

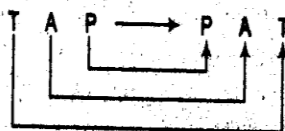
## Part (A) General Intelligence

**Directions** (Q.Nos. 1-9) Select the related words/letters/numbers from the given alternatives.

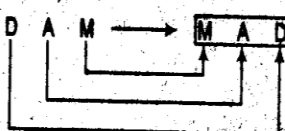
1. TAP : PAT :: DAM : ?

- (a) BUND (b) MAD  
(c) STOP (d) AMD

As

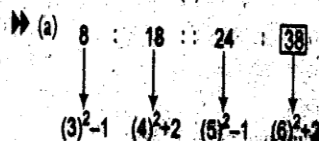


Similarly,



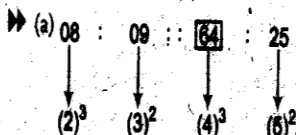
2. 8 : 18 :: 24 : ?

- (a) 38 (b) 32  
(c) 44 (d) 43



3. 08 : 09 :: ? : 25

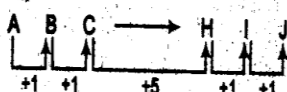
- (a) 64 (b) 16  
(c) 27 (d) 36



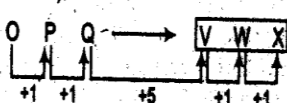
4. ABC : HIJ :: OPQ : ?

- (a) WVX (b) VWX  
(c) XWV (d) YXW

As



Similarly,



5. 6 : 35 :: 9 : ?

- (a) 18 (b) 27 (c) 53 (d) 72

As,  $6 \Rightarrow 6 \times 6 - 1 = 35$

Similarly,

$$9 \Rightarrow 9 \times 9 - 1 = 80$$

6. Library : Books :: Bank : ?

- (a) Cheque (b) Loan  
(c) Money (d) Account

(c) Books put in Library, in the same way, Money puts in Bank.

7. Child : Father :: Book : ?

- (a) Author (b) Publisher  
(c) Editor (d) Library

(a) As Child related to Father, in the same way, Book related to Author.

8. Sin : Crime :: ?

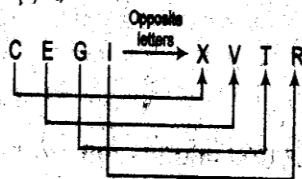
- (a) Man : Animal  
(b) Home : Court  
(c) Morality : Legality  
(d) Jury : Priest

(c) Sin is related to Crime, in the same way, Morality is related to Legality.

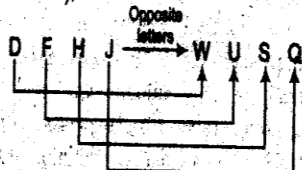
9. CEGI : XVTR :: DFHI : ?

- (a) XTRT (b) XQOM  
(c) ZVSO (d) WUSQ

(d) As



Similarly,



**Directions** (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) Except 'Frequently - Always' all other two words are opposite to each other.

11. (a) 46, 24 (b) 62, 32

(c) 56, 30 (d) 74, 38

(c)  $46 + 2 \Rightarrow 23 + 1 \Rightarrow 24$

$$62 + 2 \Rightarrow 31 + 1 \Rightarrow 32$$

$$56 + 2 \Rightarrow 28 + 1 \Rightarrow 29$$

$$74 + 2 \Rightarrow 37 + 1 \Rightarrow 38$$

Therefore, 56, 30 is different from the other three.

12. (a) RPSZ (b) AILUE

(c) QRTM (d) HQMAR

(b) Only AILUE has vowel letters.

13. (a) 441 (b) 256

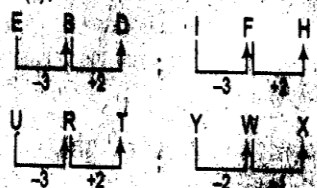
(c) 481 (d) 361

(c) 481 is different from the other three because 441, 256 and 361 are the perfect squares but 481 is not a perfect square.

14. (a) EBD (b) FGH

(c) URT (d) YWX

(d)



Therefore, YWX is different from the other three.

15. (a) Cricket (b) Hockey

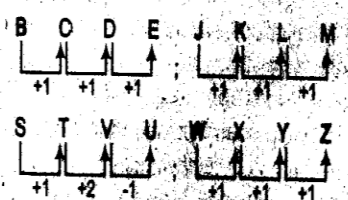
(c) Shuttle Cock (d) Tennis

(c) Shuttle Cock is different from the other three because Cricket, Hockey and Tennis are the names of different games.

16. (a) BCDE (b) JKLM

(c) STVU (d) WXYZ

(c)



Therefore, STVU is different from the other three.

17. (a) 3216 (b) 2338  
(c) 3205 (d) 2015

⇒ (d)  $3216 \Rightarrow 3+2+6-1 \Rightarrow 10$   
 $2338 \Rightarrow 2+3+8-3 \Rightarrow 10$   
 $3205 \Rightarrow 3+2+5-0 \Rightarrow 10$   
 $2015 \Rightarrow 2+0+5-1 \Rightarrow 6$

Therefore 2015 is different from the other three.

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

⇒ (d) 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?

19. 1. Hundred 2. Unit  
3. Thousand 4. Tens

5. Lakh  
(a) 2, 4, 1, 3, 5 (b) 4, 1, 3, 2, 5  
(c) 5, 1, 2, 3, 4 (d) 5, 1, 3, 4, 2

⇒ (a) Ascending order of the given words is as follows  
Unit, Tens, Hundred, Thousand, Lakh.

20. 1. Lucknow 2. Uttar Pradesh  
3. India 4. World

5. Asia  
(a) 1, 2, 3, 5, 4 (b) 4, 1, 2, 3, 5  
(c) 5, 1, 2, 3, 4 (d) 5, 1, 3, 2, 4

⇒ (a) Ascending order of the given words is as follows,  
Lucknow, Uttar Pradesh, India, Asia, World.

21. Which will appear fourth in the English dictionary?

- (a) Quick (b) Question  
(c) Quality (d) Quit

⇒ (d) The order of words according to the English dictionary is as follows  
Quality, Question, Quick, Quit.  
So, Quit will appear fourth in English dictionary.

22. Which one set of letters when sequentially placed at the gaps in the given letter-series shall complete it?

- A' B — B' A A' — B B' — A  
(a) A' B A B' (b) A' B' A B  
(c) A B A B (d) A B' A' B

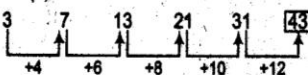
⇒ (c)  $\Delta A' B' B' A / A' \Delta B' B' A \Rightarrow A B A B$

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

23. 3, 7, 13, 21, 31, ?

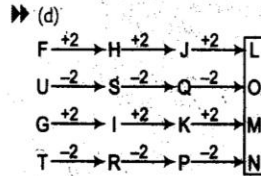
- (a) 33 (b) 36  
(c) 41 (d) 43

⇒ (d)



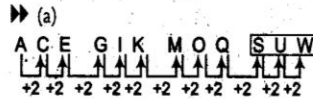
24. FUGT, HSIR, JQKP, ?

- (a) KNLO (b) LNNM  
(c) LOMM (d) LOMN



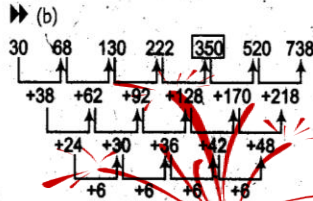
25. ACE, GIK, MOQ, ?

