Part (A) General Intelligence

1. TAP : PAT :: DAM :: ?
   (a) BUND
   (b) MAD
   (c) STOP
   (d) AMD

   (b) MAD

   Similarly,

   T A P
   P A T

2. 8 : 18 :: 24 : ?
   (a) 38
   (b) 32
   (c) 44
   (d) 43

   (d) 43

3. 08 : 09 :: ? : 25
   (a) 64
   (b) 16
   (c) 27
   (d) 36

   (a) 64

   Similarly,

   C E G I
   X V T R

4. ABC : HIL :: OPQ :: ?
   (a) WWX
   (b) VXW
   (c) XWV
   (d) VWX

   (c) XWV

   Similarly,

   O P Q
   V W X

5. 6 : 35 :: 9 : ?
   (a) 18
   (b) 27
   (c) 53
   (d) 72

   (c) 53

   Similarly,

   6 = 6 x 6 - 1 = 35
   9 = 9 x 9 - 1 = 80

6. Library : Books :: Bank :: ?
   (a) Cheque
   (b) Loan
   (c) Money
   (d) Account

   (c) Money

   Similarly,

   Library : Books in a library, in the same way, Money puts in Bank.

7. Child : Father :: Book :: ?
   (a) Author
   (b) Publisher
   (c) Editor
   (d) Librarian

   (b) Publisher

   Similarly,

   Child : Father in the same way, Book related to Author.

8. Sin : Crime :: ?
   (a) Man : Animal
   (b) House : Court
   (c) Morality : Legacy
   (d) Jury : Priest

   (c) Morality : Legacy

   Similarly,

   Sin is related to Crime in the same way, Morality is related to Legacy.

9. CEIG : XVTR :: DEFLU :: ?
   (a) XTRT
   (b) XQOM
   (c) ZVSO
   (d) WJSP

   (d) WJSP

   Similarly,

   C E G I
   X V T R

10. (Q Nos. 10-18) Select the one which is different from the other three responses.

10. (a) Work : Leisure
    (b) Day : Night
    (c) Expedite : Procrastinate
    (d) Frequently : Always

    (d) Frequently : Always

   Similarly,

   B O D E
   L I K M

11. (a) 46, 24
    (b) 62, 32
    (c) 56, 30
    (d) 74, 28

    (c) 56

   Similarly,

   46 + 2 = 23 + 1 = 24
   62 + 2 = 31 + 1 = 32
   56 + 2 = 28 + 1 = 29
   74 + 2 = 37 + 1 = 38

   Therefore, 56 is different from the other three.

12. (a) RPSZ
    (b) A4UE
    (c) QRFM
    (d) ABCD

    (b) A4UE

   Similarly,

   R P S Z
   A 4 U E

   Therefore, A4UE has vowel letters.

13. (a) 441
    (b) 256
    (c) 481
    (d) 361

    (c) 481

   Similarly,

   441 is different from the other three because 441, 256 and 361 are the perfect squares that differ by 100.

14. (a) EBD
    (b) FH
    (c) URT
    (d) YVR

    (d) YVR

   Similarly,

   E B D
   F H
   U R T
   Y V R

   Therefore, YVR is different from the other three.

15. (a) Cricket
    (b) Hockey
    (c) Shuttle Cock
    (d) Tennis

    (c) Shuttle Cock

   Similarly,

   Cricket : Hockey and Tennis are the names of different games.
17. (a) 32\(^{16}\) (b) 238 (c) 5025 (d) 2015

20. (a) 32\(^{16}\) \(\Rightarrow 3 + 2 + 6 - 1 = 10\)
    238 \(\Rightarrow 2 + 3 + 8 - 3 = 10\)
    5025 \(\Rightarrow 5 + 2 + 5 - 0 = 10\)
    2015 \(\Rightarrow 2 + 0 + 1 + 5 = 8\)

21. (a) Sunflower oil (b) Coconut oil (c) Palm oil (d) Sandal wood oil

22. (a) Sandal wood oil is different from the other three.

Directions (Q.Nos. 19-20) Which one of the given responses would be a meaningful order of the following words in ascending order?

26. (a) Hundred, Unit, Tens, Thousand, Lakh.
(b) 4, 4, 3, 3, 2, 2
(c) 5, 1, 2, 3, 4

27. In a certain code, "KINDLE" is coded as 1 2 3 4 5 6 8. Which will appear fourth in the English dictionary?
(a) Quick (b) Question (c) Quality (d) Quiet

28. Which one of the letters when sequentially placed at the gaps in the given letter-series shall complete it?
- A'B - B'A - BB' - A
(a) A'B'B' (b) A'B'A'B' (c) A'B'A'B' (d) A'B'B'A'B'

29. Devendra is older by 4 yr to Rajendra. After 16 yr, Devendra will be three times his present age and Rajendra will be five times of his present age. How old would Rajendra be after 16 yr?
(a) 30 yr (b) 35 yr (c) 24 yr (d) 20 yr

32. If "HIGH" is written as 8978 then "DEAF" = ?
(a) 13 42 (b) 14 32 (c) 45 16 (d) 46 15

33. Directions (Q.Nos. 23-26) Choose the correct alternative from the given ones, that will complete the series.

(a) 32, 36, 41, 44, 48
(d) 4, 8, 10, 12, 12
38. (b) As \(8 + 10 \Rightarrow 18 + 2 = 9\) 
   and \(7 + 7 = 14 + 2 = 7\)  
   Similarly,  
   \(5 + 5 \Rightarrow 10 + 2 = 5\)  
\[\begin{array}{llll}
9 & 5 & 4 & 10 \\
8 & 7 & 6 & 9 \\
12 & 6 & 8 & ? \\
\end{array}\]
(a) 8  
(b) 9  
(c) 10  
(d) 12  
\(\Rightarrow\) (c) As \(9 + 5 = 4 + 10 \Rightarrow 14 = 14\)  
   and \(8 + 7 = 6 + 9 \Rightarrow 15 = 15\)  
   Similarly,  
   \(12 + 6 = 8 + 1 \Rightarrow 19 = 8 = 10\)  
\[\begin{array}{llll}
30 \text{m} & 40 \text{m} & 50 \text{m} & \text{A} \\
30 \text{cm} & 30 \text{cm} & 50 \text{cm} & \text{D} \\
\end{array}\]
(c) 30 m  
(d) 10 m  
\(\Rightarrow\) (d)  

