

Held on 22-06-2014

SSC

Sub-Inspector and Assistant Sub-Inspector Exam

Time : 2 Hours

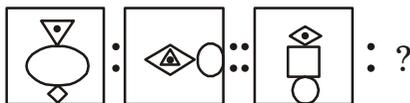
(Based on Memory)

Max. Marks : 200

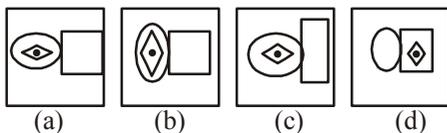
PART-A : GENERAL INTELLIGENCE & REASONING

DIRECTIONS (Qs. 1-7) : In questions below, select the related word/letter/number/figure from the given alternatives.

- Saint : Meditation :: Scientist : ?
(a) Research (b) Knowledge
(c) Spiritual (d) Rational
- King : Palace :: Eskimo : ?
(a) Caravan (b) Asylum
(c) Monastery (d) Igloo
- AFKP : DINS :: WBGL : ?
(a) ORUX (b) OSWA
(c) OTYD (d) OQSU
- SINGER : QGLECP :: MONSTER : ?
(a) KLNSCP (b) KLMSCP
(c) KMLQRCP (d) KLMTDO
- 18 : 5 :: 12 : ?
(a) 4 (b) 10
(c) 3 (d) 6
- 12 : 20 :: ?
(a) 15 : 37 (b) 16 : 64
(c) 27 : 48 (d) 30 : 42
- Question figures



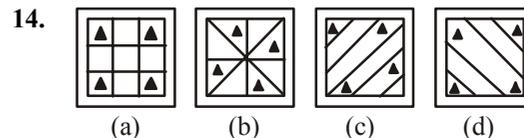
Answer figures



- In the following questions number of letters skipped in between adjacent letters in the series increased by one. Which of the following series observe the rule ?
(a) KORYBGJ (b) LMEYTPK
(c) KMPTYEL (d) KPTYELM
- In the following letter series how many Ms are followed by N, but not preceded by N?
NMWVMNMVWNMNMNMWVMN
(a) 1 (b) 2
(c) 3 (d) 4

DIRECTIONS (Qs. 10-14) : In questions below, find the odd word/letters/number pair/figure from the given alternatives.

- (a) Tennis (b) Cricket
(c) Volleyball (d) Football
- (a) artificial (b) insincere
(c) affected (d) naive
- (a) 68 (b) 85
(c) 153 (d) 174
- (a) 7 : 98 (b) 9 : 162
(c) 12 : 288 (d) 17 : 572



- Which one of the given responses would be a meaningful order of the following ?
1. Orange 2. Indigo 3. Red 4. Blue 5. Green 6. Yellow 7. Violet
(a) 7, 2, 4, 5, 6, 1, 3 (b) 7, 2, 4, 6, 5, 1, 3
(c) 7, 2, 6, 4, 5, 1, 3 (d) 7, 2, 6, 4, 1, 5, 3
- Arrange the following words as per order in the dictionary.
1. Forecast 2. Forget 3. Foreign 4. Forsook 5. Force
(a) 3, 5, 1, 2, 4 (b) 5, 1, 3, 2, 4
(c) 5, 1, 3, 4, 2 (d) 5, 1, 2, 3, 4
- Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it ?
rtx _ sx _ z _ txy _ _ yz
(a) y y r x s (b) y y s x r
(c) y y r s x (d) y y x r s

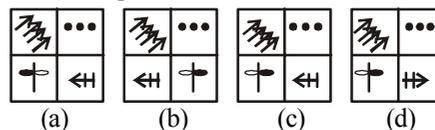
DIRECTIONS (Qs. 18-21) : In questions below, a series is given with one term missing. Choose the correct alternative from the given ones that will complete the series.

- FAG, GAF, HAI, IAH, _____
(a) JAK (b) HAK
(c) JAI (d) HAL
- 3, 6, 9, 15, 24, 39, 63, ?
(a) 100 (b) 87
(c) 102 (d) 99
- 1, 0, ?, 8, 15, 24
(a) 4 (b) 3
(c) 2 (d) 1

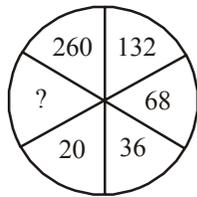
21. Question figures:



Answer figures :



22. Govind is 48 years old. He is twice as old as his son Prem is now. How old was Prem seven years before ?
 (a) 16 (b) 17
 (c) 13 (d) 18
23. Pointing to a man, a lady said "His mother is the only daughter of my mother". How is the lady related to the man?
 (a) Mother (b) Daughter
 (c) Sister (d) Aunt
24. Five policemen are standing in a row facing south. Shekhar is to the immediate right of Dhanush. Bala is between Basha and Dhanush. David is at the extreme right end of the row. Who is standing in the middle of the row?
 (a) Bala (b) Basha
 (c) Shekhar (d) Dhanush
25. From the given alternatives select the word which can be formed using the letters given in the word.
 ULTRANATIONALISM
 (a) ULTRAMONTANE (b) ULTRAMODERN
 (c) ULTRAIST (d) ULULATE
26. From the given alternatives select the word which cannot be formed using the letters of the given word.
 LEGALIZATION
 (a) ALERT (b) ALEGATION
 (c) GALLANT (d) NATAL
27. In a certain code DEPUTATION is written as ONTADEPUTI. How is DERIVATION written in that code?
 (a) ONVADERITI (b) ONDEVARITI
 (c) ONVAEDIRTI (d) ONVADEIRTI
28. If MADRAS is coded as 517916 and TENANT is coded as 432121, how would you encode RMATSN?
 (a) 851353 (b) 951363
 (c) 951462 (d) 941562
29. Find the missing number from the given responses.



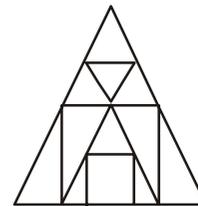
- (a) 12 (b) 10
 (c) 9 (d) 8
30. If '-' stands for '+', '+' stands for '×', '×' stands for '-' then which one of the following is not correct ?
 (a) $22 + 7 - 3 \times 9 = 148$ (b) $33 \times 5 - 10 + 20 = 228$
 (c) $7 + 28 - 3 \times 52 = 127$ (d) $44 - 9 + 6 \times 11 = 87$
31. Some equations are solved on the basis of a certain system. Find the correct answer for the unsolved equation on that basis.
 $5 * 6 = 35, 8 * 4 = 28, 6 * 8 = ?$
 (a) 46 (b) 34
 (c) 23 (d) 38
32. Select the correct combination of mathematical signs to replace * signs and to balance the following equation.
 $12 * 3 * 4 = 6 * 8 * 8$
 (a) +, ×, -, × (b) ×, +, -, ×
 (c) ×, +, ×, - (d) ×, -, ×, +

DIRECTIONS (Qs. 33-34) : In questions below, select the missing number from the given responses.

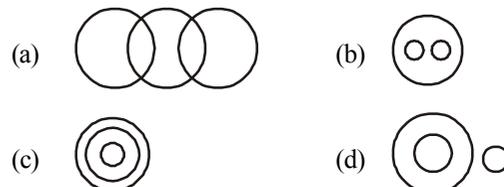
33.

7	9	8
2	4	3
5	7	6
16	32	?

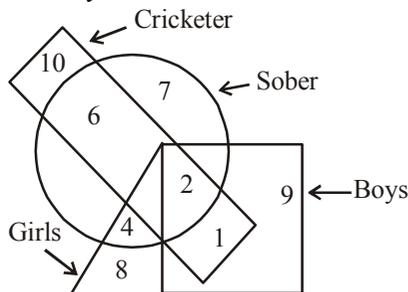
- (a) 17 (b) 23
 (c) 47 (d) 73
- 34.
-
- (a) 1 (b) 8
 (c) 6 (d) 16
35. A person walks towards his house at 8.00 am and observes his shadow to his right. In which direction he is walking ?
 (a) North (b) South
 (c) East (d) West
36. A boat moves from a jetty towards East. After sailing for 9 nautical miles, she turns towards right and covers another 12 nautical miles. If she wants to go back to the jetty, what is the shortest distance now from her present position ?
 (a) 21 nautical miles (b) 20 nautical miles
 (c) 18 nautical miles (d) 15 nautical miles
37. Find out the number of triangles in the given figure.



- (a) 13 (b) 15
 (c) 16 (d) 17
38. Four positions of a dice are given below, Identify the number at the bottom then top is 6.
Question figures
-
- (a) 1 (b) 3
 (c) 4 (d) 5
39. Identify the diagram that best represents the relationship among classes given below :
 Food, Curd, Spoons



40. In the following figure, the boys who are cricketer and sober are indicated by which number ?



- (a) 6
- (b) 5
- (c) 4
- (d) 2

DIRECTIONS (Qs. 41-42) : In questions below, some statements are given followed by three/two conclusions/assumptions respectively. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given conclusions/assumptions if any, follow from the given statements.

41. Statement : Pictures can tell a story. All story books have pictures. Some story books have words.

- Conclusions: I. Pictures can tell a story better than words can.
 II. The stories in story books are very simple.
 III. Some story books have both words and pictures.

- (a) Only conclusion I follows
- (b) Only conclusion II follows
- (c) Only conclusion III follows
- (d) Both conclusions I and II follow

42. Statement : It is desirable to put the child in school at the age of 5 or so.

- Assumptions: I. At that age the child reaches appropriate level of development and is ready to learn.
 II. The schools do not admit children after 6 years of age.

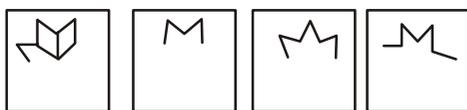
- (a) Only assumption I is implicit
- (b) Only assumption II is implicit
- (c) Neither assumption I nor II is implicit
- (d) Both assumption I and II are implicit

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

Question figure:



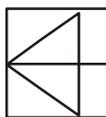
Answer figure:



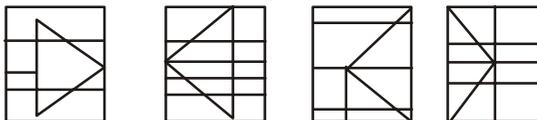
- (a)
- (b)
- (c)
- (d)

44. From the given answer figures, select the one in which the question figure is hidden/ embedded.

Question figure:



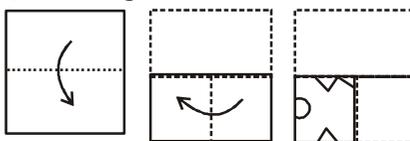
Answer figures:



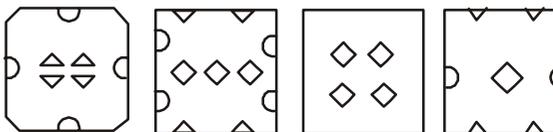
- (a)
- (b)
- (c)
- (d)

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

Question figure:



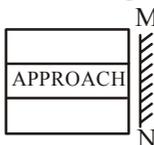
Answer figures:



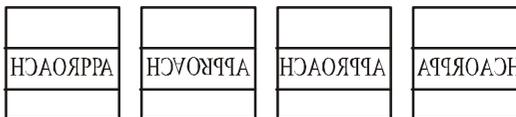
- (a)
- (b)
- (c)
- (d)

46. If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure ?

Question figure:



Answer figures:



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

47. A word is represented by 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 40, 01, 13, 32, and 'N' can be represented by 56, 68, 89 etc. Similarly, you have to identify the set for the word given below :

SIX-KIDS

Matrix I

	0	1	2	3	4
4	A	F	K	P	U
3	F	K	A	U	P
2	P	U	F	K	A
1	K	P	U	A	F
0	U	A	P	F	K

Matrix II

	5	6	7	8	9
9	D	I	N	S	X
8	X	S	I	D	N
7	N	X	S	I	D
6	S	D	X	N	I
5	I	N	D	X	S

- (a) 86, 87, 99 — 40, 41, 86, 64
 (b) 98, 96, 85 — 42, 78, 88, 77
 (c) 77, 69, 76 — 22, 95, 28, 31
 (d) 65, 55, 67 — 05, 25, 91, 40

48. A student is caught cheating in her test. What would you do in this situation?

- (a) Warn her and let her off
 (b) Warn her and give her counselling
 (c) Tell her parents
 (d) Put up her name on the board

49. An address has been given below, which has been reproduced against A, B, C and D alternatives. Three of these have some mistake or the other. Identify the one without any mistake.