- (a) SUW (b) XYZ  
(c) ABC (d) DFG



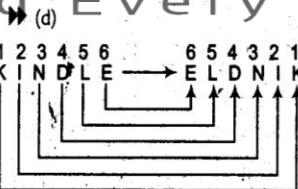
26. 30, 68, 130, 222, ?, 520, 738

- (a) 420 (b) 350  
(c) 250 (d) 280

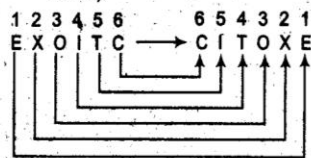


27. In a certain code "KINDLE" is coded as "ELDNIK".

- (a) EXOTIC (b) CXOTIE  
(c) COXITE (d) CITOXE



Similarly,



28. Devendra is older by 4 yr to Rajendra. After 16 yr, Devendra will be thrice 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) 25 yr (c) 24 yr (d) 20 yr

⇒ (d) Suppose Rajendra's age = x yr  
and Devendra's age = x + 4 yr  
Then,  $(x + 4) + 16 = 3(x + 4)$   
 $\Rightarrow x + 20 = 3x + 12$

$$\Rightarrow 2x = 8$$

$$\Rightarrow x = 4 \text{ yr}$$

Hence, Rajendra's age after 16 yr = x + 16 = 20 yr

29. From the given alternatives select the word, which cannot be formed by using the letters of the given word.

MORTGAGE

- (a) AROMA (b) GEAR  
(c) ROAM (d) GRATE

⇒ (a) The word AROMA cannot be formed using the given letters.

30. From the given alternatives select the word, which can be formed by using the letters of the given word.

RECOMMENDATION

- (a) COMMUNICATE  
(b) MEDIATES  
(c) MEDICO  
(d) REMINDER

⇒ (c) The word MEDICO can be formed using the given letters.

31. Hari is older than Chaman. Vijai is older than Satish. Mukesh is not as old as Vijai but is older than Chaman. Satish is not as old as Chaman. Who is the youngest?

- (a) Hari (b) Mukesh  
(c) Chaman (d) Satish

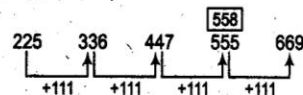
⇒ (d) According to given conditions,  
 Hari > Chaman  
 Vijai > Satish  
 Mukesh > Chaman  
 Chaman > Satish  
 Using these conditions we can conclude that Satish is the youngest.

32. Find the wrong number in the given series.

225, 336, 447, 555, 669

- (a) 225 (b) 447 (c) 555 (d) 669

⇒ (c)



So, 555 is the wrong number in the given series.

33. If HIGH is written as 8978 then DEAF = ?

- (a) 1342 (b) 1432  
(c) 4516 (d) 4615

⇒ (c) As, H I G H  $\rightarrow$  8978

Similarly,

D E A F  $\rightarrow$  4516

**Directions (Q.Nos. 34-35)** Select the missing number from the given responses.

34. 8 7 5

10 7 5

9 7 ?

- (a) 2 (b) 5 (c) 1 (d) 25



►► (b) As,  $8 + 10 \Rightarrow 18 + 2 = 9$

and  $7 + 7 \Rightarrow 14 + 2 = 7$

Similarly,

$5 + 5 \Rightarrow 10 + 2 \Rightarrow 5$

35. 9 5 4 10

8 7 6 9

12 6 8 ?

(a) 8 (b) 9 (c) 10 (d) 12

►► (c) As,  $9 + 5 = 4 + 10 \Rightarrow 14 = 14$

and  $8 + 7 = 6 + 9 \Rightarrow 15 = 15$

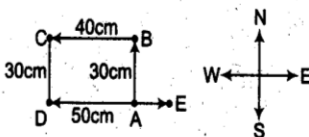
Similarly,

$12 + 6 = 8 + ? \Rightarrow ? = 18 - 8 = 10$

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) 50 m (b) 40 m  
(c) 30 m (d) 10 m

►► (d)



The required distance is

$AE = DE - AD$

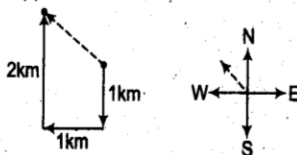
$AE = 50 - 40 = 10 \text{ m}$

( $\because AD = BC$ )

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) North-East

►► (c)



The required direction is North-West.

38. If A for Addition, M for Multiplication, D for Division, G for Greater than, L for Less than, then, which of the following will be logically correct?

(a) 4A 5D 3G 6A 2M 3  
(b) 4A 5M 4L 6D 2A 8  
(c) 4D 2A 4G 6D 2A 4  
(d) 4A 3M 2L 4D 2M 6

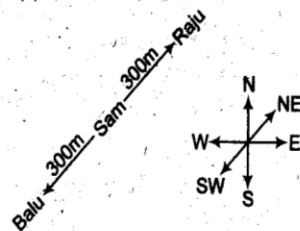
►► (d) From option (d),  
 $4 \div 3 \times 2 \times 4 \div 2 \times 6$   
 $4 \div 3 \times 2 < 4 \div 2 \times 6$   
 $10 < 12$

39. Balu's house is 300 m away from that of Sam. Balu stays 300 m South-West of Sam's house. Raju

resides 600 m North-East of Balu's house. Then where is the position of Sam's house in relation to Raju's?

(a) North-East (b) South-East  
(c) North-West (d) South-West

►► (d)

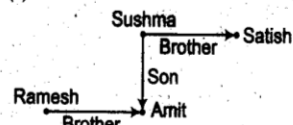


Hence, Sam's house is in South-West direction with respect to Raju's house.

40. Ramesh is the brother of Amit. Sushma is the sister of Satish. Amit is the son of Sushma. How is Ramesh related to Sushma?

(a) Father (b) Brother  
(c) Son (d) Nephew

►► (c)



So, Ramesh is son of Sushma.

41. Select the correct combination of mathematical signs to replace (\*) signs and to balance the given equation.

$24 * 2 * 4 * 3$

(a)  $= \times$  (b)  $+ =$   
(c)  $+ \times$  (d)  $= \times +$

►► (c)

From option (c),

$24 + 2 = 4 \times 3$

$\Rightarrow 12 = 12$

42. Some equations are solved on the basis of certain system. On the same basis, find out the correct answer for the unsolved equation.

$3 \times 5 \times 7 = 15, 2 \times 4 \times 6 = 12, 4 \times 7 \times 9 = ?$

(a) 28 (b) 21  
(c) 20 (d) 18

►► (c) As,  $3 + 5 + 7 = 15$

and  $2 + 4 + 6 = 12$

Similarly,

$4 + 7 + 9 = 20$

**Directions** (Q.Nos. 43-44) Two statements are given below followed by two conclusions (I) and (II). You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You are to decide which of given conclusions, if any, follow from the given statements? Indicate your answer.

43. **Statements** Latha is a beautiful and intelligent 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

►► (d)



Conclusions

I. x

II. x

44. **Statements** All writers are lawyers.

All readers are lawyers.

**Conclusions** I. Some lawyers are readers.

II. Some readers are writers.

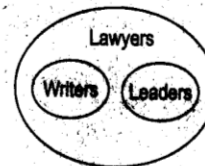
(a) Only conclusion I follows

(b) Only conclusion II follows

(c) Both conclusions I and II follow

(d) Neither conclusion I nor II follows

►► (a)



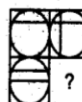
Conclusions

I. ✓

II. x

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

**Question Figure**



**Answer Figures**



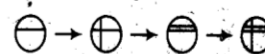
(a)

(b)

(c)

(d)

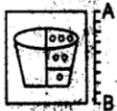
►► (d) From the figure (d),



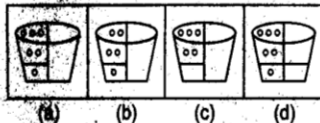
Now, the pattern of the question figure is completed.

