

PRACTICE SET

SSC-CGL TIER-I

Part A: General Intelligence And Reasoning

Directions: In question nos. 1 to 9, select the related word/letters/number from the given alternatives.

- JUNK : LXRP :: HOME : ?
(A) JRQJ (B) JPNF (C) JQRJ (D) IPOF
- ACD : ZWX :: FHJ : ?
(A) QSU (B) UQS (C) SQU (D) USQ
- RT : QU :: VX : ?
(A) WY (B) TW (C) YW (D) UY
- Chug : Train :: Bang : ?
(A) House (B) Animal (C) Door (D) Man
- Chiku : Fruit : Supermarket :: Novel : ? : ?
(A) Book : Stationery (B) Book : Bookstore
(C) Book : Shop (D) Shop : Market
- Loth : Reluctant :: Timid : ?
(A) Bad (B) Memorize
(C) Shy (D) Recluse
- Beak : Bird :: Lip : ?
(A) Cup (B) Grass (C) Food (D) Kettle
- 343 : 678 :: 512 : ?
(A) 1024 (B) 1536 (C) 1000 (D) 1016
- 225 : 12 : 435 : ?
(A) 12 (B) 20 (C) 25 (D) 19

Directions: In questions nos. 10 to 15, find the odd word/numbers/letters from the given alternatives.

- (A) 8 – 32 (B) 6 – 18
(C) 3 – 4.5 (D) 2 – 4
- (A) 4 – 20 (B) 5 – 30
(C) 7 – 42 (D) 8 – 72
- (A) Ship (B) Steamer
(C) Submarine (D) Boat
- (A) PQR (B) KJI
(C) FED (D) TSR
- (A) Ideal (B) Abort
(C) Saint (D) Ocean
- (A) EGI (B) TUX
(C) MOQ (D) LNP
- A series is given with one term missing. Choose the correct alternative from the given ones:
BDGI, KMPR, ?, CEHJ
(A) TUYZ (B) TVXY
(C) TVZY (D) TVYA

Directions: In question nos. 17 and 18 arrange the given words in a meaningful order and select the option indicating the correct order.

- | | |
|----------------------|----------------------|
| 17. 1. Seeds | 2. Plant |
| 3. Plough | 4. Harvest |
| 5. Crop | |
| (A) 3, 1, 2, 5, 4 | (B) 1, 2, 3, 5, 4 |
| (C) 3, 4, 2, 5, 1 | (D) 1, 4, 3, 2, 5 |
| 18. 1. Sale | 2. Plan |
| 3. Production | 4. Money |
| 5. Product | 6. Advertisement |
| (A) 2, 3, 5, 6, 4, 1 | (B) 1, 2, 3, 4, 6, 5 |
| (C) 2, 4, 3, 5, 6, 1 | (D) 2, 4, 3, 1, 6, 5 |

Directions: In question nos. 19 and 20 which set of letters when sequentially placed in the gaps in the given letter series shall complete it?

- ab_ca_bbca_abbc_aaa_bc
(A) abcab (B) baaab (C) abbaa (D) aabbc
- M_OM_NOMM_NOMM_NO_
(A) NNOMM (B) MNMON
(C) NMMNO (D) NMNNO
- What is the least number to be added to 50600 to make it a perfect cube?
(A) 53 (B) 56 (C) 60 (D) 72
- Certain numbers are indicated by symbols as given below:

2	1	0	5	4	8	9	3	6	7
=	#	©	%	@	□	\$	¥	£	

What is the number indicated by these symbols?

% @ □ £ = ©

- | | |
|------------|------------|
| (A) 547820 | (B) 548720 |
| (C) 540287 | (D) 548702 |

Directions: In questions nos. 23 to 27 a series is given with one term missing. Choose the correct alternative from the given ones.

- ZXV USQ PNL ?
(A) KIG (B) LIG (C) MIG (D) HIG
- ADC FIH KNM ?
(A) PQR (B) PRS (C) PSR (D) SPR
- 11 22 55 165 ?
(A) 657.5 (B) 578.5 (C) 577.5 (D) 567.5
- 3 6 15 45 ?
(A) 135 (B) 54 (C) 63 (D) 157.5
- 46 38 32 28 ?
(A) 20 (B) 26 (C) 30 (D) 24

Directions: In question nos. 28 to 30, from the given alternative words, select the word which cannot be formed using the letters of the given word.

- UNIFORMITY
(A) FORM (B) FAMILY
(C) UNITY (D) NORM

29. TEMPERAMENT
 (A) PETER (B) TEMPER
 (C) MEMBER (D) TEAM
30. RECREATION
 (A) CREAM (B) CENTRE
 (C) EATER (D) ACTION

Directions: In questions nos. 31 to 33, find the missing number from the given responses.

31.

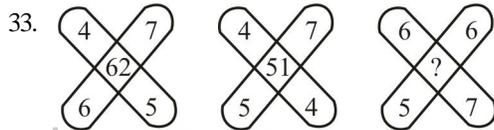
4	5	6
48	65	?
32	40	48

- (A) 72 (B) 78 (C) 80 (D) 84

32.

6	2	6	5
3	8	4	3
1	?	3	3
30	70	?	99

- (A) 4, 90 (B) 3, 65 (C) 4, 91 (D) 7, 80



- (A) 24 (B) 72 (C) 71 (D) 84

34. If FOUR is written as RUOF, then FORM is written as
 (A) MROF (B) MORF
 (C) RMOF (D) MFRO
35. If CREAM is coded as 68521 and ACTION is coded as 267349, then ROMAN will be coded as
 (A) 81249 (B) 81294 (C) 84129 (D) 84219
36. L stands for addition, P stands for equal to, Q stands for greater than, R stands for less than, M stands for subtraction, N stands for multiplication and O stands for division. In each of the four alternatives only one expression is correct according to the letter symbols. Identify that expression.
 (A) 14 M 2 P 5 N 3 (B) 14 O 2 Q 5 L 3
 (C) 14 N 2 R 5 N 3 (D) 14 L 2 Q 5 M 3

37. Identify the symbols to be inserted into the boxes to make the expression correct.
 $2 \square 8 \square 6 \square 3 \square 18$
 (A) +, ×, =, ÷ (B) +, ×, ÷, =
 (C) ×, ÷, +, = (D) +, =, ×, ÷

38. One evening before sunset Raman and Pal are two friends talking to each other face to face and they go to their homes after crossing each other. If Pal's shadow was exactly to his right side, in which direction was Raman's home from the point they met at?

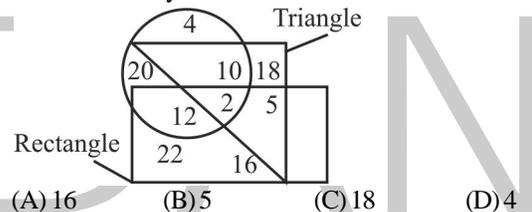
- (A) East (B) West
 (C) South (D) North

Directions: In question nos. 39 and 40, two statements are given followed by two conclusions I and II. You have to consider both statements to be true even if they seem to be at variance with commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements.

39. **Statements:** All centres are institutes.
 Classes are centres.
Conclusions: I Some classes are institutes.
 II Some centres are classes.
 (A) Only conclusion I follows
 (B) Only conclusion II follows
 (C) Either conclusion I or II follows
 (D) Both conclusions I and II follow

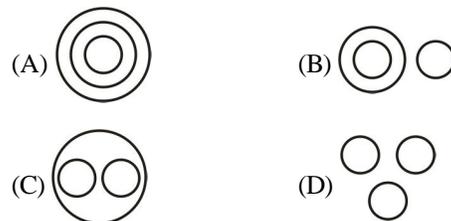
40. **Statements:** No man is old.
 Some honest are men.
Conclusions: I Some honest are not old.
 II No old is man.
 (A) Only conclusion I follows
 (B) Only conclusion II follows
 (C) Both I and II follow
 (D) Neither follows

41. In the following figure triangle represents Doctors, circle represents Players and rectangle represents Artists. Find out the number of Doctors who are neither Artists nor Players.



- (A) 16 (B) 5 (C) 18 (D) 4

42. Arrange the following words as per order in the English dictionary.
 (i) Packer (ii) Pacing
 (iii) Pacific (iv) Painful
 (v) Pacifist
 (A) (iii), (v), (ii), (i), (iv) (B) (iii), (iv), (ii), (v), (i)
 (C) (ii), (i), (v), (iv), (iii) (D) (iii), (ii), (v), (i), (iv)
43. Which of the following diagrams indicates the best relation between Hospital, Doctor and Patient?

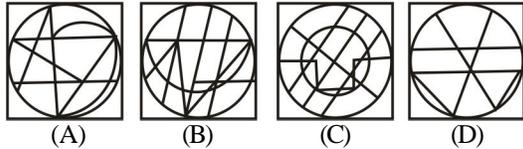


44. From the given Answer Figures, select the one in which the Question Figure is hidden/embedded.

Question Figure



Answer Figures

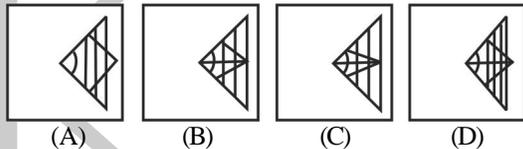


45. Which Answer Figure will complete the Question Figure?

Question Figure

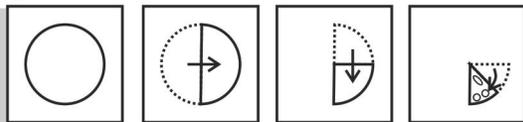


Answer Figures

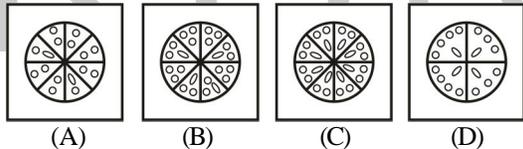


46. A sheet of paper has been folded as shown in the Question Figure. You have to figure out from among the four Answer Figures how it will appear when opened.

Question Figures

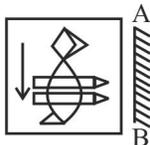


Answer Figures

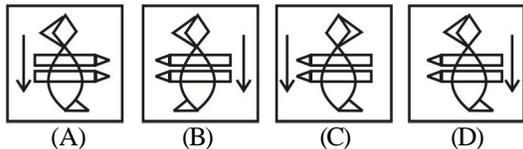


47. Which of the following Answer Figures is the exact mirror image of the given Question Figure, when the mirror is held on the line AB?