36. Arun walks to North for 30 m and moves left and walks 40 m. He again turns left and walks 30 m. He finally turns left and walks 50 m. Now, how far is Arun from the starting point?  
(a) 30 m  
(b) 40 m  
(c) 30 m  
(d) 10 m  
\(\Rightarrow\) (c) 30 m  

37. Avinash travelled towards South for 1 km. He turned right and travelled for one more km. He again turned right and travelled 2 km. In which direction is he from the starting point?  
(a) South  
(b) West  
(c) North-West  
(d) East  
\(\Rightarrow\) (c) North-West  

39. Balu's house is 300 m away from that of Sam. Balu stays 300 m South-West of Sam's house. Raja resides 600 m North-East of Balu's house. Then where is the position of Sam's house in relation to Raja's?  
(a) North-East  
(b) South-East  
(c) North-West  
(d) South-West  
\(\Rightarrow\) (d)  

43. Statements  
Latha is a beautiful and intelligence girl. She is very good.  
Conclusions I. All beautiful girls are intelligent.  
II. Beauty and intelligence are the essential factors of goodness.  
(a) Only conclusion I follows  
(b) Only conclusion II follows  
(c) Both conclusions I and II follow  
(d) Neither conclusion I nor II follows  
\(\Rightarrow\) (d)  

44. Statements  
All writers are lawyers.  
All readers are lawyers.  
Conclusions I. Some lawyers are readers.  
II. Some readers are writers.  
(a) Only conclusion I follows  
(b) Only conclusion II follows  
(c) Both conclusions I and II follow  
(d) Neither conclusion I nor II follows  
\(\Rightarrow\) (a)  

45. Which answer figure will complete the pattern in the question figure?  
\[\text{Answer Figures}\]

(a)  
(b)  
(c)  
(d)  
\(\Rightarrow\) (d) From the figure (d).  
Now, the pattern of the question figure is completed.
46. Which of the answer figures is exactly the mirror image of the given figure, when the mirror is held on the line AB?

**Question Figure**

![Picture of a figure]

**Answer Figures**

![Options (a), (b), (c), and (d)]

(a) The mirror image of the given figure is

![Selected answer figure]

47. 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 then by its column, e.g., 'A' can be represented by 01, 12, 23, etc. and 'I' can be represented by 57, 68, 85 etc. Identify the set for the word EAST.

**Matrix I**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>E</td>
<td>A</td>
<td>R</td>
<td>W</td>
</tr>
<tr>
<td>1</td>
<td>W</td>
<td>P</td>
<td>A</td>
<td>E</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
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<td>P</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>P</td>
<td>R</td>
<td>E</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>R</td>
<td>E</td>
<td>W</td>
<td>P</td>
</tr>
</tbody>
</table>

**Matrix II**

<table>
<thead>
<tr>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>S</td>
<td>B</td>
<td>K</td>
<td>T</td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>C</td>
<td>T</td>
<td>K</td>
</tr>
<tr>
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<td>8</td>
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<td>C</td>
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<tr>
<td>9</td>
<td>C</td>
<td>K</td>
<td>B</td>
<td>S</td>
</tr>
</tbody>
</table>

Select the correct answer using the options given below,
(a) 00 32 76 58
(b) 32 76 68
(c) 68 20 77 59
(d) 20 42 55 76

(a) From option (a),
00 ⇒ E
12 ⇒ A
76 ⇒ S
58 ⇒ T

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

*Question Figures*

*Answer Figures*

![Selected answer figure]

49. Which one of the following diagrams best depicts the relationship among Deer, Rabbit, and Tiger?

(a) ![Diagram (a)]
(b) ![Diagram (b)]
(c) ![Diagram (c)]
(d) ![Diagram (d)]

(a) From option (a),

50. Select the answer figure, in which the question figure is hidden/embedded.

*Question Figure*

*Answer Figures*

![Selected answer figure]

Part (B) General Awareness

52. In which year did Gandhi ji start Satyagraha Movement?
(a) 1919
(b) 1927
(c) 1934
(d) 1942

(a) Although Gandhi ji's first Satyagraha Movement in India was Champaran Satyagraha of 1917, but it remained limited to its area. An overall wide India Satyagraha led by Gandhi ji took place in 1919 against Rowlett Act.

53. An ecosystem consists of
(a) producers, consumers and decomposers in a particular area
(b) all the plants and animals of an area
(c) a living community and its environment
(d) carnivorous and herbivorous of an area

(b) An ecosystem is a biological environment consisting of all the living organisms, biotic (producer, consumer, decomposer) and abiotic components (non-living) in a particular area.

54. The crop mainly grown in hills is
(a) sweet corn
(b) sweet jowar
(c) sweet potato
(d) sweet pea

(c)

55. Who is called as the "Prophet of New India?"
(a) Dayanand Saraswati
(b) Sri Ramakrishna
(c) Raja Ram Mohan Roy
(d) Swami Vivekananda

(c)

56. Ethnic group Mongoloids are found in India in
(a) Eastern region
(b) South-Central region
(c) North-Western region
(d) North-Eastern region

(d) The people belonging to Mongoloid race are found in North-Eastern States of India in Assam, Meghalaya, Manipur etc.