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

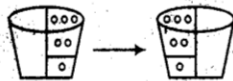
Question Figure



Answer Figures



► (a) The mirror image of the given figure is



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 next by its column, e.g., 'A' can be represented by 01, 12, 33 etc. and 'K' can be represented by 57, 68, 85 etc. Identify the set for the word EAST.

Matrix I

	0	1	2	3	4
0	E	A	R	W	P
1	W	P	A	E	R
2	A	W	P	R	E
3	P	R	E	A	W
4	R	E	W	P	A

Matrix II

	5	6	7	8	9
5	S	B	K	T	C
6	B	C	T	K	S
7	T	S	C	B	K
8	K	T	S	C	B
9	C	K	B	S	T

Select the correct answer using the options given below,

- (a) 00 12 76 58 (b) 32 34 76 68  
(c) 41 20 77 59 (d) 24 02 55 76

► (a) From option (a),

00 ⇒ E

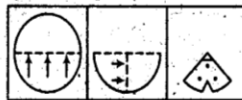
12 ⇒ A

76 ⇒ S

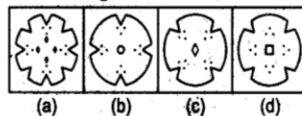
58 ⇒ T

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?

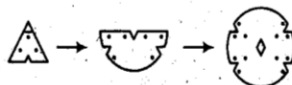
Question Figures



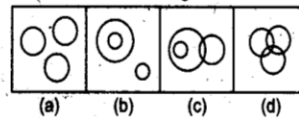
Answer Figures



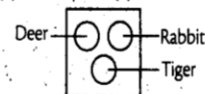
► (c)



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



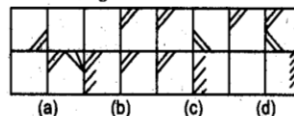
► (a) From option (a),



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



Answer Figures



► (d) From option (d),  
In the figure



question figure is embedded.

## Part (B) General Awareness

51. In which year did Gandhi ji start Satyagraha Movement?

- (a) 1919 (b) 1927  
(c) 1934 (d) 1942

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

52. 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.

53. The telephone was invented by

- (a) G Marconi  
(b) Alexander Graham Bell  
(c) J L Baird  
(d) Thomas Barrow

► (b) Telephone was invented by Alexander Graham Bell of Canada in 1876.

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) Southern 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 Asom, Meghalya, 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) Smilax  
(c) Nepenthes  
(d) Nerium
- (c) *Nepenthes* popularly known as tropical pitcher plants or monkey cups is a specie 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 to  
(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 night  
(d) guide and warn the ships coming from different directions in the ocean
- (c) A lighthouse is a tower, building or other type of structure designed to emit light from a system of lamps and lenses to aid help in navigation, to find location of harbours and other dangers during night.
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) **Capitalist Economy** An economic system based on private ownership of capital. In such an economy there is no control of government on market policies. The means of production are privately owned and operated for profit. The price of goods in such economy are determined by demand and supply.
- Higher the demand, higher the prices and vice versa.
63. Who of the following has **not** been an interlocutor on Jammu 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), Dileep Padgaonkar (Journalist) and Radha Kumar (Academician).
64. The Zone of Earth's atmosphere immediately above its surface up to a height of about 16 kms above equator and 8 kms over the poles is known as  
(a) Mesosphere (b) Thermosphere  
(c) Troposphere (d) Stratosphere
- (c) Troposphere is the lowermost layer of atmosphere above the Earth surface, followed by stratosphere at an average height of 50 kms from the Earth surface, above it mesosphere at an average height of 85 kms and above it lies the thermosphere at an average height of between 320-380 kms from the Earth surface.
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
- (d) The filament of electric bulb is made from the element tungsten, as tungsten is found best because of its high melting point (almost 3700 K) and good resistance to electric current.
67. Which of the following is called "brown paper"?  
(a) Jute (b) Cotton  
(c) Rubber (d) Tea
- (a) Jute is called the 'brown paper of wholesale trade'. Since it is used for one package of many commodities such as cotton, rice, wool, wheat etc.
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) A Secular State is one which has no religion of its own i.e., the state which does not recognize any particular religion but give equal protection to all. For e.g.,—India is a Secular State.
69. What does Jahangir mean?  
(a) National Monarch  
(b) The Grand Monarch
- (c) Conqueror of the World  
(d) Hero of Hundred Battles
70. Gol Gumbaz is in  
(a) Konark (b) Hyderabad  
(c) Puri (d) Bijapur
- (d) Gol Gumbaz is the tomb of Mohd. Adil Shah situated in Bijapur in the State of Karnataka.
71. The early Buddhist Scriptures were composed in  
(a) Prakrit texts  
(b) Pali texts  
(c) Sanskrit texts  
(d) Pictographical texts
- (b) The most common language used in Buddhist Scriptures was Pali. Buddha gave his maximum sermon in Pali language.
72. In Mohanjodaro, the largest building is  
(a) the great bath  
(b) a granary  
(c) the Pillared Hall  
(d) a two storeyed house
- (a)
73. Where was the Royal Durbar held on November 1st 1858 to issue the Queen's proclamation?  
(a) Lucknow (b) Cawnpore  
(c) Delhi (d) Allahabad
- (d) After the Revolt of 1857 the British Parliament transferred the power of East India Company to the crown by the government of India Act 1858. In order to inform the Indian rulers and people, the British Queen issued a proclamation, which was read at Royal Durbar held at Allahabad on November 1, 1858.
74. Male (Anopheles) mosquito feeds on  
(a) blood of man (b) nectar of flower  
(c) blood of Culex (d) blood of leech
- (a)
75. Tooth paste is a product sold under  
(a) monopolistic competition  
(b) perfect competition  
(c) monopoly  
(d) duopoly
- (a) **Monopolistic competition** It is a type of imperfect competition such that competing producers sell products that are different from one another as good but not perfect substitutes i.e., every producer tries to keep his product dissimilar than his rival's product in order to maintain his separate identity.
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) and (c) National Development Council the apex decision making body in India. It finalise 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 UT's and other members of Planning Commission.

77. 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

- (a) Inadequate inputs availability, fragmentation of land holdings and poor finance are the major reasons of low productivity in agriculture in India. But cooperative farming in India is introduced to increase the productivity of agriculture in India. Cooperative farming means bringing together of all the small fragmented land holdings of the farmers in such an organized and united way that they will be collectively in a position to grow on every bit of land to the best of the fertility of land.

78. The gas that is used in the manufacture of vanaspathi ghee is

- (a) oxygen (b) carbon dioxide  
(c) hydrogen (d) nitrogen

- (c)

79. Cement is usually a mixture of

- (a) calcium silicate and calcium aluminate  
(b) calcium silicate and calcium ferrate  
(c) calcium aluminate and calcium ferrate  
(d) lime stone and silicon dioxide

- (a) Cement is made up mostly of calcium silicate (50-70%) and Calcium Aluminate (15%-5%).

80. Which of the following is not a Hardware?

- (a) Processor chip (b) Printer  
(c) Mouse (d) Java

- (d) Java is a programming language in computers rest others are hardware.

81. Scurvy is caused due to the deficiency of

- (a) Vitamin - D (b) Vitamin - K  
(c) Vitamin - E (d) Vitamin - C

- (d)

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

- (c) 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'.

