son. What is the present age of the son ?
    (1) 12 years   (2) 14 years
    (3) 16 years   (4) 20 years

30. From following alternatives select the word which cannot be formed using the letters of the given word:
    DEPARTMENT
    (1) PART   (2) TREAT
    (3) MATURE   (4) TAME

31. From the following alternatives select the word which can be formed using the letters of the given word :
    EXPERIENCE

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(1) EXPIRE
(2) PERCIEVE
(3) EMPIRE
(4) EXPENSE

32. If E = 5 and TEA = 26 then TEACHER = ?
    (1) 75   (2) 59
    (3) 60   (4) 57

33. In certain code COMPUTER is written as OCPMTURE. In that code which alternative will be written as OHKCYE ?
    (1) HCOKEY   (2) HYKOCE
    (3) HOCKEY   (4) HOYECK

34. X stands for +, Z stands for ÷, Y stands for −, and P stands for ×, then what is the value of 10 P 2 X 5 Y 5 ?
    (1) 10   (2) 15
    (3) 20   (4) 25

35. Some equations are solved on the basis of a certain system. Find out the correct answer for the unsolved equation on that basis.
    If 3 ÷ 5 = 5, 4 ÷ 7 = 8, 8 ÷ 7 = 6 then, what should 9 ÷ 6 be ?
    (1) 4   (2) 9
    (3) 5   (4) 6

36. Select the correct combination of mathematical signs to replace * signs and to balance the given equation :
    28 * 4 * 9 * 16
    (1) ÷ + =   (2) + ÷ =
    (3) − × +   (4) − = ×

Directions (37-38) : In each of the following questions, find the missing number from the given responses.

37.
8	15	22
29	?	43
50	57	64

   (1) 34   (2) 50
   (3) 33   (4) 36

38.
7	9	3
8	3	5
2	5	?
112	135	900

   (1) 6   (2) 70
   (3) 60   (4) 65

39. A man starts from his house and walked straight for 10 metres towards North and turned left and walked 25 metres. He then turned right and walked 5 metres and again turned right and walked 25 metres.
    Which direction is he facing now ?
    (1) North   (2) East
    (3) South   (4) West

40. A and B start walking from the same point. A goes north and covers 3 km, then turns right and covers 4 kms. B goes west and covers 5 kms, then turns right and covers 3 kms. How far apart are they from each other ?
    (1) 10 km   (2) 9 km
    (3) 8 km   (4) 5 km

41. Five persons A, B, C, D and E are sitting in a row facing you such that D is on the left of C and B is on the right of E. A is on the right of C and B is on the left of D. If E occupies a corner postion, then who is sitting in the centre ?
    (1) A   (2) B
    (3) C   (4) D

42. If Ram's house is located to the south of Krishna's house and Govinda's house is to the east of Krishna's house, in what direction is Ram's house situated with respect to Govinda's house ?
    (1) North-East
    (2) North-West
    (3) South-East
    (4) South-West

Directions (43-44) : In each of the following questions, two statements are given followed by two conclusions I and II. You have to consider the statements to be true even if they seem to be true even if they seem to be at variance from commonly known facts. You are to decide which of the given conclusions, if any, follow from the given statements.

43. **Statements:**
    1. All children are students.
    2. All students are players.
    Conclusions:
    I. All cricketers are students.
    II. All children are players.

(1) Only conclusion I follows.
(2) Only conclusion II follows.
(3) Both conclusions I and II follow.
(4) Neither conclusion I nor II follows.

44. **Statements:**
    1. No teacher comes to the school on a bicycle.
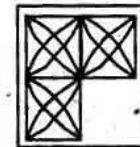   2. Anand comes to the school on a bicycle.
    Conclusions:
    I. Anand is not a teacher.
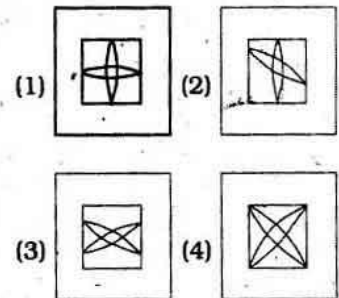   II. Anand is a student.
    (1) Conclusion I alone can be drawn.
    (2) Conclusion II alone can be drawn.
    (3) Both Conclusions can be drawn.
    (4) Both Conclusions can not be drawn.

45. Which answer figure will complete the pattern in the question figure ?
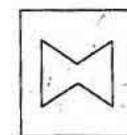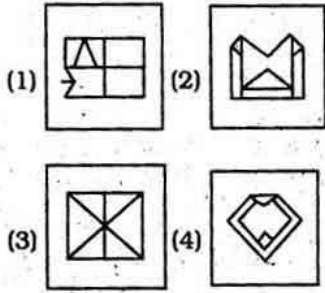   **Question Figure**

    Answer Figures :

46. Select the answer figure in which the question figure is hidden/embedded.
    Question Figure

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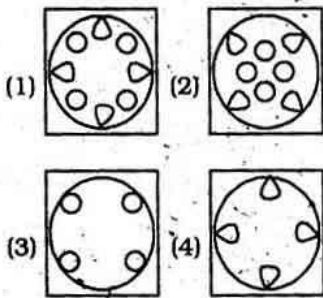
Answer Figures :

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

47. A piece of paper is folded and cut as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

Question Figures :

Answer Figures :
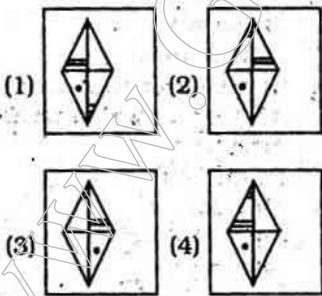

(1) (2)
(3) (4)

48. Which of the answer figure is exactly the mirror image of the given figure, when the mirror is held on the line AB ?

Question Figure

Answer Figures :

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

49. In the following question 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., 'F' can be represented by 14, 21, etc. and 'E' can be represented by 20, 32, etc. Identify the set for the word FIRE.

MATRIX–I

	0	1	2	3	4
0	D	E	F	I	N
1	I	N	D	E	F
2	E	F	I	N	D
3	N	D	E	F	I
4	F	I	N	D	E

MATRIX–II

	5	6	7	8	9
5	O	P	R	S	T
6	S	T	O	P	R
7	P	R	S	T	O
8	T	O	P	R	S
9	R	S	T	O	P

(1) 21, 22, 88, 33
(2) 14, 10, 69, 14
(3) 33, 34, 76, 22
(4) 02, 03, 57, 01

50. Which one of the following diagrams best depicts the relationship among people, women and mothers ?

(1)

(2)

(3)

(4) None of these

GENERAL AWARENESS

51. The value of a commodity expressed in terms of money is known as
(1) Price (2) Utility
(3) Value (4) Wealth

52. The Planning Commission of India was established in the year
(1) 1947 (2) 1949
(3) 1950 (4) 1952

53. Green Revolution was started in
(1) 1960 (2) 1970
(3) 1980 (4) 1990

54. The term of the Finance Commission is
(1) Ten years
(2) Five years
(3) Six years
(4) Three years

55. Reserve Bank of India was nationalised in
(1) 1948 (2) 1947
(3) 1949 (4) 1950

56. Who was the Chairman of the Constituent Assembly ?
(1) Dr. B.R. Ambedkar
(2) Dr. Rajendra Prasad
(3) Jawahar Lal Nehru
(4) Vallabh Bhai Patel

57. Which one of the following methods is used to ascertain the public opinion on important legislation ?
(1) Initiative
(2) Recall
(3) Referendum
(4) None of the above

58. Fundamental Duties were added to the Constitution by
(1) 24th Amendment
(2) 39th Amendment
(3) 42nd Amendment
(4) 44th Amendment

59. The final authority to interpret our Constitution is the
(1) President
(2) Parliament
(3) Prime Minister
(4) Supreme Court

60. Compared with Society, the scope of State activity is
(1) Wider (2) Narrow
(3) Just equal
(4) No comparison between the two

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61. Seleucus Nicator was defeated by
    (1) Asoka
    (2) Chandragupta Maurya
    (3) Bindu Sara
    (4) Brihadratha

62. The striking feature of the Indus Valley Civilization was
    (1) Urban Civilization
    (2) Agrarian Civilization
    (3) Mesolithic Civilization
    (4) Paleolithic Civilization

63. The Governor-General who abolished the practice of Sati was
    (1) Dalhousie
    (2) Ripon
    (3) William Bentinck
    (4) Curzon

64. The famous Bhakti Saint who belonged to the royal family of Mewar was
    (1) Chaitanya   (2) Andal
    (3) Meerabai   (4) Ramabai

65. After Alexander's death the Eastern part of his empire came under
    (1) Seleucus Nicator
    (2) Menander
    (3) Rudradaman
    (4) Kanishka

66. The Thar Express goes to
    (1) Afghanistan
    (2) Bangladesh
    (3) Pakistan
    (4) Myanmar

67. The product used for manufacturing of Industrial alcohol is
    (1) Khandasari
    (2) Bagasse
    (3) Molasses
    (4) Paper-pulp