FGEUROFRED LIMITED

Centennial Park,
 Centennial Avenue,
 Elstree, Hertfordshire
 United Kingdom
 WD6 3SG

(a) FGEUROFRED LIMITED
 Centennial Park,
 Elstree, Hertfordshire,
 United Kingdom
 WD6 3SG

(b) FGEUROFRED LIMITED
 Centennial Park,
 Centennial Avenue,
 Elstree, Hertfordshire,
 United Kingdom
 WD6 3SG

(c) FGEUROFRED LIMITED
 Centennial Park,
 Centennial Avenue,
 Elstree, Hertfordshire,
 United Kingdom
 WD6 3SG

(d) FGEUROFRED LIMITED
 Centennial Park,
 Centennial Avenue,
 Elstree, Hertfordshire,
 United Kingdom
 WD6 3SG

50. Given below are numbers in the first line and symbols in the second line. Numbers and symbols are code for each other. Choose the correct code for given symbols.

1 2 3 4 5 6 7 8 9
 + - × ÷ ≠ ↑ → □ β

Which number can be decoded from the following :

$$\neq \square \uparrow \times \rightarrow$$

- (a) 5 8 6 3 7 (b) 5 6 8 7 3
 (c) 5 7 8 6 3 (d) 5 8 3 6 7

PART-B : GENERAL AWARENESS

51. In the balance of payments account, unrequited receipts and payments are also regarded as
 (a) bilateral transfers (b) unilateral transfers
 (c) capital account transfers (d) invisible transfers
52. Price and output are determinates in market structure other than
 (a) monopoly (b) perfect competition
 (c) oligopoly (d) monopsony
53. A philosophy that the worker should share in industrial decisions is termed as
 (a) industrial democracy (b) worker sovereignty
 (c) industrial socialism (d) worker dictatorship
54. If average cost falls, marginal cost
 (a) increases at a higher rate (b) falls at the same rate
 (c) increases at a lower rate (d) falls at a higher rate
55. Which one of the following disburses long term loans to private industry in India ?
 (a) Food Corporation of India
 (b) Life Insurance Corporation of India
 (c) Primary Credit Society
 (d) Land Development Banks
56. Most important safeguard of liberty is
 (a) bold and impartial judiciary
 (b) well-knit party system
 (c) decentralisation of power
 (d) declaration of rights
57. What is the ancient school of law ?
 (a) The Philosophical School
 (b) The Historical School
 (c) The Analytical School
 (d) The Sociological School
58. Liberty stands for
 (a) absence of restraint
 (b) consists in the presence of restraint
 (c) feeling enjoyed in a congenial atmosphere
 (d) the eager maintenance of that atmosphere in which men have the opportunity to be their best selves - Laski
59. When the Vice-President is acting as President he
 I. will have all powers and functions of both President and Vice-President
 II. gets all the allowances and privileges of the President
 III. should continue to work as the Chairman of the Rajya Sabha
 (a) I, II and III (b) I and III
 (c) I and II (d) II only
60. In Presidential Government, the President is
 (a) independent of the Legislature
 (b) dependent on the Legislature
 (c) dependent on the Judiciary
 (d) bound by the advice of the Council of Ministers

61. The method of amending the Constitution by popular veto is found in
 (a) Britain (b) Switzerland
 (c) Russia (d) India
62. Which of the following is the inalienable attribute of the parliamentary system of government ?
 (a) Flexibility of the Constitution
 (b) Fusion of Executive and Legislature
 (c) Judicial Supremacy
 (d) Parliamentary Sovereignty
63. Which one of the following kinds of equality is not compatible with the liberal notion of equality ?
 (a) Legal Equality (b) Political Equality
 (c) Social Equality (d) Economic Equality
64. Which was the second capital of Akbar ?
 (a) Delhi (b) Agra
 (c) Fatehpur-Sikri (d) Patna
65. The first country which discovered sea route to India was
 (a) Portugal (b) Dutch
 (c) French (d) Britain
66. The unification of Karnataka was achieved in the year
 (a) 1956 (b) 1957
 (c) 1958 (d) 1960
67. Who introduced the Indian University Act?
 (a) Lord Curzon (b) Lord Minto
 (c) Lord Morelay (d) Lord Rippon
68. Chinese travellers visited India primarily because
 (a) they were interested in Buddhism
 (b) they were invited by the Indian kings
 (c) they were interested to study Indian culture
 (d) they were interested to stay in India
69. The first short based integrated steel plant in the country is
 (a) Vijaynagar (b) Salem
 (c) Vishakapatnam (d) Bhadravati
70. Name the condition which influences the development of plants into distinctive forms.
 (a) Climatic conditions
 (b) Soil conditions
 (c) Environmental conditions
 (d) Social conditions
71. Agriculture should serve as an instrument of income, livelihood and opportunity to the local community - this statement is given by
 (a) Dr Madhavan Nair (b) Dr Manmohan Singh
 (c) Dr Abdul Kalam (d) Dr M S Swaminathan
72. When was the Geological Survey of India established ?
 (a) 1841 (b) 1851
 (c) 1941 (d) 1951
73. Development that meets the needs of the present, without compromising the ability of future generations to meet their own needs was the focal point of Brundtland commission is
 (a) sustainable development
 (b) mitigation
 (c) disaster management
 (d) capacity building
74. The pancreas secretes
 (a) Insulin (b) Bile juice
 (c) Peptic juice (d) None of these
75. When we touch leaves of "Touch me not plant", they close, these movements are called
 (a) photonastic movements
 (b) nyctinastic movements
 (c) seimonastic movements
 (d) chemonastic movements
76. The concept of tissue culture was introduced by
 (a) Halfmeister (b) Hanstein
 (c) Haberlandt (d) Hanning
77. Beak is formed by
 (a) cheeks (b) jaws
 (c) teeth (d) none
78. Pinna (external ear) is present in
 (a) Amphibian (b) Fish
 (c) Mammal (d) Reptile
79. Purity of a metal can be determined with the help of
 (a) Pascal's law
 (b) Boyle's law
 (c) Archimedes principle
 (d) Conservation of mass principle
80. If both the mass and the velocity of a body is increased to twice of their magnitude, the kinetic energy will increase by
 (a) 2 times (b) 4 times
 (c) 8 times (d) 16 times
81. Two bodies kept at a certain distance feel a gravitational force F to each other. If the distance between them is made double the former distance, the force will be
 (a) 2F (b) $\frac{1}{2}$ F
 (c) 4F (d) $\frac{1}{4}$ F
82. Stationary wave is formed by
 (a) a transverse wave superposing a longitudinal wave
 (b) two waves of the same speed superposing
 (c) two waves of same frequency travelling in the same direction
 (d) two waves of same frequency travelling in the opposite direction
83. Which is not an extension of a picture file on a computer ?
 (a) .jpeg (b) .png
 (c) .gif (d) .mdb
84. Which measure of memory is the largest ?
 (a) MB Megabyte (b) GB Gigabyte
 (c) TB Terabyte (d) KB Kilobyte
85. Which of the following is the maximum number of electrons that can be present in M-shell?
 (a) 2 (b) 8
 (c) 18 (d) 32
86. In an oxygen molecule, two atoms are united by
 (a) the bond (b) two bonds
 (c) three bonds (d) four bonds
87. The inert gas which is substituted for nitrogen in the air used by deep sea divers for breathing is
 (a) Neon (b) Krypton
 (c) Argon (d) Helium
88. How many neutrons are there in ${}_{92}\text{U}^{238}$ atom ?
 (a) 92 (b) 238
 (c) 146 (d) 330