83. The Parliament can legislate on subjects given in the Union List only in consultation with the State Government for the State of

- (a) Asom  
(b) Rajasthan  
(c) Jammu and Kashmir  
(d) Kerala

- (c) Union List of India is mentioned under VII schedule of Indian Constitution and contains 100 subjects. Parliament has the exclusive power to legislate on the subjects given under Union List but any legislation effecting J & K would only be passed after in consultation with the State government of J & K because under Article 370 of Indian Constitution J & K is given special status.

84. Tsunamis are waves generated by

- (a) earthquakes beneath the Sea  
(b) moon's pull  
(c) high tides of the Oceans  
(d) cyclones

- (a) Tsunami is a Japanese word which are a series of very very high water waves, caused due to earthquakes, volcanic eruption beneath the sea.

85. Which is the largest State of India?

- (a) Madhya Pradesh  
(b) Andhra Pradesh  
(c) Rajasthan  
(d) Maharashtra

- (c) Rajasthan is the biggest State of India in terms of area followed by Madhya Pradesh, Maharashtra and Andhra Pradesh. Goa is the smallest State of India.

86. Which one of the following is a system software?

- (a) Database programmes  
(b) Word processors  
(c) Spreadsheets  
(d) Compilers

- (b) A word processor is a computer application software used for the production of any sort of printable material.

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

- (a) Upthrust When an object is dropped into the water, it sinks down or float, it depends upon its upthrust

force, it is that force which pushes upward or downward. an object. When a body is fully or partly submerged in a fluid the upthrust equals the weight of fluid displaced. Since the wood is heavy so it will sink down, so the upthrust on it will be equal to the weight of the wood.

88. Kamakhya temple is an important place of tourism in the State of

- (a) Tamil Nadu  
(b) Asom  
(c) Himachal Pradesh  
(d) Manipur

- (b) Kamakhya Temple is a Shakti-Peeth Temple situated on the Nilachal hill in Western part of Guwahati, Asom.

89. Electric bulbs are filled with

- (a) nitrogen (b) carbon dioxide  
(c) argon (d) oxygen

- (c) Electric bulbs are filled with an inert gas Argon because it resists the filament tendency to burn up.

90. The atmospheric gas that is mainly responsible for Green House effect

- (a) Ozone (b) Nitrogen  
(c) Oxygen (d) Carbon dioxide

- (d) Green House effect is the heating up of Earth's atmosphere. It is the phenomenon in which incoming solar radiation are absorbed the atmosphere but outgoing terrestrial radiation are unable to pass. Thus the trapping of heat again and again results in higher temperature of Earth's atmosphere. The main gas which is responsible for Green House effect is CO<sub>2</sub>.

91. Wisdom teeth is the

- (a) 1st molar teeth (b) 2nd molar teeth  
(c) 3rd molar teeth (d) 4th molar teeth

- (c) There are four type of teeth in an adult human : Incisors (4x2), canines (1x4), premolars (2x4) and molars (3x4). Molars are food grinding teeth placed far back in the mouth. Wisdom teeth or 3rd molars are the last ones to erupt about at the age of 20.

92. Who of the following Pairs of Nobel Laureates in Physics was awarded 2010 Nobel Prize?

- (a) John C Mather, George F Smoot  
(b) Albert Fert, Peter Grunberg  
(c) David J Gross, Frank Wilczek  
(d) Andre Geim, Konstantin Novoselov

- (d) The Nobel Prize in Physics 2010 was Awarded jointly to Andre Geim and Konstantin of Russia "for ground breaking experiments regarding the two dimensional material graphene."

93. "Tabel Chongli" is a form of folk dance associated with the State of

- (a) Paschim Bengal (b) Asom  
(c) Andhra Pradesh (d) Maharashtra

- (b)



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

►► (d)

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

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

Order given place	State
Itanagar	Arunachal Pradesh
Guwahati	Assam
Shillong	Meghalaya

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

Varnas	Occupation
1. Brahmins	priests
2. Kshatriya	kings, governors and soldiers
3. Vaishyas	cattle herders, agriculturists and merchants
4. 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 ore. They are  
 (i) Magnetite ( $\text{Fe}_3\text{O}_4$ ) — contains 72% iron  
 (ii) Hematite ( $\text{Fe}_2\text{O}_3$ ) — contains 70% iron  
 (iii) Limonite ( $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$ ) — contains 50-66% iron  
 (iv) Siderite ( $\text{FeCO}_3$ ) — contains 48% iron

99. Surat is located on the banks of the river  
 (a) Narmada (b) Sharavathi  
 (c) Mahi (d) Tapi

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

100. The tusk of elephant is an enormously enlarged  
 (a) upper incisor (b) upper canine  
 (c) lower canine (d) lower incisor

►► (a)

### 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) 12% (b) 16%  
 (c) 18% (d) 20%

►► (d) Let Principle amount is ₹ P, amount after 1 yr is ₹ A and simple interest is SI. We know that  $A = SI + P$

$$\text{and } \frac{P}{A} = \frac{10}{12}$$

$$(\text{Given}) \quad A = \frac{12P}{10}$$

$$\Rightarrow \frac{12P}{10} = \frac{1 \times P \times r}{100} + P$$

$$\Rightarrow \frac{12P}{10} = P \left( \frac{r}{100} + 1 \right)$$

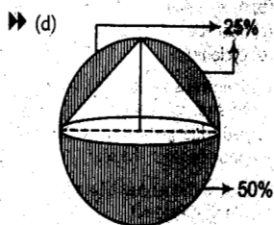
$$\frac{6}{5} = \frac{r}{100} + 1$$

$$\frac{6}{5} - 1 = \frac{r}{100}$$

$$\frac{1}{5} = \frac{r}{100}$$

$$r = 20\%$$

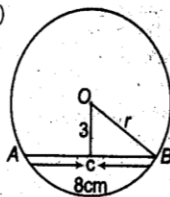
102. A solid cone of height 9 cm with diameter of its base 18 cm is cut out from a wooden solid sphere of radius 9 cm. The percentage of wood wasted is  
 (a) 25 (b) 30 (c) 30 (d) 75



Percentage of wood wastage = 50% + 25% = 75%

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)



Let the radius of circle is r cm.

$$\text{Then, } (OB)^2 = (OC)^2 + (BC)^2$$

[Pythagoras Theorem]

$$r^2 = (3)^2 + (4)^2$$

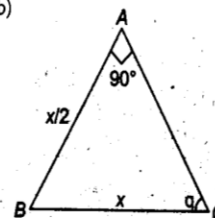
$$= 9 + 16$$

$$= 25$$

$$\therefore r = \sqrt{25} = 5 \text{ cm}$$

104. In  $\triangle ABC$ ,  $\angle BAC = 90^\circ$  and  $AB = \frac{1}{2}BC$ . Then the measure of  $\angle ABC$  is  
 (a)  $60^\circ$  (b)  $30^\circ$  (c)  $45^\circ$  (d)  $15^\circ$

►► (b)



Here,  $\angle BAC = 90^\circ$ , hypotenuse = x and perpendicular =  $\frac{x}{2}$

$$\sin \theta = \frac{x}{2 \times \frac{x}{2}} = \frac{1}{2}$$

$$\therefore \theta = 30^\circ$$

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 =  $4 \times 130 = 520$   
 $\therefore$  The excluded numbers =  $700 - 520 = 180$

