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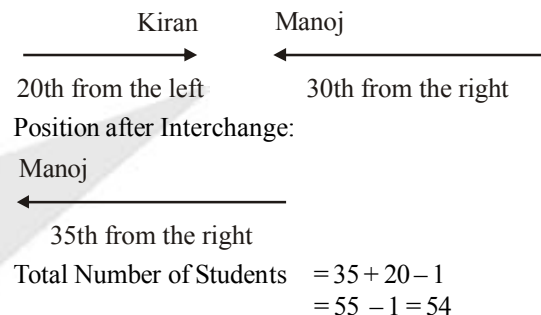
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SSC CGL (9 August) 2015 SOLVED PAPER : Morning Shift

GENERAL INTELLIGENCE AND REASONING

- (a) c c b a / b b c a / a a b c / c c b a / b
- (a) a b c d / b a c d / b c a d / b c d a / a b c d.
- (c)
- (c)

- (b) Let 'D' be the distance between A and B and T be the time taken by them
Then,
Distance = Speed × Time
 $D = 40 \times \left(T + \frac{15}{60}\right)$... (1)
 $D = 30 \times \left(T + \frac{24}{16}\right)$... (2)
Equating (1) and (2)
 $40 \left(T + \frac{1}{4}\right) = 30 \left(T + \frac{2}{5}\right)$
 $\frac{4}{3} = 4T = 1 = 3T + \frac{6}{5}$
 $T = \frac{6}{5} - 1$
 $T = \frac{1}{5}$ hour
Putting 'T' value in equation (1), we get
 $D = 40 \times \left(\frac{1}{5} + \frac{1}{4}\right) = \frac{40 \times 9}{20} = 18$ km.
Hence, the distance between the two stations is 18 km.
- (c) Original Position:



- (d) Standing Arrangement:

G is standing on the extreme left.
- (d) MERCY cannot be formed from the given word CUMBERSOME, as there is no 'Y' in the word.
- (a) Only 'S' can be prefixed to the given words.
New words are:
STILL, STABLE, SPILE, STAB, SPRING
- (c) Meaningful word is:
U N S C R A M B L E
3 9 4 2 8 10 5 1 7 6
- (c) Coded word: Z B Y X M N Q B
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
Key: s t r a i g h t
M O U S E
↓ +3 ↓ +3 ↓ +0 ↓ -2 ↓ -2
Coded as: P R U Q C
- (d) Similarly,
S H I F T
↓ +3 ↓ +3 ↓ +0 ↓ -2 ↓ -2
Coded as: V K I D R

- (a) 2 (5) (3) ⇒ are (old)
- (5) 4 6 ⇒ man is (old)
- (3) 7 8 ⇒ buy good

Codes are :

5 \Rightarrow old 4 \Rightarrow man or is 8 \Rightarrow buy or good

3 \Rightarrow books 6 \Rightarrow man or is

2 \Rightarrow are 7 \Rightarrow buy or good

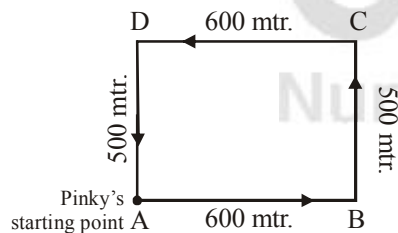
2 stands for "are" in that code.

14. (b) $46 \times 6 \div 4 + 5 - 3$
 $= 46 \times 1.5 + 5 - 3$
 $= 69 + 5 - 3 = 71$
15. (b) $18 \times 6 \div 4 + 2 - 3$
 $= 18 \times 1.5 + 2 - 3$
 $= 27 + 2 - 3 = 26$
16. (c) $8 \times 2 + 1 = 17$
 $8 \times 17 + 1 = 137$
 $8 \times 137 + 1 = 1097$
17. (c) $36 - 14 + 12 + 7 = 3$
 $54 - 9 + 11 + 16 = 18$
18. (c) $9 \xrightarrow{+4} 13 \xrightarrow{-3} 10 \xrightarrow{+4} 14 \xrightarrow{-3} 11$
 $11 \xrightarrow{+4} 15 \xrightarrow{-3} 12 \xrightarrow{+4} 16 \xrightarrow{-3} 13$
 $13 \xrightarrow{+4} 17 \xrightarrow{-3} 14 \xrightarrow{+4} 18 \xrightarrow{-3} 15$

Hence, 15 is the correct answer.