57. When a vibrating tuning fork is placed on a table, a loud sound is heard. This is due to
(a) reflection
(b) refraction
(c) forced vibrations
(d) damped vibrations

(c) The tendency of one object to force another adjoining or interconnected object into vibrational motion is referred to as a forced vibration. Musical instrument and other objects are set into vibration at their natural frequency when a person hits the object which results into sound.
58. An insect- catching plant is (a) Australian Acacia (b) Samllas (c) Nepenthes (d) Nerium (c) Nepenthes popularly known as tropical pitcher plants or monkey cups is a species of carnivorous plants, found mainly in tropical countries (Indonesia, Malaysia, Madagascar), which can catch mice and insects.

59. The method not used as a biological control is (a) use of predators of a pest (b) pheromone traps (c) use of pesticides (d) use of neem extracts (a) Biological control i.e., biological method of controlling the pests (insects, mice, weeds etc.) in agriculture include—use of predators of a pest, pheromone traps (insect trapping method) and pesticides.

60. The States in India are demanding greater autonomy from the centre in the ______ field (a) legislative (b) administrative (c) financial (d) All of these (d)

61. Light houses are places with powerful lights (a) guide and resolve traffic jams in crowded metro-cities during nights (b) guide and help large crowds at religious gatherings during nights (c) indicate to the incoming war-ships, the location of a harbour during nights (d) guide and warn the ships coming from different directions in the ocean (b)

62. In a Capitalistic Economy, the Prices are determined by (a) demand and supply (b) government authorities (c) buyers in the market (d) sellers in the market (a)

63. Higher the demand, higher the prices and vice versa (c) Conqueror of the World (d) Hero of Hundred Battles (d)

64. Who of the following has not been an interlocutor on Jamuna and Kashmir? (a) M M Ansari (b) Radha Kumar (c) Shujaat Bukhari (d) Dilip Padgaonkar (c) The government of J & K appointed a 3 member interlocutor team to solve the problem of Kashmir. Its members are M M Ansari (Academician), Dilip Padgaonkar (Journalist) and Radha Kumar (Academician).

65. The term ‘Pitcher’ is associated with (a) Wrestling (b) Boxing (c) Baseball (d) Basketball (d)

66. The filament of electric bulb is made up of (a) copper (b) nichrome (c) lead (d) tungsten (b)

67. Which of the following is called “brown paper”? (a) Jute (b) Cotton (c) Rubber (d) Tea (a)

68. A Secular State is one which (a) has no religion of its own (b) is irreligious (c) is anti-religion (d) takes into consideration the religious sentiments of the people (a)

69. Where was the Royal Durbar held on November 1st, 1858 to issue the Queen’s proclamation? (a) Lucknow (b) Cawnpore (c) Delhi (d) Allahabad (b)

70. Gol Gumbaz is in (a) Konark (b) Hyderabad (c) Puri (d) Bijapur (d)

71. The early Buddhist Scriptures were composed in (a) Prakrit texts (b) Pali texts (c) Sanskrit texts (d) Pictographical texts (b)

72. In Mohanjodaro, the largest building is (a) the great bath (b) a granary (c) the Pillared Hall (d) a two storied house (a)

73. Match the following with the correct historical events: (a) Lucknow (b) Cawnpore (c) Delhi (d) Allahabad (d)

74. Male (Anopheles) mosquito feeds on (a) blood of man (b) nectar of flower (c) blood of Culex (d) blood of leech (b)

75. Tooth paste is a product sold under (a) monopolistic competition (b) perfect competition (c) monopoly (d) duopoly (c)

76. The National Development Council includes (a) all Central Cabinet Ministers (b) Chief Ministers of all the States (c) Cabinet Ministers of all the States and the Centre (d) Members of the Estimates Committee of the Parliament (b)
(b) and (c) National Development Council, the apex decision making body in India. It finalises the five year plans prepared by Planning Commission of India.

It is presided by the Prime Minister of India and includes all the Cabinet Ministers and Chief Ministers of all the states, Administrators of UTs and other members of Planning Commission.

79. Which of the following is not a cause of low productivity in Indian agriculture?
(a) Co-operative farming
(b) Inadequate inputs availability
(c) Sub-division and fragmentation of land holdings
(d) Poor finance and marketing facilities

80. The gas that is used in the manufacture of vasapatti ghee is
(a) oxygen
(b) carbon dioxide
(c) hydrogen
(d) nitrogen

81. Scarcity is caused due to the deficiency of
(a) Vitamin - D
(b) Vitamin - K
(c) Vitamin - E
(d) Vitamin - C

82. According to a study conducted by Hyderabad’s National Institute of Nutrition, the healthiest of 14 fresh fruits commonly consumed in India with maximum ‘Goodness Index’ is
(a) Indian Plum
(b) Mango
(c) Guava
(d) Custard apple

83. Among the healthiest fruit for human body guava tops the list of 14 fresh fruits commonly consumed in India, followed by Indian plum. Mango, pomegranate, custard apple are among the other fruits that offer highest amount of antioxidants, while the pineapple is at the bottom of “Goodness Index”.