68. Guwahati is situated on the bank of the river
    (1) Teesta
    (2) Brahmaputra
    (3) Hooghly
    (4) Sone

69. Kanchenjunga is situated in
    (1) Nepal
    (2) Sikkim
    (3) West Bengal
    (4) Himachal Pradesh

70. With which set of following countries has Arunachal Pradesh common border?
    (1) Bhutan, Bangladesh and China
    (2) Myanmar, Bangladesh and China
    (3) Bhutan, China and Myanmar
    (4) Bhutan, Bangladesh and Myanmar

71. The green colour of the leaves is due to the presence of
    (1) Proteins   (2) Lipids
    (3) Chlorophyll
    (4) Carbohydrates

72. The edible part of an onion is
    (1) Modified root
    (2) Aerial flower
    (3) Aerial stem
    (4) Fleshy leaves

73. To which group of blood an universal recipient belongs?
    (1) A group   (2) B group
    (3) O group   (4) AB group

74. The normal body temperature of human beings is
    (1) 96.4 °F   (2) 97.4 °F
    (3) 98.4 °F   (4) 99.4 °F

75. Columba livia is the scientific name of
    (1) Pigeon   (2) Snake
    (3) Rabbit   (4) Shark

76. Bones are pneumatic in
    (1) Fishes
    (2) Amphibians
    (3) Reptiles   (4) Birds

77. Name the process of production of energy in the Sun
    (1) Nuclear fission
    (2) Radioactivity
    (3) Nuclear fusion
    (4) Ionization

78. A spherical ball made of steel when dropped in mercury container will
    (1) sink in mercury
    (2) will be on the surface of mercury
    (3) will be partly immersed mercury
    (4) will dissolve in mercury

79. The sounds having a frequency of 20 Hertz to 20,000 Hertz are known as
    (1) Audible sounds
    (2) Ultrasonics
    (3) Infrasonics
    (4) Megasonics

80. Eclipses occur due to which optical phenomena?
    (1) Reflection   (2) Refraction
    (3) Rectilinear propagation
    (4) Diffraction

81. Which of the following produces highest amount of energy upon oxidation?
    (1) Protein   (2) Fat
    (3) Glucose   (4) An alkane

82. Pure water is bad conductor of electricity because it is
    (1) feebly ionized
    (2) not volatile
    (3) a very good solvent
    (4) a non-polar solvent

83. Where is National Chemical Laboratory (NCL) located?
    (1) Chandigarh
    (2) Bhavnagar
    (3) Pune
    (4) Panaji

84. The metals commonly used for electroplating are
    (1) Gold, Sodium and Chromium
    (2) Chromium, Copper and Nickel
    (3) Nickel, Lead and Chromium
    (4) Gold, Sodium and Potassium

85. Which of the following in automobile exhaust can cause cancer?
    (1) Oxides of nitrogen
    (2) Carbon monoxide
    (3) Lead
    (4) Polyclinic hydrocarbons

86. Bleaching powder is used in drinking water as a/an
    (1) disinfectant   (2) antibiotic
    (3) antiseptic   (4) coagulant

87. Gamma rays have greatest similarity with
    (1) α-rays
    (2) β-rays
    (3) X-rays
    (4) U.V.-rays

88. In the absence of ozone layer, which rays will enter into atmosphere?
    (1) Infrared
    (2) Visible
    (3) Ultraviolet
    (4) X-rays

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89. Where are programs and data to be used by the computer available?
(1) Processing Unit
(2) Output
(3) Storage
(4) Input

90. In HTML, <B> and </B> tags display the enclosed text in
(1) black colour
(2) background
(3) bold
(4) bright

91. Who invented chloroform as anaesthetic?
(1) James Simpson
(2) Edward Jenner
(3) Alexander Fleming
(4) Christian Barnard

92. The Nobel Prize for Chemistry for the year 2011 has been awarded to
(1) Saul Perlmutter, Brian P. Schmidt and Adam G. Riess
(2) Bruce A. Beutler, Jules A. Hoffmann and Ralph M. Steinman
(3) Christopher A. Sims and Thomas J. Sargent
(4) Dan Schechtman

93. Sebastian Vettel won the Formula 1 Indian Grand Prix held at Greater Noida on October 30, 2011. This was also his _____ win of the season.
(1) 10th
(2) 11th
(3) 12th
(4) 13th

94. Of which of the following States of India is Kuchipudi a dance-drama?
(1) Orissa
(2) Andhra Pradesh
(3) Kerala
(4) Tamil Nadu

95. With which of the following was Satyajit Ray associated?
(1) Classical dance
(2) Journalism
(3) Classical music
(4) Direction of films

96. Census data released on July 15, 2011 reflects that 13.48 percent urban population lives in
(1) Uttar Pradesh
(2) Bihar
(3) Maharashtra
(4) Rajasthan

97. National Social Assistance Programme is aimed at providing
(1) financial support to Scheduled Castes and Scheduled Tribes
(2) old age pension to very poor
(3) insurance for the poor
(4) All of the above

98. As per studies, the Tummalapalle mine in Andhra Pradesh could have Uranium reserve of
(1) 1 lakh tonnes
(2) 1.5 lakh tonnes
(3) 2 lakh tonnes
(4) 2.5 lakh tonnes

99. Which of the following is a famous Assamese festival ?
(1) Makar Sakranti
(2) Yugadi
(3) Onam
(4) Rongali Bihu

100. The least populated State in India is
(1) Arunachal Pradesh
(2) Sikkim
(3) Mizoram
(4) Uttarakhand

QUANTITATIVE APTITUDE

101. If $\sqrt{4096} = 64$, then value of $\sqrt{40.96}\ \sqrt{0.4096} + \sqrt{0.004096} + \sqrt{0.00004096}$ is
(1) 7.09
(2) 7.1014
(3) 7.1104
(4) 7.12

102. The value of $\frac{1}{15} + \frac{1}{35} + \frac{1}{63} + \frac{1}{99} + \frac{1}{143}$ is
(1) $\frac{5}{39}$
(2) $\frac{41}{39}$
(3) $\frac{2}{39}$
(4) $\frac{7}{39}$

103. When simplified $(256)^{-\left(4^{-\frac{3}{2}}\right)}$ is
(1) 8
(2) $\frac{1}{8}$
(3) 2
(4) $\frac{1}{2}$

104. The number $2.5\overline{2}$, when written as a fraction and reduced to lowest terms, the sum of the numerator and denominator is
(1) 7
(2) 29
(3) 141
(4) 349

105. If the square root of x is the cube root of y, then the relation between x and y is
(1) $x^3 = y^2$
(2) $x^2 = y^3$
(3) $x = y$
(4) $x^6 = y^5$

106. A and B together can complete a work in 12 days. A alone can complete in 20 days. If B does the work only half a day daily, then in how many days A and B together will complete the work ?
(1) 10 days
(2) 20 days
(3) 11 days
(4) 15 days

107. A can do a piece of work in 70 days and B is 40% more efficient than A. The number of days taken by B to do the same work is
(1) 40 days
(2) 60 days
(3) 50 days
(4) 45 days

108. A right circular cylinder, a hemisphere and a right circular cone stand on the same base and have the same height. The ratio of their volumes is
(1) 3 : 6 : 1
(2) 3 : 4 : 1
(3) 3 : 2 : 1
(4) 4 : 3 : 1

109. A cylinder has 'r' as the radius of the base and 'h' as the height. The radius of base of another cylinder, having double the volume but the same height as that of the first cylinder must be equal to
(1) $\frac{r}{\sqrt{2}}$
(2) $2r$
(3) $r\sqrt{2}$
(4) $\sqrt{2}r$

110. Area of the base of a pyramid is 57 sq.cm. and height is 10 cm, then its volume in cm^3, is
(1) 570
(2) 390
(3) 190
(4) 590

111. If the length of the diagonal of a cube is $8\sqrt{3}$ cm, then its surface area is
(1) 192 cm²
(2) 512 cm²
(3) 768 cm²
(4) 384 cm²

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112. The area of a circle inscribed in a square of area 2 m² is
(1) $\frac{\pi}{4}$ m² (2) $\frac{\pi}{2}$ m²
(3) πm² (4) 2πm²

113. If the numerical value of the perimeter of an equilateral triangle is $\sqrt{3}$ times the area of it, then the length of each side of the triangle is
(1) 2 unit (2) 3 unit
(3) 4 unit (4) 6 unit

114. An equilateral triangle is drawn on the diagonal of a square. The of the area of the triangle to that of the square is
(1) $\sqrt{3} : 2$ (2) $\sqrt{2} : \sqrt{3}$
(3) $2 : \sqrt{3}$ (4) $1 : \sqrt{2}$

115. For a certain article, if discount is 25% the profit is 25%. If the discount is 10%, then the profit is
(1) 50% (2) 40%
(3) 30% (4) $33\frac{1}{3}$%

116. The price that Akbar should mark on a pair of shoes which costs him ₹ 1,200 to gain 12% after allowing a discount of 16% (in rupees) is
(1) 1,344 (2) 1,433
(3) 1,600 (4) 1,500