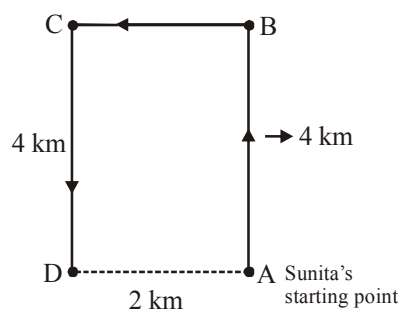
19. (c) $3 \times 4 \times 2 = 24$
 $2 \times -2 \times -1 = 4$
 $6 \times 0 \times 5 = 0$
20. (b) $7 \times 8 \times 2 = 112$
 $5 \times 4 \times 8 = 160$
 $3 \times 9 \times ? = 162$
 $27 \times ? = 162$
 $? = \frac{162}{27} = 6$

21. (c)



Hence, Pinky is 0 metres from the starting point.

22. (b)



Hence, Sunita rode 4 km northwards initially.

23. (a) Parental involvement and participation is necessary for promoting the growth of children.
24. (c) Conclusion I is not based upon the given statement.

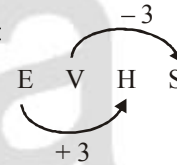
Conclusion II does not prove the given statement so, neither I nor II follows.

25. (c) Hematology is the branch of medicine concerned with the study and prevention of diseases related to the blood.
 Similarly, phycology is the scientific study of algae.
26. (c) A group of Lions is called a pride.
 A group of Cats is called a clowder.
27. (a) $M \quad A \quad N \quad W \quad A \quad N$
 $\downarrow +3 \quad \downarrow +3 \quad \downarrow +3 \quad \text{Similarly,} \quad \downarrow +3 \quad \downarrow +3 \quad \downarrow +3$
 $P \quad D \quad Q \quad Z \quad D \quad Q$
28. (b) $A \quad E \quad F \quad J$
 $\downarrow +10 \quad \downarrow +10 \quad \downarrow +10 \quad \downarrow 10$
 $K \quad O \quad P \quad T$
 Similarly,
 $G \quad K \quad L \quad P$
 $\uparrow -10 \quad \uparrow -10 \quad \uparrow -10 \quad \uparrow -10$
 $Q \quad U \quad V \quad Z$
29. (a) $2^5 = 32$
 $3^5 = 243$
30. (c) $D \times H \quad M \times Q$
 $\downarrow \quad \downarrow \quad \text{Similarly,} \quad \downarrow \quad \downarrow$
 $4 \times 8 \quad 13 \times 17$

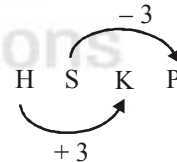
Respective place value of letters in English alphabet.

Hence, option (c) is the correct answer.

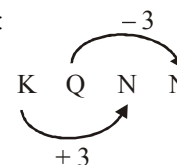
31. (d) Except (d), all others belong to the period of before sunset.
32. (b) Except (b), all others are principles of society.
33. (a) Option (b):



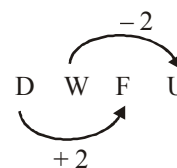
Option (c):



Option (d):



Option (a):



Hence, option (a) is the group of odd letters.

34. (d) Option (a): $C \xrightarrow{-1} B \xrightarrow{+3} E \xrightarrow{+1} F$
 Option (b): $E \xrightarrow{-1} D \xrightarrow{+3} G \xrightarrow{+1} H$

Option (c): $I \xrightarrow{-1} H \xrightarrow{+3} K \xrightarrow{+1} L$

Option (d): $G \xrightarrow{-1} F \xrightarrow{+1} H \xrightarrow{+1} I$

Hence, option (d) is the odd group of letters.

35. (d) $4+0+2+5=11$
 $6+0+2+3=11$
 $7+2+0+2=11$
 $5+0+6+1=12$

Hence, (d) is the odd one out.

36. (a) $64 : 48$
 $(8 \times 8) : (8 \times 6)$

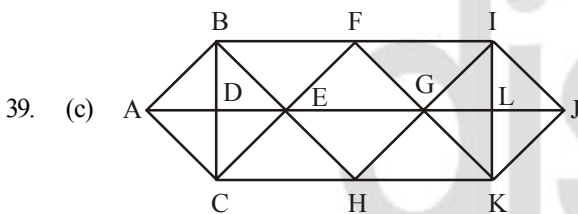
$80 : 60$
 $(10 \times 8) : (10 \times 6)$

$104 : 78$
 $(13 \times 8) : (13 \times 6)$

Hence, option (a) is odd one out

37. (d) Lily, Daisy, Datura all have outer part white and inner part yellow.
 Jasmine also has outer part white and inner part yellow.