106. If toys are bought at ₹ 5 each and sold at ₹ 4.50 each, then the loss is  
(a) 10% (b) 11% (c) 12% (d) 13%

►► (a) Cost price of toys = 5x  
and Selling price = 4.5x  
Loss = 5x - 4.5x = 0.5x  
∴ % loss =  $\frac{0.5x}{5x} \times 100$   
= 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

►► (b) Required number = HCF of (110 - 2) and (128 - 2) = 108, 126  
108) 126 (1

$$\begin{array}{r} 108 \\ 18) 108 (6 \\ \underline{108} \\ 0 \end{array}$$

= 18

108. If  $a = 23$  and  $b = -29$ , then the value of  $25a^2 + 40ab + 16b^2$  is

(a) 1 (b) -1  
(c) 0 (d) 2

►► (a)  $25a^2 + 40ab + 16b^2$   
=  $(5a + 4b)^2$   
=  $[5 \times 23 + 4 \times (-29)]^2$   
=  $[115 + (-116)]^2$   
=  $(-1)^2 = 1$

109. If  $(2^x)(2^y) = 8$  and  $(9^x)(3^y) = 81$ , then

(x, y) is  
(a) (1, 2) (b) (2, 1)  
(c) (1, 1) (d) (2, 2)

►► (a)  $(2^x)(2^y) = (2^3)$   
 $x + y = 3$  ... (i)

$$(9^x)(3^y) = 81$$

$$(3^{2x})(3^y) = (3^4)$$

$$2x + y = 4$$
 ... (ii)

Solving the Eqs. (i) and (ii),

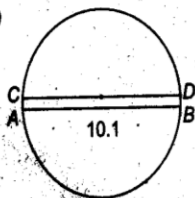
$$x = 1, y = 2$$

$$\therefore (x, y) = (1, 2)$$

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

►► (b)



∴ AB (chord) = 10.1 cm, and Longest chord = Diagonal

CD = Longest chord = 2x radius > chord  
= 2x5 > chord

∴ The radius of this circle must be greater than 5 cm.

111. Both the end digits of a 99 digit number N are 2. N is divisible by 11, then all the middle digits are

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

►► (d)

112. If  $0 < x < \frac{\pi}{2}$  and  $\sec x = \csc y$ , then

the value of  $\sin(x + y)$  is

(a) 0 (b) 1  
(c)  $\frac{1}{2}$  (d)  $\frac{1}{\sqrt{3}}$

►► (a)  $\sec x = \csc y$

$$(\sec x)^2 = (\csc y)^2$$

$$\sec^2 x = \csc^2 y$$

$$1 + \tan^2 x = 1 + \cot^2 y$$

$$\tan x = \cot y$$

$$\frac{\sin x}{\cos x} = \frac{\cos y}{\sin y}$$

$$\sin x \cdot \sin y - \cos x \cdot \cos y = 0$$

$$\cos(x + y) = \cos \frac{\pi}{2}$$

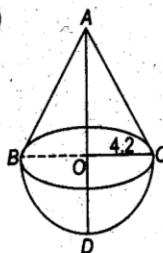
$$\therefore x + y = \frac{\pi}{2}$$

$$\therefore \sin(x + y) = \sin\left(\frac{\pi}{2}\right) = 1$$

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 (nearly)

(a) 104 cm<sup>3</sup> (b) 162 cm<sup>3</sup>  
(c) 427 cm<sup>3</sup> (d) 266 cm<sup>3</sup>

►► (d)



Height of cone = AD - OD

$$= 10.2 - 4.2$$

$$[ \because OD = OC = r ]$$

$$= 6 \text{ cm}$$

$$\text{Radius} = 4.2 \text{ cm}$$

∴ Volume of wooden toy

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

$$= \frac{1}{3} \times \pi \times r^2 \times 6 + \frac{2}{3} \times \pi \times r^3$$

$$= \frac{2\pi \times r^2}{3} (3 + r)$$

$$= \frac{2 \times 22 \times 4.2 \times 4.2}{3 \times 7} (3 + 4.2)$$

$$= \frac{44 \times 7.2 \times 17.64}{21}$$

$$= 44 \times 7.2 \times 0.84$$

$$= 266.112 \approx 266 \text{ cm}^3$$

114. A can do a 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

►► (b) ∵ A can do a piece of work in 12 days and B is 50% more efficient

	A	B
Efficiency	100	150
Day	150	100
	↓ + 12.5	↓ + 12.5
	12	x

$$\therefore x = \frac{100}{12.5} = 8 \text{ days}$$

115. Each interior angle of a regular polygon is three times its exterior angle, then the number of sides of the regular polygon is

(a) 9 (b) 8  
(c) 10 (d) 7

►► (b)  $\frac{(2n - 4) \times 90}{2} = \frac{3}{1}$   
 $\frac{360}{2n - 4} = \frac{3}{1}$   
 $\frac{2n - 4}{4} = \frac{3}{1}$   
 $2n - 4 = 12$   
 $2n = 16$   
 $n = 8$

116. Selling an article at a profit of 5%, Mr X gets ₹ 150 more than selling it at a loss of 5%. Mr X purchased the article at

(a) ₹ 15,000 (b) ₹ 1500  
(c) ₹ 150 (d) ₹ 15

►► (b) Let the cost price of an article = ₹ 100

Then difference

$$= 105 - 95 = ₹ 10$$

If difference of ₹ 10, then 'x' gets ₹ 150 more, than selling price

If difference of ₹ 100, then purchased

$$\text{the article at} = \frac{150 \times 100}{10} = ₹ 1500$$

117. The ratio of the radii of two circles is 1 : 2, then the ratio of their areas is

(a) 1 : 2 (b) 2 : 1  
(c) 1 : 4 (d) 4 : 5



117. (c) The required ratio =  $\frac{\pi r_1^2}{\pi r_2^2}$   

$$= \frac{\pi (2)^2}{\pi (2)^2}$$

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

$$= 1:4$$

118. The true discount on a sum of money during 2 yr hence at 5% is ₹ 15. Find the sum.

- (a) 150 (b) 165  
(c) 170 (d) 160

119. (b) True discount =  $\frac{ART}{100 + RT}$

[Here R = 5%, T = 2, Let amount is A]

$$15 = \frac{A \times 5 \times 2}{100 + 5 \times 2}$$

$$3 = \frac{2A}{110}$$

$$2A = 330$$

$$A = 165$$

119. The average weight of 5 persons sitting in a boat is 38 kg. The average weight of the boat and the persons sitting in the boat is 52 kg. What is the weight of the boat?

- (a) 228 kg (b) 122 kg  
(c) 232 kg (d) 242 kg

120. (b) Total weight without boat =  $38 \times 5$   
 $= 190$  kg

Total weight with boat =  $52 \times 6$

$$= 312 \text{ kg}$$

Weight of the boat =  $(312 - 190)$  kg  
 $= 122$  kg

120. The value of the expression  $x^4 - 17x^3 + 17x^2 - 17x + 17$  at  $x=16$  is

- (a) 0 (b) 1  
(c) 2 (d) 3

121. (b) If  $x=16$ , then  $(x-16)=0$ , and  $(x-16)$  is a factor of given expression

$$x-16 \mid \begin{array}{r} x^4 - 17x^3 + 17x^2 - 17x + 17 \\ x^4 - 16x^3 \\ \hline -x^3 + 17x^2 \\ -x^3 + 16x^2 \\ \hline x^2 - 17x \\ x^2 - 16x \\ \hline -x + 17 \\ -x + 16 \\ \hline 1 \text{ Remainder} \end{array}$$

$$-x^3 + 17x^2$$

$$-x^3 + 16x^2$$

$$x^2 - 17x$$

$$-x^2 + 16x$$

$$-x + 17$$

$$-x + 16$$

1 Remainder

So, the value of expression = 1

121. In a cylindrical vessel of diameter 24 cm filled up with sufficient quantity of water, a solid spherical ball of radius 8 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