Question Figure



Answer Figures



48. Three different positions of a dice have been shown in the following figures. What number will be opposite '5'?



- (A) 2 (B) 4 (C) 3 (D) 6

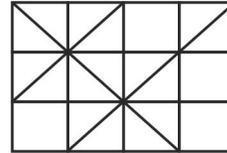
49. Find out the water image of the given group of letters.

FASHION

(A) EVASHION (B) FVZHIION

(C) EVZHIION (D) FVASHION

50. How many triangles and squares are there in the figure given below?



- (A) 18 squares and 37 triangles
 (B) 20 squares and 31 triangles
 (C) 22 squares and 30 triangles
 (D) 16 squares and 34 triangles

Part B: General Awareness

51. What is the maximum strength of the lower house of the Indian Parliament called Lok Sabha envisaged by the Constitution?
 (A) 530 (B) 545
 (C) 550 (D) 552
52. Which of the following articles of the Indian Constitution is related to Andhra Pradesh which needs to be amended to facilitate bifurcation of the state?
 (A) Article 371(D) (B) Article 370
 (C) Article 368 (D) Article 329(A)
53. Which of the following inscriptions is related to king Ashoka?
 (A) Maski (B) Nasik
 (C) Hathigumpha (D) Aihole
54. The Parliamentary form of govt consists of the following:
 (A) Nominal or Titular Head
 (B) Collective Responsibility and Individual Responsibility
 (C) Harmony between Executive and Legislature
 (D) All the above
55. Which of the following Sikh Gurus is also known as Bal Guru (Child Guru) as he had become Guru at the tender age of five?
 (A) Guru Tegh Bahadur (B) Guru Arjan Dev
 (C) Guru Har Krishan (D) Guru Hargovind
56. Identify the two states which elected non-Congress ministries in the elections held in 1937.
 (A) Punjab and Bengal
 (B) Punjab and Uttar Pradesh
 (C) Bihar and NWFP
 (D) NWFP and Madras

57. Dumping is a situation of price discrimination at which of the following levels?
 (A) Local (B) State
 (C) National (D) International
58. A situation in which a particular market is controlled by a small group of firms is called
 (A) Monopoly
 (B) Perfect competition
 (C) Monopolistic competition
 (D) Oligopoly
59. A negative income elasticity of demand is associated with
 (A) superior goods (B) sticky goods
 (C) normal goods (D) inferior goods
60. The 12th Finance Commission of India was headed by
 (A) KC Pant (B) C Rangarajan
 (C) Vasant Sathé (D) VV Desai
61. The law of 'increasing state spending' is associated with
 (A) Adolph Wagner (B) John Locke
 (C) Abba P Learner (D) Adam Smith
62. The Right to Information was given the status of a fundamental right under which of the following articles?
 (A) Article 51(A) (B) Article 17
 (C) Article 19(1) (D) Article 26
63. Match correctly the following deserts and their locations by choosing the correct response:
- | | |
|-------------------|--------------|
| a. Gobi | 1. Argentina |
| b. Patagonia | 2. Australia |
| c. Great Victoria | 3. US |
| d. Great Basin | 4. China |
- | | | | | |
|-----|---|---|---|---|
| | a | b | c | d |
| (A) | 4 | 1 | 2 | 3 |
| (B) | 1 | 3 | 2 | 4 |
| (C) | 4 | 2 | 1 | 3 |
| (D) | 2 | 3 | 4 | 1 |
64. India announced itself free from which of the following diseases recently as there has been no occurrence of the disease in the last three months in the country, this being the international norm for such a declaration?
 (A) Swine Flu (B) Bird Flu
 (C) Polio (D) Cowpox
65. Of all of the different types of tissue, which of the following is the most abundant in most animals?
 (A) Nervous Tissue (B) Connective Tissue
 (C) Muscle Tissue (D) Epithelial Tissue
66. Yeast is an important source of which of the following?
 (A) Vitamin B (B) Vitamin C
 (C) Vitamin E (D) Vitamin D
67. What is a water-insoluble substance referred to in biology?
 (A) Hydrophilic (B) Hydrophobic
 (C) Hydrokinetic (D) Hydrodynamic
68. Who among the following is known as the father of medicine?
 (A) HJ Muller (B) Stephen Hales
 (C) William Harvey (D) Hippocrates
69. World Diabetes Day is observed on
 (A) 14 Nov (B) 16 Nov
 (C) 18 Nov (D) 20 Nov
70. India acquired Dadra, Nagar and Haveli in 1961 from
 (A) French (B) Portuguese
 (C) British (D) Dutch
71. The Battle of Wandiwash decided the fate of which of the following in India?
 (A) French (B) Portuguese
 (C) Dutch (D) Mughals
72. Moraines are one of the most easily identifiable depositional landforms found in:
 (A) Glacial region (B) River deltas
 (C) Forests (D) Deserts
73. Which of the following is/are fold mountain(s)?
 (A) The Himalayas (B) The Alps
 (C) The Andes (D) All the above
74. Which of the following is a cool ocean current?
 (A) Gulf Stream (B) California Current
 (C) Kuroshio Current (D) Agulhas Current
75. Which of the following is mainly responsible for the depletion of ozone layer?
 (A) Automotive exhaust (B) Aviation exhaust
 (C) Chlorofluorocarbons (D) Space shuttles
76. One byte is equal to
 (A) 1 nibble (B) 2 nibbles
 (C) 3 nibbles (D) 4 nibbles
77. An example of system software among the following is
 (A) Tally (B) MS Office
 (C) Windows (D) Epic
78. Data transfer rates for disk drives and networks are measured in terms of
 (A) Throughput (B) Turnaround
 (C) Transfer rate (D) Output
79. The book *First Person* has been authored by
 (A) Angela Merkel
 (B) Bladimir Putin
 (C) Jorge W Bush
 (D) Bill Clinton
80. The process of nuclear fusion is involved in
 (A) Energy generation in the Sun
 (B) Hydrogen bomb
 (C) Atom bomb
 (D) Both (A) and (B)
81. The substance which does not have one melting point is
 (A) Mercury (B) Glass
 (C) Tungsten (D) Diamond

82. The metal which does not undergo corrosion too soon due to formation of oxide layer is
(A) Copper (B) Tin
(C) Silver (D) Aluminium
83. Petroleum products are used in the manufacture of
(A) Nylon (B) Silk
(C) Terylene (D) Rayon
84. Match the following diseases and the body parts being affected by them using the codes given below:
- | | |
|-----------------|--------------------------|
| a. Measles | 1. Brain |
| b. Encephalitis | 2. Joints and muscles |
| c. Dengue | 3. Brain and spinal cord |
| d. Rabies | 4. Respiratory tract |
- | | | | | |
|-----|---|---|---|---|
| | a | b | c | d |
| (A) | 2 | 1 | 4 | 3 |
| (B) | 2 | 4 | 1 | 3 |
| (C) | 4 | 1 | 2 | 3 |
| (D) | 3 | 1 | 4 | 2 |
85. Match the following inventions and their inventors and choose the correct answer using the codes given below:
- | | |
|-------------------|-------------------|
| a. Motorcycle | 1. Ferdinand Kare |
| b. Refrigerator | 2. Edward Butler |
| c. Television | 3. Room Corf |
| d. Induction coil | 4. JL Baird |
- | | | | | |
|-----|---|---|---|---|
| | a | b | c | d |
| (A) | 2 | 1 | 4 | 3 |
| (B) | 2 | 4 | 1 | 3 |
| (C) | 4 | 2 | 1 | 3 |
| (D) | 3 | 1 | 4 | 2 |
86. A common diesel engine produces fire to burn fuel by
(A) spark plug (B) compression
(C) friction (D) None of the above
87. The sweetest natural sugar is
(A) Glucose (B) Fructose
(C) Sucrose (D) Lactose
88. The primary colours are
(A) Red, Yellow and Blue
(B) Red, Green and Blue
(C) Magenta, Blue and Red
(D) Yellow, Violet and Blue
89. India's first national park is
(A) Jim Corbett (B) Kanha
(C) Periyar (D) Manas
90. The most stable ecosystem is
(A) Forest (B) Desert
(C) Ocean (D) Mountain
91. Rand is the currency of
(A) Malaysia (B) South Africa
(C) Egypt (D) Venezuela
92. The concentration of pollutants in the atmosphere is expressed in terms of
(A) parts per trillion
(B) parts per billion
(C) parts per million
(D) parts per square metre
93. Who is the comptroller and auditor general (CAG) of India at present?
(A) Arunima Sinha (B) N Gopalaswami
(C) Vinod Rai (D) Shashi Kant Sharma
94. The Ashes cricket tournament is played between
(A) Australia and South Africa
(B) West Indies and Australia
(C) England and Australia
(D) England and South Africa
95. Who among the following has been given the European Union (EU)'s prestigious Sakharov Prize 2013?
(A) Hillary Clinton (B) Aung San Suu Kyi
(C) Malala Yousafzai (D) Angela Merkel
96. The 23rd Commonwealth Heads of Government Meeting (CHOGM) will be held in 2015 in
(A) Mauritius (B) Malta
(C) Maldives (D) Myanmar
97. Which of the following gases does not come under the category of greenhouse gases?
(A) Carbon Dioxide (B) Methane
(C) Nitrous Oxide (D) Oxygen
98. What is the name of India's first inter-planetary mission to Mars which was launched successfully recently?
(A) Mangalayaan (B) Mangaladoot
(C) Mangalamover (D) Mangala Rover
99. Which of the following investigation agencies of India completed fifty years in operation recently?
(A) Central Bureau of Investigation (CBI)
(B) National Investigation Agency (NIA)
(C) Research and Analysis Wing (RAW)
(D) Intelligence Bureau (IB)
100. Who among the following had given the title 'Father of the Nation' to Mahatma Gandhi?
(A) Rabindranath Tagore
(B) Subhas Chandra Bose
(C) Jawaharlal Nehru
(D) Bal Gangadhar Tilak

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Part C: Quantitative Aptitude