84. Tsunamis are waves generated by
(a) earthquakes beneath the Sea
(b) moon’s pull
(c) high tides of the Oceans
(d) cyclones

85. Which is the largest State of India?
(a) Madhya Pradesh
(b) Andhra Pradesh
(c) Rajasthan
(d) Maharashtra

86. Which one of the following is a system software?
(a) Database programmes
(b) Word processers
(c) Spreadsheets
(d) Compilers

87. A piece of wood is held under water. The upthrust on it will be
(a) equal to the weight of the wood
(b) less than weight of the wood
(c) more than weight of the wood
(d) zero

88. Kamakhya temple is an important place of tourism in the State of
(a) Tamil Nadu
(b) Assam
(c) Himachal Pradesh
(d) Manipur

89. Electric bulbs are filled with
(a) nitrogen
(b) carbon dioxide
(c) argon
(d) oxygen

90. The atmospheric gas that is mainly responsible for Greenhouse effect is
(a) Ozone
(b) Nitrogen
(c) Oxygen
(d) Carbon dioxide

91. Wisdom teeth is the
(a) 1st molar teeth
(b) 2nd molar teeth
(c) 3rd molar teeth
(d) 4th molar teeth

92. The Nobel Prize in Physics 2010 was awarded jointly to André Geim and Konstantin Novoselov.

93. Tabel Chongli is a form of folk dance associated with the State of
(a) Paschim Bengal
(b) Assam
(c) Andhra Pradesh
(d) Maharashtra
94. Who is the supreme Commander-in-Chief of armed forces of the country? (a) Defence Minister (b) Prime Minister (c) Senior-most among the three service chiefs (d) President

95. Which of the following is correctly matched?
(a) Assam : Itanagar (b) Arunachal Pradesh : Guwahati (c) Tripura : Agartala (d) Nagaland : Shillong

(c) Only option (c) is correctly matched. Agartala is the Capital of Tripura.

96. The purest form of Iron is
(a) Cast iron (b) Steel (c) Pig iron (d) Wrought iron

(d) Wrought iron is the purest form of iron with a very low carbon content (0.10% - 0.25%) and less than 0.25% of impurities.

97. The Caste System of India was created for
(a) immobility of labour (b) recognition of the dignity of labour (c) economic uplift (d) occupational division of labour

(d) The Caste System in India was introduced during Rig Vedic times, it divided the Hindu society into four Varnas (Castes) and each Varna is attached with a fixed occupation. These four Varnas were

- Brahmins (priests, scholars)
- Kshatriya (kings, governors and soldiers)
- Vaishyas (cattle herders, agriculturists and merchants)
- Shudras (labourers, artisans and service providers)

98. The iron ore which contains 72% of iron is
(a) Magnetite (b) Limonite (c) Haematite (d) Siderite

(a) There are mainly four types of iron ores. They are
(i) Magnetite (Fe₃O₄) — contains 72% iron
(ii) Haematite (Fe₂O₃) — contains 70% iron
(iii) Limonite (Fe₂O₃ · nH₂O) — contains 50-60% iron
(iv) Siderite (FeCO₃) — contains 48% iron

99. Surat is located on the banks of the river
(a) Narmada (b) Tapi (c) Mahi (d) Shatt-al-Arab

(d) Surat is located on the river bank of Tapi in Gujarath.

100. The task of an elephant is to
(a) Upper incisor (b) Lower incisor (c) Upper canine (d) Lower canine

(a) Upper incisor

Part (C) Quantitative Aptitude

101. Ratio of the principal and the amount after 1 yr is 10 : 12. Then the rate of interest per annum is
(a) 20% (b) 16% (c) 18% (d) 12%

(d) Let Principle amount is P, amount after 1 yr is A and simple interest is SI

\[ SI = \frac{10}{12} \times P \]

We know that
\[ A = P + SI \]

\[ A = \frac{10}{12} P + SI \]

\[ 12P = 1 \times P \times r \times \frac{100}{10} \]

\[ r = \frac{6}{5} \times 100 \]

\[ r = 20\% \]

102. A solid cone of height 9 cm with diameter of its base 18 cm is cut out from a wooden solid sphere of radius 9 cm. The percentage of wood wasted is
(a) 25 (b) 30 (c) 30 (d) 75

(b) 30

103. The length of the chord of a circle is 8 cm and perpendicular distance between centre and the chord is 3 cm. Then the radius of the circle is equal to
(a) 4 cm (b) 5 cm (c) 6 cm (d) 8 cm

(b) 5 cm

104. In \( \triangle ABC \), \( \angle BAC = 60^\circ \) and \( AB = \frac{1}{2} BC \). Then the measure of \( \angle ABC \) is
(a) 60° (b) 30° (c) 45° (d) 15°

(b) 30°

105. The average of 5 numbers is 140. If one number is excluded, the average of the remaining 4 numbers is 130. The excluded number is
(a) 135 (b) 134 (c) 180 (d) 150

(c) Sum of 5 numbers = 5 \times 140 = 700

Sum of rest 4 numbers = 4 \times 130 = 520

\[ \text{The excluded number} = 700 - 520 = 180 \]
106. If tops are bought at 5 each and sold at 4.50 each, then the loss is (a) 10% (b) 11% (c) 12% (d) 13% 

\[ \text{(a) Cost price of 75 = 5x} \]
\[ \text{and Selling price = 4.50x} \]
\[ \text{Loss = 5x - 4.50x = 0.50x} \]
\[ \therefore \% \text{ loss} = \frac{0.50}{5} \times 100 = 10\% \]

107. What is the greatest number which will divide 110 and 128 leaving a remainder 2 in each case? (a) 8 (b) 18 (c) 28 (d) 38

\[ \text{(b) Required number = HCF of (110 - 2) and (128 - 2) = 108, 126} \]
\[ 108 \div 108 = 6 \]
\[ 108 \div x = 18 \]

108. If \( a = 23 \) and \( b = -29 \), then value of \( 25a^2 + 40ab + 16b^2 \) is (a) \( 1 \) (b) \( -1 \) (c) \( 0 \) (d) \( 2 \)

\[ (a) 25a^2 + 40ab + 16b^2 = (5a + 4b)^2 \]
\[ = (5 \times 23 + 4 \times -29)^2 \]
\[ = 115^2 = 11025 \]
\[ = 1 \]