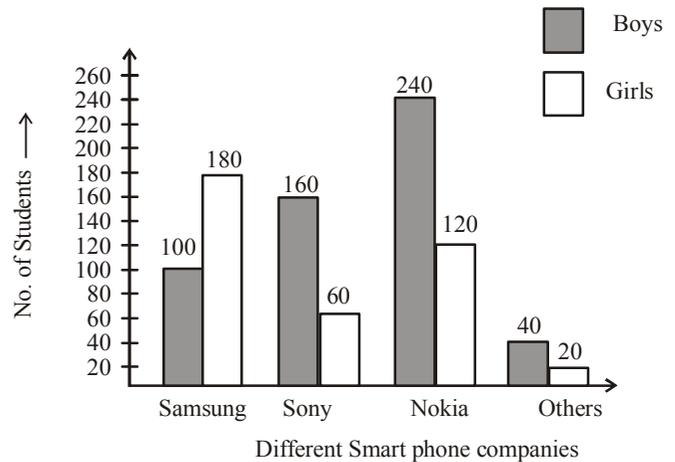
89. Root pressure is measured by
 (a) Barometer (b) Atmometer
 (c) Manometer (d) Auxanometer
90. Cell becomes turgid because of
 (a) Plasmolysis (b) Exosmosis
 (c) Endosmosis (d) Diffusion
91. The process of imbibition involves
 (a) Diffusion (b) Capillary action
 (c) Absorption (d) Both (A) & (B)
92. A cell increases in volume when it is placed in
 (a) Hypertonic solution (b) Hypotonic solution
 (c) Isotonic solution (d) None of these
93. Who launched National Peoples Party on 5th January, 2013?
 (a) Somnath Chatterjee (b) Shivraj Patil
 (c) K S Hegde (d) PA Sangma
94. Which Indian University bagged Best Research Award at 100th Indian Science Congress ?
 (a) University of Delhi (b) University of Kashmir
 (c) University of Mumbai (d) University of Sikkim
95. Who was the first woman winner of Kaun Banega Crorepati 6 ?
 (a) Kiran Bedi (b) Lata Mangeshkar
 (c) Sumeet Kaur Sawhney (d) Preity Zinta
96. Who was appointed new United State Defence Secretary in January 2013 ?
 (a) Donald Rumsfeld (b) Robert M Gates
 (c) Leon Panetta (d) Chuck Hagel
97. Who took the charge as new Deputy Governor of Reserve Bank of India in January 2013?
 (a) Urijit Patel (b) Dr C Rangarajan
 (c) S Vekitaramanam (d) Dr Y Venugopal Reddy
98. Which political leader was sent to jail for teacher recruitment scam in January 2013 ?
 (a) Om Prakash Chautala (b) D V Sadananda Gowda
 (c) Raja Bhaiya (d) Suresh Kalmadi
99. Which player got stripped of his seven Tour de France titles and got banned for life after the International Cycling Union?
 (a) Nicola Adams (b) Chris Hoy
 (c) Lance Armstrong (d) Jason Kenny
100. Who won the Top Ranker's Entrepreneurial Path Breaker Award 2013?
 (a) Prof D K Bandyopadhyay
 (b) Ajay Shankar
 (c) B Prasada Rao
 (d) Pratip Chaudhuri
- (a) 31 litres (b) 62 litres
 (c) 41 litres (d) 84 litres
103. The value of
 $3 \div \left[(8-5) \div \left\{ (4-2) \div \left(2 + \frac{8}{13} \right) \right\} \right]$ is
 (a) $\frac{15}{17}$ (b) $\frac{13}{17}$
 (c) $\frac{15}{19}$ (d) $\frac{13}{19}$
104. If '+' means ' \div ', ' \times ' means '-', ' \div ' means ' \times ' and '-' means '+', what will be the value of the following expression?
 $9 + 3 \div 4 - 8 \times 2 = ?$
 (a) $6\frac{1}{4}$ (b) $6\frac{3}{4}$
 (c) $-1\frac{3}{4}$ (d) 18
105. The next term of the sequence,
 $\left(1 + \frac{1}{2}\right), \left(1 + \frac{1}{2}\right)\left(1 + \frac{1}{3}\right), \left(1 + \frac{1}{2}\right)\left(1 + \frac{1}{3}\right)\left(1 + \frac{1}{4}\right), \dots$ is
 (a) 3 (b) $\left(1 + \frac{1}{5}\right)$
 (c) 5 (d) $\left(1 + \frac{1}{2}\right)\left(1 + \frac{1}{5}\right)$
106. A can do $\frac{7}{8}$ of work in 28 days, B can do $\frac{5}{6}$ of the same work in 20 days. The number of days they will take to complete if they do it together is
 (a) $15\frac{3}{7}$ days (b) $17\frac{3}{5}$ days
 (c) $14\frac{5}{7}$ days (d) $13\frac{5}{7}$ days
107. Seventy-five men are employed to lay down a railway line in 3 months. Due to certain emergency conditions, the work was to be finished in 18 days. How many more men should be employed to complete the work in the desired time ?
 (a) 300 (b) 325
 (c) 350 (d) 375
108. A trader who marks his goods up to 50% offered a discount of 20%. What % profit the trader makes after offering the payment?
 (a) 30% (b) 70%
 (c) 20% (d) 50%
109. A retailer buys a sewing machine at a discount of 15% and sells it for ₹1955. Thus he makes a profit of 15%. The discount is
 (a) ₹270 (b) ₹290
 (c) ₹300 (d) ₹310
110. If $x : y :: 2 : 3$ and $2 : x :: 4 : 8$ the value of y is
 (a) 6 (b) 8
 (c) 4 (d) 12

PART-C : QUANTITATIVE APTITUDE

101. Evaluate $\frac{\sqrt{24} + \sqrt{6}}{\sqrt{24} - \sqrt{6}}$
 (a) 2 (b) 3
 (c) 4 (d) 5
102. Three tankers contain 403 litres, 434 litres, 465 litres of diesel respectively. Then the maximum capacity of a container that can measure the diesel of the three container exact number of times is

111. ₹ 730 were divided among A, B, C in such a way that if A gets ₹ 3, then B gets ₹ 4 and if B gets ₹ 3.50 then C gets ₹ 3. The share of B exceeds that of C by
- (a) ₹ 30 (b) ₹ 40
(c) ₹ 70 (d) ₹ 210
112. A boy found that the average of 20 numbers is 35 when he writes a number '61' instead of '16'. The correct average of 20 numbers is
- (a) 32.75 (b) 37.25
(c) 34.75 (d) 34.25
113. 11 friends went to a hotel and decided to pay the bill amount equally. But 10 of them could pay ₹ 60 each, as a result 11th has to pay ₹ 50 extra than his share. Find the amount paid by him.
- (a) ₹ 105 (b) ₹ 110
(c) ₹ 115 (d) ₹ 120
114. A tea-merchant professes to sell tea at cost price but uses a false weight of 900 gram for a kilogram. The profit percent in his transaction is
- (a) $11\frac{1}{9}\%$ (b) 10%
(c) $9\frac{1}{11}\%$ (d) 15%
115. Mahesh earned a profit of 20% by selling 60 apples at the rate of ₹ 42.50 for 5 apples. Then the total cost, at which the apples were bought is
- (a) ₹ 452 (b) ₹ 425
(c) ₹ 450 (d) ₹ 485
116. In an examination 75% candidates passed in English and 60% passed in Mathematics. 25% failed in both and 240 passed the examination. Find the total number of candidates.
- (a) 492 (b) 300
(c) 500 (d) 400
117. If 40% of $\frac{4}{5}$ of $\frac{3}{4}$ of a number is 48, then what is 1% of the same number ?
- (a) 20 (b) 2
(c) 10 (d) 1
118. A student goes to school at the rate of $\frac{5}{2}$ km/hr and reaches 6 minutes late. If he travels at the speed of 3 km/hr, he reaches 10 minutes earlier. The distance of the school is
- (a) 45km (b) 20km
(c) 10km (d) 4km
119. A train 50 metre long passes a platform 100 metre long in 10 sec. The speed of the train in km/hr is
- (a) 10 (b) 54
(c) 15 (d) 100
120. A sum amounts double in 8 years by simple interest. Then the rate of simple interest p.a. is
- (a) 10% (b) 12.5%
(c) 15% (d) 20%
121. Rekha invested a sum of ₹ 12000 at 5% per annum compound interest. She received an amount of ₹ 13230 after n years. Find n.
- (a) 2.8 years (b) 3.0 years
(c) 2.5 years (d) 2.0 years

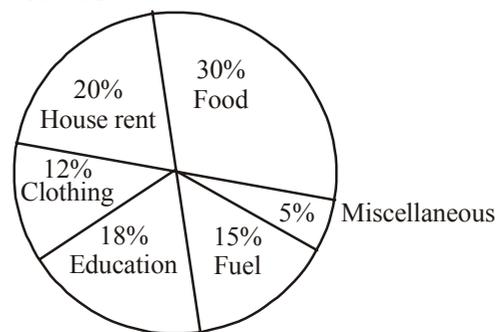
DIRECTIONS (Qs. 122-125) : The bar chart representing the number of first year B.Com. students of St. Xavier's College using different companies' smart phones. Study bar chart and answer the question that follow:



The bar chart representing the no. of students using different smart phones.

122. The ratio of the number of boys to the number of girls using the smart phones of Samsung and Sony together is
- (a) 12 : 13 (b) 13 : 12
(c) 14 : 11 (d) 11 : 14
123. What percentage of boys are using the smart phones of Samsung ?
- (a) 16.52% (b) 17.52%
(c) 18.52% (d) 15.52%
124. What percentage of girls are using the smart phones of Nokia ?
- (a) 33.58% (b) 32.58%
(c) 30.58% (d) 31.58%
125. The difference between the total number of students using smart phones of Samsung combined together and the total number of students using smart phone of Sony taken together is
- (a) 20 (b) 60
(c) 80 (d) 40
126. The radius of a right circular cone is 3 cm and its height is 4 cm. The total surface area of the cone is
- (a) 48.4 sq.cm (b) 64.4 sq.cm
(c) 96.4 sq.cm (d) 75.4 sq.cm
127. A wooden box of dimension 8 metre × 7 metre × 6 metre is to carry rectangular boxes of dimensions 8 cm × 7 cm × 6 cm. The maximum number of boxes that can be carried in 1 wooden box is
- (a) 7500000 (b) 9800000
(c) 1200000 (d) 1000000
128. Two circular cylinders of equal volume have their heights in the ratio 1 : 2; Ratio of their radii is (Take $\pi = \frac{22}{7}$)
- (a) 1 : 4 (b) $1 : \sqrt{2}$
(c) $\sqrt{2} : 1$ (d) 1 : 2
129. A rectangular piece of paper of dimensions 22 cm by 12 cm is rolled along its length to form a cylinder. The volume (in cm^3) of the cylinder so formed is (use $\pi = \frac{22}{7}$)
- (a) 562 (b) 412
(c) 462 (d) 362