101. A shopkeeper offers a discount of 15% on the marked price and earns a profit of 19%. If the difference between the discount offered and the profit earned is ₹100, find the cost price of the article.
 (A) ₹4000 (B) ₹5500
 (C) ₹5000 (D) ₹6000
102. A person rows $\frac{3}{4}$ of a kilometre downstream in 6 minutes and $\frac{3}{5}$ of a kilometre upstream in 9 minutes. Find the speed of the stream.
 (A) 1.5 kmph (B) 1.75 kmph
 (C) 2 kmph (D) 2.25 kmph
103. A trader marks the price of an article 40% above the cost price and also allows a certain discount and thus he earns a profit of 20.4%. If the marked price of the article is ₹1050, then the discount offered on the marked price is equal to
 (A) ₹157 (B) ₹164
 (C) ₹177 (D) ₹147
104. A man is twice as efficient as a woman. If 4 men can do a piece of work in 6 days, then in how many days can the same work be done by 3 men and 8 women?
 (A) $3\frac{3}{7}$ days (B) 4 days
 (C) $4\frac{1}{4}$ days (D) 3 days
105. A contractor agreed to complete a work in 90 days. He engaged 48 men for the work and after doing the work for 50 days he came to know that three-fifths of the work has already been completed. How many men should he remove to finish the work in the agreed time?
 (A) 4 men (B) 8 men
 (C) 6 men (D) 10 men
106. How many almonds at ₹6 for ₹21 should be mixed with 64 at ₹8 for ₹38 so as to sell them at ₹60 per dozen for 25% gain?
 (A) 128 (B) 80
 (C) 112 (D) 96
107. The average of six consecutive even integers is 37. Find the average of the next five consecutive odd integers.
 (A) 47 (B) 43
 (C) 45 (D) 41
108. The length of the sides of a triangle are 12 cm, 16 cm and 20 cm. Find the length of the perpendicular from the opposite vertex to the side whose length is 20 cm.
 (A) 11.4 cm (B) 10.4 cm
 (C) 9.6 cm (D) 8.8 cm
109. The compound interest on a certain sum at a certain rate of interest after 1 year is ₹1250 and after two years is ₹2625. Find the rate of interest per annum.
 (A) 12% (B) 8%
 (C) 9% (D) 10%
110. If $\frac{13p^2 - 7p}{p^2} + \frac{17q^2 - 7q}{q^2} + \frac{19r^2 - 7r}{r^2} = 0$, then $\frac{pq - qr - rp}{pqr}$ is equal to
 (A) 0 (B) 14 (C) 23 (D) 7
111. O is a point outside a circle and is 15 cm away from its centre. A secant drawn from the point O intersects the circle at I_1 and I_2 in such a way that $OI_1 = 8$ cm and $4I_1I_2 = 5OI_2$. The radius of the circle is
 (A) 8 cm (B) 9 cm
 (C) 10 cm (D) 7 cm
112. If $a^2 + 13a + 37 = 0$, then $(a + 9)^3 + \frac{1}{a - 9}^3$ is equal to
 (A) 52 (B) 198
 (C) 110 (D) 192
113. Find the length of common chord of two circles of radii 15 cm and 20 cm respectively whose centres are 25 cm apart.
 (A) 20 cm (B) 24 cm
 (C) 28 cm (D) 22 cm
114. The sum of 8 consecutive odd integers is S_1 and the sum of next 8 consecutive even integers is S_2 . Then $\frac{S_2 - S_1}{150}$ is equal to
 (A) $\frac{3}{5}$ (B) $\frac{2}{5}$
 (C) $\frac{1}{5}$ (D) $\frac{4}{5}$
115. A trader marked the price 35% above the cost price of an article and offered a discount of 15%, which is equal to ₹243. Find the profit.
 (A) ₹167 (B) ₹153
 (C) ₹177 (D) ₹184
116. A tangent PT is drawn at any point P of a circle of radius 3.5 cm. PC_1 and PC_2 are the two chords of this circle. If $\angle TPC_2 = 45^\circ$ and C is the centre of the circle, then the length of arc PC_2 is assume $\frac{22}{7}$
 (A) 6.5 cm (B) 7 cm
 (C) 6 cm (D) 5.5 cm

117. A boy is running on a straight road at a constant speed towards a building. Suddenly, from point P_1 he observes that the angle of elevation of the top of the building is 30° . After 14 seconds, running at the same speed, he reaches at P_2 and observes the angle of elevation to be 60° . If the height of the building is 63 metres, then the speed of the boy is
- (A) $2\sqrt{3}$ mps (B) $3\sqrt{3}$ mps
(C) $4\sqrt{3}$ mps (D) $\frac{7}{2}\sqrt{3}$ mps
118. If $a^{\frac{1}{3}} = 13$, then $a^2 - 1497a$ is equal to
(A) 1437550 (B) 1437500
(C) 1536700 (D) 1537900
119. If $x = 2\sqrt{3}$, then $\frac{x^6 - 1}{x^5 - x}$ is equal to
(A) $\frac{17}{4}$ (B) $\frac{19}{5}$
(C) $\frac{13}{5}$ (D) $\frac{17}{6}$
120. The difference between the compound interest and the simple interest on a certain sum at 11% per annum after two years is ₹ 27.83. Find the sum.
(A) ₹ 2300 (B) ₹ 2100
(C) ₹ 2400 (D) ₹ 2200
121. In a regular polygon the ratio of an exterior angle to an interior angle is 1 : 5. The number of sides in that regular polygon is
(A) 16 (B) 12
(C) 14 (D) 13
122. If the area of the circumcircle of an equilateral triangle is 154 sq cm. , then the radius of the circle inscribed in the equilateral triangle is
(A) 4 cm (B) 3.5 cm
(C) 5 cm (D) 4.5 cm
123. Sakshi's grandfather was 8 times older than her 9 years ago. Sakshi's grandfather would be $3\frac{1}{3}$ times of her age 3 years from now. What will be Sakshi's age after 6 years?
(A) 24 years (B) 23 years
(C) 22 years (D) 21 years
124. The radius of a circle is 9 cm. Find the area of the regular hexagon in which this circle is inscribed.
(A) $135\sqrt{3}$ sq cm (B) $162\sqrt{3}$ sq cm
(C) $145\sqrt{3}$ sq cm (D) $154\sqrt{3}$ sq cm
125. In a rhombus one angle is 60° and the length of the bigger diagonal is $6\sqrt{3}$ cm. Find the area of that rhombus.
(A) $16\sqrt{3}$ sq cm (B) $12\sqrt{3}$ sq cm
(C) $18\sqrt{3}$ sq cm (D) $20\sqrt{3}$ sq cm
126. From a container full of spirit 9 litres of spirit is replaced with water. This operation is performed two more times. The ratio of the quantity of spirit now left in the container to that of water is 27 : 37. How much spirit was there in the container initially?
(A) 36 litres (B) 40 litres
(C) 32 litres (D) 42 litres
127. The circumference of a semicircle of area 693 sq cm is equal to the breadth of a rectangle. If the length of the rectangle is equal to the perimeter of an equilateral triangle of height $27\sqrt{3}$ cm, what is the perimeter of the rectangle?
(A) 624 cm (B) 596 cm
(C) 664 cm (D) 540 cm
128. 4 men can complete a piece of work in 3 days. 3 women can do the same piece of work in 6 days, whereas 6 boys can complete the same piece of work in 4 days. 3 men and 6 boys worked together for 1 day. If only women were to finish the remaining work in 1 day, how many women would be required?
(A) 9 (B) 12
(C) 8 (D) 10
129. If $\tan^2 \theta - \tan^2 \phi = 1$, then the value of $\sec^{12} \theta - \sec^6 \theta - 3\sec^8 \theta \cdot \tan^2 \theta + 4$ is
(A) 2 (B) 3
(C) 4 (D) 5
130. If $a = 13.5$, $b = 7$ and $c = 9.5$, then $\frac{a^3}{a} - \frac{b^3}{b^2} + \frac{c^3}{c^2} - \frac{3abc}{c a^2}$ is equal to
(A) 15 (B) 7
(C) 8 (D) 10
131. If $T_n = \cos^n \theta + \sin^n \theta$, then $10T_6 - 15T_4 + 17$ is equal to
(A) 0 (B) 2 (C) 77 (D) 12
132. Find the sum of all the three-digit numbers which when divided by 6 leave the remainder 3.
(A) 82800 (B) 88220
(C) 88800 (D) 89820
133. In a right-angled triangle ABC, $\angle A = 90^\circ$ and AD \perp BC. If AC = 12 cm and CD = 9.6 cm then find the length of AB.
(A) 10.5 cm (B) 9.75 cm
(C) 8.5 cm (D) 9 cm
134. I is the incentre of triangle PQR. If $\angle PRQ = 80^\circ$, $\angle QIR = 110^\circ$ and QI = 21 cm, then what will be the area of the incircle?
(A) 376.5 cm^2 (B) 346.5 cm^2
(C) 364 cm^2 (D) 396 cm^2
135. If $a \operatorname{cosec} \theta + b \cot \theta = z$, then the value of $a \cot \theta +$

$b \operatorname{cosec}$ is equal to

(A) $\sqrt{z^2 - a^2 - b^2}$ (B) $\sqrt{a^2 - b^2 - z^2}$

(C) $\sqrt{z^2 - a^2 - b^2}$ (D) $\sqrt{a^2 - b^2 - z^2}$

136. If $\sec + \cot = a$ and $\tan + \operatorname{cosec} = b$ then $\cos - \sin$ is equal to

(A) $\frac{a^2 - b^2}{2} \sin \cdot \cos$

(B) $\frac{a^2 - b^2}{2} \sec \cdot \operatorname{cosec}$

(C) $\frac{a^2 - b^2}{2} \operatorname{cosec} \cdot \sec$

(D) $\frac{a^2 - b^2}{2} \sin \cdot \cos$

137. If $(4 \cos x)^2 + (2 \sin x)^4 = 13$, then $\tan x$ is equal to

(A) $\sqrt{3}$ (B) $\frac{1}{\sqrt{3}}$

(C) Both $\sqrt{3}$ and $\frac{1}{\sqrt{3}}$ (D) $\sqrt{3}$

138. A thief started running from a place at 10 am at a speed of 18 kmph. The police started chasing him after 1 hour 36 minutes by a car along the same path and caught him at 12 : 24 pm. Find the speed of the car (in kmph).

(A) 54 (B) 56
(C) 42 (D) 48

139. If $a^2b = 1 + ab^2$, then $\frac{1 - 4a^3b^3}{a^2b^2}$ is equal to

(A) $(a - b)^2$ (B) $a + b$
(C) $a - b$ (D) $(a + b)^2$

140. If $x \sec - y \operatorname{cosec} = 0$, then $\sec \cdot \operatorname{cosec}$ is equal to

(A) $\frac{x^2 - y^2}{xy}$ (B) $\frac{xy}{x^2 - y^2}$

(C) $\frac{x^2 - y^2}{xy}$ (D) $\frac{xy}{x^2 - y^2}$

141. An amount of ₹ 671 is divided among A, B and C in such a way that B gets ₹ 33 more than $\frac{3}{5}$ of the amount

that A gets and C gets ₹ 42 less than $\frac{4}{3}$ of the amount

that B gets. What amount does B get?