109. If \( (\theta_1)^2 = 8 \) and \( (\theta_2)^2 = 81 \), then \( \sqrt{\theta_1 \cdot \theta_2} \) is (a) \( \sqrt{8} \) (b) \( 2 \) (c) \( \sqrt{81} \) (d) \( 2 \cdot 2 \)

\[ (a) \sqrt{\theta_1 \cdot \theta_2} = \sqrt{8 \cdot 81} \]
\[ x + y = 3 \]
\[ \theta_1 \cdot \theta_2 = 81 \]
\[ \theta_1 \cdot \theta_2 = 8 \]

\[ 2x + y = 4 \]

Solving the Eq. (i) and (ii).
\[ x = 1, y = 2 \]
\[ (x, y) = (1, 2) \]

110. One chord of a circle is known to be 10.1 cm. The radius of this circle must be (a) 5 cm (b) greater than 5 cm (c) greater than or equal to 5 cm (d) less than 5 cm

\[ \text{(b)} \]

\[ \therefore \text{AB (chord)} = 10.1 \text{ cm, and longest} \]
\[ \text{chord = Diagonal} \]
\[ CD = \text{Longest chord = 2x radius} \]
\[ = 2 \times 5 \times \text{radius} \]
\[ \therefore \text{The radius of this circle must be greater than 5 cm.} \]

111. Both the end digits of a 90 digit number N are 2. N is divisible by 11, then all the middle digits are (a) \( \frac{1}{3} \) (b) \( \frac{3}{4} \) (c) \( \frac{1}{2} \) (d) \( \frac{3}{5} \)

\[ \begin{align*}
\therefore \text{(b)} \\
\end{align*} \]

112. If \( 0 < x < \frac{\pi}{2} \) and \( \sec x = \cos y \), then the value of \( \sin (x + y) \) is (a) 0 (b) 1 (c) \( \frac{1}{2} \) (d) \( \frac{1}{3} \)

\[ \begin{align*}
\therefore \text{(c)} \\
\end{align*} \]

113. A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm, find the volume of the wooden toy. (a) \( 104 \text{ cm}^3 \) (b) \( 162 \text{ cm}^3 \) (c) \( 422 \text{ cm}^3 \) (d) \( 266 \text{ cm}^3 \)

\[ \begin{align*}
\therefore \text{(d)} \\
\end{align*} \]

114. A can do piece of work in 12 days. B is 50% more efficient than A. In how many days B will finish the same work? (a) 6 days (b) 8 days (c) 12 days (d) 24 days

\[ \begin{align*}
\therefore \text{(c)} \\
\end{align*} \]

115. Each interior angle of a regular polygon is 3 times its exterior angle, then the number of sides of the regular polygon is (a) 9 (b) 8 (c) 10 (d) 7

\[ \begin{align*}
\therefore \text{(c)} \\
\end{align*} \]

116. Selling an article at a profit of 9%, Mr X gets \$ 150 more than selling it at a loss of 9%. Mr X purchased the article at (a) \$ 15000 (b) \$ 1600 (c) \$ 150 (d) \$ 125

\[ \begin{align*}
\therefore \text{(a)} \\
\end{align*} \]

117. The ratio of the radii of two circles is 1 : 2, then the ratio of their areas is (a) 1 : 2 (b) 1 : 1 (c) 1 : 4 (d) 4 : 5

\[ \begin{align*}
\therefore \text{(c)} \\
\end{align*} \]
(c) The required ratio \( r \) = \( \frac{z^2}{x^2} \)
\[ \therefore 4 = \frac{1}{4} \]

118. The true discount on a sum of money during 2 yr hence at 5% is \( 150 \). Find the sum.
(a) 150
(b) 165
(c) 170
(d) 160

\[ (b) \text{ True discount} = \frac{150 \times 5}{100 + 5 \times 2} \]
\[ = \frac{1500}{110} \]
\[ = 4 \frac{5}{11} \text{ kg} \]

119. The average weight of 5 persons sitting in a boat is 38 kg. The average weight of the boat is 0 kg. What is the weight of the boat? (a) 228 kg
(b) 122 kg
(c) 232 kg
(d) 242 kg

\[ (b) \text{ Total weight without boat} = 38 \times 5 \]
\[ = 190 \text{ kg} \]

Total weight with boat = 32 kg + 6 = 38 kg

120. If \( \sqrt{x^2 - 17x + 17} \) is a factor of \( x^3 - 17x^2 + 17x + 17 \) at \( x = 18 \), then the value of \( \sqrt{x^2 - 17x + 17} \) is
(a) 0
(b) 1
(c) 2
(d) 3

\[ (c) \text{ remainders} = 1 \]

121. In a cylindrical vessel of diameter 24 cm filled up with sufficient quantity of water, a solid spherical ball of radius 6 cm is completely immersed. Then the increase in height of water level is
(a) 1.5 cm
(b) 2 cm
(c) 3 cm
(d) 4.2 cm

\[ (c) \text{ required height} = h \]
\[ = \frac{r^2}{x^2} \]
\[ = \frac{1}{4} \]

122. If \( x = \frac{1}{2} \), then \( x + \frac{1}{x} \) = \( \frac{3}{2} \)
(a) 5
(b) 10
(c) 15
(d) 20

\[ (c) \]

123. Each side of an equilateral triangle is 6 cm. Find its area.
(a) 9\( \Rightarrow \frac{12}{13} \text{ sq cm} \)
(b) 6\( \Rightarrow \frac{12}{13} \text{ sq cm} \)
(c) 6\( \Rightarrow \frac{12}{13} \text{ sq cm} \)
(d) 6\( \Rightarrow \frac{12}{13} \text{ sq cm} \)

\[ (a) \text{ area} = \frac{\sqrt{3}}{4} \times 6 \]
\[ = \frac{9\sqrt{3}}{4} \]