- 130.** A sphere is placed inside a right circular cylinder so as to touch the top, base and the lateral surface of the cylinder. If the radius of the sphere is R , the volume of the cylinder is
 (a) $2\pi R^3$ (b) $4\pi R^3$
 (c) $8\pi R^3$ (d) $\frac{8}{3}\pi R^3$
- 131.** If $a = \sqrt{6} + \sqrt{5}$ $b = \sqrt{6} - \sqrt{5}$ then $2a^2 - 5ab + 2b^2 =$
 (a) 38 (b) 39
 (c) 40 (d) 41
- 132.** If $p = \frac{5}{18}$
 then $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$ is equal to
 (a) $\frac{4}{27}$ (b) $\frac{5}{27}$
 (c) $\frac{8}{27}$ (d) $\frac{10}{27}$
- 133.** If $x + \frac{1}{x} = 2$, then $x^{2013} + \frac{1}{x^{2014}} = ?$
 (a) 0 (b) 1
 (c) -1 (d) 2
- 134.** If $a = 331$, $b = 336$ and $c = -667$, then the value of $a^3 + b^3 + c^3 - 3abc$ is
 (a) 1 (b) 6
 (c) 3 (d) 0
- 135.** The simplified value of $(\sqrt{6} + \sqrt{10} - \sqrt{21} - \sqrt{35})(\sqrt{6} - \sqrt{10} + \sqrt{21} - \sqrt{35})$ is
 (a) 13 (b) 12
 (c) 11 (d) 10
- 136.** In a ΔABC , $\frac{AB}{AC} = \frac{BD}{DC}$, $\angle B = 70^\circ$ and $\angle C = 50^\circ$, then $\angle BAD = ?$
 (a) 60° (b) 20°
 (c) 30° (d) 50°
- 137.** In a ΔABC , AD , BE and CF are three medians. The perimeter of ΔABC is always
 (a) equal to $(\overline{AD} + \overline{BE} + \overline{CF})$
 (b) greater than $(\overline{AD} + \overline{BE} + \overline{CF})$
 (c) less than $(\overline{AD} + \overline{BE} + \overline{CF})$
 (d) None of these
- 138.** In a ΔABC , \overline{AD} , \overline{BE} and \overline{CF} are three medians. Then the ratio $(\overline{AD} + \overline{BE} + \overline{CF}) : (\overline{AB} + \overline{AC} + \overline{BC})$ is
 (a) equal to $\frac{3}{4}$ (b) less than $\frac{3}{4}$
 (c) greater than $\frac{3}{4}$ (d) equal to $\frac{1}{2}$
- 139.** Two circles with radii 25 cm and 9 cm touch each other externally. The length of the direct common tangent is
 (a) 34 cm (b) 30 cm
 (c) 36 cm (d) 32 cm
- 140.** If $AB = 5$ cm, $AC = 12$ and $AB \perp AC$ then the radius of the circumcircle of ΔABC is
 (a) 6.5 cm (b) 6 cm
 (c) 5 cm (d) 7 cm
- 141.** If $0 \leq \theta \leq \frac{\pi}{2}$ and $\sec^2 \theta + \tan^2 \theta = 7$, then θ is
 (a) $\frac{5\pi}{12}$ radian (b) $\frac{\pi}{3}$ radian
 (c) $\frac{\pi}{5}$ radian (d) $\frac{\pi}{6}$ radian
- 142.** The simplest value of $\sin^2 x + 2 \tan^2 x - 2 \sec^2 x + \cos^2 x$ is
 (a) 1 (b) 0
 (c) -1 (d) 2
- 143.** A kite is flying at a height of 50 metre. If the length of string is 100 metre then the inclination of string to the horizontal ground in degree measure is
 (a) 90 (b) 60
 (c) 45 (d) 30
- 144.** From the top of a light-house at a height 20 metres above sea-level, the angle of depression of a ship is 30° . The distance of the ship from the foot of the light-house is
 (a) 20 m (b) $20\sqrt{3}$ m
 (c) 30 m (d) $30\sqrt{3}$ m
- 145.** If $x = a \sin \theta$ and $y = b \tan \theta$ then prove that $\frac{a^2}{x^2} - \frac{b^2}{y^2}$ is
 (a) 1 (b) 2
 (c) 3 (d) 4
- The following pie-chart shows the monthly expenditure of a family on food, house rent, clothing, education, fuel and miscellaneous. Study the pie-chart and answer questions nos. 146 to 150.



- 146.** If the expenditure for food is ₹ 9000, then the expenditure for education is
 (a) ₹ 5000 (b) ₹ 5200
 (c) ₹ 5400 (d) ₹ 6000
- 147.** The central angle of the sector for the expenditure on fuel (in degrees) is
 (a) 50.4 (b) 54
 (c) 57.6 (d) 72
- 148.** If the expenditure on fuel is ₹ 3000, then the total expenditure excluding expenditure on house rent and education is
 (a) ₹ 11600 (b) ₹ 12000
 (c) ₹ 12400 (d) ₹ 12500

149. If the percentage of expenditure on food is $x\%$ of the total percentage of expenditure on clothing, education and fuel, then x equals

- (a) 66 (b) $66\frac{1}{3}$
 (c) $66\frac{2}{3}$ (d) 67

150. Total percentage of expenditure on house rent, clothing and fuel is greater than the percentage of expenditure on food by

- (a) 16 (b) 17
 (c) 18 (d) 20

PART-D : ENGLISH COMPREHENSION

DIRECTIONS (Qs. 151-155) : In questions below, some parts of the sentences have errors and some are correct. Find out which part of a sentence has an error and blacken the oval [●] corresponding to the appropriate letter (a, b, c). If a sentence is free from error, blacken the oval corresponding to (d) in the Answer Sheet.

151. In 1906 a earthquake destroyed much
 (a) (b)
of San Francisco. No error.
 (c) (d)
152. His parents does not approve of
 (a) (b)
his business No error.
 (c) (d)
153. The college library is
 (a)
not only equipped with
 (b)
very good books but also with the latest journals.
 (c)
 No error.
 (d)
154. The lovers walked besides each other
 (a) (b)
in silence. No error.
 (c) (d)
155. Men are wanted
 (a)
for the army,
 (b)
and the navy, and the air force,
 (c)
 No error.
 (d)

DIRECTIONS (Qs. 156-160) : In questions below, sentences are given with blanks to be filled in with an appropriate word (s). Four alternatives are suggested for each question. Choose the correct alternative out of the four and indicate it by blackening the appropriate oval [●] in the Answer Sheet.

156. China is a big country, in area it is bigger than any other country _____ Russia.
 (a) accept (b) except
 (c) expect (d) access
157. The masks worn by the men helped them _____ their identity.
 (a) conceal (b) congeal
 (c) masquerade (d) cheat
158. On the _____ occasion of Laxmi Puja the Mathurs bought a new car.
 (a) officious (b) auspicious
 (c) fortuitous (d) prosperous
159. Precautions are to be taken with any one who seems _____.
 (a) contagious (b) infectious
 (c) diseased (d) defiled
160. The treasure was hidden _____ a big shore.
 (a) on (b) underneath
 (c) toward (d) off

DIRECTIONS (Qs. 161-165) : In questions below, out of the four alternatives, choose the one which best expresses the meaning of the given word and mark it in the Answer sheet.

161. Scorn
 (a) concise (b) despise
 (c) bias (d) fierce
162. Catastrophe
 (a) tragedy (b) anger
 (c) violence (d) hatred
163. Abjure
 (a) renounce (b) announce
 (c) pronounce (d) denounce
164. Assess
 (a) overload (b) measure
 (c) permit (d) enter
165. Elastic
 (a) free (b) liberal
 (c) flexible (d) broad

DIRECTIONS (Qs. 166-170) : In questions below, choose the word opposite in meaning to the given word and mark it in the Answer sheet.

166. Safe
 (a) rash (b) insecure
 (c) beneficial (d) harsh
167. Redundant
 (a) repentant (b) surplus
 (c) singular (d) required
168. Fair
 (a) untrue (b) unjust
 (c) coarse (d) harsh
169. Boisterous
 (a) serenity (b) calm
 (c) cheerful (d) courageous
170. Substantial
 (a) flimsy (b) hefty
 (c) actual (d) excess

DIRECTIONS (Qs. 171-175) : In questions below, four alternatives are given for the Idiom/phrase underlined in the sentence. Choose the alternative which best expresses the meaning of the Idiom/Phrase and mark it in the Answer Sheet.

171. We must work with all our might and main, otherwise we cannot succeed.
 (a) full force (b) complete trust
 (c) exceptional skill (d) full unity
172. The sailors nailed their colours to their mast.
 (a) put up a colourful mast
 (b) refused to climb down
 (c) took over the ship
 (d) decided to abandon the ship
173. We had (had) better batten down the hatches. The weather is unpredictable.
 (a) stay in-door
 (b) prepare for a difficult situation
 (c) go somewhere safe
 (d) face the obstacles
174. It is difficult to have a sensible discussion with her as she flies off at a tangent.
 (a) gets carried away
 (b) starts discussing something irrelevant
 (c) loses her temper easily
 (d) does not really understand anything
175. The students found it hard to go at equal speed with the professor.
 (a) get away from (b) put up with
 (c) keep up with (d) race against

DIRECTIONS (Qs. 176-180) : In questions below, a sentence a part of the sentence is underlined. Below are given alternatives to the underlined part at (A), (B), (C) which may improve the sentence. Choose the correct alternative. In case no improvement is needed your answer is (D). Mark your answer in the Answer sheet.

176. He will revise it when he is comes back.
 (a) when he comes back (b) on coming back
 (c) when he came back (d) No improvement
177. The members of the student's union did not give the examination in protest.
 (a) did not write (b) did not sit for
 (c) did not show up for (d) No improvement
178. She was kept from her assignment because of her loquacious room-mate.
 (a) noisy (b) irritating
 (c) talkative (d) No improvement
179. James epitomizes everything that a leader should be.
 (a) worships (b) loves
 (c) adores (d) No improvement
180. The businessman is respectively connected.
 (a) respectfully (b) respectably
 (c) receptively (d) No improvement

DIRECTIONS (Qs. 181-185) : In questions below, out of the four alternatives, choose the one which can be substituted for the given words/sentences and indicate it by blackening the appropriate oval [●] in the Answer Sheet.

181. One who offers his service of his own free will
 (a) Worker (b) Slave
 (c) Volunteer (d) Servant

182. One who is always doubting
 (a) Sceptic (b) Deist
 (c) Rationalist (d) Positivist
183. A collection of slaves
 (a) Coffle (b) Crew
 (c) Company (d) Cortege
184. A professional soldier hired to serve in a foreign army
 (a) Mercenary (b) Liquidator
 (c) Venal (d) Hireling
185. Not likely to be easily pleased
 (a) Fastidious (b) Infallible
 (c) Fatalist (d) Communist

DIRECTIONS (Qs. 186-190) : In questions below, four words are given in each question, out of which only one word is correctly spelt. Find the correctly spelt word and mark your answer in the Answer Sheet.

186. (a) Resillient (b) Persuade
 (c) Dubious (d) Deplete
187. (a) Ineffectual (b) ineffctual
 (c) Inefectual (d) infectual
188. (a) Massacer (b) Massecre
 (c) Masacre (d) Massacre
189. (a) Conciance (b) Consience
 (c) Conscience (d) Connsience
190. (a) Nirvana (b) Nirvena
 (c) Nirvanna (d) Nyrvana

DIRECTIONS (Qs. 191-200) : In questions below, you have two brief passages with 5 questions following each passage. Read the passages carefully and choose the best answer to each question out of the four alternatives and mark it by blackening the appropriate oval [●] in the Answer Sheet.

PASSAGE-I

(Question Nos. 191 to 195)

Street theatre in India is a well established ancient art form. Despite the proliferation of modern means of entertainment and communication, street theatre continues to flourish in India.

Street theatre as a channel of communication has for centuries been propagating reforms by highlighting social, economic and political issues present in the society. Unlike in the olden days, its performance is no longer restricted to villages or small localities of the city. Today small groups of performers including students, would stage performances to mobilize public opinion or to help create or raise awareness over a particular issue of public importance. Themes on substance abuse, AIDS awareness, and domestic violence are some of the areas highlighted by contemporary street theatre troupe. Unlike in regular drama street drama employ very little props and images. The human body becomes the main tool in which choreography, mime, dialogues, songs and slogans are extensively used.

Street theatre is one of the most intimate media. Its appeal is to the emotions leading to quick psychological impact on audiences. By being local and live they also are able to establish not only direct contact with the audience but by being cost-effective and flexible they are popular among all age groups.