(A) ₹ 192 (B) ₹ 188
(C) ₹ 211 (D) ₹ 219

142. A reduction of 17% in the price of maize enables a person to get 10.2 kg more maize for ₹ 249. What is the reduced price of maize per kg?

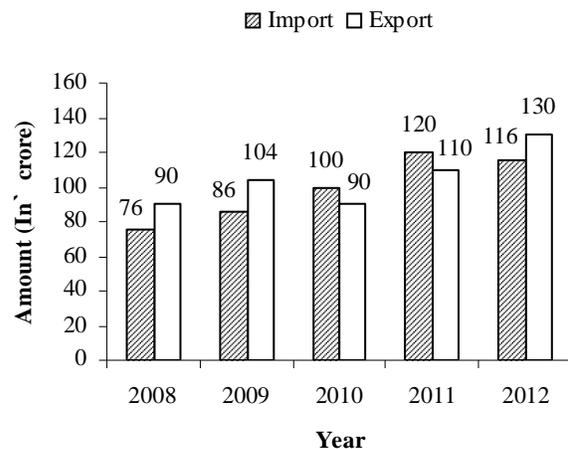
(A) ₹ 4.75 (B) ₹ 4.25
(C) ₹ 4.15 (D) ₹ 4.65

143. If $A + B = 30^\circ$, then $\sqrt{3} \tan A - \sqrt{3} \tan B$ is equal to

(A) 0 (B) 1
(C) 2 (D) 4

Directions (Q. 144-147): Study the following information and answer the given questions.

Import and Export of a company over the given years



144. In which of the following years is the percentage increase/decrease in import with respect to previous year the maximum?

(A) 2009 (B) 2010
(C) 2011 (D) 2012

145. What is the average export (in ₹) of the company over the given years?

(A) 104.8 crore (B) 98.6 crore
(C) 110.4 crore (D) 115.6 crore

146. Total import of the company in 2008, 2009 and 2012 is approximately what percentage of the total export in the same years?

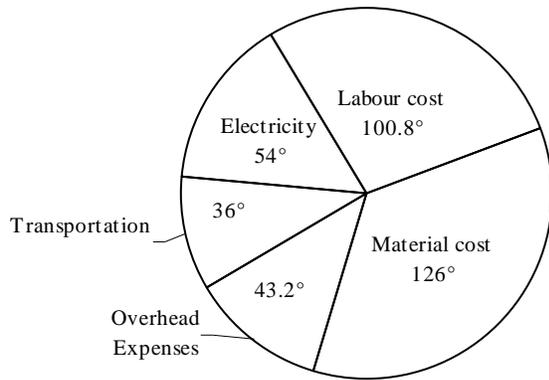
(A) 76% (B) 80%
(C) 74% (D) 86%

147. What is the ratio of the average import in 2010 and 2011 to the average export in the same years?

(A) 13 : 11 (B) 12 : 11
(C) 11 : 10 (D) 5 : 4

Directions (Q. 148-150): Study the following information and answer the questions given below.

Following pie-chart shows item-wise manufacturing cost of a certain product.



148. Total overhead expenses is ₹ 84000. The cost of labour is
 (A) ₹ 148000 (B) ₹ 196000
 (C) ₹ 172000 (D) ₹ 164000
149. The cost of electricity is approximately what percentage of the material cost?
 (A) 43% (B) 53%
 (C) 47% (D) 55%
150. If the cost of electricity is ₹ 105000, then what is the difference between overhead expenses and expenses on transportation?
 (A) ₹ 12500 (B) ₹ 13000
 (C) ₹ 14500 (D) ₹ 14000

Part-D: English Comprehension

Directions: In question nos. 151-155, some parts of the sentences have errors and some have none. Find out which part of a sentence has an error and blacken the rectangle [■] corresponding to the appropriate letter (A, B, C). If there is no error, blacken the rectangle [■] corresponding to (D) in the Answer Sheet.

151. The Congress's recent comment on banning opinion
 (A)
polls before elections has set the cat among the
 (B) (C)
pigeons. No error
 (D)
152. Stealing a foreign country's secrets necessarily
 (A)
involves telling lies and break their laws. No error
 (B) (C) (D)
153. Time alert by fishermen helped police intercept
 (A)
intruders who entered the land via sea to target vital
 (B)
installations across Tamil Nadu. No error
 (C) (D)
154. The City Police Commissioner ordered the detention
 (A)
of founder-president in the National Security Act.

- (B) (C)
No error
 (D)
155. The issues of safety of women and other vulnerable
 (A)
sections of society is engaging the attention of the
 (B)
police and concerned agencies in and outside the
 (C)
Government. No error
 (D)

Directions: In question nos. 156 to 160 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 and indicate it by blackening the appropriate rectangle [■] in the Answer-Sheet.

156. Two persons, including a teenager, were stabbed to death in separate incidents _____ petty disputes.
 (A) in (B) over
 (C) about (D) of
157. Rajendra Singh _____ out of school after the seventh standard and started a small clothing business.
 (A) fled (B) left
 (C) escaped (D) dropped
158. A 25-year-old woman was found _____ from a ceiling fan of her residence.
 (A) oscillating (B) hanged
 (C) hanging (D) swinging
159. Smog is _____ a combination of factors.
 (A) caused because of
 (B) caused due to
 (C) made as a result of
 (D) produced because of a reason of
160. The police said he entered the world of crime after committing a _____ not amounting to murder.
 (A) suicide (B) murder
 (C) culpable genocide (D) culpable homicide
- Directions: In question nos. 161 to 165, out of the four alternatives choose the one which best expresses the meaning of the given word and mark it in your Answer-Sheet.**
161. Zombie
 (A) walking dead (B) birdhouse
 (C) horoscope (D) serpentarium
162. Abdicate
 (A) curtail (B) repudiate
 (C) kidnap (D) resign
163. Sanguine
 (A) sad (B) cheerful
 (C) hopeless (D) tasty
164. Retrieve

- (A) decline (B) reduce
(C) restore (D) rusticate
165. Upshot
(A) outcome (B) disturb
(C) kill (D) eradicate

Directions: In question nos. 166 to 170, choose the word opposite in meaning to the given word and mark it in the Answer-Sheet.

166. Vertex
(A) apex (B) bottom
(C) climax (D) basic
167. Saucy
(A) impudent (B) bold
(C) savoury (D) dull
168. Mushroom
(A) boom (B) expand
(C) lessen (D) edible
169. Clamour
(A) uproar (B) tumult
(C) dullness (D) tranquillity
170. Disseminate
(A) collect (B) camouflage
(C) anatomise (D) disorganise

Directions: In question nos. 171 to 175, four alternatives are given for the idiom/phrase and bold-italicised in the sentence. Choose the alternative which best expresses the meaning of the idiom/phrase and mark it in the Answer-Sheet.

171. Prajakta is **banking on** getting a loan from his neighbour.
(A) believing (B) approaching
(C) refusing (D) transacting
172. It is a very interesting idea, but some members of the committee may well not **fall in with** it.
(A) explain (B) deny
(C) disapprove (D) agree
173. It is dangerous for a driver to **drift off** when he is at the wheels of his car.
(A) talk (B) doze
(C) think (D) gossip
174. Praveen is organising a huge party and expecting his parents to **shell out** for it.
(A) attend (B) arrange
(C) pay (D) cover
175. Rakesh needs somewhere to stay for a few days and we **bailed him out** by offering him our spare room.
(A) helped (B) punished
(C) cornered (D) threw out

Directions: In question nos. 176-180, a part of the sentence is underlined. Below are given alternatives to the underlined part at (A), (B) and (C) which may improve the sentence. Choose the correct alternative. In case no improvement is needed your answer is (D). Mark your

answer in the Answer-Sheet.

176. Based on a seer's dream that tonnes of gold **lies burying under** an old fort in a village in UP, the decision of ASI to undertake a massive exercise to unearth hidden treasure is ridiculous.
(A) lie buried behind
(B) lying buried within
(C) lie buried underneath
(D) No improvement
177. While industrialists and business houses shouldn't be spared legal enquiries they **should not be harassed unless** there is adequate proof of their involvement in a scam.
(A) should be harassed till
(B) should be harassed until
(C) should not unless be harassed
(D) No improvement
178. It seems that controversial stars dominating fights with others add to the show's TRP and they are rarely **vacated** from the show.
(A) convicted (B) evicted
(C) emptied (D) No improvement
179. There is an attempt by the government to ban opinion polls **previous of** elections.
(A) ahead of (B) in front of
(C) in lieu of (D) No improvement
180. A savings or investment product that allows you to **set out the** investment as a deduction on your taxable income is known as a tax-saving product.
(A) set up the (B) set in an
(C) set off the (D) No improvement

Directions: In question nos. 181 to 185, out of the four alternatives, choose the one which can be substituted for the given words/sentence.

181. Persons who actively use the internet
(A) Crony (B) Netizen
(C) Laggard (D) Citizen
182. Having a dull appearance
(A) Dowdy (B) Piquant
(C) Otiose (D) Blonde
183. One who has no money
(A) Reticent (B) Honorary
(C) Insatiable (D) Pauper
184. Morbid fear of being in a moving vehicle
(A) Lalophobia (B) Lygophobia
(C) Ochophobia (D) Aerophobia
185. A delusion that one is beautiful
(A) Hedomania (B) Callomania
(C) Egomania (D) Melomania

Directions: In question nos. 186 to 190, four words are given in each question, out of which only one word is correctly spelt. Find the correctly spelt word and indicate it in the Answer Sheet by blackening the appropriate

rectangle.

186. (A) counterfeet (B) leprechoun
(C) dissension (D) dextrous
187. (A) saunter (B) fryvolity
(C) fiering (D) hencefourth
188. (A) giber (B) prattle
(C) watchfull (D) merryment
189. (A) whammy (B) sandwiched
(C) porcelene (D) metadoor
190. (A) gnomeik (B) gudy
(C) goly (D) gluttonous

PASSAGE I (Question Nos. 191 to 195)

Plans to create two vast ocean sanctuaries in Antarctica to protect the pristine wilderness failed for a third time, with Russia and China blocking the bids, delegates at multinational talks said.

The proposals for two huge Marine Protected Areas were on the table at the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) meeting in Hobart, which brought together 24 countries and the European Union.

But the 10-day talks ended with the nations unable to agree to a US-New Zealand proposal for a protected zone in the Ross Sea and another by Australia, France and the European Union for a sanctuary off East Antarctica.