124. The value of \( \tan^4 \theta + \frac{1}{\tan^4 \theta} \) is equal to
(a) \( \sec^2 \theta \)
(b) \( \tan^2 \theta \)
(c) \( \sin^2 \theta \)
(d) \( \cos^2 \theta \)

\[ (a) \sec^2 \theta \]

125. The distance between Howrah and New Delhi via Patna is 1140 km, and the distance between Howrah and New Delhi via Gaya is 568 km less. Then the distance between the places via Gaya (in km) is
(a) 1980
(b) 1938
(c) 1388
(d) 1268

\[ (b) 5\% = 72 \text{ km} \]
\[ \therefore \text{ Required distance} = 1440 - 72 \]
\[ = 1368 \text{ km} \]

126. If \( \tan^4 \theta \tan^2 \theta = \tan^8 \theta \)
\[ = \tan^2 \theta \angle \angle \tan^2 \theta \text{ is equal to} \]
\[ (a) 1 \]
\[ (b) 0 \]
\[ (c) \angle \theta \]
\[ (d) \angle \theta \]

\[ (b) \angle \theta \]

127. If \( \sin \theta = \frac{1}{\theta} \) is equal to
(a) \( \sin \theta \)
(b) \( \cos \theta \)
(c) \( \sin \theta \)
(d) \( \cos \theta \)

\[ (a) \sin \theta \]

128. ABCD is a cyclic parallelogram. The \( \angle B \) is equal to
(a) \( 36^\circ \)
(b) \( 60^\circ \)
(c) \( 45^\circ \)
(d) \( 90^\circ \)

\[ (d) \angle B \]

129. Ravi travels 300 km partly by train and partly by car. He takes 4 hr to reach, if he travels 60 km by train and rest by car. He will take 10 minutes more if he were to travel 100 km by train and rest by car. The speed of the train is
(a) 50 km/hr
(b) 60 km/hr
(c) 100 km/hr
(d) 120 km/hr

\[ (b) \text{ let speed of train and car is} \]
\[ s_1 \text{ and} \]

130. \( \angle ABC \text{ and} \angle ADB \text{ are}\)
\[ \angle B \text{ is a square, therefore,} \]
\[ \angle B = 90^\circ \]

131. In a cylindrical vessel of diameter 24 cm filled up with sufficient quantity of water, a solid spherical ball of radius 6 cm is completely immersed. Then the increase in height of water level is
(a) 1.5 cm
(b) 2 cm
(c) 3 cm
(d) 4.2 cm

\[ (a) \text{ required height} = h \]
\[ = \frac{1}{4} \]

132. The distance between Howrah and New Delhi via Patna is 1440 km, and the distance between Howrah and New Delhi via Gaya is 568 km less. Then the distance between the places via Gaya (in km) is
(a) 1980
(b) 1938
(c) 1388
(d) 1268

\[ (b) 5\% = 72 \text{ km} \]
\[ \therefore \text{ Required distance} = 1440 - 72 \]
\[ = 1368 \text{ km} \]

Now, \[ 100 + \frac{200}{6} = \]
180. The angles of elevation of the top of a tower from two points A and B lying on the horizontal through the foot of the tower are respectively 15° and 30°. If A and B are on the same side of the tower and AB = 48 m, then the height of the tower is

(a) 24√3 m  
(b) 24 m  
(c) 24√2 m  
(d) 96 m

181. If A : B = 2 : 3, B : C = 6 : 11, then A : B : C is

(a) 2 : 3 : 11  
(b) 4 : 6 : 22  
(c) 4 : 6 : 11  
(d) 2 : 6 : 11

(c) A : B = 2 : 3  
B : C = 6 : 11
A : B : C = 12 : 18 : 33

182. The allowances of an employee constitute 165% of his basic pay. If he receives ₹11925 as gross salary, then his basic pay is ₹7000 (a) 5000 (b) 5500

(c) 4500  
(d) 5000

(c) Let the basic pay be ₹x.

\[
\begin{align*}
 x \times 165/100 &= 11925 \\
 x &= 11925 \times 100/165 \\
 x &= 7000
\end{align*}
\]

183. A cistern is normally filled in 8 h but takes another 2 h longer to fill because of a leak in its bottom. If the cistern is full, the leak will empty it in

(a) 16 h  
(b) 20 h  
(c) 25 h  
(d) 40 h

(d) The filling tap takes 2 h more therefore the leak empties in 10 h which filling tap fills in 8 h.

So, the leak empties in 10 h in \(x\) i.e.,

\[
x = \frac{1}{10} \text{tank}
\]

Hence, the full tank is emptied by leak in

\[
10 \times 4 = 40 \text{h}
\]

184. The product of two numbers is 36 and their sum is 13. The positive difference between the two numbers is

(a) 1  
(b) 3  
(c) 5  
(d) 9

(c) Let the numbers be \(x\) and \(13-x\)

\[
x(13-x) = 36 \\
x^2 - 13x + 36 = 0 \\
x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}
\]

\[
x = \frac{13 \pm \sqrt{169-4 \times 1 \times 36}}{2} \\
= \frac{13 \pm \sqrt{49}}{2} \\
= \frac{13 \pm 7}{2} \\
= 10, 4
\]

185. Two equal circles of radius 4 cm intersect each other such that each passes through the centres of the other. The length of the common chord is

(a) 2√2 cm  
(b) 2√3 cm  
(c) 2√5 cm  
(d) 2√7 cm

(b)

186. From four corners of a square sheet of side 4 cm, four pieces, each in the shape of a quarter of a circle with radius 2 cm, are cut out. The area of the remaining portion is

(a) (32- π) sq cm  
(b) (16- 4π) sq cm  
(c) (16- 8π) sq cm  
(d) (4- 2π) sq cm

(b)