122. (b) Let required height be  $h$

$$\pi r^2 h = \frac{4}{3} \pi r^3$$

$$\frac{22}{7} \times 12 \times 12 \times h = \frac{4}{3} \times \frac{22}{7} \times 6 \times 6 \times 6$$

$$h = 2 \text{ cm}$$

123. If  $x - \frac{1}{x} = 5$ , then  $x^2 + \frac{1}{x^2}$  is

- (a) 5 (b) 25 (c) 27 (d) 23

124. (c)  $\left(x - \frac{1}{x}\right) = 5$ ,  $x^2 + \frac{1}{x^2} = ?$

$$\left(x - \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} - 2$$

$$\therefore x^2 + \frac{1}{x^2} = \left(x - \frac{1}{x}\right)^2 + 2$$

$$= (5)^2 + 2$$

$$= 25 + 2$$

$$= 27$$

125. Each side of an equilateral triangle is 6 cm. Find its area.

- (a)  $9\sqrt{3}$  sq cm (b)  $6\sqrt{3}$  sq cm  
(c)  $4\sqrt{3}$  sq cm (d)  $8\sqrt{3}$  sq cm

126. (a) Area =  $\frac{\sqrt{3}}{4} \times (\text{side})^2$

$$= \frac{\sqrt{3}}{4} \times 36$$

$$= 9\sqrt{3}$$

124. If  $\sin 17^\circ = \frac{x}{y}$ , then the value of

$\sec 17^\circ - \sin 73^\circ$  is

- (a)  $\frac{y^2 - x^2}{xy}$  (b)  $\frac{x^2}{\sqrt{y^2 - x^2}}$

- (c)  $\frac{x^2}{y\sqrt{y^2 + x^2}}$  (d)  $\frac{x^2}{y\sqrt{y^2 - x^2}}$

125. (d)  $\sin 17^\circ = \frac{x}{y}$ ,  $\sec 17^\circ - \sin 73^\circ = ?$

$$\frac{1}{\cos 17^\circ} - \sin 73^\circ = \frac{1}{\cos 17^\circ} - \sin (90 - 17)^\circ$$

$$= \frac{1}{\cos 17^\circ} - \cos 17^\circ = \frac{1 - \cos^2 17^\circ}{\cos 17^\circ}$$

$$= \frac{\sin^2 17^\circ}{\cos 17^\circ} = \frac{x^2 + y^2}{\sqrt{1 - \sin^2 17^\circ}} = \frac{x^2 + y^2}{\sqrt{1 - \frac{x^2}{y^2}}}$$

$$= \frac{x^2}{y\sqrt{y^2 - x^2}}$$

125. The distance between Howrah and New Delhi via Patna is 1440 km, and the distance between Howrah and New Delhi via Gaya is 5% less. Then the distance between the places via Gaya (in kms) is

- (a) 1398 (b) 1368 (c) 1388 (d) 1268

126. (b) 5% of 1440 = 72 km

$$\therefore \text{Required distance} = 1440 - 72$$

$$= 1368 \text{ km}$$

126. The value of

$\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$  is

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

127. (a)  $\tan 1^\circ \tan 2^\circ \dots \tan 89^\circ$

$$= \tan 1^\circ \tan 2^\circ \dots \tan 45^\circ \dots \tan 88^\circ \tan 89^\circ$$

$$= \tan 1^\circ \tan 2^\circ \dots \tan 44^\circ \tan 45^\circ$$

$$\dots \tan (90 - 44)^\circ$$

$$\dots \tan (90 - 2^\circ) \tan (90 - 1)^\circ$$

$$= \tan 1^\circ \tan 2^\circ \dots \tan 44^\circ \tan 45^\circ \cot 44^\circ$$

$$\dots \cot 2^\circ \cot 1^\circ$$

$$= \tan 1^\circ \tan 2^\circ \dots \tan 44^\circ \tan 45^\circ \times \frac{1}{\tan 44^\circ}$$

$$\dots \frac{1}{\tan 2^\circ} \times \frac{1}{\tan 1^\circ}$$

$$= 1 \cdot 1 \cdot 1 \cdot \dots \tan 45^\circ$$

$$= 1 \cdot 1 \cdot 1 \cdot \dots 1 \cdot 1 = 1$$

127. 0.123 is equal to

- (a)  $\frac{14}{333}$  (b)  $\frac{41}{333}$   
(c)  $\frac{123}{1000}$  (d)  $\frac{441}{333}$

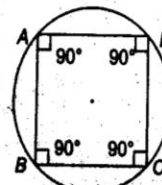
128. (b)  $0.123 = \frac{123}{999}$   

$$= \frac{41}{333}$$

128. ABCD is a cyclic parallelogram. The  $\angle B$  is equal to

- (a)  $30^\circ$  (b)  $60^\circ$   
(c)  $45^\circ$  (d)  $90^\circ$

129. (d)



$\therefore AB \parallel CD$  and  $AD \parallel BC$

$\therefore ABCD$  is a square, therefore,  $\angle B = 90^\circ$

129. Ravi travels 300 km partly by train and partly by car. He takes 4 h 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/h (b) 60 km/h  
(c) 100 km/h (d) 120 km/h

130. (b) Let speed of train and car is  $s_1$  and  $s_2$  respectively

$$\frac{60}{s_1} + \frac{240}{s_2} = 4 \quad \dots (i)$$

$$\Rightarrow \frac{15}{s_1} + \frac{60}{s_2} = 1$$

$$s_1 s_2 = 15s_2 + 60s_1$$

Now,  $\frac{100}{s_1} + \frac{200}{s_2} = 4 \frac{1}{6} \quad \dots (ii)$

$$\frac{100s_2 + 200s_1}{s_2 s_1} = \frac{25}{6}$$

$$\Rightarrow \frac{100s_2 + 200s_1}{15s_2 + 60s_1} = \frac{25}{6} \text{ (putting the value of } s_2)$$

$$\Rightarrow 600s_2 + 1200s_1 = 375s_2 + 1500s_1$$

$$\Rightarrow 225s_2 = 300s_1$$

$$\Rightarrow \frac{s_2}{s_1} = \frac{4}{3}$$

$$\therefore s_1 = \frac{3s_2}{4}$$

Putting the value of  $s_1$  in Eq. (i)

$$\Rightarrow \frac{60}{\frac{3s_2}{4}} + \frac{240}{s_2} = 4$$

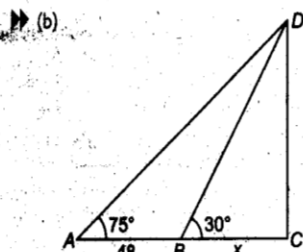
$$\Rightarrow \frac{240}{3s_2} + \frac{240}{s_2} = 4$$

$$\Rightarrow \frac{240 + 720}{3s_2} = 4$$

$$s_2 = \frac{320}{4} = 80 \text{ km/h}$$

$$\therefore s_1 = \frac{3 \times 80}{4} = 60 \text{ km/h}$$

130. 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  $15^\circ$  and  $30^\circ$ . If A and B are on the same side of the tower and  $AB = 48$  m, then the height of the tower is
- (a)  $24\sqrt{3}$  m (b) 24 m  
(c)  $24\sqrt{2}$  m (d) 96 m