117. If $y : x = 4 : 15$, then the value of $\left(\frac{x-y}{x+y}\right)$ is
(1) $\frac{11}{19}$ (2) $\frac{19}{11}$
(3) $\frac{4}{11}$ (4) $\frac{15}{19}$

118. Some carpenters promised to do a job in 9 days but 5 of them were absent and remaining men did the job in 12 days. The original number of carpenters was
(1) 24 (2) 20
(3) 16 (4) 18

119. One third of a certain journey is covered at the rate of 25 km/hour, one-fourth at the rate of 30 km/hour and the rest at 50 km/hour. The average speed for the whole journey is
(1) 35 km/hour
(2) $33\frac{1}{3}$ km/hour
(3) 30 km/hour
(4) $37\frac{1}{12}$ km/hour

120. The average of two numbers is 62. If 2 is added to the smallest number, the ratio between the numbers becomes 1 : 2. The difference of the numbers is
(1) 62 (2) 40
(3) 84 (4) 24

121. The cost price of 25 articles is equal to the selling price of 20 of them. The gain or loss percent is given by
(1) 20% loss (2) 25% gain
(3) 60% loss (4) 75% gain

122. A shopkeeper makes a profit of 20% even after giving a discount of 10% on the marked price of an article. If marked price is ₹ 500 then the cost price of the article is
(1) ₹ 350 (2) ₹ 375
(3) ₹ 425 (4) ₹ 475

123. If 40% of (A + B) = 60% of (A – B) then $\frac{2A-3B}{A+B}$ is
(1) $\frac{7}{6}$ (2) $\frac{6}{7}$
(3) $\frac{5}{6}$ (4) $\frac{6}{5}$

124. A number is first increased by 10% and then it is further increased by 20%. The original number is increased altogether by
(1) 30% (2) 15%
(3) 32% (4) 36%

125. If a train runs at 40 km/hour, it reaches its destination late by 11 minutes. But if it runs at 50 km/hour, it is late by 5

minutes only. The correct time (in minutes) for the train to complete the journey is
(1) 13 (2) 15
(3) 19 (4) 21

126. A tree increases annually by $\frac{1}{8}$ th of its height. By how much will it increase after 2 years, if it stands today 64 cm high?
(1) 72 cm (2) 74 cm
(3) 75 cm (4) 81 cm

127. If $2^{x+3} = 32$, then the value of 3^{x+1} is equal to
(1) 27 (2) 81
(3) 72 (4) 9

128. If $x + \frac{1}{x} = 2, x \neq 0$ then value of $x^2 + \frac{1}{x^3}$ is equal to
(1) 1 (2) 2
(3) 3 (4) 4

129. If $\frac{a}{b} + \frac{b}{a} = 1, a \neq 0, b \neq 0$ the value of $a^3 + b^3$ is
(1) 0 (2) 1
(3) –1 (4) 2

130. If $a^2 + b^2 + c^2 + 3 = 2(a + b + c)$ then the value of $(a + b + c)$ is
(1) 2 (2) 3
(3) 4 (4) 5

131. If $\frac{2p}{p^2 - 2p + 1} = \frac{1}{4}, p \neq 0$, then the value of $p + \frac{1}{p}$ is
(1) 4 (2) 5
(3) 10 (4) 12

132. The ortho centre of a right angled triangle lies
(1) outside the triangle
(2) at the right angular vertex
(3) on its hypotenuse
(4) within the triangle

133. The angles of a triangle are $(x + 5)°, (2x – 3)°$ and $(3x + 4)°$. The value of x is
(1) 30 (2) 31
(3) 29 (4) 28

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134. Two line segments PQ and RS intersect at X in such a way that XP = XR. if ∠PSX = ∠RQX, then one must have
(1) PR = QS
(2) PS = RQ
(3) ∠XSQ = ∠XRP
(4) ar(ΔPXR) = ar(ΔQXS)

135. AD is the median of a triangle ABC and O is the centroid such that AO = 10 cm. The length of OD in cm is
(1) 4 (2) 5
(3) 6 (4) 8

136. The external bisector of ∠B and ∠C of ΔABC (where AB and AC extended to E and F respectively) meet at point P. If ∠BAC = 100°, then the measure of ∠BPC is
(1) 50° (2) 80°
(3) 40° (4) 100°

137. If tan (2θ + 45°) = cot 3θ where (2θ + 45°) and 3θ are acute angles, then the value of θ is
(1) 5° (2) 9°
(3) 12° (4) 15°

138. One flies a kite with a thread 150 metre long. If the thread of the kite makes an angle of 60° with the horizontal line, then the height of the kite from the ground (assuming the thread to be in a straight line) is
(1) 50 metre
(2) $75\sqrt{3}$ metre
(3) $25\sqrt{3}$ metre
(4) 80 metre

139. If θ be acute angle and $\cos \theta = \dfrac{15}{17}$, then the value of cot (90° – θ) is
(1) $\dfrac{2\sqrt{8}}{15}$ (2) $\dfrac{8}{15}$
(3) $\dfrac{\sqrt{2}}{17}$ (4) $\dfrac{8\sqrt{2}}{17}$

140. If $\sec^2 \theta + \tan^2 \theta = \dfrac{7}{12}$, then $\sec^4 \theta - \tan^4 \theta =$
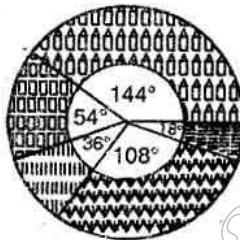
(1) $\dfrac{7}{12}$ (2) $\dfrac{1}{2}$
(3) $\dfrac{5}{12}$ (4) 1

141. If cos x + cos y = 2, the value of sin x + sin y is
(1) 0 (2) 1
(3) 2 (4) –1

Directions (142-145) : The following Pie-chart shows the land distribution of a housing complex. If the total area of the complex is 5 acres, examine the pie chart and answer the questions.

Residental Area	⋔
Commercial Area :	▯
Road Area	‖
Green Zone	↓
Water body	~

142. The ratio of area allotted for residential and road purpose is
(1) 1 : 4 (2) 4 : 1
(3) 3 : 8 (4) 8 : 3

143. The percentage of the total area allotted for water body and green zone together is
(1) 35% (2) 30%
(3) 45% (4) 40%

144. Land allotted for green zone is greater than that for commercial purpose by
(1) $\dfrac{3}{2}$ acres (2) $\dfrac{2}{3}$ acres
(3) $\dfrac{4}{3}$ acres (4) $\dfrac{3}{4}$ acres

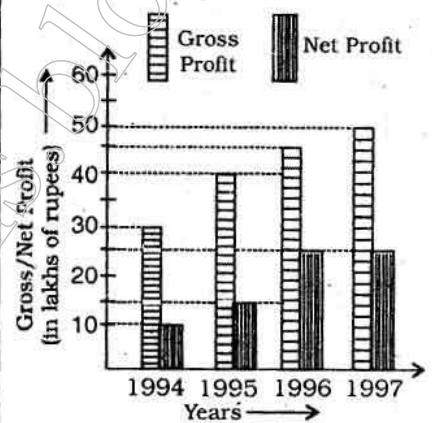**145.** The total land allotted for residential and commercial purpose is
(1) $2\dfrac{1}{4}$ acres
(2) $4\dfrac{1}{2}$ acres
(3) $2\dfrac{3}{4}$ acres
(4) $2\dfrac{1}{2}$ acres

Directions (146-150) : Study the following bar graph and answer the questions.
Gross Profit and Net Profit of a company in lakhs of rupees for the years 1994-1997:

146. The year in which the gross profit is double the net profit
(1) 1997 (2) 1995
(3) 1996 (4) 1994

147. The percentage of net profit of 1995 as compared to the gross profit in that year is
(1) 25.5% (2) 35.5%
(3) 37.5% (4) 42.5%

148. The difference of average gross profit and average net profit calculated for four years is
(1) ₹ 18.75 lakhs
(2) ₹ 19.75 lakhs
(3) ₹ 20.5 lakhs
(4) ₹ 22.5 lakhs

149. The ratio of gross profit to net profit in a year was greatest in the year
(1) 1994 (2) 1995
(3) 1996 (4) 1997

150. For the entire four years as shown, the ratio of total gross profit to total net profit is
(1) 13 : 4 (2) 11 : 6
(3) 11 : 5 (4) 9 : 4

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ENGLISH LANGUAGE

Directions (151–155) : In the following questions, some sentences have errors and some have none. Find out which part of a sentence has an error. The number of that part is your answer. If there is no error, then your answer is (4) i.e. No error.

151. Neither of them (1)/ are (2)/ good (3)/. No error (4)
152. Due to me being a new comer (1)/ I was unable (2)/ to get a good house (3)/. No error (4)
153. The circulation of The States-man (1)/ is greater than (2)/ that of any newspaper. (3)/. No error (4)
154. In the garden (1)/ were the more beautiful flowers (2)/ and silver bells (3)/. No error (4)
155. The poet (1)/ describes about (2)/ the spring season (3)/. No error (4)

Directions (156–160) : In the following questions, sentences are given with blanks to be filled in with an appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four as your answer.