191. Modern means of entertainment and communication _____ street theatre.
 (a) does affect (b) does not affect
 (c) helps popularis (d) helps establish

192. In the olden days street theatre _____ to villages or small localities of the city.
 (a) was restricted (b) was not restricted
 (c) was opened (d) was entertained
193. Street theatre usually _____ with issues of public importance.
 (a) is distanced (b) is performed
 (c) deals (d) does not deal
194. Street theatre is _____ to stage.
 (a) nothing (b) costly
 (c) reasonable (d) affordable
195. Street theatre creates an/a _____ impact on audiences.
 (a) intimate (b) emotional
 (c) mystical (d) physical

PASSAGE-II

(Question Nos. 196 to 200)

Self directed learning, in its broadest meaning, describes a process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs formulating learning goals, identifying resources for learning, choosing and implementing learning strategies and evaluating learning outcomes. Thus it is important to attain new knowledge easily and skillfully for the rest of his or her life.

What is the need for self directed learning? One reason is that there is convincing evidence that people, who take the initiative in learning, learn more things and learn better than people who sit at the feet of teachers passively waiting to be taught. The

second reason is that self-directed learning is more in tune with our natural processes of psychological development; an essential aspect of maturing is developing the ability to take increasing responsibility of our own lives to become increasingly self-directed. The third reason is that many of the new developments in education put a heavy responsibility on the learners to take a good deal of initiative in their own learning. To meet the challenges in today's instructive environment, self-directed learning is most essential.

196. In self-directed learning, an individual
 (a) Takes initiative with or without the help of others
 (b) Is passive and waits for directions
 (c) Is helpless and dependent
 (d) Takes initiative, without an objective
197. There is need for self-directed learning because
 (a) it is less challenging
 (b) it helps people to learn more things and learn better
 (c) it is a more cost-effective method
 (d) it is a modern method of learning
198. Which word best describes self-directed learning ?
 (a) Active learning (b) Passive learning
 (c) Compulsory learning (d) Repulsive learning
199. The modern environment according to the author is
 (a) Restrictive (b) Instructive
 (c) Less developed (d) Impracticable
200. The synonym of the word "diagnosing" is
 (a) Searching (b) Examining
 (c) Identifying (d) Complying

ANSWER KEY

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

Hints & Explanations

PART-A : GENERAL INTELLIGENCE & REASONING

- (a) A saint practices meditation.
Similarly,
A scientist does research.
- (d) A palace is the official home of a King.
Similarly,
An igloo is a small round house of an Eskima.
- (c) $A \xrightarrow{+5} F \xrightarrow{+5} K \xrightarrow{+5} P$
 $D \xrightarrow{+5} I \xrightarrow{+5} N \xrightarrow{+5} S$
 $W \xrightarrow{+5} B \xrightarrow{+5} G \xrightarrow{+5} L$
 $O \xrightarrow{+5} T \xrightarrow{+5} Y \xrightarrow{+5} D$
- (c) $S \xrightarrow{-2} Q$ Similarly $M \xrightarrow{-2} K$
 $I \xrightarrow{-2} G$ $O \xrightarrow{-2} M$
 $N \xrightarrow{-2} L$ $N \xrightarrow{-2} L$
 $G \xrightarrow{-2} E$ $S \rightarrow Q$
 $E \xrightarrow{-2} C$ $T \rightarrow R$
 $R \xrightarrow{-2} P$ $E \rightarrow C$
 $R \rightarrow P$
- (c) $18/3 - 1 = 5$
 $12/3 - 1 = 3$
- (d) $12 : 20 :: 30 : 42$
 $(3 \times 4) \quad (4 \times 5) \quad (5 \times 6) \quad (6 \times 7)$
- (a) The middle element adjects to the right side line after rotating 90° anticlock wise. The bottom element goes up on the top and becomes enlarge. The top element becomes the inner figure of bottom element.
- (c) By given options
 $K \xrightarrow{+2} M \xrightarrow{+3} P \xrightarrow{+4} T \xrightarrow{+5} Y \xrightarrow{+6} E \xrightarrow{+7} L$
- (c) Required sequence would be

NOT	N	M	N
N	M	N	M

Hence, This sequence occurs three times.
- (d) Except (d) all others are divided by 17.
- (d) Except (d) in all others second number is divisible by the first one.
- (a) These all are the colours of the rainbow. Hence meaningful order is VIBGYOR.
- (b) Force → Forecast → Foreign → Forget → Forsook
(5) (1) (3) (2) (4)
- (c) rtxy/
sxyz/
rtxy/
sxyz.

- (a) $F \xrightarrow{+1} G \xrightarrow{+1} H \xrightarrow{+1} J \xrightarrow{+1} J$
 $A \xrightarrow{+0} A \xrightarrow{+0} A \xrightarrow{+3} A \xrightarrow{+0} A$
 $G \xrightarrow{-1} F \xrightarrow{+3} I \xrightarrow{-1} H \xrightarrow{+3} K$
- (c) $3+3=6$
 $6+3=9$
 $9+6=15$
 $15+9=24$
 $24+15=39$
 $39+24=63$
 $63+39=102$
- (b)

-1	0	③	8	15	24
↑	↑	↑	↑	↑	↑
+1	+3	+5	+7	+9	
- (c)
 - Arrows (→) are increasing by one.
 - Dots (•) are decreasing by one.
 - P element changes its position from right to left. Square alternately also changes its shaded portion also.
 - ↑ element changes its position from left to right in square after rotating 45° clockwise.
- (b) Govind's age = 48 years
According to question
Prem's age = $48/2 = 24$ years
Prem's age seven years before = $24 - 7 = 17$ years.
- (a)

Mother	man	
↓ ⁽⁻⁾	(His)	mother is the
Mother = Lady		only daughter of (my)
↓ ⁽⁻⁾		mother. lady
Man		
↑ ⁽⁺⁾		
- (d) Standing arrangement : (facing south)
Right End ↓ ↓ ↓ ↓ ↓ Left End
David Shekhar Dhanush Bala Basha
Hence, Dhanush is standing at the middle of the row.
- (c) By options,
(a) can not be formed as there is no 'E' in the given word.
(b) can not be formed as there is no 'D' in the given word.
(d) can not be formed as there is no 'E' and only 'U' in the given word.
- (a) ALERT can not be formed as there is no 'R' in the word LEGALIZATION. Hence, (a) is the correct choice.

1	2	3	4
DEPU	TA	TI	ON
- (a) Coded →

ON	TA	DEPU	TI
4	2	1	3

Similarly,

1	2	3	4
DERI	VA	TI	ON

Coded →

ON	VA	DERI	TI
4	2	1	3

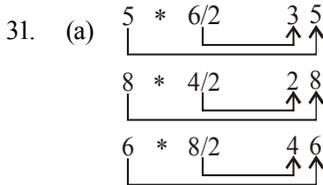
28. (c) M A D R A S T E N T
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 Coded as → 5 1 7 9 1 6 4 3 2 1
 Similarly,

R M A T S N
 ↓ ↓ ↓ ↓ ↓
 Coded as → 9 5 1 4 6 2

The shortest distance = $\sqrt{AB^2 + BC^2}$
 $= \sqrt{9^2 + 12^2}$
 $= \sqrt{225} = 15$ nautical miles

29. (a) 12 $\xrightarrow{+8}$ 20 $\xrightarrow{+16}$ 36 $\xrightarrow{+32}$ 68 $\xrightarrow{+64}$ 132 $\xrightarrow{128}$ 260

30. (c) By options—
 (a) $22 \times 7 + 3 - 9 = 148$
 $154 + 3 - 9$
 $157 - 9 = 148$ (Correct)
 (b) $33 - 5 + 10 \times 20 = 228$
 $33 - 5 + 200$
 $200 + 33 - 5$
 $233 - 5 = 228$ (Correct)
 (c) $7 \times 28 + 3 - 52 = 127$
 $196 + 3 - 52$
 $199 - 52 = 147$ (Incorrect)
 (d) $44 + 9 \times 6 - 11 = 87$
 $44 + 54 - 11$
 $98 - 11 = 87$ (Correct)

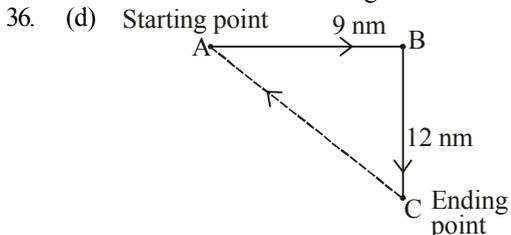


32. (c) (a) $12 + 3 \times 4 = 6 - 8 \times 8$
 $12 + 12 = 6 - 64$
 By options, $24 = 58$ (Incorrect)
 $\therefore 58 > 24$
 (b) $12 \times 3 + 4 = 6 - 8 \times 8$
 $36 + 4 = 6 - 64$
 $40 = 58$ (Incorrect)
 $\therefore 58 > 48$
 (c) $12 \times 3 + 4 = 6 \times 8 - 8$
 $36 + 4 = 48 - 8$
 $40 = 40$ (Correct)
 (d) $12 \times 3 - 4 = 6 \times 8 + 8$
 $36 - 4 = 48 + 8$
 $32 = 56$ (Incorrect)
 $\therefore 56 > 32$

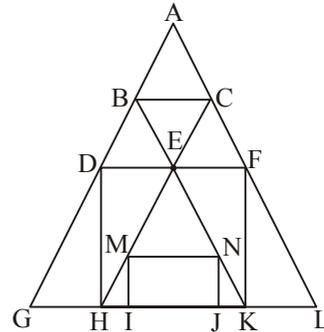
33. (b) $7 + 2^2 + 5 = 16$
 $9 + 4^2 + 7 = 32$
 $8 + 3^2 + 6 = 23$

34. (c) $3 + 9 - 5 = 7$
 $2 + 8 - 6 = 4$
 $4 + 7 - 5 = 6$

35. (b) A person observes his shadow to his right. The sun is to his left. He is walking towards the south.



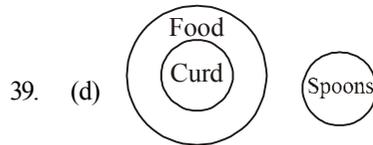
37. (c)



$\Delta ABC, \Delta BDE, \Delta BCE, \Delta CEF, \Delta ADF,$
 $\Delta DGH, \Delta DEH, \Delta MHI, \Delta EMN, \Delta NKJ,$
 $\Delta FKE, \Delta EHK, \Delta AGL, \Delta FKL, \Delta CHL, \Delta BGK.$
 Number of triangles = 16

38. (a) $6 \rightarrow 1 \cancel{2} 3 \cancel{4} \cancel{5}$
 $1 \rightarrow \cancel{2} \cancel{3} \cancel{4} 5 6$
 $4 \rightarrow \cancel{1} \cancel{2} 3 \cancel{4} \cancel{5}$

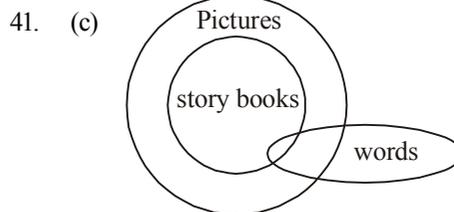
From above, it is clear that 3 is opposite to 4.
 Therefore, 1 is opposite 6.