"The international community came together in Hobart to protect key parts of the Antarctic Ocean – one of the last pristine environments in the world – yet Russia chose to stand in the way," said Joshua Reichert, executive vice president of the US-based Pew Charitable Trusts, which had a delegate at the talks.

Environmentalists said an ocean wilderness that is home to 16,000 known species, including whales, seals, albatrosses, penguins and unique species of fish, was at stake.

CCAMLR, a treaty tasked with overseeing conservation and sustainable **exploitation** of the Antarctic Ocean, also known as the Southern Ocean, has not yet made any official comment.

The US-New Zealand bid for a sanctuary in the Ross Sea, the deep bay on Antarctica's Pacific side, had been considered the best hope after its size was reduced, with its no-fish zone to be 1.25 million square kilometres.

The second proposal called for a 1.6-million-sq-km protected zone off East Antarctica, on the frozen continent's Indian Ocean side. Their creation would make the largest marine protection areas in the world.

191. What was the agenda of the meeting in Hobart?
- (A) To call a meeting of 24 member countries and the European Union
(B) To form a body to protect wildlife
(C) To create two vast ocean sanctuaries in Antarctica
(D) None of these
192. What was/were the outcome(s) of the multination

talks?

- (A) The nations did not agree to a US-New Zealand proposal for a protected zone in the Ross Sea.
(B) Australia, France and the European Union wanted to form a sanctuary off East Antarctica, but there was no agreement on this.
(C) Russia was not in favour of protecting key parts of the Antarctic Ocean.
(D) All the above
193. What was the opinion of the environmentalists about ocean wilderness?
- (A) That the Commission for Conservation of Antarctic Marine Living Resources has successfully protected the lives of many marine species.
(B) That an ocean wilderness, which is home to a large number of known species, was in danger.
(C) Now, species such as whale, seal and albatross have come under the category of preserved species.
(D) All the above
194. Find the incorrect statement on the basis of the given passage.
- (A) The Antarctic Ocean is also known as the Southern Ocean.
(B) The Ross Sea is situated on Antarctica's Pacific side.
(C) China and Russia proposed for a vast protected zone off East Antarctica.
(D) All the above
195. What is the meaning of the word 'exploitation' as used in the given passage?
- (A) utilise (B) search
(C) abuse (D) discourse

PASSAGE II (Question Nos. 196 to 200)

The GM technology introduced in crops addresses various stresses that affect growth. Herbicide-tolerant technology deals with weeds that compete with plants for sunlight, nutrients and water. Bt technology takes on pests that affect plant productivity. There are others that address various climatic stresses like moisture and drought.

The biggest challenge of the 21st century is to provide better nutrition to a growing population. With India alone estimated to add close to half-a-billion people by 2050, farmers will have to grow crops more efficiently, conserve existing land, improve biodiversity and, most importantly, integrate smallholders currently holding less than two hectares into the mainstream of the developmental process.

With 98 per cent of the available agricultural land under cultivation, more than 80 per cent of the increase in production will have to come from yield increases. There is only 5-6 per cent scope for expansion of arable area. We also need to have more biodiversity and less **degradation**

as the inappropriate use of fertilisers and pesticides has led to water pollution and damage to larger ecosystems. Estimates reveal that nearly 120.72 million hectares of land in India is degraded due to soil erosion and about 8.4 million hectares has soil salinity and water-logging problems. Besides, huge quantities of nutrients are lost during the crop production cycle. Annually, India loses nearly 0.8 million tonnes of nitrogen, 1.8 million tonnes of phosphorus and 26.3 million tonnes of potassium.

GM holds out promise for small farmers, who cultivate 44 per cent of farmland and whose contribution to farm output exceeds 50 per cent.

196. What is/are the problems associated with agricultural land under cultivation?
- (A) A large part of agricultural land in India is degraded due to soil erosion.
 - (B) About 8.4 million hectares of land has soil salinity and water-logging problems.
 - (C) Huge quantities of nutrients are lost during crop production cycle.
 - (D) All the above
197. According to the given passage, which of the following is the biggest challenge of the 21st century?
- (A) To provide a better technology to farmers
 - (B) To provide better food full of nutrients to a growing population

- (C) To improve biodiversity and integrate small holders into the mainstream of the developmental process

- (D) To control population, which is expected to touch half a billion mark by 2050

198. Which of the following technologies addresses various climatic stresses like moisture and drought?

- (A) Bt technology

- (B) GM technology

- (C) Herbicide-tolerant technology

- (D) None of these

199. Find the incorrect statement on the basis of the given passage.

- (A) It is not possible to expand arable land more than 5-6 per cent.

- (B) Small farmers cultivate more than fifty per cent of the farmland.

- (C) Bt technology takes on pests that have harmful effect on plant productivity.

- (D) Inappropriate use of pesticides harms larger ecosystems.

200. What is the meaning of the word 'degradation' as used in the given passage?

- (A) Preservation

- (B) Degeneration

- (C) Malformation

- (D) Distortion

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Answers

1. A: $\begin{matrix} J & U & N & K \\ +2 & +3 & +4 & +5 \\ \downarrow & \downarrow & \downarrow & \downarrow \\ L & X & R & P \end{matrix}$
 Similarly, $\begin{matrix} H & O & M & E \\ +2 & +3 & +4 & +5 \\ \downarrow & \downarrow & \downarrow & \downarrow \\ J & R & Q & J \end{matrix}$

2. B; The corresponding letters are the same - positioned letter from the right. However, the second and the third letter interchange their positions.

$\begin{matrix} A & C & D \\ \downarrow & \swarrow & \searrow \\ Z & W & X \end{matrix}$
 Similarly, $\begin{matrix} F & H & J \\ \downarrow & \swarrow & \searrow \\ U & Q & S \end{matrix}$

3. D; $\begin{matrix} R & T \\ -1 & +1 \\ \downarrow & \downarrow \\ Q & U \end{matrix}$ Similarly, $\begin{matrix} V & X \\ -1 & +1 \\ \downarrow & \downarrow \\ U & Y \end{matrix}$

4. C; The first is the sound of the second.
 5. B; The second is a class of the first and is available at the third.
 6. C; Both are synonyms.

7. A
 8. D; $343 \times 2 = 686 - (2)^3 = 686 - 8 = 678$
 Similarly, $512 \times 2 = 1024 - (2)^3 = 1024 - 8 = 1016$

9. D; $225 = 2 \times 5 + 2 = 12$
 Similarly, $435 = 3 \times 5 + 4 = 19$

10. D; $8 \times 8 \div 2 = \frac{64}{2} = 32$
 $6 \times 6 \div 2 = \frac{36}{2} = 18$
 $3 \times 3 \div 2 = \frac{9}{2} = 4.5$

$2 \times 2 \div 2 = \frac{2}{2} = 2$
 11. C; $x(x+1)x$
 $4 \times (4+1) = 4 \times 5 = 20$
 $5 \times (5+1) = 5 \times 6 = 30$
 $7 \times (7+1) = 7 \times 8 = 56$
 $8 \times (8+1) = 8 \times 9 = 72$

12. C; Rest move on water.
 13. A;
 $\begin{matrix} P & Q & R & K & J & I & F & E & D & T & S & R \\ \downarrow & \downarrow \\ +1 & +1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{matrix}$

14. C; Rest begin with a vowel.
 15. B;
 $\begin{matrix} E & G & I & T & U & X & M & O & Q & L & N & P \\ \downarrow & \downarrow \\ +2 & +2 & +3 & +1 & +1 & +1 & +2 & +2 & +2 & +2 & +2 & +2 \end{matrix}$

16. D;
 $\begin{matrix} & +3 & & +2 & & +3 & & +2 & & +3 & & \\ & \downarrow & & \\ B & D & G & I & K & M & P & R & T & V & Y & A \dots \\ \downarrow & \\ +2 & +2 & +2 & +2 & +2 & +2 & +2 & +2 & +2 & +2 & +2 & \end{matrix}$

17. A;
 Plough $\xrightarrow{3}$ Seeds $\xrightarrow{1}$ Plant $\xrightarrow{2}$ Crop $\xrightarrow{5}$ Harvest

18. C; Plan Money Production
 Product Advertisement Sale

19. B; $abbc/aabbca/aaabbc/aaaabbc$

20. D; $MNO/MMNO/MMNNO/MMNNOO$

21. A; 50600 lies between 36^3 and 37^3
 So, $46656 < 50600 < 50653$
 Hence, $50600 + 53 = 50653$, which is cube of 37.

22. B; $\begin{matrix} \% & @ & \square & \pounds & = & \textcircled{c} \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 5 & 4 & 8 & 7 & 2 & 0 \end{matrix}$

23. A;
 $\begin{matrix} -2 & -2 & -1 & -2 & -2 & -1 & -2 & -2 & -1 & -2 & -2 \\ \downarrow & \downarrow \\ Z & X & V & U & S & Q & P & N & L & K & I & G \end{matrix}$

24. C;
 $\begin{matrix} +2 & +3 & +2 & +3 & +2 & +3 & +2 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ A & D & C & F & I & H & K & N & M & P & S & R \\ \downarrow & \downarrow \\ +1 & +1 & +1 & +1 & +1 & +1 & +1 & +1 & +1 & +1 & +1 & +1 \end{matrix}$

25. C; $11 \times 2 = 22$
 $22 \times 2.5 = 55$
 $55 \times 3 = 165$
 $165 \times 3.5 = 577.5$

26. D; $3 \times 2 = 6$
 $6 \times 2.5 = 15$
 $15 \times 3 = 45$
 $45 \times 3.5 = 157.5$

27. B; $\begin{matrix} 46 & 38 & 32 & 28 & 26 \\ -8 & -6 & -4 & -2 & \end{matrix}$

28. B; There is no A or L in the key word.
 29. C; There is no B in the key word.
 30. A; There is no M in the key word.

31. D; $4 \times 12 = 48 - 4^2 = 32$
 $5 \times 13 = 65 - 5^2 = 40$
 $6 \times 14 = 84 - 6^2 = 48$

32. C; $6 + 3 + 1 = 10 \times 3 = 30$
 $2 + 8 + 4 = 14 \times 5 = 70$
 $6 + 4 + 3 = 13 \times 7 = 91$
 $5 + 3 + 3 = 11 \times 9 = 99$

33. B; $4 \times 5 + 7 \times 6 = 20 + 42 = 62$
 $4 \times 4 + 7 \times 5 = 16 + 35 = 51$
 $6 \times 7 + 6 \times 5 = 42 + 30 = 72$

34. A; $\begin{matrix} F & O & U & R \\ \swarrow & \downarrow & \searrow & \downarrow \\ R & U & O & F \end{matrix}$
 Similarly, $\begin{matrix} F & O & R & M \\ \swarrow & \downarrow & \searrow & \downarrow \\ M & R & O & F \end{matrix}$

35. C;

C	R	A	M	E	T	I	O	N
6	8	2	1	5	7	3	4	9

Then, ROMAN 84129
 36. D; 14 L 2 Q 5 M 3

or, $14 + 2 > 5 - 3$
 or, $16 > 2$

37. B; $2 \square 8 \square 6 \square 3 \square 18$
 $2 + 8 \times 6 \div 3 = 18$
 or, $2 + 8 \times 2 = 18$
 or, $2 + 16 = 18$

38. C; Pal's shadow falls to his right at sunset, ie his shadow falls to the east. If east is to Pal's right Pal is walking towards north to his home. Hence, Raman is walking towards south to his home.
 Hence, Raman's home is in south.