156. The news was _____ good to be true.
    (1) very   (2) too
    (3) so   (4) as
157. How much longer ____ this book ?
    (1) you are needing
    (2) will you be needing
    (3) will you have needed
    (4) have you needed
158. _____ you hear the President's speech ?
    (1) Have   (2) Has
    (3) Had   (4) Did
159. I _____ to the movies with some friends last night.
    (1) have gone (2) went
    (3) am gone   (4) am going
160. She has only_____ friends.
    (1) fewer   (2) less
    (3) more   (4) a few

Directions (161–165) : In the following questions, out of the four alternatives, choose the one which best expresses the meaning of the given word.

161. magnificent
    (1) magnanimous
    (2) modest
    (3) generous
    (4) splendid
162. spirited
    (1) heated
    (2) drunk
    (3) enthusiastic
    (4) possessed
163. gloomy
    (1) misty   (2) obscure
    (3) murky   (4) shadowy
164. grumble
    (1) to scold
    (2) to complain
    (3) to sheer
    (4) to fight
165. crude
    (1) unrefined   (2) cruel
    (3) rude   (4) savage

Directions (166–170) : In the following questions choose the word opposite in meaning to the given word.

166. detest
    (1) test   (2) dislike
    (3) like   (4) interest
167. intentional
    (1) accidental
    (2) undecided
    (3) concentrated
    (4) broken
168. commence
    (1) start   (2) schedule
    (3) conclude   (4) dissolve
169. expand
    (1) contract   (2) contrast
    (3) consist   (4) controvert
170. prosperity
    (1) propriety
    (2) property
    (3) adversity
    (4) perspicacity

Directions (171–175) : In the following questions, four alternatives are given for the Idiom/Phrase. Choose the alternative which best expresses the meaning of the Idiom/Phrase.

171. to speak one's mind.
    (1) To be frank and honest
    (2) To think aloud
    (3) To talk about one's ideas
    (4) To express one's thoughts
172. to make a mountain of a molehill
    (1) to make advantage of a small thing
    (2) to give great importance to little things
    (3) to get into trouble
    (4) to see a thing with prejudiced mind
173. hand in glove
    (1) in close relationship
    (2) non-cooperative
    (3) critical
    (4) on bad terms
174. to add fuel to the fire
    (1) to make matters bright
    (2) to cause additional anger
    (3) to bring matters to a conclusion
    (4) to start a revolt
175. wear and tear
    (1) a brand name
    (2) damage
    (3) lot of sorrow
    (4) a warning

Directions (176–180) : In the following questions, part of the sentence is printed in **bold**. Below are given alternatives to the **bold** part at (1), (2) and (3) which may improve the sentence. Choose the correct alternative. In case no improvement is needed your answer is (4)

176. A pair of shoes **have been** purchased by me.
    (1) has been
    (2) has being
    (3) would been
    (4) No improvement
177. When **I shall go** to Agra, I shall visit the Taj Mahal.
    (1) have gone
    (2) shall travel
    (3) go
    (4) No improvement
178. You must apologise **with** him for this.
    (1) to
    (2) of
    (3) for
    (4) No improvement
179. **Since** he worked hard he failed to secure good grades.
    (1) As
    (2) When
    (3) Though
    (4) No improvement

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180. The minister agreed **will answer** questions on television.
(1) to answer
(2) for answering
(3) with answering
(4) No improvement

Directions (181–185) : In the following questions out of the four alternatives, choose the one which can be substituted for the given sentence.

181. A person who loves wealth and spends as little money as possible
(1) Curmudgeon
(2) Money-grabber
(3) Scrimp
(4) Miser

182. State of anxiety or dismay causing mental confusion
(1) Constriction
(2) Consternation
(3) Concentration
(4) Contraction

183. A person who is fluent in two languages
(1) Versatile
(2) Expert
(3) Bilingual
(4) Knowledgeable

184. One who eats human flesh
(1) Maneater   (2) Cannibal
(3) Beast   (4) Savage

185. The quality of being politely firm and demanding
(1) assertive   (2) bossy
(3) aggressive   (4) lordy

Directions (186–190) : In the following questions groups of four words are given. In each group, one word is correctly spelt. Find the correctly spelt word.

186. (1) independance
(2) independence
(3) independens
(4) independance

187. (1) hypocrisy   (2) hypocresy
(3) hipocrisy   (4) hipocrecy

188. (1) aeroplane   (2) airoplane
(3) aeroplain   (4) airoplain

189. (1) loanly   (2) lonly
(3) lonelie   (4) lonely

190. (1) cerimony   (2) ceremoney
(3) ceremony   (4) cerimoney

Directions (191–200) : In the following passage, some of the words have been left out. First read the passage over and try to understand what it is about. Then fill in the blanks with the help of the alternatives given.

"Quit India" came not from the lips but the aching hearts of millions. In this open rebellion, the Inidan **191** reached its climax. The British were not only **192** by it, but also were obliged to quit unilaterally. The importance of Quit India can be **193** from Lord Linlithgow's statement, "I am engaged here in meeting by far the most **194** rebellion since that of 1857, the gravity and extent of which we have so far **195** from the world for reasons of military security." Still more significant was Churchill's gloomy disclosure to the King Emperor that, "the idea of **196** of power had become an admitted **197** in the minds of British party leaders," although his public statements were diametrically opposite. The **198** created by Quit India made the British **199** that they could no longer keep India in **200**.

191. (1) freedom   (2) patriotism
(3) liberation   (4) revolution

192. (1) threatened
(2) inspired
(3) attacked
(4) impressed

193. (1) diffused   (2) gauged
(3) established   (4) determined

194. (1) trivial
(2) magnificent
(3) serious
(4) auspicious

195. (1) excluded   (2) elicited
(3) prevented   (4) concealed

196. (1) transfer   (2) seizure
(3) grabbing   (4) retainment

197. (1) tactics   (2) fantasy
(3) inevitability
(4) occurrence

198. (1) violence   (2) taboos
(3) vengeance   (4) anarchy

199. (1) imagine   (2) pretend
(3) realise   (4) anxious

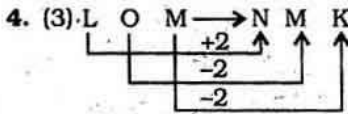**200.** (1) power   (2) bondage
(3) exile   (4) suspense

ANSWERS

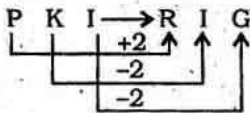|			
1. (4)	2. (2)	3. (3)	4. (3)
5. (1)	6. (4)	7. (3)	8. (4)
9. (2)	10. (4)	11. (1)	12. (3)
13. (2)	14. (1)	15. (3)	16. (3)
17. (4)	18. (2)	19. (3)	20. (3)
21. (4)	22. (3)	23. (2)	24. (3)
25. (1)	26. (4)	27. (2)	28. (1)
29. (3)	30. (3)	31. (1)	32. (3)
33. (3)	34. (3)	35. (1)	36. (1)
37. (4)	38. (3)	39. (2)	40. (2)
41. (4)	42. (4)	43. (2)	44. (1)
45. (4)	46. (2)	47. (4)	48. (2)
49. (4)	50. (2)	51. (1)	52. (3)
53. (1)	54. (2)	55. (3)	56. (2)
57. (1)	58. (3)	59. (4)	60. (1)
61. (2)	62. (1)	63. (3)	64. (3)
65. (1)	66. (3)	67. (3)	68. (2)
69. (2)	70. (3)	71. (3)	72. (4)
73. (4)	74. (3)	75. (1)	76. (4)
77. (3)	78. (2)	79. (1)	80. (3)
81. (2)	82. (1)	83. (3)	84. (2)
85. (4)	86. (1)	87. (3)	88. (3)
89. (3)	90. (2)	91. (1)	92. (4)
93. (2)	94. (2)	95. (4)	96. (3)
97. (2)	98. (2)	99. (4)	100. (2)
101. (3)	102. (1)	103. (4)	104. (4)
105. (1)	106. (4)	107. (3)	108. (1)
109. (3)	110. (3)	111. (4)	112. (2)
113. (3)	114. (3)	115. (1)	116. (3)
117. (1)	118. (2)	119. (2)	120. (*)
121. (2)	122. (2)	123. (1)	124. (3)
125. (3)	126. (4)	127. (1)	128. (2)
129. (1)	130. (2)	131. (3)	132. (2)
133. (3)	134. (2)	135. (2)	136. (3)
137. (2)	138. (2)	139. (2)	140. (1)
141. (1)	142. (2)	143. (1)	144. (4)
145. (3)	146. (1)	147. (3)	148. (4)
149. (1)	150. (3)	151. (2)	152. (1)
153. (3)	154. (2)	155. (2)	156. (2)
157. (4)	158. (4)	159. (2)	160. (4)
161. (4)	162. (3)	163. (3)	164. (2)
165. (1)	166. (3)	167. (3)	168. (3)
169. (1)	170. (3)	171. (1)	172. (2)
173. (1)	174. (2)	175. (2)	176. (1)
177. (3)	178. (1)	179. (3)	180. (1)
181. (4)	182. (2)	183. (3)	184. (1)
185. (1)	186. (2)	187. (1)	188. (1)
189. (4)	190. (3)	191. (2)	192. (1)
193. (2)	194. (3)	195. (3)	196. (1)
197. (3)	198. (4)	199. (3)	200. (2)