40. (d)

Regions \rightarrow	1	2	4	6	7	8	9	10
Persons \downarrow								
Boys \square	✓	✓	×	×	×	×	✓	×
Girls \triangle	×	×	✓	×	×	✓	×	×
Sober \circ	×	✓	✓	✓	✓	×	×	×
Cricketer \square	✓	✓	×	✓	×	×	×	✓

Region 2 presents the boys who are cricketer and sober.



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

PART-B : GENERAL AWARENESS

51. (b) In the balance of payment accounts, unrequited payments or receipts (gifts) are regarded as unilateral transfers. In the balance-of-payments statement of a country, the accounts that show the amount of money sent or received as gifts.
52. (b) Price, output and perfect competition are the determinants of market structure. The demand curve of an individual firm under a purely competitive industry is perfectly elastic. This is the increase or decrease of the output of a single seller has no effect on the total supply and market place.
53. (a) Industrial democracy is an arrangement which involves workers making decisions, sharing responsibility and authority in the workplace.
54. (b) Marginal cost and average cost curves are related. If average costs falls, marginal cost falls at the same rate.
55. (d) Land development bank (LDB) disburses long term loans to private industry in India. The main objective of the LDB is to promote the development of land, agriculture and increase the agricultural production. The LDB provides long-term finance to members directly through its branches
56. (a) Bold and impartial judiciary is the most important safeguard of liberty and no one can restrain it. One of the most important safeguards is that the person has someone appointed with legal powers to represent them even in extreme case of deprivation of liberty.
57. (a) The philosophical school of law is the ancient school of law. It came into existence in 3rd century in Roman empire.
58. (a) Liberty means absence of restraint and assures freedom of thought, expression, belief, faith and worship.
59. (d) The Vice-President shall, during, and in respect of, the period while he is so acting as, or discharging the functions of, President have all the powers and immunities of the President and be entitled to such emoluments, allowances and privileges as may be determined by Parliament by law and, until provision in that behalf is so made, such emoluments, allowances and privileges as are specified in the Second Schedule. When the President is unable to discharge his functions owing to absence, illness or any other cause, the Vice-President shall discharge his functions until the date on which the President resumes his duties. The Vice-President shall not be a member of either House of Parliament or of a House of the Legislature of any State, and if a member of either House of Parliament or of a House of the Legislature of any State be elected Vice-President, he shall be deemed to have vacated his seat in that House on the date on which he enters upon his office as Vice-President.
60. (a) a system of government in which the powers of the president are constitutionally separate from those of the legislature.
61. (b) The method of amending the Constitution by popular veto is found in Switzerland.
62. (b) A parliamentary form of government is a democratic one where the head of state and head of government are held by different people and the executive and legislature branches of government are linked. The executive and legislature branch are linked because the executive branch gets its power from the legislative branch and is held accountable for their actions by them as well. The leaders of the majority party or alliance in the legislature become the members of the Cabinet or Ministry. Naturally, the ministers can easily extend their influence on the legislature. Consequently, the programs and policies of the Cabinet are backed by a majority inside the legislature. This feature is inalienable in Parliamentary form of government.
63. (d) Economic equality is not compatible with the liberal notion of equality. Liberal means free of restraints and economic equality is about a level playing field where everyone has the same access to the same wealth; which is not possible.
64. (c) Akbar celebrated his conquest of Rajputana by laying the foundation of a new capital, 23 miles (37 km) W.S.W of Agra in 1569. It was called Fatehpur Sikri ("the city of victory").
65. (a) Vasco da Gama was a Portuguese explorer who discovered the sea route to India from Europe through the Cape of Good Hope.
66. (a) The Unification of Karnataka refers to the formation of the Indian state of Karnataka, then named Mysore State, in 1956 when several Indian states were created by redrawing borders based on linguistic demographics
67. (a) Lord Curzon introduced the Indian University Act. The Indian Universities Act of 1904, passed on March, 21 was formulated on the basis of the recommendations of the Indian University Commission of 1902. Curzon gave importance on improving the standard and quality of higher education.
68. (a) After the spread of the Buddhist religion, Chinese travelers came to India in big numbers to collect religious books and to visit holy places of Buddhism.
69. (c) Visakhapatnam Steel Plant (VSP) is the first shore based integrated steel plant Public sector in the country located at Visakhapatnam in Andhra Pradesh. The plant was commissioned in August 1992 with a capacity to produce 3 million tonnes per annum (MTPA) of liquid steel. The plant has been built to match international standards with state-of-the-art technology, incorporating extensive energy saving and pollution control measures. VSP has an excellent layout capable of expanding up to 16 MTPA.
70. (c) Environmental conditions play a key role in defining the function and distribution of plants, in combination with other factors which influence the development of plants into distinctive forms.
71. (d) Dr. M S Swaminathan said the given lines. Swaminathan is known as "Indian Father of Green Revolution" for his leadership and success in introducing and further developing high-yielding varieties of wheat in India.

72. (b) The Geological Survey of India (GSI), established in 1851, is a government organization in India which is an office attached to the Ministry of Mines of Union Government of India for conducting geological surveys and studies.
73. (a) Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
74. (a) The pancreas is a glandular organ in the upper abdomen, but really it serves as two glands in one: a digestive exocrine gland and a hormone-producing endocrine gland. Functioning as an exocrine gland, the pancreas excretes enzymes to break down the proteins, lipids, carbohydrates, and nucleic acids in food. Functioning as an endocrine gland, the pancreas secretes the hormones insulin and glucagon to control blood sugar levels throughout the day.
75. (b) Due to the action of motor cells at the base of the petiole and leaflets, the leaves of touch me not plant closes. The motor cells are activated by touch of the sensitive hairs present on the surface of touch-me-not plant. Like a number of other plant species, it undergoes changes in leaf orientation termed "sleep" or nyctinastic movement. The foliage closes during darkness and reopens in light.
76. (c) The theoretical basis for plant tissue culture was proposed by Gottlieb Haberlandt, German Academy of science in 1902 on his experiments on the culture of single cell.
77. (d) Beak is technically only the external surface of a bird's mouth. The entire mouth structure of a bird is called the bill. The bill (or rostrum) consists of a bony framework, a vascular layer containing the blood vessels and nerves, a layer of connective tissue, which "glues" the beak to the bones, and the beak, which is the outer sheath covering the jaw bones. The beak is composed of keratin - the same tough, insoluble protein found in fingernails, hoofs, antlers and horns.
78. (c) External ear is present in Mammals. Many mammals can move the pinna (with the auriculares muscles) in order to focus their hearing in a certain direction in much the same way that they can turn their eyes. Most humans, unlike most other mammals, do not have this ability.
79. (c) Archimedes used the principle of buoyancy to find the purity of gold. According to which a body immersed in fluid experiences a buoyant force equal to the weight of the fluid it displaces. With the help of this principle, the density of the golden crown and solid gold was compared by balancing the crown on a scale with a reference piece, this set up is then immersed in water. If the crown is less dense than gold, it will displace more water, and thereby will experience a greater buoyant force than the reference piece.
80. (c) The kinetic energy of a non-rotating object of mass m travelling at a speed v is $\frac{1}{2}mv^2$. If m and v are increased to twice its magnitude, then $K.E = \frac{1}{2} \times 2m \times 2v \times 2v = \frac{1}{2}mv^2 (8) = 8$ times kinetic energy.
81. (d) The gravitational force is inversely proportional to the square of the distance: If you double the distance between the two bodies, the force of gravity is reduced to one-fourth its original value.
82. (d) Stationary wave can occur because the medium is moving in the opposite direction to the wave, or it can arise in a stationary medium as a result of interference between two waves travelling in opposite directions
83. (d) .mdb is not a picture file. It is a database file used by Microsoft Access. Though Access is tied into the Microsoft Office, MDB is Access's own format, which is based on the Access Jet Database Engine. .jpeg; .gif; and .png files are graphic files. The PNG, JPEG, and GIF formats are most often used to display images on the Internet. JPEG stands for Joint Photographic Experts Group. PNG stands for Portable Network Graphics. GIF stands for Graphics Interchange Format.
84. (c) Terrabyte (TB) is the largest measure of memory. 1 Bit = Binary Digit; 8 Bits = 1 Byte; 1024 Bytes = 1 KB (Kilo Byte); 1024 KB = 1 MB (Mega Byte); 1024 MB = 1 GB (Giga Byte) 1024 GB = 1 TB (Terra Byte). Thus TB > GB > MB > KB > Byte > Bit
85. (c) Maximum number of electrons present in M-shell are 18. The maximum number of electrons that can occupy a specific energy level can be found using the following formula.
Electron Capacity = $2n^2$, the variable n represents the Principal Quantum Number. Shell M has principle quantum number 3.
86. (b) Two oxygen atoms can both achieve stable structures by sharing two pairs of electrons joined in a double bond. O=O. Each line represents one pair of shared electrons.
87. (d) Helium is used by deep sea divers in their diving tanks as a substitute of nitrogen. The trouble with nitrogen in this situation is that nitrogen is a fairly heavy gas, and is soluble in blood at high pressure. Long term use of nitrogen can cause a strange sense of euphoria, or well being called nitrogen narcosis. This is a bit like being drunk, and makes the diver unable to assess dangers. Divers who work at depth or for long periods use a mixture of 20% Oxygen and 80% Helium. Helium is used for a number of reasons - It is light, cheap, and does not dissolve in blood the same way that nitrogen does. Being inert it cannot be toxic to the diver or corrosive to equipment.
88. (c) The atomic number of uranium is 92, and the mass number of the isotope is given as 238. Therefore, it has 92 protons, 92 electrons, and $238 - 92 = 146$ neutrons.
89. (d) Auxanometer measure root pressure which is developed in the xylem of the roots. The auxanometer measures plant growth as well as the pressure developed within the xylem cells of roots.