Required Area = Area of square - Area of circle

\[
=(4^2-π\times 2^2) = 16-4π
\]

187. If A, B and C be the angles of a triangle, then which of the following in incorrect relation is

(a) \(\sin A + \sin B = \sin C\)  
(b) \(\cos A + \cos B = \cos C\)  
(c) \(\tan A + \tan B = \tan C\)  
(d) \(\cot A + \cot B = \cot C\)

(c) \(\sin A + \sin B = \sin C\)  
(b) \(\cos A + \cos B = \cos C\)  
(c) \(\tan A + \tan B = \tan C\)  
(d) \(\cot A + \cot B = \cot C\)

(c) \(A + B + C = π\)
\[ A + B = \pi - C \]
and
\[ \frac{A + B}{2} = \frac{\pi - C}{2} \]

\[ \sin \left( \frac{A + B}{2} \right) = \cos \left( \frac{\pi - C}{2} \right) \]

\[ \sin \left( \frac{A + B}{2} \right) = \frac{C}{2} \]

\[ \cos \left( \frac{A + B}{2} \right) = \frac{\pi - C}{2} \]

\[ \tan \left( \frac{A + B}{2} \right) = \tan \left( \frac{\pi - C}{2} \right) \]

\[ \frac{A + B}{2} = \frac{\pi - C}{2} \]

Therefore option (c) is wrong.

138. If two-thirds of A is four-fifths of B, then

\[ \frac{2}{3}A = \frac{4}{5}B \]

\[ A : B = 5 : 6 \]

(b) 6 : 5

(c) 10 : 9

(d) 9 : 10

139. The lines 2x + y = 5 and x + 2y = 4 intersect at the point

(a) (1, 2)

(b) (2, 1)

(c) (5, 2)

(d) (0, 2)

140. If \( x + 3 + 2 \sqrt{3}, \) then the value of \( \sqrt{x + 3} - \sqrt{x} \)

(a) 1

(b) 2

(c) \( 2 \sqrt{2} \)

(d) \( 3 \sqrt{2} \)

\[ \sqrt{x + 3} - \sqrt{x} = \frac{1}{\sqrt{3} + 2 \sqrt{2}} \]

\[ = \frac{1}{\sqrt{3} + 2 \sqrt{2}} \cdot \frac{\sqrt{3} - 2 \sqrt{2}}{\sqrt{3} - 2 \sqrt{2}} \]

\[ = \frac{\sqrt{3} - 2 \sqrt{2}}{3 + 8} \]

\[ = \frac{\sqrt{3} - 2 \sqrt{2}}{11} \]

141. Two successive discounts of 5%, 10% are given for an article costing \( \text{Rs. } 950. \) Present cost of the article is (in \( \text{Rs. } )

(a) 872.5

(b) 762.75

(c) 700

(d) 650

142. How far, from the start, did the motorist meet the scootist (in km)

(a) 75

(b) 70

(c) 90

(d) 80

\[ \text{By Graph, the required distance is } 80 \text{ km} \]

143. What was the speed of the scootist during the journey? (in km/hr)

(a) 45

(b) 48

(c) 42

(d) 46

\[ \text{Required speed } = \frac{\text{Distance}}{\text{Time}} \]

\[ = \frac{120}{2} \]

\[ = 60 \text{ km/hr} \]

144. The scootist completes the journey in (h)

(a) 3

(b) 2

(c) 2

(d) 3

\[ \text{The scootist completes his journey in } 2 \text{ h} \]

145. At what time did the motorist meet the scootist?

(a) 10.30 am

(b) 10.45 am

(c) 10.15 am

(d) 10.20 am

\[ \text{At 10:30 the motorist meet the scootist.} \]

Directions (Q. Nos. 146-150) Read the bar graph below and answer the questions.

146. Which of the above States is the largest producer of rice?

(a) Uttar Pradesh

(b) Paschim Bengal

(c) Madhya Pradesh

(d) Haryana

\[ \text{(b) Paschim Bengal (8 Lac Tonnes)} \]

147. Which of the above States is the largest producer of wheat?

(a) Madhya Pradesh

(b) Haryana

(c) Maharashtra

(d) Uttar Pradesh

\[ \text{(d) Uttar Pradesh (16 lac Tonnes)} \]

148. What fraction of rice is produced by Haryana of the total production of rice by all the above States?

\[ \text{Haryana} : 2 \]

\[ \text{Uttar Pradesh} : 7 \]

\[ \text{Paschim Bengal} : 8 \]

\[ \text{Madhya Pradesh} : 4 \]

\[ \text{Maharashtra} : 3 \]

\[ \text{Total production of rice in all states } = (2 + 7 + 8 + 4 + 3) = 24 \text{ Lac Tonnes} \]

\[ \text{Therefore, required part } \frac{2}{24} = \frac{1}{12} \]

149. Which of the above States is least producer of wheat?

(a) Maharashtra

(b) Paschim Bengal

(c) Madhya Pradesh

(d) Haryana

\[ \text{(b) Paschim Bengal} \]

150. In which of the above States, the total production of rice and wheat is the least?

(a) Paschim Bengal

(b) M.P.

(c) Maharashtra

(d) Haryana

\[ \text{(c) Maharashtra} \]
Part (D) English Language

Directions (Q.Nos. 151-155) In these questions, some part of the sentences have errors and some have none. Find out which part of a sentence has an error.

151. I wasn’t at the last meeting and 
   (a) neither was you / No error 
   (b) neither was you / Error 
   (c) (d) 
   (c) ‘were’ was 

152. from one another / No error 
   (c) (d) 
   (c) 

153. He remembered that his visa / 
   (a) will be expired in a month / No error 
   (b) (c) (d) 
   (c) ‘will expire’ was 

154. When I shall see him / I shall tell him / No error 
   (a) (b) (c) (d) 
   (a) ‘shall’ is 

155. In any case no disciplinary action / 
   (a) are required / No error 
   (b) (c) (d) 
   (d) (b)’s 

Directions (Q.Nos. 156-160) In these questions sentences are given below 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.