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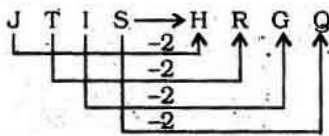
EXPLANATIONS

1. (4) Students carry and study books. Similarly, Postman carries mails.
2. (2) Illiteracy is warded off through education. Similarly, Drought is warded off by rain.
3. (3) Carpenter makes furniture. Similarly, Cook prepares soup. In this problem Worker-Product relationship has been shown.
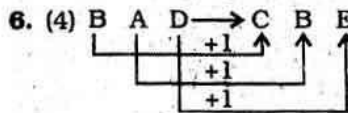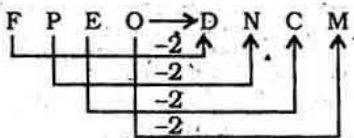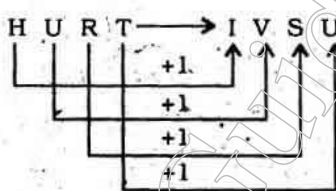4. (3) L O M → N M K
   +2, -2, -2

   Similarly,
   P K I → R I G
   +2, -2, -2

5. (1)
   J T I S → H R G Q
   -2, -2, -2, -2

   Similarly,
   F P E O → D N C M
   -2, -2, -2, -2

6. (4) B A D → C B E
   +1, +1, +1

   Similarly,
   H U R T → I V S U
   +1, +1, +1, +1

7. (3) $(5)^2 + 5 = 25 + 5 = 30$
   Similarly,
   $(8)^2 + 5 = 64 + 5 = \boxed{69}$

8. (4) $3 \times 4 = 12$
   $5 \times 6 = 30$
   $4 \times 5 = 20$

   $6 \times 7 = \boxed{42}$

9. (2) $(3)^3 + 1 = 27 + 1 = 28$
   Similarly,
   $(5)^3 + 1 = 125 + 1 = 126$

10. (4) Except Lock, all others are used to stick something or paste something on the other thing.

11. (1) Biography is an account of life of somebody, while all others are different techniques of printing.

12. (3) Smoke comes out of Fire. Petrol is used to run car. Similarly, Steam engine runs on coal and oil is burnt in Lamp.

13. (2) Except the number 25, all others are Prime Numbers. The number 25 is a perfect square.

14. (1) Except the number 6121, all other numbers are even numbers.

15. (3) $\frac{98}{21} = 4.666$; $\frac{210}{45} = 4.666$;

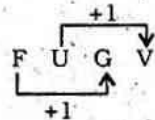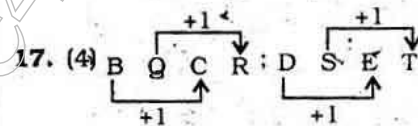 $\frac{126}{27} = 4.666$

    But, $\frac{29}{7} = 4.142$

16. (3) E $\xrightarrow{-3}$ B $\xrightarrow{+2}$ D
    I $\xrightarrow{-3}$ F $\xrightarrow{+2}$ H
    Q $\xrightarrow{-3}$ N $\xrightarrow{+1}$ O
    Y $\xrightarrow{-3}$ V $\xrightarrow{+2}$ X

17. (4) B Q C R : D S E T
    +1, +1, +1, +1

    F U G V
    +1, +1

    H W I Y
    +2, +1
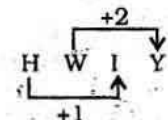
18. (2) Except the letter group BCDF, in all other letter groups there are only Vowels.

19. (3) Meaningful order of words in ascending order :
    4. Infant ↓
    1. Child ↓
    5. Education ↓
    2. Profession ↓
    3. Marriage

20. (3) Meaningful order of words in ascending order :
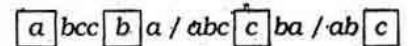   3. Foundation ↓
    4. Walls ↓
    5. Ceiling ↓
    1. Plastering ↓
    2. Painting

21. (4) 2. KNACK → 3. KNIT → 4. KNOB → 1. KNOW

22. (3)
    | a | bcc | b | a / abc | c | ba / ab | c |

23. (2) A $\xrightarrow{+1}$ B $\xrightarrow{+1}$ C $\xrightarrow{+1}$ D
    C $\xrightarrow{+1}$ D $\xrightarrow{+1}$ E $\xrightarrow{+1}$ F
    E $\xrightarrow{+1}$ F $\xrightarrow{+1}$ G $\xrightarrow{+1}$ H
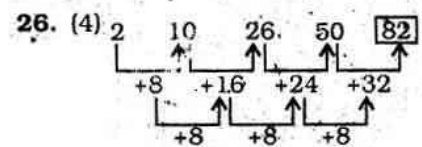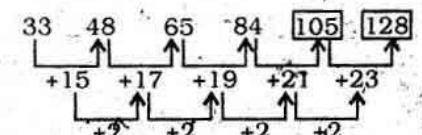
24. (3)
    A $\xrightarrow{+2}$ C $\xrightarrow{+2}$ E $\xrightarrow{+2}$ G
    Z $\xrightarrow{-2}$ X $\xrightarrow{-2}$ V $\xrightarrow{-2}$ T
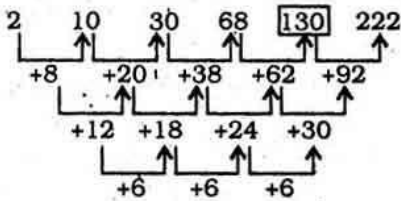   B $\xrightarrow{+2}$ D $\xrightarrow{+2}$ F $\xrightarrow{+2}$ H
    Y $\xrightarrow{-2}$ W $\xrightarrow{-2}$ U $\xrightarrow{-2}$ S

25. (1)
    33 48 65 84 $\boxed{105}$ $\boxed{128}$
    +15 +17 +19 +21 +23
    +2 +2 +2 +2

26. (4) 2 10 26. 50 $\boxed{82}$
    +8 +16 +24 +32
    +8 +8 +8

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27. (2)

2   10   30   68   [130]   222

+8   +20   +38   +62   +92

+12   +18   +24   +30

+6   +6   +6

Therefore, the number 120 is wrong in the series.

28. (1) Only daughter of the father of Savitha's maternal uncle means the mother of Savitha. Therefore, the boy is brother of Savitha.

29. (3) Suppose the present age of the son is x years.

Therefore, the present age of father will be $3x$ years.

According to question

$5(x - 8) = 3x - 8$

$\Rightarrow 5x - 40 = 3x - 8$

$\Rightarrow 5x - 3x = 40 - 8$

$\Rightarrow 2x = 32$

$\therefore x = \dfrac{32}{2} = 16$ years

30. (3) There is no 'U' letter in the keyword.

31. (1) There is no 'V' letter in the keyword and hence the word PERCIEVE cannot be formed.

There is no 'M' letter in the keyword and hence the word EMPIRE cannot be formed.

There is no 'S' letter in the keyword and hence the word EXPENSE cannot be formed.

32. (3) E $\Rightarrow$ 5,

T E A $\Rightarrow$ 20 + 5 + 1 = 26

Therefore,, T E A C H E R

$\Rightarrow$ 20 + 5 + 1 + 3 + 8 + 5 + 18

= 60

33. (3) C O M P U T E R

O C P M T U R E

Similarly,

O H K C E

H O C K E Y

34. (3)

X $\Rightarrow$ +	Z $\Rightarrow$ +
Y $\Rightarrow$ −	P $\Rightarrow$ ×

10 P 2 X 5 Y 5 = ?

$\Rightarrow$? = 10 × 2 + 5 − 5

$\Rightarrow$? = 20 + 5 − 5 = [20]

35. (1) 3 ÷ 5 $\Rightarrow$ 3 × 5 = 1 [5]

4 ÷ 7 $\Rightarrow$ 4 × 7 = 2 [8]

8 ÷ 7 $\Rightarrow$ 8 × 7 = 5 [6]

Therefore,

9 + 6 $\Rightarrow$ 9 × 6 = 5 [4]

36. (1) 28 ÷ 4 + 9 = 16

$\Rightarrow$ 7 + 9 = 16

37. (4) Columnwise

First Column

8 + 21 = 29; 29 + 21 = 50

Second Column

15 + 21 = [36]; 36 + 21 = 57

Third Column

22 + 21 = 43; 43 + 21 = 64
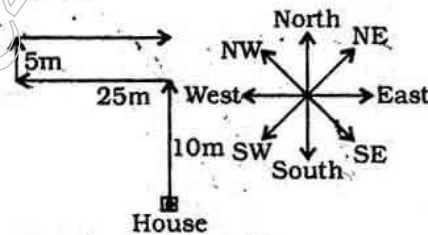
38. (3) Columnwise

First Column : 7 × 8 × 2 = 112

Second Column

: 9 × 3 × 5 = 135

Third Column

: 3 × 5 × ? = 900

$\therefore$? = $\dfrac{900}{15}$ = 60

39. (2)

He is facing East.