$$\tan 15^\circ = \frac{CD}{48 + x} \Rightarrow \frac{\sqrt{3} - 1}{\sqrt{3} + 1} = \frac{CD}{48 + x}$$

$$\tan 30^\circ = \frac{CD}{x} \Rightarrow \frac{1}{\sqrt{3}} = \frac{CD}{x}$$

$$\Rightarrow x = CD\sqrt{3}$$

$$\Rightarrow \frac{\sqrt{3} - 1}{\sqrt{3} + 1} = \frac{x}{\sqrt{3} \times 48 + x\sqrt{3}}$$

$$\Rightarrow 144 + 3x - 48\sqrt{3} - x\sqrt{3} = \sqrt{3}x + x$$

$$\Rightarrow 144 - 48\sqrt{3} = 2\sqrt{3}x - 2x$$

$$x = \frac{144 - 48\sqrt{3}}{2(\sqrt{3} - 1)}$$

$$= \frac{48\sqrt{3}(\sqrt{3} - 1)}{2(\sqrt{3} - 1)}$$

$$= 24\sqrt{3}$$

$$24\sqrt{3} = CD\sqrt{3}$$

$$\therefore CD = 24$$

131. If A : B is 2 : 3, B : C is 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  
= 4 : 6 : 11

132. The allowances of an employee constitute 165% of his basic pay. If he receives ₹ 11925 as gross salary, then his basic pay is (in ₹)
- (a) 4000 (b) 5000  
(c) 4500 (d) 5500

► (c) Let the basic pay be ₹ x.

$$x + \frac{x \times 165}{100} = 11925$$

$$x \left( 1 + \frac{165}{100} \right) = 11925$$

$$x = \frac{11925 \times 100}{265}$$

$$= ₹ 4500$$

133. 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.

$$\text{So, the leak empties in } 10 \text{ h} = \frac{2}{8} \text{ i.e.,}$$

$$= \frac{1}{4} \text{ tank}$$

Hence, the full tank is emptied by leak  
=  $10 \times 4 = 40$  h

134. 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)

$$x(13 - x) = 36$$

$$\Rightarrow 13x - x^2 = 36$$

$$\Rightarrow x^2 - 13x + 36 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \text{ [Sri Dharacharya]}$$

$$= \frac{-(-13) \pm \sqrt{(-13)^2 - 4 \times (1) \times 36}}{2}$$

$$= \frac{13 \pm \sqrt{169 - 144}}{2}$$

$$= \frac{13 \pm \sqrt{25}}{2}$$

$$= \frac{13 + 5}{2}$$

$$= \frac{13 + 5}{2} = 9$$

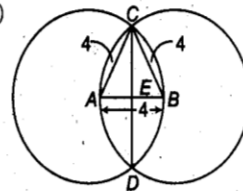
$$\text{Now, } \frac{13 - 5}{2} = 4$$

Positive difference =  $9 - 4 = 5$

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

- (a)  $2\sqrt{3}$  cm (b)  $4\sqrt{3}$  cm  
(c)  $2\sqrt{2}$  cm (d) 8 cm

► (b)



$\therefore AB = 4$  cm

Hence,  $AC = BC = AB$

Therefore, ABC is an equilateral triangle

$\therefore CD = 2 \times CE$

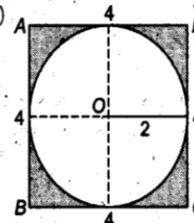
$$CE = \frac{\sqrt{3}}{2} \times \text{side}$$

$$= \frac{\sqrt{3}}{2} \times 4 = 2\sqrt{3}$$

$$\therefore CD = 2 \times 2\sqrt{3} = 4\sqrt{3}$$

136. From four corners of a square sheet of side 4 cm, four pieces, each in the shape of arc of a circle with radius 2 cm, are cut out. The area of the remaining portion is
- (a)  $(8 - \pi)$  sq cm (b)  $(16 - 4\pi)$  sq cm  
(c)  $(16 - 8\pi)$  sq cm (d)  $(4 - 2\pi)$  sq cm

► (b)



Required Area = Area of square - Area of circle

$$= (4)^2 - \pi(2)^2 = 16 - 4\pi$$

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

- (a)  $\sin \frac{A+B}{2} = \cos \frac{C}{2}$   
(b)  $\cos \frac{A+B}{2} = \sin \frac{C}{2}$   
(c)  $\tan \frac{A+B}{2} = \sec \frac{C}{2}$   
(d)  $\cot \frac{A+B}{2} = \tan \frac{C}{2}$

► (c)  $\therefore A + B + C = \pi$



$$\begin{aligned} \therefore A+B &= \pi - C \\ \text{and } \frac{A+B}{2} &= \left( \frac{\pi - C}{2} \right) \\ &= \left( \frac{\pi}{2} - \frac{C}{2} \right) \\ \therefore \sin \left( \frac{A+B}{2} \right) &= \cos \left( \frac{\pi}{2} - \frac{C}{2} \right) \\ \sin \left( \frac{A+B}{2} \right) &= \cos \frac{C}{2} \\ \cos \left( \frac{A+B}{2} \right) &= \cos \left( \frac{\pi}{2} - \frac{C}{2} \right) \\ &= \sin \frac{C}{2} \\ \tan \left( \frac{A+B}{2} \right) &= \tan \left( \frac{\pi}{2} - \frac{C}{2} \right) \\ &= \cot \frac{C}{2} \end{aligned}$$

Therefore option (c) is wrong.

138. If two-third of A is four-fifth of B, then

A : B = ?  
(a) 5 : 6 (b) 6 : 5  
(c) 10 : 9 (d) 9 : 10

$$\begin{aligned} \Rightarrow (a) \quad A \times \frac{2}{3} &= B \times \frac{4}{5} \\ \frac{A}{B} &= \frac{4}{5} \times \frac{3}{2} = \frac{6}{5} = 6 : 5 \end{aligned}$$

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

(a) (1, 2) (b) (2, 1)  
(c) (5/2, 0) (d) (0, 2)

- $\Rightarrow$  (b) The required points are x and y,

$$\begin{aligned} 2x + y &= 5 \quad \text{---(i)} \\ 2x + y - 5 &= 0 \end{aligned}$$

$$\begin{aligned} x + 2y &= 4 \quad \text{---(ii)} \\ x + 2y - 4 &= 0 \end{aligned}$$

By solving Eqs. (i) and (ii)

$$x = 2, y = 1$$

$$\therefore (x, y) = (2, 1)$$

140. If  $x = 3 + 2\sqrt{2}$ , then the value of

$$\left( \sqrt{x} - \frac{1}{\sqrt{x}} \right) \text{ is}$$

(a) 1 (b) 2  
(c)  $2\sqrt{2}$  (d)  $3\sqrt{3}$

$$\begin{aligned} \Rightarrow (b) \quad \sqrt{3 + 2\sqrt{2}} - \frac{1}{\sqrt{3 + 2\sqrt{2}}} &= \frac{1}{\sqrt{3 + 2\sqrt{2}}} - \frac{1}{\sqrt{3 + 2\sqrt{2}}} \\ &= \frac{1 + 2 + 2\sqrt{2} - 1}{1 + \sqrt{2}} \\ &= \frac{2(1 + \sqrt{2})}{1 + \sqrt{2}} = 2 \end{aligned}$$

141. Two successive discounts of 5%, 10% are given for an article costing ₹ 850. Present cost of the article is (in ₹)

(a) 725 (b) 726.75  
(c) 700 (d) 650

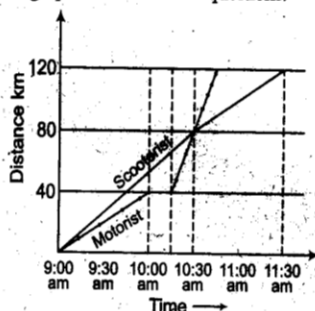
- $\Rightarrow$  (b) Single discount

$$\begin{aligned} &= \left( 100 - \frac{(100 - 5)(100 - 10)}{100} \right) \% \\ &= \left( 100 - \frac{95 \times 90}{100} \right) \% \\ &= 145\% \end{aligned}$$

Now, Present cost of article

$$\begin{aligned} &= 850 - 850 \times \frac{145}{100} \\ &= 850 \left( 1 - \frac{145}{100} \right) \\ &= 850 \times \frac{85.5}{100} \\ &= ₹ 726.25 \end{aligned}$$

**Directions** (Q.Nos. 142-145) A motorist and a scooterist made a journey of 120 km at the same time and from the same place. The graph shows the progress of the journey made by each person. Study the graph and answer the questions.