156. That hardly counts, 
   (a) does it? (b) doesn’t it? (c) do it? (d) don’t it? 
   (a) 

157. There aren’t ______ mountains in that part of the country. 
   (a) much (b) many (c) more (d) less 
   (b) 

158. An optimist thinks that all ______ well 
   (a) shall (b) will be (c) is (d) was 
   (c) 

159. Only people who are afraid to sign 
   (a) unreported (b) anonymous (c) official (d) informal 
   (b) 

160. The examination will begin ______ Monday. 
   (a) from (b) in (c) at (d) on 
   (a) 

Directions (Q.Nos. 161-165) Out of the four alternatives, choose the one which best expresses the meaning of the given word.

161. Novice 
   (a) Beginner (b) Virulent (c) Trainer (d) Learner 
   (b) 

162. Adversary 
   (a) Pervert (b) Conscientious (c) Opponent (d) Agonistic 
   (c) 

163. Dishonour 
   (a) Infamy (b) Glory (c) Uncouth (d) Wicked 
   (a) 

164. Entitle 
   (a) Scholarly (b) Friendly (c) Miserly (d) Lovely 
   (a) 

165. Idea 
   (a) Comprehension (b) Notion (c) Emotion (d) Gent 
   (b) 

Directions (Q.Nos. 166-170) Choose the word opposite in meaning to the given word.

166. Obvious 
   (a) Simple (b) Clear (c) Difficult (d) Vague 
   (d) 

167. Implicit 
   (a) Explicit (b) Implied (c) Explained (d) Exquisite 
   (b) 

168. Capable 
   (a) Catch (b) Derain (c) Liberate (d) Stop 
   (d) 

169. Repressive 
   (a) Attractive (b) Offensive (c) Defensive (d) Pensive 
   (a) 

170. Misery 
   (a) Sorry (b) Careless (c) Joy (d) Content 
   (c) 

Directions (Q.Nos. 171-175) Four alternatives are given for the idiom/phrase. Choose the alternative which best expresses the meaning of the idiom/phrase.

171. To play havoc with 
   (a) To rain (b) To alter (c) To swallow (d) To affect 
   (b) 

172. Herculean task 
   (a) An easy puzzle (b) A good convet (c) A difficult thing (d) A humbled job 
   (b) 

173. A red letter day 
   (a) An unimportant day (b) A festive occasion (c) An important day (d) An insignificant occasion 
   (b) 

174. A bone of contention 
   (a) A piece of dispute (b) A settled quarrel (c) Food for thought (d) Competition 
   (c) 

175. To give currency 
   (a) To make publicly known (b) To misinterpret (c) To bestow importance (d) To originate 
   (d) 

Directions (Q.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 alternatives. In case no improvement is needed your answer is (d).

176. He ______ it out the window. 
   (a) threw (b) throw (c) thrown (d) No improvement 
   (a) 

177. In the hot afternoon, I ______ the shade of a tree. 
   (a) shelter (b) shade (c) cool (d) No improvement 
   (a) 

178. Your answer book will be ______ with the help of a computer. 
   (a) judged (b) tested (c) evaluated (d) seen 
   (c) 

179. Marconi ______ the radio. 
   (a) discovered (b) made (c) invented (d) No improvement 
   (a) 

180. He ______ great ______ to his friend. 
   (a) kindness (b) kind heart (c) kind hearted (d) No improvement 
   (b)
Directions (Q. Nos. 181-185) Out of the four alternatives, choose the one which can be substituted for the given words/sentence.

181. Ability to go on inspite of difficulties
(a) Delinquent (b) Despotic
(c) Perseverance (d) Pervasive

182. The number of ships, vehicles etc. travelling together under escort
(a) Retinue (b) Fleet
(c) Posse (d) Convoy

183. An instrument for measuring wind pressure.
(a) Manometer (b) Micrometer
(c) Temperature (d) Barometer

184. To destroy completely.
(a) Annihilate (b) Rehabilitate
(c) Incapacitate (d) Dislocate

185. To die in water or any other liquid because one is unable to breathe
(a) Skin (b) Drown
(c) Founder (d) Founder

Directions (Q. Nos. 186-190) 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. The great advantage of early rising is the good 186. It gives us in our day's work. The early riser can do a large amount of work 187. Other men get out of bed. In the early morning the mind is fresh, and there are few sounds or other 188. So that work done at that time is generally 189. In many cases the early riser also finds time to 190. Exercise in the fresh morning air, and this exercise supplies him with a fund of energy that will last 191. The evening. By beginning so early, he knows that he has plenty of time to do 192. Or the work he can be 193. To do, and is not tempted to 194. Over any part of it. All his work being finished in good time, he has a long 195. Of rest in the evening, before the timely hour when he goes to bed.

186. (a) sick (b) habit
(c) rise (d) start

187. (a) Surgeon (b) Surgeon
(c) Surgeon (d) Surgeon

188. (a) Potatoes (b) Potatoes
(c) Potatoes (d) None of these

189. (a) irreversible (b) irreversible
(c) irreversible (d) irreversible

190. (a) quickly done (b) well done
(c) smartly done (d) secretly done

191. (a) perform (b) act
(c) do (d) undergo

192. (a) for (b) by
(c) until (d) in

193. (a) happily (b) leisurely
(c) thoroughly (d) slowly

194. (a) paid (b) deemed
(c) forced (d) expected

195. (a) run (b) hurry
(c) worry (d) ponder

196. (a) epoch (b) moment
(c) moment (d) interval