40. (2)

4 km

A

3 km

5 km   B   Starting Point
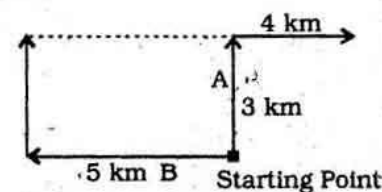
Required distance

= (5 + 4) km

= 9 km

41. (4)

RIGHT   A   C   D   B   E   LEFT
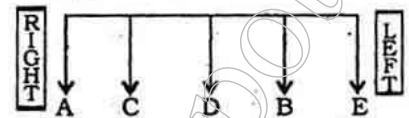
42. (4)   Krishna → Govinda

Ram
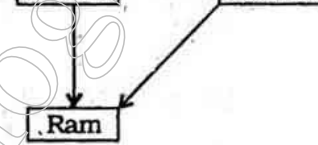
Ram's house is to the South-West of Govinda's house.

43. (2) Both the Premises are Universal Affirmative (A-type).

All children are students.

All students are players.

A + A $\Rightarrow$ A-type of Conclusion

"All children are players."

This is Conclusion II.

44. (1) It is clear that Anand is not a teacher. Anand may be a student or clerical staff.

45. (4)

46. (2)

49. (4) F $\Rightarrow$ 02, 14, 21, 33, 40

I $\Rightarrow$ 03, 10, 22, 34, 41

R $\Rightarrow$ 57, 69, 76, 88, 95

E $\Rightarrow$ 01, 13, 20, 32, 44

Option	F	I	R	E
(1)	21	22	88	36
(2)	14	10	69	14
(3)	33	34	76	22
(4)	02	03	57	01

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50. (2) All mothers are women. All women are people.
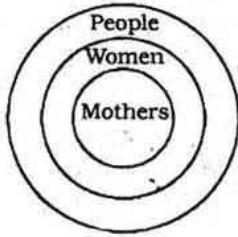
51. (1) Value "in exchange" is the relative proportion with which this commodity exchanges for another commodity (in other words, its price in the case of money).

52. (3) The Planning Commission was set up on 15 March 1950, with Prime Minister Jawaharlal Nehru as the chairman.

53. (1) The Green Revolution refers to the increase in food production and in production of non-food items that has significantly and steadily taken place in India since 1966.

54. (2) As per the Constitution, the commission is appointed every five years and consists of a chairman and four other members.

55. (3) Reserve Bank of India was nationalised in the year 1949.

56. (2) Dr. Sachchidanand Sinha was the first president (temporary chairman) of the Constituent Assembly when it met on December 9, 1946. Dr. Rajendra Prasad then became the President of the Constituent Assembly.

57. (1) In political science, an initiative (also known as a popular or citizens' initiative) is a means by which a petition signed by a certain minimum number of registered voters can force a public vote (plebiscite).

58. (3) The Fundamental Duties of citizens were added to the Constitution by the 42nd Amendment in 1976, upon the recommendations of the Swarna Singh Committee.

59. (4) The Supreme Court of India is vested with the authority to interpret the Constitution and ensure that laws adhere to the spirit and letter of the Constitution.

60. (1) state is the conceptual unit of politics, the most inclusive organisation in any society that is recognised as having final say.

61. (2) He was defeated by the emperor of India, Chandragupta Maurya and accepted a matrimony alliance for 500 elephants after ceding the territories considered as part of India.

62. (1) The most striking feature of the Indus valley civilization was found that emphasis on the organization of everyday civic life.

63. (3) In their own sphere of influence the Portuguese, Dutch and French banned Sati but efforts to stamp out Sati were formalised only under Lord William Bentinck.

64. (3) Meera, a Rajput princess was born in Kudki (Kurki), a little village near Merta City, which is presently in the Nagaur district of Rajasthan in northwest India.

65. (1) After the death of Alexander, Seleucus was nominated as the satrap of Babylon in 320 BC.

66. (3) Thar Express is an international train that connects Karachi, Pakistan to Bhagat Ki Kothi, India.

67. (3) All beverage alcohol and much of that used in industry is formed through fermentation of a variety of products including grain such as corn, potato mashes, fruit juices, and beet and cane sugar molasses.

68. (2) The city is situated between the southern bank of the Brahmaputra river and the foothills of the Shillong plateau.

69. (2) Kanchenjunga is the third highest mountain in the world, located along the India-Nepal border in the Himalayas.

70. (3) It shares international borders with Bhutan in the west, Burma in the east and the People's Republic of China in the north.

71. (3) Chlorophyll is a green pigment found in almost all plants, algae, and cyanobacteria.

72. (4) The edible portion is swollen leaves with a bit of stem.

73. (4) Although those with AB blood type may be referred to as universal recipients, in actuality, type AB+ blood is that of the universal recipient, whereas type AB- is not.

74. (3) The normal core body temperature of a healthy, resting adult human being is stated to be at 98.6 degrees Fahrenheit or 37.0 degrees Celsius.

75. (1) The Rock Dove (Columba livia) or Rock Pigeon is a member of the bird family Columbidae (doves and pigeons).

76. (4) Many of a bird's bones are pneumatic, with struts across their hollow interiors to provide a combination of light weight and strength as an adaptation to flying.

77. (3) Nuclear fusion is the process by which two or more atomic nuclei join together, or "fuse", to form a single heavier nucleus.

78. (2) The ball will float on mercury because of different densities.

79. (1) The human ear can respond to minute pressure variations in the air if they are in the audible frequency range, roughly 20 Hz - 20 kHz.

81. (2) Fats have the highest amount of energy per gram of consumption.

82. (1) Pure or a distilled form of water is a bad conductor of electricity because in pure form of water there are no free ions

83. (3) The National Chemical Laboratory (NCL) is an Indian government laboratory based in Pune, in western India.

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84. (2) Among the metals most commonly used for plating are zinc, nickel, chromium, cadmium, copper, silver, and gold.

85. (4) The U.S. Department of Health and Human Services states that some Polycyclic hydrocarbons may be carcinogens in humans and animals and can cause harmful effects on skin and the auto-immune system.

86. (1) Calcium hypochlorite is used for the disinfection of drinking water or swimming pool water.

87. (3) In the past, the distinction between X-rays and gamma rays was based on energy (or equivalently frequency or wavelength), with gamma rays being considered a higher-energy version of X-rays.

88. (3) This layer absorbs 97–99% of the Sun's high frequency ultraviolet light, which potentially damages the life forms on Earth.

89. (3) Computer data storage, often called storage or memory, refers to computer components and recording media that retain digital data.

91. (1) Simpson discovered the anaesthetic properties of chloroform and successfully introduced it for general medical use.

92. (4) The 2011 Nobel Prize in Chemistry was awarded to Dan Shechtman "for the discovery of Quasicrystal".

93. (2) The win at the Buddh International Circuit (BIC) was Vettel's 11th win this year and put him on course to equal the record for the most number of wins in one F1 season.

94. (2) Kuchipudi is a Classical Indian dance form Andhra Pradesh, India.

95. (4) He was an Indian Bengali filmmaker. He is regarded as one of the greatest auteurs of 20th century cinema.

96. (3) The data reflects that 18.62% of the country's rural population lives in Uttar Pradesh and 13.48% urban population lives in Maharashtra.

97. (2) The National Old Age Pension Scheme provides a pension for the elderly who live below the poverty line.

98. (2) The Department of Atomic Energy (DAE) has estimated uranium reserves of the mine at 150,000 tonnes, which are one of the largest in the world.

99. (4) Rongali Bihu (mid-April, also called Bohag Bihu), the most popular Bihu celebrates the onset of the Assamese New Year

100. (2) With around 600000 inhabitants, Sikkim is the least populous state in India and the second-smallest state after Goa in total area.

101. (3) Given, $\sqrt{4096} = 64$

$\therefore \sqrt{40.96} + \sqrt{0.4096} +$

$\sqrt{0.004096} + \sqrt{0.00004096}$

$= 6.4 + 0.64 + 0.064 + 0.0064$

$= 7.1104$

102. (1) $\frac{1}{15} + \frac{1}{35} + \frac{1}{63} + \frac{1}{99} + \frac{1}{143}$

$= \frac{1}{3 \times 5} \times \frac{1}{5 \times 7} + \frac{1}{7 \times 9}$

$+ \frac{1}{9 \times 11} + \frac{1}{11 \times 13}$

$= \frac{1}{2}\left(\frac{1}{3} - \frac{1}{5} + \frac{1}{5} - \frac{1}{7} + \frac{1}{7} - \frac{1}{9} + \frac{1}{9} - \frac{1}{11} + \frac{1}{11} - \frac{1}{13}\right)$

$= \frac{1}{2}\left(\frac{1}{3} - \frac{1}{13}\right) = \frac{1}{2}\left(\frac{13-3}{39}\right) = \frac{5}{39}$

103. (4) $(256)^{-\left(4^{\frac{-3}{2}}\right)} = (256)^{-\left(\frac{1}{4^{3/2}}\right)}$

$= (256)^{-\frac{1}{8}} = \frac{1}{(256)^{\frac{1}{8}}} = \frac{1}{(2^8)^{\frac{1}{8}}} = \frac{1}{2}$

104. (4) $2.5\overset{..}{2} = 2\frac{52}{99} = \frac{250}{99}$

$\therefore$ Required sum

$= 250 + 99 = 349$

105. (1) $\sqrt{x} = \sqrt[3]{y}$

$\Rightarrow x^{\frac{1}{2}} = y^{\frac{1}{3}}$

$\Rightarrow (x^{\frac{1}{2}})^6 = (y^{\frac{1}{3}})^6$

$\Rightarrow x^3 = y^2$

106. (4) B's 1 day's work

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

$\therefore$ B's $\frac{1}{2}$ day's work $= \frac{1}{60}$

$\therefore$ (A + B)'s 1 day's work

$= \frac{1}{20} + \frac{1}{60} = \frac{3+1}{60} = \frac{1}{15}$

B works for half day daily

$\therefore$ The work will be completed in 15 days.