39. D; Classes are centres All classes are centres (A) + All centres are institutes (A) = A + A = A = All classes are institutes implication Some classes are institutes. Hence, conclusion I follows. Again, classes are centres conversion Some centres are classes. Hence, conclusion II follows.

40. C; No man is old conversion No old is man. Hence, conclusion II follows. Again, Some honest are men (I) + No man is old (E) = I + E = O = Some honest are not old. Hence, conclusion I follows.

41. C
 42. A;

Pacific \rightarrow Pacifist \rightarrow Pacing \rightarrow Packer \rightarrow Painful
 (iii) (v) (ii) (i) (iv)
 43. D 44. A 45. A 46. C 47. D
 48. C 49. C 50. A 51. D 52. A
 53. A 54. D 55. C 56. A 57. D
 58. D 59. D 60. B 61. A 62. C
 63. A 64. B 65. C 66. A 67. B
 68. D 69. A 70. B 71. A 72. A
 73. D 74. B 75. C 76. B 77. C
 78. A 79. B 80. D 81. B 82. D
 83. C 84. C 85. A 86. B 87. B
 88. B 89. A 90. A 91. B 92. C
 93. D 94. C 95. C 96. B 97. D
 98. A 99. A 100. B

101. C; Let the cost price of the article be x.
 Then, SP of the article = $1.19x$

And, MP of the article = $\frac{1.19x}{1 \cdot 0.15} = \frac{1.19x}{0.85}$
 $= 1.4x$
 Difference = Discount offered - profit earned = 100
 Then, $1.4x \times 0.15 - 0.19x = 100$
 or, $0.21x - 0.19x = 100$
 or, $0.02x = 100$
 or, $x = 5000$
 Cost price of the article = 5000

102. B; Given that, the person rows $\frac{3}{4}$ kilometre downstream in 6 minutes
 He rows 1 kilometre downstream in

$\frac{6}{3} \times 4 = 8$ minutes
 Now, speed of the person downstream
 $= \frac{60}{8} = 7.5$ kmph

Again, person row $\frac{3}{5}$ kilometre upstream in 9 minutes.

He rows 1 km upstream in $\frac{5}{3} \times 9$
= 15 minutes

Speed of person upstream = $\frac{60}{15} = 4$ kmph

Let the speed of the person in still water be u kmph and the speed of stream be v kmph
 $u + v = 7.5$... (i)

$u - v = 4$... (ii)

On solving both equations (i) and (ii), we get
 $u = 5.75$ kmph
 $v = 1.75$ kmph

103. D; Given, marked price of the article = ₹ 1050

Then, cost price of the article = $\frac{1050}{1.4}$

= ₹ 750

And selling price of the article = 750×1.204
= ₹ 903

Discount offered = MP - SP
= $1050 - 903 = ₹ 147$

104. A;

∴ 4 men can do a piece of work in 6 days.

1 man can do the work in $6 \times 4 = 24$ days

Then, according to the conditions,

1 woman can do the work in $\frac{24}{2}$

= 12 days

(∵ Efficiency of man is twice that of the woman)

Work done by 3 men and 8 women in 1 day

$$= \frac{3}{24} + \frac{8}{48} + \frac{7}{24}$$

Number of days taken to finish the work by 3 men and 8 women

$$= \frac{24}{\frac{3}{24} + \frac{8}{48} + \frac{7}{24}} \text{ days} = 3\frac{3}{7} \text{ days}$$

105. B; In 50 days the work finished by 48

men is $\frac{3}{5}$ of the work.

$$\text{Remaining work} = 1 - \frac{3}{5} = \frac{2}{5}$$

Let x men be removed to finish the work in time.

$$\text{Then, } \frac{48}{\frac{3}{5}} = \frac{48 - x}{\frac{2}{5}}$$

or, $x = 8$

8 men should be removed from the work to finish the work in time.

106. D; For the first variety, the cost of 6 almonds = ₹ 21

$$\text{Cost of 1 almond} = \frac{21}{6}$$

For the second variety, the cost of 8 almonds = ₹ 38

$$\text{Cost of 1 almond} = \frac{38}{8} = \frac{19}{4}$$

Now, Actual cost of mixture = $\frac{60}{1.25} = ₹ 48$

Cost of almond per dozen = $\frac{48}{12} = ₹ 4$

By method of alligation

First mixture	Second mixture
$\frac{21}{6}$	$\frac{19}{4}$
\swarrow \swarrow \searrow \searrow $\left(\frac{19}{4} - 4\right)$ $\left(\frac{21}{6} - 4\right)$	
$\frac{3}{4}$	$\frac{1}{2}$

Ratio of quantities = $\frac{3}{4} : \frac{1}{2}$ or 3 : 2

Required number of almonds

$$= \frac{64 \times 3}{2} = 96$$

107. A; Let six consecutive even integers be $x - 5, x - 3, x - 1, x + 1, x + 3$ and $x + 5$
Then,

$$\frac{x - 5 + x - 3 + x - 1 + x + 1 + x + 3 + x + 5}{6}$$

$$= 37$$

$$x = 37$$

Six consecutive even integers are 32, 34, 36, 38, 40 and 42.

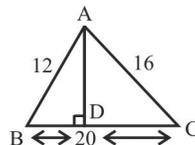
Next 5 consecutive odd integers are 43, 45, 47, 49 and 51.

$$\text{Average} = \frac{43 + 45 + 47 + 49 + 51}{5} = 47$$

108. C; Lengths of the sides of a triangle are 12 cm, 16 cm and 20 cm

$$\therefore 12^2 + 16^2 = 20^2$$

This is a right-angled triangle



∴ ABC and ADC are similar triangles

$$\text{Then, } AD = \frac{AB \cdot AC}{BC} = \frac{12 \cdot 16}{20} = 9.6 \text{ cm}$$

109. D; Compound interest on a certain sum at certain rate of interest after 1 year = ₹ 1250

We know that compound interest for 1 year

= Simple interest for 1 year

$$\text{Simple interest of 2 years} = 2 \times 1250 = 2500$$

And compound interest of 2 years = ₹ 2625

Rate of interest

$$= \frac{\text{Difference in CI and SI for 2 years}}{\text{SI of one year}} \times 100$$

$$= \frac{2625 - 2500}{1250} \times 100 = 10\%$$

110. D; Given that,

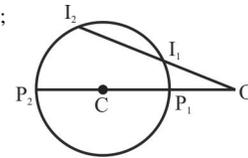
$$\frac{13p^2}{p^2} + \frac{7p}{q^2} + \frac{17q^2}{q^2} + \frac{7q}{r^2} + \frac{19r^2}{r^2} + \frac{7r}{r} = 0$$

$$\text{or, } 13 + \frac{7}{p} + 17 + \frac{7}{q} + 19 + \frac{7}{r} = 0$$

$$\text{or, } \frac{7}{p} + \frac{7}{q} + \frac{7}{r} = -49$$

$$\text{or, } \frac{pq}{pqr} + \frac{qr}{pqr} + \frac{rp}{pqr} = \frac{49}{7} = 7$$

111. B;



Let the centre of the circle be C and OC intersect the circle at two points P_1 and P_2 . The radius of the circle is r cm.

Given, $CO = 15$ cm

$OI_1 = 8$ cm

$$\text{And } I_1I_2 = \frac{5}{4} OI_1 = \frac{5}{4} \times 8 = 10 \text{ cm}$$

Then, $OI_1 \times OI_2 = OP_1 \times OP_2$

(Properties of chords)

$$\text{or, } 8 \times (8 + 10) = (15 - r) \times (15 + r)$$

$$\text{or, } 8 \times 18 = 225 - r^2$$

$$\text{or, } r^2 = 225 - 144 = 81$$

$$\text{or, } r = 9 \text{ cm}$$

Radius of the circle = 9 cm

112. C; Given that, $a^2 + 13a + 37 = 0$

$$\text{or, } a^2 + 9a + 4a + 36 + 1 = 0$$

$$\text{or, } a(a + 9) + 4(a + 9) + 1 = 0$$

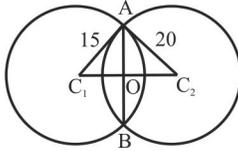
$$\text{or, } a + 4 + \frac{1}{a - 9} = 0$$

$$\text{or, } (a + 9) + \frac{1}{a - 9} = 5$$

$$(a + 9)^3 + \frac{1}{a - 9} = (5)^3 - 3 \times 5 = 110$$

113. B; Let the two circles of radii 15 cm and 20 cm intersect each other at points A and B. C_1 and C_2 are the centres of the circles and C_1C_2 intersects AB at O.

$$C_1O = x$$



$$\text{Then } OC_2 = 25 - x$$

$$AC_1^2 - C_1O^2 = AC_2^2 - OC_2^2$$

$$\text{or, } 15^2 - x^2 = (20)^2 - (25 - x)^2$$

$$\text{or, } x = 9 \text{ cm}$$

$$\text{In } AC_1O, AC_1^2 = AO^2 + C_1O^2$$

$$AO = \sqrt{AC_1^2 - C_1O^2} = \sqrt{15^2 - 9^2}$$

$$= 12 \text{ cm}$$

Length of the common chord AB

$$= 2 \times AO = 2 \times 12 = 24 \text{ cm}$$

114. D; Let the average of 8 consecutive odd integers = x

$$\text{Then, } S_1 = 8x$$

$$\text{According to the condition, } S_2 = 8(x + 15)$$

$$= 8x + 120$$

$$\frac{S_2}{S_1} = \frac{8x + 120}{8x} = \frac{4}{5}$$

115. C; Let the marked price of the article be x

Then, the selling price of the article

$$= x - 0.15x$$

$$\therefore 0.15x = 243 \text{ (Given)}$$

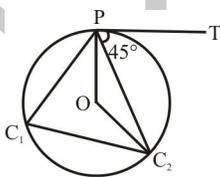
$$\text{Marked Price (x)} = \text{`}1620$$

$$\text{Selling Price} = 1620 - 243 = \text{`}1377$$

$$\text{Cost price of the article} = \frac{1620}{1.35} = \text{`}1200$$

$$\text{Profit} = \text{SP} - \text{CP} = 1377 - 1200 = \text{`}177$$

116. D; PT is the tangent of a circle drawn at point P.



$$\angle TPC_2 = 45^\circ$$

$$\angle PC_1C_2 = 45^\circ \text{ (Property of a circle)}$$

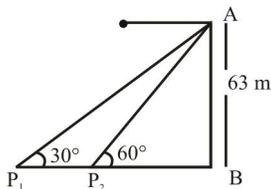
$$\angle POC_2 = 2 \angle PC_1C_2 = 2 \times 45 = 90^\circ$$

Length of arc PC_2

$$= \frac{90}{360} \times 2\pi r \text{ (where } r \text{ is the radius of circle)}$$

$$= \frac{1}{4} \times 2 \times \frac{22}{7} \times 3.5 = 5.5 \text{ cm}$$

117. B;



AB is a building and its height is 63 m.