90. (c) Cell becomes turgid because of endosmosis. Plant cells need to be turgid (i.e. rigid) to support plant tissues. Plant cells become turgid when the concentration inside the cell is higher than outside. Therefore water moves into the cell by osmosis, and the vacuole swells and pushes against the cell wall. Endosmosis is the movement of water molecules from outside to inside of a cell through osmosis process.
91. (c) Imbibition is a process by which a photographic print is produced by absorption of a water-soluble dye by a relief image or a differentially absorbing image in gelatin or a similar medium or in which a previously formed dye image is transferred by absorption from one layer into another layer
92. (b) A physical phenomenon known as osmosis causes water to flow from an area of low solute, high water concentration to an area of high solute, low water concentration, until the two areas have an equal ratio of solute to water. Normally, the solute diffuses toward equilibrium as well; however, all cells are surrounded by a lipid bilayer cell membrane which permits the flow of water in and out of the cell but restricts the flow of solute under many circumstances. As a result, when a cell is placed in a hypotonic solution, water rushes into the membrane, increasing the cell's volume.
93. (d) Purno Agitok Sangma founded National People's Party on 5 January 2013 with Book as its National symbol.
94. (b) University of Kashmir was awarded the prestigious Best Research award in Earth Sciences at the Centenary year of Indian Science Congress held at the Calcutta University from 3-7 January 2013.
95. (c) Sunmeet Kaur Sawhney, a Punjabi woman, is the winner of ₹ 5 crore on TV game show Kaun Banega Crorepati 6.
96. (d) Charles Timothy "Chuck" Hagel is an American politician who is the 24th United States Secretary of Defence.
97. (a) The Governor of RBI is Raghuram Rajan. There are 4 Deputy Governors, Deputy Governor H R Khan, Dr Urjit Patel, R Gandhi and S S MUNDRA. Dr. Urjit Patel became Deputy Governor in January 2013.
98. (a) A Delhi court pronounced its order on the quantum of jail sentence for former Haryana Chief Minister Om Prakash Chautala and his son Ajay Chautala, who were convicted and sent to jail on January 16, 2013 in connection with a teacher recruitment scam.
99. (c) American anti-doping officials stripped Lance Armstrong of his seven Tour de France titles and imposed a lifelong ban from cycling -- the sport that made him an American hero and a sports icon. USADA maintains that Armstrong has used banned substances as far back as 1996, including the blood-booster EPO and steroids as well as blood transfusions -- all to boost his performance.
100. (c) B. Prasada Rao, CMD, BHEL has been conferred the Top Rankers Entrepreneurial Path Breaker Award 2013. The Award was received on the CMD's behalf by R. Krishnan, Director (HR) from Ajay Shankar, Member Secretary, National Manufacturing Competitiveness.

PART-C : QUANTITATIVE APTITUDE

101. (b) $\frac{\sqrt{24} + \sqrt{6}}{\sqrt{24} - \sqrt{6}} = \frac{2\sqrt{6} + \sqrt{6}}{2\sqrt{6} - \sqrt{6}} = \frac{3\sqrt{6}}{\sqrt{6}} = 3$
102. (a) H.C.F. of 403, 434 and 465 is 31.
103. (b) $3 \div \left[3 \div \left\{ 2 \div \frac{34}{13} \right\} \right]$
 $3 \div \left[3 \div 2 \times \frac{13}{24} \right]$
 $3 \div \left[3 \times \frac{34}{2 \times 13} \right]$
 $\frac{3 \times 2 \times 13}{3 \times 34} = \frac{13}{17}$
104. (d) $9 + 3 \div 4 - 8 \times 2 = ?$
 Applying rules
 $9 \div 3 \times 4 + 8 - 2 = ?$
 $3 \times 4 + 8 - 2 = ?$
 $20 - 2 = ?$
 $? = 18$
105. (a) Next term will be
 $\left(1 + \frac{1}{2}\right) \left(1 + \frac{1}{3}\right) \left(1 + \frac{1}{4}\right) \left(1 + \frac{1}{5}\right)$
 $= \frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \frac{6}{5} = 3$
106. (d) A can complete whole work in $\frac{28}{7} \times 8 = 32$ days
 B can complete whole work in $\frac{20 \times 6}{5} = 24$ days
 A and B together can complete whole work in
 $\frac{32 \times 24}{32 + 24} = \frac{32 \times 24}{56} = \frac{96}{7} = 13\frac{5}{7}$ days
107. (a) More the no. of men less time they take to complete work.
 Let x men are added
 $\frac{75}{75 + x} = \frac{18}{90}$ (Inverse Proportion)
 $\frac{75}{75 + x} = \frac{1}{5}$
 $375 - 75 = x$
 $x = 300$
108. (c) Let cost price of goods be 100
 Trader mark up at 50% more i.e. 150
 Selling price of goods = $150 - \frac{20}{100} \times 150 = 120$
 Profit % = $\frac{120 - 100}{100} \times 100 = 20$

109. (c) Let original price of sewing machine be ₹ x

$$\text{Retailer bought it at } x - \frac{15}{100}x = 0.85x$$

$$0.85x + \frac{15}{100} \times 0.85x = 1955$$

$$1.15 \times 0.85x = 1955$$

$$x = \frac{1955 \times 10000}{115 \times 85} = 2000$$

$$\text{Discount is } \frac{15}{100} \times 2000 = ₹ 300$$

110. (a) $\frac{x}{y} = \frac{2}{3}; \frac{2}{x} = \frac{4}{8}$

$$x = 4$$

$$y = \frac{3}{2}x = \frac{3}{2} \times 4 = 6$$

111. (b) $\frac{A}{B} = \frac{3}{4}; \frac{B}{C} = \frac{3.5}{3} = \frac{7}{6}$

$$\text{and } A + B + C = 730$$

$$\frac{3}{4}B + B + \frac{6}{7}B = 730$$

$$B\left(\frac{3}{4} + 1 + \frac{6}{7}\right) = 730$$

$$B = \frac{730 \times 28}{73} = 280$$

$$C = \frac{6}{7} \times B = \frac{6}{7} \times 280 = 240$$

$$B \text{ exceeds that of } C \text{ by } (280 - 240) = ₹ 40$$

112. (a) Sum of 20 numbers = $20 \times 35 = 700$

$$\text{Sum of 20 numbers when 61 is replaced by 16} \\ \Rightarrow 700 - 61 + 16 = 655$$

$$\text{Correct average of 20 numbers} = \frac{655}{20} = 32.75$$

113 (c) Let total bill would be ₹ x

$$\text{Each one decided to pay} = ₹ \left(\frac{x}{11}\right)$$

$$10 \text{ friends could pay } 10 \times 60 = ₹ 600$$

According to question,

$$600 + \frac{x}{11} + 50 = x$$

$$650 = x - \frac{x}{11} = \frac{10x}{11}$$

$$x = \frac{650 \times 11}{10} = 715$$

$$\text{Amount paid by 11th friend} = \frac{715}{11} + 50 = ₹ 115$$

114. (a) Profit % = $\frac{1000 - 900}{900} \times 100 = 11\frac{1}{9}\%$

115. (b) Selling price of 5 apples = ₹ 42.50

$$\text{Selling price of 60 apples} = \frac{42.5}{5} \times 60 = 510$$

$$C.P + \text{Profit} = S.P$$

$$C.P + \frac{20}{100} \times C.P = 510$$

$$C.P = \frac{510}{120} \times 100 = ₹ 425$$

116. (d) Let the total number of students be x.

Let A and B represent the sets of students who passed in English and Mathematics respectively.

Then, number of students passed in one or both the subjects

$$= n(A \cup B) = n(A) + n(B) - n(A \cap B) \\ = 75\% \text{ of } x + 60\% \text{ of } x - (x - 25\% \text{ of } x)$$

$$= \frac{3}{4}x + \frac{3}{5}x - \frac{3}{4}x = \left(\frac{15 + 12 - 15}{20}\right)x = \frac{3}{5}x$$

$$\text{So, } \frac{3}{5}x = 240$$

$$x = \frac{240 \times 5}{3} = 400$$

117. (b) $\frac{40}{100} \times \frac{4}{5} \times \frac{3}{4} \times x = 48$

$$\frac{6}{25}x = 48$$

$$x = \frac{48 \times 25}{6} = 200$$

$$1\% \text{ of } 200 \text{ is } 2.$$

118. (d) Let original time taken by student be x hours.

$$\frac{5}{2} \times \left(x + \frac{6}{60}\right) = 3 \times \left(x - \frac{10}{60}\right)$$

$$5x + \frac{1}{2} = 6x - 1$$

$$x = \frac{3}{2} \text{ hours}$$

$$\therefore \text{Distance from school} = \frac{5}{2} \times \left(\frac{3}{2} + \frac{1}{10}\right) = 4 \text{ km}$$

119. (b) Total distance = $(100 + 50) \text{ m} = 150 \text{ m}$

$$\text{Speed of the train} = \frac{150 \times 3600}{1000 \times 10} = 54 \text{ km/hr}$$

120. (b) Let P be the principle amount and R be rate of interest.

$$2P = P + \frac{P \times R \times 8}{100}$$

$$R = \frac{100}{8} = 12.5\%$$

121. (d) $P = ₹ 12000$, Rate = 5 %, Time (n) = ?, Amount = 13230

$$A = P \left(1 + \frac{R}{100} \right)^T \Rightarrow 13230 = 12000 \left(1 + \frac{5}{100} \right)^n$$

$$\Rightarrow \frac{13230}{12000} = \left(\frac{21}{20} \right)^n \Rightarrow \frac{1323}{1200} = \left(\frac{21}{20} \right)^n$$

$$\Rightarrow \frac{441}{400} = \left(\frac{21}{20} \right)^n$$

$$\left(\frac{21}{20} \right)^2 = \left(\frac{21}{20} \right)^n$$

$\therefore n = 2$ years

122. (b) $(100 + 160) : (180 + 60)$
 $= 260 : 240 = 13 : 12$

123. (c) Required % = $\frac{100}{(100 + 160 + 240 + 40)} \times 100$
 $= \frac{100}{540} \times 100 \approx 18.52\%$

124. (d) Required % = $\frac{120}{(180 + 60 + 120 + 20)} \times 100 = 31.58\%$

125. (b) Total students using Samsung = $100 + 180 = 280$
 Total students using Sony = $160 + 60 = 220$
 Difference = $280 - 220 = 60$

126. (d) Total surface area of cone = $\pi r(l + r)$

$$S = \frac{22}{7} \times 3 \times (\sqrt{3^2 + 4^2} + 3)$$

$$= \frac{22}{7} \times 3 \times 8 = \frac{528}{7}$$

$$S = 75.4 \text{ sq. cm}$$

127. (d) Maximum number of boxes = $\frac{800 \times 700 \times 600 \text{ cm}^3}{8 \times 7 \times 6 \text{ cm}^3}$
 $= 1000000$

128. (c) $\pi r_1^2 h_1 = \pi r_2^2 h_2$

$$\frac{r_1}{r_2} = \sqrt{\frac{h_2}{h_1}} = \sqrt{\frac{2}{1}}$$

$$r_1 : r_2 = \sqrt{2} : 1$$

129. (c) $2\pi r = 22 \text{ cm}$

$$r = \frac{22 \times 7}{2 \times 22} = \frac{7}{2} \text{ cm}$$

Height, $h = 12 \text{ cm}$

$$\text{Volume of cylinder} = \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 12 = 462 \text{ cm}^3$$