107. (3) A : B = D_2 : D_1

$\Rightarrow 100 : 140 = D_2 : 70$

$\Rightarrow 100 \times 70 = 140 \times D_2$

$\Rightarrow D_2 = \frac{100 \times 70}{140} = 50$ days.

108. (1) If the radius of the hemisphere be r units, then height of cylinder and cone = r units

$\therefore$ Required ratio

$= \pi r^2 h : 2\pi r^3 : \frac{1}{3}\pi r^2 h$

$= \pi r^3 : 2\pi r^3 : \frac{1}{3}\pi r^3$

$= 3 : 6 : 1$

109. (3) If the radius of the new cylinder be R then,

$2\pi r^2 h = \pi R^2 h$

$\Rightarrow R^2 = 2r^2 \Rightarrow R = \sqrt{2}r$

110. (3) Volume of the pyramid

$= \frac{1}{3} \times$ height $\times$ area of the base

$= \frac{1}{3} \times 10 \times 57 = 190$ cu.cm.

111. (4) If the length of the edge of cube be x cm, then

diagonal $= \sqrt{3}x$ cm

$\therefore \sqrt{3}x = 8\sqrt{3} \Rightarrow x = 8$ cm

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∴ Surface area of the cube

$= 6x^2$

$= 6 \times 8 \times 8$

$= 384$ sq. cm

112. (2) Side of square $= \sqrt{2}$ metre

Radius of in-circle

$= \dfrac{\sqrt{2}}{2} = \dfrac{1}{\sqrt{2}}$ metre

Area of the circle $= \pi r^2$

$= \pi \times \dfrac{1}{2} = \dfrac{\pi}{2}$ sq. metre.

113. (3) If the side of the equilateral triangle be x units, then,

$3x = \sqrt{3}\left(\dfrac{\sqrt{3}}{4}x^2\right)$

$\Rightarrow 3x = \dfrac{3x^2}{4}$

$\Rightarrow x = 4$ units

114. (3) If the side of the square be x units, then

diagonal $= \sqrt{2}x$ units

∴ Area of the square $= x^2$

and area of triangle

$= \dfrac{\sqrt{3}}{4}(\sqrt{2}x)^2$

$= \dfrac{\sqrt{3}x^2}{2}$ sq. units

∴ Required ratio

$= x^2 : \dfrac{\sqrt{3}x^2}{2}$

$= 2 : \sqrt{3}$

115. (1) If the marked price be Rs. x and cost price be Rs. 100, then,

$\dfrac{x \times 75}{100} = 125$

$\Rightarrow x = \dfrac{125 \times 100}{75} = \text{Rs.} \dfrac{500}{3}$

S.P. after a discount of 10%

$= \dfrac{500}{3} \times \dfrac{90}{100} = \text{Rs.} 150$

∴ Gain per cent = 50%

116. (3) Let the marked price be Rs. x.

∴ $x \times \dfrac{84}{100} = \dfrac{1200 \times 112}{100}$

$\Rightarrow x \times \dfrac{84}{100} = 112 \times 12$

$\Rightarrow x = \dfrac{112 \times 1200}{84} = \text{Rs.} 1600$

117. (1) $y : x = 4 : 15 \Rightarrow x : y = 15 : 4$

By componendo and dividendo,

$\dfrac{x-y}{x+y} = \dfrac{15-4}{15+4} = \dfrac{11}{19}$

118. (2) Let the original number of carpenters be x.

$M_1 D_1 = M_2 D_2$

$\Rightarrow x \times 9 = (x-5) \times 12$

$\Rightarrow 9x = 12x - 60$

$\Rightarrow 3x = 60 \Rightarrow x = 20$

119. (2) Let the total distance be x km.

Total time $= \dfrac{\frac{x}{3}}{25} + \dfrac{\frac{x}{4}}{30} + \dfrac{\frac{5x}{12}}{50}$

$= \dfrac{x}{75} + \dfrac{x}{120} + \dfrac{x}{120}$

$= \dfrac{x}{75} + \dfrac{x}{60} = \dfrac{4x + 5x}{300} = \dfrac{3x}{100}$ hours

∴ Average speed

$= \dfrac{\text{Total distance}}{\text{Time taken}}$

$= \dfrac{x}{\frac{3x}{100}} = \dfrac{100}{3} = 33\dfrac{1}{3}$ kmph

120. (*) Sum of the numbers = 124

If the larger number be x, then smaller number $= 124 - x$

∴ $\dfrac{124 - x + 2}{x} = \dfrac{1}{2}$

$\Rightarrow 252 - 2x = x$

$\Rightarrow 3x = 252 \Rightarrow x = 84$

∴ Smaller number

$= 124 - 84 = 40$

∴ Difference $= 84 - 40 = 44$

121. (2) Percentage profit

$= \dfrac{25 - 20}{20} \times 100 = 25\%$

122. (2) If the cost price of article be Rs. x then

$\dfrac{500 \times 90}{100} = \dfrac{x \times 120}{100}$

$\Rightarrow 450 = \dfrac{6x}{5}$

$\Rightarrow 6x = 5 \times 450$

$\Rightarrow x = \dfrac{5 \times 450}{6} = \text{Rs.} 375$

123. (1) $(A + B) \times \dfrac{40}{100}$

$= (A - B) \times \dfrac{60}{100}$

$\Rightarrow 2 (A + B) = 3 (A - B)$

$\Rightarrow 2A + 2B = 3A - 3B$

$\Rightarrow A = 5B$

∴ $\dfrac{2A - 3B}{A + B} = \dfrac{10B - 3B}{5B + B}$

$= \dfrac{7B}{6B} = \dfrac{7}{6}$

124. (3) Required percentage increase

$= \left(10 + 20 + \dfrac{10 \times 20}{100}\right)\%$

$= 32\%$

125. (3) If the distance be x km, then

$\dfrac{x}{40} - \dfrac{x}{50} = \dfrac{6}{60}$

$\Rightarrow \dfrac{x}{4} - \dfrac{x}{5} = 1$

$\Rightarrow x = 20$ km.

∴ Required time

$= \left(\dfrac{20}{40}\right)$ hour $- 11$ minutes

$= \left(\dfrac{1}{2} \times 60 - 11\right)$ minutes

$= 19$ minutes

126. (4) Height of tree after 1 year

$= 64 + 64 \times \dfrac{1}{8} = 72$ cm

Height of tree after 2 years

$= 72 + 72 \times \dfrac{1}{8}$

$= 72 + 9 = 81$ cm

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127. (1) $2^{x+3} = 32 = 2^5$
$\Rightarrow x + 3 = 5 \Rightarrow x = 5 - 3 = 2$
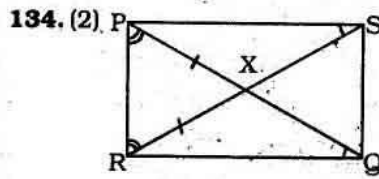$\therefore 3^{x+1} = 3^3 = 27$

128. (2) $x + \dfrac{1}{x} = 2$
$\Rightarrow x^2 + 1 = 2x \Rightarrow x^2 - 2x + 1 = 0$
$\Rightarrow (x - 1)^2 = 0$
$\Rightarrow x = 1$
$\therefore x^2 + \dfrac{1}{x^3} = 1 + 1 = 2$

129. (1) $\dfrac{a}{b} + \dfrac{b}{a} = 1$
$\Rightarrow \dfrac{a^2 + b^2}{ab} = 1$
$\Rightarrow a^2 + b^2 = ab$
$\Rightarrow a^2 + b^2 - ab = 0$
$\therefore a^3 + b^3$
$\quad = (a + b)(a^2 - ab + b^2) = 0$

130. (2) $a^2 + b^2 + c^2 + 3$
$\quad = 2a + 2b + 2c$
$\Rightarrow a^2 - 2a + 1 + b^2 - 2b + 1 + c^2$
$\quad - 2c + 1 = 0$
$\Rightarrow (a - 1)^2 + (b - 1)^2 + (c - 1)^2$
$\quad = 0$
$\Rightarrow a - 1 = 0 \Rightarrow a = 1;$
$\quad b - 1 = 0 \Rightarrow b = 1$
and, $c - 1 = 0 \Rightarrow c = 1$
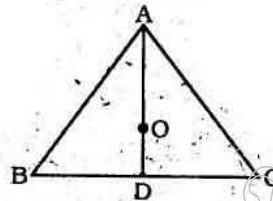$\therefore a + b + c = 3$