Let the length of P_2B be x m.

Then, in $\triangle AP_2B$,

$$\tan 60^\circ = \frac{AB}{P_2B}$$

$$x = \frac{63}{\sqrt{3}} = 21\sqrt{3} \text{ m}$$

Again in $\triangle AP_1B$, we get

$$\tan 30^\circ = \frac{AB}{P_1B}$$

$$\text{or, } \frac{63}{P_1P_2 + x} = \frac{1}{\sqrt{3}}$$

$$\text{or, } P_1P_2 = 63\sqrt{3} - 21\sqrt{3} = 42\sqrt{3} \text{ m}$$

$$(\therefore x = 21\sqrt{3} \text{ m})$$

$$\text{Speed of the boy} = \frac{P_1P_2}{\text{time}} = \frac{42\sqrt{3}}{14}$$

$$= 3\sqrt{3} \text{ mps}$$

118. D; Given, $a^{\frac{1}{3}} = 13$

Cubing both sides, we get

$$a = 13^3$$

$$\text{Then } a^2 - 1497a = a(a - 1497)$$

$$= 13^3(13^3 - 1497) = 2197 \times (2197 - 1497)$$

$$= 2197 \times 700 = 1537900$$

119. C; Given, $x = 2\sqrt{3}$

$$\text{or, } \frac{1}{x} = \frac{1}{2\sqrt{3}}$$

$$\text{or, } x + \frac{1}{x} = 2\sqrt{3} + \frac{1}{2\sqrt{3}} = 4$$

$$\text{Now, } \frac{x^6 - 1}{x^5 - x} = \frac{1}{6x^3}$$

On dividing both numerator and denominator by x^3 , we get

$$= \frac{x^3 - \frac{1}{x^3}}{x^2 - \frac{1}{x^2}} = \frac{x - \frac{1}{x}}{x + \frac{1}{x}} = \frac{3x - \frac{1}{x}}{2x + \frac{1}{x}}$$

$$= \frac{4^3 - 3}{4^2 - 2} = \frac{52}{20} = \frac{13}{5}$$

120. A; SI for 2 years at 11% = 2×11 = 22% of the sum.

$$\text{CI for 2 years at 11%} = 11 + 11 + \frac{121}{100}$$

$$= 23.21\% \text{ of the sum}$$

$$\text{Difference between CI and SI} = 27.83$$

$$(23.21 - 22)\% \text{ of the sum} = 27.83$$

$$1.21\% \text{ of the sum} = 27.83$$

$$\text{Sum} = \frac{27.83}{1.21} \times 100 = \text{`}2300$$

Quicker Method

$$\text{Sum} = \frac{\text{Difference}}{r^2} \times 100 \times 100$$

$$= \frac{27.83}{121} \times 100 \times 100 = \text{`}2300$$

121. B; The ratio of the exterior angle to the interior angle of a polygon = 1 : 5

$$\therefore \text{Exterior angle of the polygon} = \frac{360}{n}$$

(where n is the number of sides of the polygon)

Interior angle of the polygon

$$= \frac{n - 2}{n} \times 180$$

$$\text{Now, } \frac{360}{n - 2} = \frac{1}{5}$$

$$n = 12$$

Number of sides of the regular polygon = 12

122. B; Area of the circumcircle of an equilateral triangle = 154 sq cm

Then, $r_1^2 = 154$ (where r_1 is the radius of the circumcircle of the equilateral triangle)

$$r_1 = 7 \text{ cm}$$

\therefore Ratio of the radius of the circumcircle to the incircle of an equilateral triangle = 2 : 1

$$\text{Then, radius of the incircle} = \frac{7}{2} = 3.5 \text{ cm}$$

123. D; Let 9 years ago the age of Sakshi's grandfather and Sakshi be $8x$ and x years respectively.

Then, present ages will be $8x + 9$ and $x + 9$

According to the given condition,

$$(8x + 12) = \frac{10}{3}(x + 12)$$

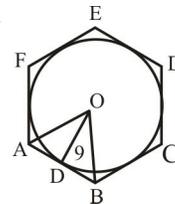
$$\text{or, } x = 6 \text{ years}$$

$$\text{Sakshi's present age} = x + 9 = 15 \text{ years}$$

$$\text{Sakshi's age after 6 years} = 15 + 6$$

$$= 21 \text{ years}$$

124. B;



Radius of the circle = 9 cm

\therefore The regular hexagon is a combination of 6 equal equilateral triangles.

Then the height of equilateral triangle = 9 cm

$$\text{Side of the equilateral triangle} = \frac{9}{\sqrt{3}}$$

$$= 6\sqrt{3} \text{ cm}$$

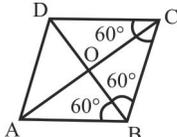
$$\text{Area of the equilateral triangle} = \frac{\sqrt{3}}{4}$$

$$6\sqrt{3}^2 = 27\sqrt{3} \text{ sq cm}$$

$$\text{Area of the hexagon} = 6 \times 27\sqrt{3}$$

$$= 162\sqrt{3} \text{ sq cm}$$

125. C; Given that, ABCD is a rhombus in which $\angle BCD = 60^\circ$



$$\angle ABC = 180 - 60 = 120^\circ$$

$$\angle ABD = \angle DBC = \frac{120}{2} = 60^\circ$$

$$\therefore AC = 6\sqrt{3} \text{ cm (Given)}$$

$$OC = 3\sqrt{3} \text{ cm (O bisects AC and DB)}$$

$\therefore \triangle OAB$ and $\triangle OCB$ are equilateral triangles.

$$\text{Then, } CD = \frac{2}{\sqrt{3}} \times 3\sqrt{3} = 6 \text{ cm}$$

$$\text{Area of the rhombus} = 2 \times \text{area of } \triangle DCB$$

$$= 2 \times \frac{\sqrt{3}}{4} \times 6 \times 6 = 18\sqrt{3} \text{ sq cm}$$

126. A; Let the quantity of the spirit contained initially be v litres.

Then, final quantity of spirit = Initial

quantity of spirit $\frac{v \cdot 9^n}{v}$ (where n is number of times)

$$\text{or, } \frac{27}{37} \cdot \frac{27}{27} = 1 \cdot \frac{v \cdot 9^3}{v}$$

$$\text{or, } \frac{27}{64} = \frac{v \cdot 9}{v} \quad \text{or, } v = 36 \text{ litres}$$

127. D; Area of the semicircle = 693 sq cm

$$\text{Radius of the semicircle} = \sqrt{\frac{693 \cdot 2 \cdot 7}{22}}$$

$$= 21 \text{ cm}$$

$$\text{Circumference of the semicircle} = r + 2r$$

$$= \frac{22}{7} \cdot 21 + 42 = 108 \text{ cm}$$

(where r is the radius of the semicircle)

$$\text{Breadth of the rectangle} = 108 \text{ cm}$$

$$\text{Height of the equilateral triangle} = 27\sqrt{3} \text{ cm}$$

$$\text{Side of the equilateral triangle}$$

$$= 27\sqrt{3} \cdot \frac{2}{\sqrt{3}} = 54 \text{ cm}$$

$$\text{Perimeter of the equilateral triangle}$$

$$= \text{Length of the rectangle} = 3 \times 54 = 162 \text{ cm}$$

$$\text{Perimeter of the rectangle} = 2(108 + 162) = 540 \text{ cm}$$

128. A; \therefore 4 men can complete a piece of work in 3 days

$$3 \text{ men can complete the work in } \frac{3 \cdot 4}{3}$$

= 4 days

6 boys can complete the work in 4 days
Work done by 3 men and 6 boys in one day

$$= \frac{1}{4} \cdot \frac{1}{4} = \frac{1}{2}$$

$$\text{Remaining work} = 1 - \frac{1}{2} = \frac{1}{2} \text{ of the work}$$

\therefore 3 women can do the work in 6 days

18 women can do the work in 1 day

Hence, to finish $\frac{1}{2}$ work in 1 day by women

$$\text{only we require} = 18 \cdot \frac{1}{2} = 9 \text{ women}$$

$$129. B; \tan^{-1} \tan^2 = 1$$

$$\text{or, } \tan = 1 + \tan^2 = \sec^2$$

$$\text{or, } \tan^2 = \sec^4$$

$$\text{or, } \sec^2 - 1 = \sec^4$$

$$\text{or, } \sec^4 - \sec^2 = -1$$

On cubing both LHS and RHS,

$$\sec^{12} - \sec^6 - 3\sec^{10} + 3\sec^8 = -1$$

$$\text{or, } \sec^{12} - \sec^6 - 3\sec^8 (\sec^2 - 1) = -1$$

$$\text{Now, } \sec^{12} - \sec^6 - 3\sec^8 \cdot \tan^2 + 4$$

$$= -1 + 4 = 3$$

130. C; If $a = 13.5$, $b = 7$ and $c = 9.5$

$$\text{Then, } \frac{a^3 - b^3}{a^2 b} - \frac{b^3 - c^3}{b^2 c} + \frac{c^3 - a^3}{c^2 a} = \frac{3abc}{a^2 b^2 c}$$

$$\frac{1}{2} \cdot \frac{a^3 - b^3}{a^2 b} - \frac{b^3 - c^3}{b^2 c} + \frac{c^3 - a^3}{c^2 a} = \frac{3abc}{a^2 b^2 c}$$

$$= \frac{1}{2} \cdot \frac{a^3 - b^3}{a^2 b} = \frac{1}{2} \cdot \frac{13.5^3 - 7^3}{13.5^2 \cdot 7} = 8$$