130. (a) Radius of cylinder = Radius of sphere = R
 Height of cylinder = 2R

$$\text{Volume of cylinder} = \pi R^2 \times (2R) = 2\pi R^3$$

131. (b) $2a^2 - 5ab + 2b^2$
 $2(a^2 - 2ab + b^2) - ab$
 $2(a - b)^2 - ab$

$$2[\sqrt{6} + \sqrt{5} - \sqrt{6} + \sqrt{5}]^2 - (\sqrt{6} + \sqrt{5})(\sqrt{6} - \sqrt{5})$$

$$2 \times 4 \times 5 - 1 = 39$$

132. (c) $27P^3 - \frac{1}{216} - \frac{9}{2}P^2 + \frac{1}{4}P$

$$= (3P)^3 - \left(\frac{1}{6}\right)^3 - 3 \cdot (3P)^2 \cdot \frac{1}{6} + 3 \cdot 3P \cdot \left(\frac{1}{6}\right)^2$$

$$= \left(3P - \frac{1}{6}\right)^3$$

$$= \left(3 \times \frac{5}{18} - \frac{1}{6}\right)^3 = \frac{8}{27}$$

133. (d) $x + \frac{1}{x} = 2$

$$x^2 - 2x + 1 = 0; (x - 1)^2 = 0; x = 1$$

$$x^{2013} + \frac{1}{x^{2014}} = 1 + 1 = 2$$

134. (d) Here, $a + b + c = 0$
 $\therefore a^3 + b^3 + c^3 - 3abc = 0$

135. (d)

$$[(\sqrt{6} - \sqrt{35}) + (\sqrt{10} - \sqrt{21})][(\sqrt{6} - \sqrt{35}) - (\sqrt{10} - \sqrt{21})]$$

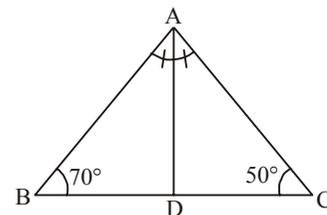
$$= (\sqrt{6} - \sqrt{35})^2 - (\sqrt{10} - \sqrt{21})^2$$

$$= 6 + 35 - 2\sqrt{6} \cdot \sqrt{35} - 10 - 21 + 2\sqrt{10} \cdot \sqrt{21}$$

$$= 10 - 2\sqrt{210} + 2\sqrt{210}$$

$$= 10$$

136. (c)



According to angle bisector theorem : The angle bisector, like segment AD, divides the sides of the triangle proportionally.

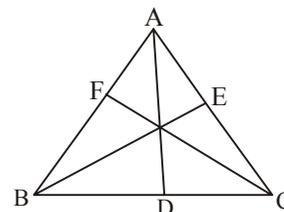
In ΔABC

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\angle A = 180^\circ - 70^\circ - 50^\circ = 60^\circ$$

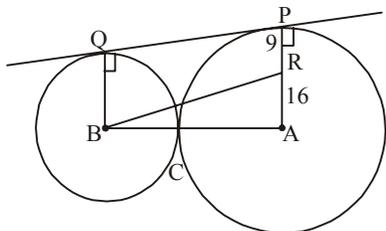
$$\angle BAD = \frac{60}{2} = 30^\circ$$

137. (b)



Let ABC be the triangle and D, E and F are midpoints of BC, CA and AB respectively.
 Hence, in ΔABD , AD is median
 $AB + AC > 2 AD$
 Similarly, we get
 $BC + AC > 2 CF$
 $BC + AB > 2 BE$
 On adding the above inequations, we get
 $(AB + AC + BC + AC + BC + AB) > 2(AD + BE + CF)$
 $2(AB + AC + BC) > 2(AD + BE + CF)$
 $\therefore AB + BC + BC > AD + BE + CF$
 Thus, the perimeter of triangle is greater than the sum of the medians.

139. (b)

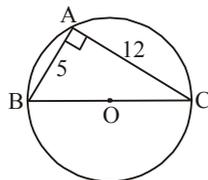


Let the two circles with centre A, B and radii 25 cm and 9 cm touch each other externally at point C. Then $AB = AC + CB = 25 + 9 = 34$ cm
 Let PQ be the direct common tangent i.e. $BQ \perp PQ$ and $AP \perp PQ$. Draw $BR \perp AP$. Then BRQP is a rectangle. (Tangent \perp radius at pt. of contact)

In ΔABR
 $AB^2 = AR^2 + BR^2$
 $(34)^2 = (16)^2 + (BR)^2$
 $BR^2 = 1156 - 256 = 900$
 $BR = \sqrt{900} = 30$ cm

140. (a)

In ΔABC ,
 $BC^2 = AB^2 + AC^2$
 $BC^2 = (5)^2 + (12)^2$
 $BC^2 = 25 + 144$
 $BC^2 = 169$
 $BC = \sqrt{169} = 13$ cm



Radius of triangle = $\frac{BC}{2} = \frac{13}{2} = 6.5$ cm

141. (b)

$\sec^2\theta + \tan^2\theta = 7$
 $1 + \tan^2\theta + \tan^2\theta = 7$
 $\tan^2\theta = \frac{6}{2} = 3$

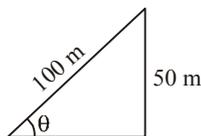
for $0 \leq \theta \leq \frac{\pi}{2}$ $\tan \theta = \sqrt{3}$

$\theta = 60^\circ = \frac{\pi}{3}$

142. (c)

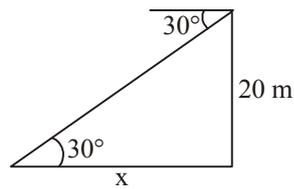
$\sin^2x + \cos^2x - 2(\sec^2x - \tan^2x)$
 $1 - 2(1) = -1$

143. (d)



$\sin\theta = \frac{50\text{ m}}{100\text{ m}} = \frac{1}{2}$
 $\theta = 30^\circ$

144. (b)



$$\tan 30^\circ = \frac{20}{x}$$

$$\frac{1}{\sqrt{3}} = \frac{20}{x}$$

$$x = 20\sqrt{3}$$

145. (a)

$$\frac{a^2}{a^2 \sin^2\theta} - \frac{b^2}{b^2 \tan^2\theta}$$

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

146. (c) Expenditure for education = $\frac{9000}{30} \times 18 = ₹ 5,400$

147. (b) Central angle of the sector for the expenditure on fuel
 $= \frac{360}{100} \times 15 = 54^\circ$

148. (c) Expenditure excluding rent and education
 $= \frac{3000}{15} \times (100 - 20 - 18)$

$$= 200 \times 62$$

$$= ₹ 12400$$

149. (c)

$30 = x\%$ of $(12 + 18 + 15)$

$$30 = \frac{x}{100} \times 45$$

$$x = \frac{200}{3} = 66\frac{2}{3}$$

150. (b)

$$\text{Required difference} = (20 + 12 + 15) - 30$$

$$= 47 - 30$$

$$= 17$$

PART-D : ENGLISH COMPREHENSION

151. (a) In 1906 an earthquake destroyed much of San Francisco. Instead of 'a' before earthquake, article 'an' should be used because it is followed by a vowel letter.
152. (a) His parents don't approve of his business. In English, don't is used when speaking in the first and second person plural and singular and the third person plural ("I," "you," "we," and "they"). Doesn't, on the other hand, is used when speaking in the third person singular only ("he," "she," and "it").
153. (d) No error.
154. (b) The lovers walked beside each other in silence. (the preposition besides means in addition to, whereas beside means next to)
155. (c) Men are wanted for the army, the navy and the air force. When joining two or more grammatically similar expressions, and is used followed in the end and commas are used to distinguish the other expressions.

156. (b) China is a big country. In area it is bigger than any other country except Russia. [except means other than, accept means consent, expect means to anticipate and access means entrance].
157. (a) The masks worn by the men helped them conceal their identity. Conceal means hide.
158. (b) On the auspicious occasion of Laxmi puja, the Mathurs bought a new car.
159. (b) Precautions are to be taken with anyone who seems infectious. [infectious means likely to transmit or spread in a rapid manner. Contagious and diseased is not used in this context because they refers to already having infection].
160. (d) The treasure was hidden off the shore. When something is hidden "off the shore," it just means that it's hidden somewhere near it.
161. (b) Scorn means contempt toward something.
162. (a) Catastrophe means an event causing great and usually sudden damage or suffering.
163. (a) Abjure means solemnly renounce.
164. (b) Assess means to get measure of.
165. (c) Elastic means able to encompass much variety and change; flexible and adaptable.
166. (b) Safe means free from harm. Its opposite is insecure.
167. (c) Redundant means excessive. Its opposite is singular.
168. (b) Fair means impartial. Its opposite is unjust.
169. (b) Boisterous means noisy and mischievous. Its opposite is calm.
170. (a) Flimsy means insubstantial and easily damaged.
171. (a) The idiom 'with all our might and main' means with great physical strength; great force.
172. (b) the idiom 'nailed their colours to their mast' means to defiantly display one's opinions and beliefs. Also, to show one's intention to hold on to those beliefs until the end. Its origin dates back to 17th century. In 17th century nautical battles colours (flags) were struck (lowered) as a mark of submission. It was also the custom in naval warfare to direct one's cannon fire at the opponent's ship's mast, thus disabling it. If all of a ship's masts were broken the captain usually had no alternative but to surrender. If the captain decided to fight on this was marked by hoisting the colours on the remnants of the ship's rigging, that is, by 'nailing his colours to the mast'.
173. (b) the idiom 'batten down the hatches' means to prepare for difficult times.
174. (b) the idiom 'she flies off at a tangent' means to pursue a somewhat related or irrelevant course while neglecting the main subject.
175. (b) the idiom 'go at equal speed' means to go neck-to-neck and put up with the teacher.
176. (b) He will revise it when he comes back.
177. (b) The members of the student's union did not sit for the examination in protest.
178. (d) She was kept from her assignment because of her loquacious roommate.
179. (d) James epitomises everything that a teacher should be. Epitomises means to personify, typify the traits/ characteristics.
180. (a) The businessman is respectfully connected.
181. (a) A volunteer is a person who freely offers to take part in an enterprise and undertake a task.
182. (a) Scepticism means a person inclined to question or doubt accepted opinions.
183. (a) Cofle means a line of slaves / animals fastened or driven along together.
184. (a) A mercenary is a hired professional soldier who fights for any state or nation without regard to political principles.
185. (a) Fastidious means difficult to please.
186. (c) Dubious is the correctly spelt word. It means hesitating.
187. (a) Ineffectual is the correctly spelt word. It means not producing any significant or desired result.
188. (d) Massacre is the correctly spelt word. It means the act or an instance of killing a large number of humans indiscriminately and cruelly.
189. (c) Conscience is the correctly spelt word. Conscience is an aptitude, faculty, intuition or judgment that assists in distinguishing right from wrong
190. (a) Nirvana is the correctly spelt word. Nirvana literally means "blown out", as in a candle. It is most commonly associated with Buddhism
191. (b) Modern means of entertainment and communication does not affect street theatre. It is still a popular mode of taking up crucial societal issues.
192. (a) In the olden days, street theatre was restricted to villages or small localities of the cities.
193. (c) Street theatre usually deals with issues of public importance.
194. (c) Street theatre is reasonable to stage as little props and images are used and not huge set up is required.
195. (b) Street theatre creates an emotional impact on audiences that leads to quick psychological impact.
196. (a) In self directed learning, an individual takes initiative with or without the help of others to learn new things.
197. (b) there is need for self-directed learning because it helps people to learn more things in a better way.
198. (a) Self-directed learning is active learning as one does not sit passively and waits for someone to teach. The learner actively initiates its own learning process.
199. (b) The modern environment is instructive in nature.
200. (c) Diagnosing means identifying.