131. (3) $\dfrac{2p}{p^2 - 2p + 1} = \dfrac{1}{4}$
$\Rightarrow \dfrac{p^2 - 2p + 1}{2p} = 4$
$\Rightarrow \dfrac{p^2 - 2p + 1}{p} = 8$
$\Rightarrow \dfrac{p^2}{p} - \dfrac{2p}{p} + \dfrac{1}{p} = 8$
$\Rightarrow p + \dfrac{1}{p} = 8 + 2 = 10$

133. (3) Sum of angles of a triangle
$\quad = 180°$
$\therefore x + 5 + 2x - 3 + 3x + 4$
$\quad = 180°$
$\Rightarrow 6x + 6 = 180°$
$\Rightarrow 6x = 180 - 6 = 174°$
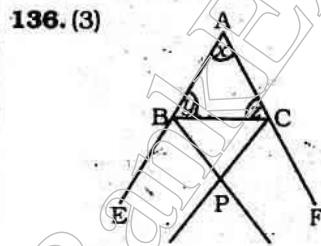$\Rightarrow x = \dfrac{174}{6} = 29$

134. (2)

$XP = XR$
$\therefore \angle XPR = \angle XRP$
If $\angle PSX = \angle RQX$,
then, PS = RQ

135. (2) D, is the mid-point of side BC.
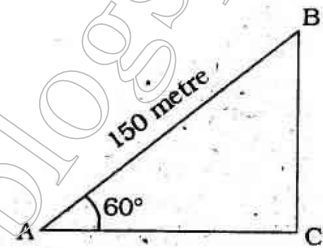Point O is the centroid that divides AD in the ratio 2 : 1.

$\therefore OD = 5$ cm.

136. (3)

In $\triangle ABC$,
$\angle A = x, \angle B = y; \angle C = z$
In $\triangle PBC$,
$\angle PBC + \angle PCB + \angle BPC = 180°$
$\Rightarrow \dfrac{1}{2} \angle EBC + \dfrac{1}{2} \angle FCB + \angle BPC$
$= 180°$
$\Rightarrow \angle EBC + \angle FCB + 2\angle BPC$
$= 360°$
$\Rightarrow (180° - y) + (180° - z) + 2\angle BPC = 360°$
$\Rightarrow 360° - (y + z) + 2\angle BPC = 360°$
$\Rightarrow 2\angle BPC = y + z$
$\Rightarrow 2\angle BPC = 180° - x$
$= 180° - \angle BAC$
$\therefore \angle BPC = 90° - \dfrac{1}{2} \angle BAC$
$= 90° - 50° = 40°$

137. (2) $\tan (2\theta + 45°) = \cot 3\theta$
$= \tan (90° - 3\theta)$
$\Rightarrow 2\theta + 45° = 90° - 3\theta$
$\Rightarrow 5\theta = 90° - 45° = 45°$
$\therefore \theta = 9°$

138. (2) AB = Length of the thred = 150 metre
$\angle BAC = 60°$

In $\triangle ABC$,
$\sin 60° = \dfrac{BC}{AB} \Rightarrow \dfrac{\sqrt{3}}{2} = \dfrac{BC}{150}$
$\Rightarrow BC = 150 \times \dfrac{\sqrt{3}}{2} = 75\sqrt{3}$ metre

139. (2) $\cos\theta = \dfrac{15}{17}$
$\Rightarrow \sec\theta = \dfrac{1}{\cos\theta} = \dfrac{17}{15}$
$\therefore \cot (90° - \theta) = \tan \theta$
$= \sqrt{\sec^2\theta - 1}$
$= \sqrt{\left(\dfrac{17}{15}\right)^2 - 1} = \sqrt{\dfrac{289}{225} - 1}$
$= \sqrt{\dfrac{289 - 225}{225}} = \sqrt{\dfrac{64}{225}} = \dfrac{8}{15}$

140. (1) $\sec^2\theta - \tan^2\theta = 1$
$\sec^2\theta + \tan^2\theta = \dfrac{7}{12}$
$\therefore \sec^4\theta - \tan^4\theta$
$= (\sec^2\theta - \tan^2\theta)(\sec^2\theta + \tan^2\theta)$
$= 1 \times \dfrac{7}{12} = \dfrac{7}{12}$

141. (1) $\cos x + \cos y = 2$
$\because \cos x \le 1$
$\Rightarrow \cos x = 1; \cos y = 1$
$\Rightarrow x = y = 0°$
$\therefore \sin x + \sin y = 0$

142. (2) Required ratio
$= 144 : 36 = 4 : 1$

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143. (1) Required percentage

$$= \frac{18 + 108}{360} \times 100 = 35\%$$

144. (4) Difference in the angles allotted for green zone and commercial purpose

$$= 108 - 54 = 54°$$

$$\because 360° \equiv 5 \text{ acres}$$

$$\therefore 54° \equiv \frac{5}{360} \times 54 = \frac{3}{4} \text{ acres}$$

145. (3) $\because$ 360° ≡ 5 acres

$$\therefore 198° (= 144° + 54°)$$

$$= \frac{5}{360} \times 198 = \frac{11}{4} \text{ acres}$$

$$= 2\frac{3}{4} \text{ acres}$$

146. (1) In 1997,

Gross profit = Rs. 50 lakh

Net profit = Rs. 25 lakh

147. (3) Required percentage

$$= \frac{15}{40} \times 100 = 37.5\%$$

148. (4) Required difference

$$= Rs. \frac{1}{4} (20 + 25 + 20 + 25) \text{ lakh}$$

$$= \frac{1}{4} \times 90 = Rs. 22.5 \text{ lakh}$$

149. (1) Gross profit : net profit

Year 1994 ⇒ 3 : 1

Year 1995 ⇒ 40 : 15 = 8 : 3

Year 1996 ⇒ 45 : 25 = 9 : 5

Year 1997 ⇒ 50 : 25 = 2 : 1

150. (3) Required ratio

$$= 165 : 75 = 11 : 5$$

151. (2) After either of, each of and neither of, plural subject is used, but the verb is singular. Hence, **is** should be used here.

152. (1) If a pronoun (I, we, you, he, she, it etc) comes before a Gerund (–ing form), then it is in the form of possessive adjective (my, our, your, his, her, its etc). Hence, Due to my being a new comer .... should be used here.

153. (3) Here, that of any other newspaper .... should be used.

154. (2) Here, there were more beautiful flowers.......should be used. Use of article 'the' is not proper.

155. (2) Here, **describes** should be used. Use of preposition 'abouf' is superfluous.

156. (2) **Look at the sentence.**

The fact is too evident to require proof.

Here, 'too' means : more than required.

too + adjective + to gives a negative sense.

161. (4) The word **Magnificent (Adjective)** means : extremely attractive and impressive; deserving praise; splendid.

Look at the sentence :

The Taj Mahal is a magnificent building.

162. (3) The word **Spirited (Adjective)** means : full of energy, determination or courage; enthusiastic.

Look at the sentence :

She put up a spirited defence in the final game.

163. (3) The word **Gloomy (Adjective)** means : depressing; nearly dark or badly lit in a way that makes you feel sad; glum; murky.

Look at the sentences :

It was a wet and gloomy day. Suddenly the future didnot look so gloomy after all.

164. (2) The word **Grumble (Verb)** means : to complain about somebody/something in a bad-tempered way.

Look at the sentences :

She is always grumbling to me about how badly she is treated at work.

165. (1) The word **Crude (Adjective)** means : unrefined; vulgar; simple and not very accurate.

166. (3) The word **Detest (Verb)** means : to hate somebody/ something very much; loathe; dislike.

Look at the sentence :

They detested each other on sight.

Its antonym should be **like**.

167. (1) The word **Intentional (Adjective)** means : done deliberately; deliberate; intended.

The word **Accidental (Adjective)** means : happening by chance; not planned.

168. (3) The word **Commence (Verb)** means : to begin something; start.

The word **Conclude (Verb)** means : to come to an end; to bring something to an end.

169. (1) The words **Expand** and **Contract** are antonymous.

170. (3) The word **Prosperity (Noun)** means : the state of being successful, especially in making money; affluence.

The word **Adversity (Noun)** means : a difficult or unpleasant situation.

Look at the sentences :

Our future prosperity depends on economic growth.

He overcame many personal adversities.

171. (1) Idiom **speak your mind** means: to say exactly what you think, in a very direct way.

172. (2) Idiom **make a mountain out of a molehill** means : to make an unimportant matter seem important.

173. (1) Idiom **hand in glove** means : working closely with somebody, especially in a secret and/ or illegal way.

174. (2) Idiom **add fuel to the fire** means : a thing that is done that makes something (an argument) get worse.

175. (2) Idiom **wear and tear** means the damage to objects, furniture, property etc. that is the result of normal use.

Look at the sentence :

The insurance policy does not cover damage caused by normal wear amd tear.

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