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

(a) 75 (b) 70  
(c) 90 (d) 80

- $\Rightarrow$  (d) By Graph, the required distance = 80 km

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

(a) 45 (b) 48  
(c) 42 (d) 46

$$\begin{aligned} \Rightarrow (b) \quad \text{Required speed} &= \frac{\text{Distance}}{\text{Time}} \\ &= \frac{120}{2\frac{1}{2}} \\ &= 48 \text{ km/h} \end{aligned}$$

144. The scooterist completes the journey in (hrs)

(a) 3 (b) 2  
(c)  $2\frac{1}{2}$  (d)  $3\frac{1}{2}$

- $\Rightarrow$  (c) The scooterist completes his journey in  $2\frac{1}{2}$  h.

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

(a) 10:30 am (b) 10:45 am  
(c) 10:15 am (d) 10:20 am

- $\Rightarrow$  (a) At 10:30 the motorist meet the scooterist.

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

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

(a) Uttar Pradesh (b) Paschim Banga  
(c) Madhya Pradesh (d) Haryana

- $\Rightarrow$  (b) Paschim Banga (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

- $\Rightarrow$  (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?

(a)  $\frac{1}{8}$  (b)  $\frac{1}{12}$  (c)  $\frac{1}{4}$  (d)  $\frac{1}{6}$

States	Production of Rice (in lac tonnes)
Haryana	2
Uttar Pradesh	7
Paschim Banga	8
Madhya Pradesh	4
Maharashtra	3

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?

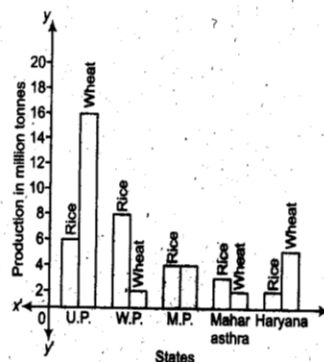
(a) Maharashtra (b) Paschim Banga  
(c) Madhya Pradesh (d) Haryana

- $\Rightarrow$  (b) The state which have least producer of wheat is Paschim Banga.

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

(a) Paschim Banga (b) M P  
(c) Maharashtra (d) Haryana

- $\Rightarrow$  (c) The state which have least production of rice and wheat is 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) (b)  
neither was you / No error  
(c) (d)  
▶▶ (c) 'were'
152. from one another / No error  
(c) (d)  
▶▶ (c) 'each other'
153. He remembered / that his visa /  
(a) (b)  
will be expired in a month / No error  
(c) (d)  
▶▶ (c) 'will expire'
154. When I shall see him / I shall  
(a) (b)  
/ tell him / No error  
(c) (d)  
▶▶ (a) 'delete shall'
155. In any case no disciplinary action /  
(a)  
are required / to be taken / No error  
(b) (c) (d)  
▶▶ (b) 'is'

**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  
with the world.  
(a) shall (b) will be (c) is (d) was  
▶▶ (c)
159. Only people who are afraid to sign  
their names, send \_\_\_\_\_ letters.  
(a) unanimous (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) Virtuous  
(c) Trainer (d) Learner  
▶▶ (a)
162. Adversary  
(a) Poverty (b) Contestant  
(c) Opponent (d) Antagonistic  
▶▶ (c)
163. Dishonour  
(a) Infamy (b) Glory  
(c) Uncouth (d) Wicked  
▶▶ (a)
164. Erudite  
(a) Scholarly (b) Friendly  
(c) Miserly (d) Lovely  
▶▶ (a)
165. Idea  
(a) Comprehension (b) Notion  
(c) Emotion (d) Gist  
▶▶ (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  
▶▶ (a)
168. Capture  
(a) Catch (b) Detain  
(c) Liberate (d) Stop  
▶▶ (c)
169. Repulsive  
(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 ruin (b) To alter  
(c) To swallow (d) To affect  
▶▶ (a)

172. Herculean task  
(a) An easy puzzle (b) A good contest  
(c) A difficult thing (d) A hurried job  
▶▶ (c)

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

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

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

**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 threwed it out the window.  
(a) threw  
(b) throw  
(c) thrown  
(d) No improvement  
▶▶ (a)
177. In the hot afternoon, after a long walk, I rested under the shadow of a tree.  
(a) shelter  
(b) shade  
(c) cool  
(d) No improvement  
▶▶ (b)
178. Your answer book will be answered with the help of a computer.  
(a) judged (b) rested  
(c) evaluated (d) seen  
▶▶ (c)
179. Marconi assembled the radio.  
(a) discovered  
(b) made  
(c) invented  
(d) No improvement  
▶▶ (c)
180. He showed great kind to his friend.  
(a) kindness (b) kind heart  
(c) kind hearted (d) no improvement  
▶▶ (a)



**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) Delirious (b) Desirous  
(c) Perseverance (d) Pervasive

» (c)

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

» (d)

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

» (d)

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

» (a)

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

» (b)

**Directions** (Q.Nos. 186-190) *Groups of four words are given. In each group, one word is correctly spelt. Find the correctly spelt word.*

186. (a) Emanicipation (b) Emancipation  
(c) Emancipation (d) Emansipation

» (a)

187. (a) Prejudice (b) Prejudise  
(c) Predjudice (d) Prejudis

» (a)

188. (a) Surgeon (b) Surjon  
(c) Surgen (d) Surjun

» (a)

189. (a) Potatos (b) Potatoes  
(c) Potatose (d) None of these

» (b)

190. (a) Irreversible (b) Irreversible  
(c) Irreversible (d) Irravarsible

» (b)

**Directions** (Q. Nos. 191-200) *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 **191**, it gives us in our day's work. The early riser can do a large amount of work **192** other men get out of bed. In the early morning the mind is fresh, and there are few sounds or other **193**, so that work done at that time is generally **194**. In many cases the early riser also finds time to **195**, some exercise in the fresh morning air, and this exercise supplies him with a fund of energy that will last **196** the evening. By beginning so early, he knows that he has plenty of time to do **197** or the work he can be **198** to do, and is not tempted to **199** over any part of it. All his work being finished in good time, he has a long **200** of rest in the evening, before the timely hour when he goes to bed.*

191. (a) kick (b) habit  
(c) rise (d) start

» (d)

192. (a) after (b) before  
(c) while (d) as

» (b)

193. (a) distractions (b) attractions  
(c) passions (d) contraptions

» (a)

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

» (b)

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

» (c)

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

» (b)

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

» (c)

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

» (d)

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

» (b)

200. (a) epoch (b) cycle  
(c) moment (d) interval

» (d)