131. D; Given that, $T_n = \cos^n + \sin^n$

Then $10T_6 - 15T_4 + 17$

$$= 10(\cos^6 + \sin^6) - 15(\cos^4 + \sin^4) + 17$$

$$= 10 \frac{\cos^2 \sin^2}{3 \sin^2 \cdot \cos^2} \cdot \cos^2 \sin^2 + 17$$

$$15 \sin^2 \cos^2 + 2 \sin^2 \cos^2 + 17$$

$$= 10 - 15 + 17 = 12 \quad \therefore \sin^2 \cos^2 = 1$$

132. A; First three-digit number which when divided by 6 leaves remainder 3 = 105 Last and three-digit number = 999

$$\text{Number of terms} = \frac{999 - 105}{6} + 1$$

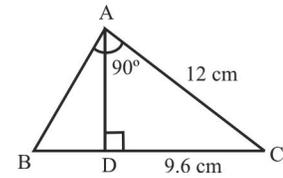
$$= 149 + 1 = 150$$

Sum of all such three-digit numbers

$$= \frac{n}{2} [\text{first term} + \text{last term}]$$

$$= \frac{150}{2} [105 + 999] = 82800$$

133. D;



Given that, $\triangle ABC$ is a right-angled triangle

$$\angle A = 90^\circ, AD \perp BC \text{ and } CD = 9.6 \text{ cm}$$

$\therefore \triangle ADC$ and $\triangle ABC$ are similar triangles.

$$\text{Then, } \frac{BC}{AC} = \frac{AC}{CD}$$

$$= \frac{9.6 \cdot BD}{12} = \frac{12}{9.6}$$

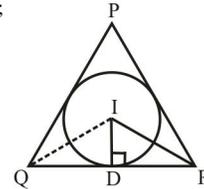
$$BD = 5.4 \text{ cm}$$

$$BC = BD + CD = 9.6 + 5.4 = 15 \text{ cm}$$

In $\triangle ABC$, $AB = \sqrt{BC^2 - AC^2}$

$$= \sqrt{15^2 - 12^2} = 9 \text{ cm}$$

134. B;



Given that, I is the incentre of the triangle PQR and $\angle PRQ = 80^\circ$.

Now, $\angle QIR = 110^\circ$ and $QI = 21 \text{ cm}$

Let $\angle IDQ = \alpha$

$$\angle PQR = 2(110 - 90) = 40^\circ$$

(By the property of incentre)

$$\angle PQR = 180 - \angle QPR - \angle PRQ$$

$$= 180 - 40 - 80 = 60^\circ$$

$$\angle IQD = \frac{\angle PQR}{2} = \frac{60}{2} = 30^\circ$$

$$\text{Now, } ID = IQ \sin 30^\circ = 21 \times \frac{1}{2} = \frac{21}{2} \text{ cm}$$

$$\text{Area of incircle} = \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2}$$

$$= 346.5 \text{ cm}^2$$

135. C; Given, $a \operatorname{cosec} \theta + b \cot \theta = z \dots$ (i)

Let $a \cot \theta + b \operatorname{cosec} \theta = x \dots$ (ii)

From eqns (i) and (ii), we have

$$a^2(\operatorname{cosec}^2 \theta - \cot^2 \theta) - b^2(\operatorname{cosec}^2 \theta - \cot^2 \theta)$$

$$= z^2 - x^2$$

$$(\therefore \operatorname{cosec}^2 \theta - \cot^2 \theta = 1)$$

$$\text{or, } a^2 - b^2 = z^2 - x^2$$

$$x = \sqrt{z^2 - a^2 + b^2}$$

$$a \cot \theta + b \operatorname{cosec} \theta = \sqrt{z^2 - a^2 + b^2}$$

136. D; $\sec \theta + \cot \theta = a \dots$ (i)

$\tan \theta + \operatorname{cosec} \theta = b \dots$ (ii)

Now, squaring both the equations and

subtracting equation (ii) from (i), we get

$$\sec^2 \theta + \cot^2 \theta + 2 \sec \theta \cot \theta - \tan^2 \theta - \operatorname{cosec}^2 \theta$$

$$- 2 \tan \theta \operatorname{cosec} \theta = a^2 - b^2$$

$$\text{or, } (\sec^2 \theta - \tan^2 \theta) - (\operatorname{cosec}^2 \theta - \cot^2 \theta) + 2$$

$$(\operatorname{cosec} - \sec) = a^2 - b^2$$

$$\text{or, } \operatorname{cosec} - \sec = \frac{a^2 - b^2}{2}$$

$$\text{or, } \frac{1}{\sin} - \frac{1}{\cos} = \frac{a^2 - b^2}{2}$$

$$\text{or, } \frac{\cos - \sin}{\sin \cdot \cos} = \frac{a^2 - b^2}{2}$$

$$\text{or, } \cos - \sin = \frac{a^2 - b^2}{2} \sin \cdot \cos$$

$$137. \text{ C; } 16\cos^2x + 16\sin^4x = 13$$

$$\text{or, } \cos^2x + \sin^4x = \frac{13}{16}$$

Putting value of $x = 30^\circ$ satisfies the above condition.

$x = 60^\circ$ also satisfies the above condition
Then $x = 30^\circ$ and 60°

$$\tan 30^\circ = \frac{1}{\sqrt{3}} \text{ and } \tan 60^\circ = \sqrt{3}$$

138. A; Distance travelled by the thief in 1

$$\text{hour and 36 minutes} = 18 + 18 \frac{36}{60}$$

$$= 28.8 \text{ km}$$

According to the question, time taken by the police to catch the thief = 40 minutes
Let the speed of car be x kmph.

$$\text{Then, } \frac{28.8}{x} = \frac{48}{60}$$

$$\text{or, } x = 54 \text{ kmph}$$

139. D; Given that, $a^2b = 1 + ab^2$

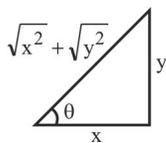
$$\text{or, } a^2b - ab^2 = 1$$

$$\text{or, } ab(a - b) = 1 \quad \text{or, } (a - b) = \frac{1}{ab}$$

$$\text{Then } \frac{1 - 4a^3b^3}{a^2b^2} = \frac{1}{a^2b^2} + 4ab$$

$$= (a - b)^2 + 4ab = (a + b)^2$$

140. C; Given that $x \sec - y \operatorname{cosec} = 0$



$$\text{Then, } \frac{x}{y} = \cot$$

$$\text{So, } \sec = \frac{\sqrt{x^2 + y^2}}{x}$$

$$\text{And } \operatorname{cosec} = \frac{\sqrt{x^2 + y^2}}{y}$$

$$\sec \cdot \operatorname{cosec} = \frac{x^2 + y^2}{xy}$$

141. A; Let the amount received by A be $\text{`}x$.

$$\text{Then, amount received by B} = \frac{3}{5}x + 33$$

And the amount received by C

$$= \frac{4}{3}x - 33 - 42 = \frac{4}{5}x - 2$$

$$\text{Now, } x + x \frac{3}{5} - 33 + \frac{4}{5}x - 2 = 671$$

$$\text{or, } x = \text{`}265$$

$$\text{Amount received by B} = \frac{3}{5} \cdot 265 + 33$$

$$= \text{`}192$$

142. C; Let the original quantity of maize purchased earlier for $\text{`}249$ be x kg.

Reduction in price of maize
= 17% of the original price

$$\text{Increase in quantity of maize} = \frac{17}{100}x$$

$$= \frac{17}{83} \text{ of original quantity}$$

$$\text{Now, } \frac{17}{83}x = 10.2$$

$$\text{or, } x = 49.8 \text{ kg}$$

$$\text{Reduced price of maize} = \frac{249}{10.2}$$

$$= \frac{249}{60} = \text{`}4.15$$

143. D; Given that, $A + B = 30^\circ$

$$\text{or, } \tan(A + B) = \tan 30^\circ$$

$$\text{or, } \frac{\tan A + \tan B}{1 - \tan A \cdot \tan B} = \frac{1}{\sqrt{3}}$$

$$\text{or, } \sqrt{3} \tan A + \sqrt{3} \tan B = 1 - \tan A \cdot \tan B$$

$$\text{or, } \sqrt{3} \tan A + \tan A \cdot \tan B + \sqrt{3} \tan B = 1$$

Now, on adding 3 to both sides, we get

$$\text{or, } \sqrt{3} \tan A + \tan A \cdot \tan B + \sqrt{3} \tan B + 3 = 1 + 3 = 4$$

$$\text{or, } \tan A \sqrt{3} \tan B + \sqrt{3} \tan B \sqrt{3} = 4$$

$$\text{or, } \tan A \sqrt{3} \tan B \sqrt{3} = 4$$

$$144. \text{ C; In 2011 } \frac{120 - 100}{100} \cdot 100 = 20\%$$

145. A; Average export

$$= \frac{90 + 104 + 90 + 110 + 130}{5} = \text{`}104.8 \text{ crore}$$

$$146. \text{ D; Reqd \%} = \frac{76 - 86}{90} \cdot \frac{116}{130} \cdot 100$$

$$= 85.8 \quad 86\%$$

$$147. \text{ C; Reqd ratio} = \frac{100 - 120}{90} \cdot \frac{120}{110} = 220 : 200$$

$$= 11 : 10$$

$$148. \text{ C; Cost of labour} = \frac{84000}{43.2} = 196000$$

$$= \text{`}196000$$

$$149. \text{ A; Reqd \%} = \frac{54 - 126}{126} \cdot 100 = 42.85 \quad 43\%$$

150. D; Difference in cost of overhead expenses and transportation

$$= \frac{105000}{54} \cdot 43.2 - 36 = \text{`}14000$$

151. D

152. C; Replace 'break' with 'breaking'

153. A; Replace 'time' with 'timely'

154. B; Replace 'in' with 'under'

155. B; Replace 'is' with 'are'

156. B 157. D 158. C 159. A 160. D

161. A 162. D 163. B 164. C 165. A

166. B 167. D 168. C 169. D 170. A

171. A 172. D 173. B 174. C 175. A

176. C 177. D 178. B 179. A 180. C

181. B 182. A 183. D 184. C 185. B

186. C 187. A 188. B 189. A 190. D

191. C 192. D 193. B 194. C 195. A

196. D 197. B 198. D 199. B 200. B