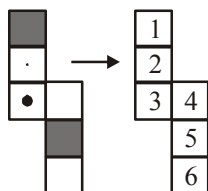
38. (c) Meaningful Order:
 Mosquito \rightarrow Cat \rightarrow Tiger \rightarrow Elephant \rightarrow Whale
 (3) (2) (4) (1) (5)



$\triangle ABD, \triangle ADC, \triangle BDE, \triangle DEC,$
 $\triangle ABC, \triangle BEC, \triangle ACE, \triangle ABE,$
 $\triangle BEF, \triangle FIG, \triangle CEH, \triangle HGK,$
 $\triangle FGE, \triangle EGH, \triangle GIL, \triangle ILJ,$
 $\triangle GLK, \triangle LJK, \triangle GIJ, \triangle GKJ,$
 $\triangle GIK, \triangle IJK, \triangle ABCH, \triangle IHK,$
 $\triangle ABFC, \triangle FIK, \triangle FCK, \triangle HBI$

Total Triangles = 28

40. (b) The given figure can be numbered like this:



In this figure:

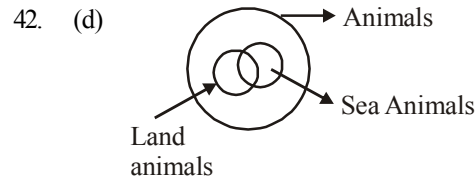
- 1 lies opposite 3;
 2 lies opposite 5;
 4 lies opposite 6.

When the sheet of question figure is folded to form a cube, then the face bearing a dot lies opposite to one

of the shaded faces.

Therefore, figure (2) which has both the shaded faces adjacent to the face bearing the dot, cannot be formed. Hence, the cubes shown in figures (1), (2) and (4) can be formed.

41. (c) There are 17 number of circles in the given figure.



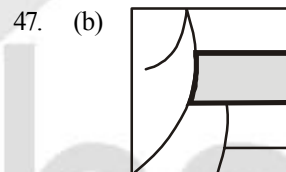
43. (d)

Persons	Numbers					
	1	2	3	4	5	6
\triangle Doctors	✓	✓	×	×	✓	✓
\circ Professors	×	×	×	✓	✓	✓
\square Married	×	✓	✓	×	×	✓

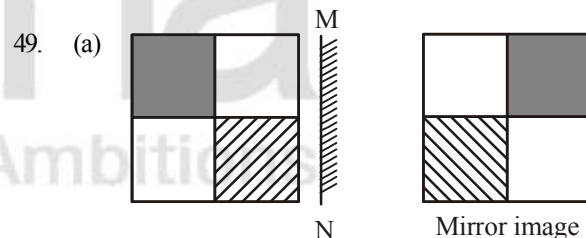
Number 1 indicates doctors who are not married

P and K is nothing but R.

44. (a)
 45. (a)
 46. (c)



48. (c)



50. (a) $P \quad E \quad A \quad R \quad L$
 $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 00 55 22 11 96

GENERAL AWARENESS

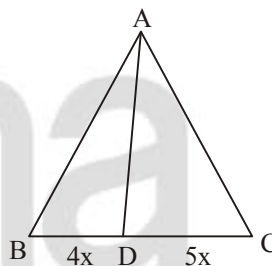
51. (a) Endymion is a poem, written by John Keats. It begins with the line "A thing of beauty is a joy forever". The poem tells about how nature and its wonder mesmerize us and take away all the sorrow that surrounds us from time to time.
52. (b) The birthday of Sarvepalli Radhakrishnan is celebrated as Teacher's Day. The day commemorates the birthday of Dr Sarvepalli Radhakrishnan, a philosopher and a teacher par excellence, and his contribution towards Indian education system. As a tribute to this great teacher, his birthday is observed as Teacher's Day across India on 5th September.

53. (c) The Arjuna Awards are given by the Ministry of Youth Affairs and Sports, government of India to recognize outstanding achievement in National sports.
54. (c) "Place of the Thunderbolt" is associated with Darjeeling (west Bengal). The word Darjeeling is a combination of two words 'dorje,' which means 'thunderbolt' and 'ling', which means 'place'. Hence the word Darjeeling means 'the Land of Thunderbolt'.
55. (c) The Ship building yard Mazagon Dock Limited (MDL) is located in Mumbai (Maharashtra). It is India's prime shipyard. It manufactures warships and submarines for the Indian Navy and offshore platforms and associated support vessels for offshore oil drilling.
56. (d) Electric current is measured using a device called an ammeter.
57. (d) Aga Khan Cup is related to Football. When Prince Aga Khan IV of Iran visited in 1958, expressed his interest to start a major international football club tournament in the region. The football authorities of East Pakistan in collaboration with Asian Football Confederation (AFC) decided to start this event.
58. (a) The first summit was held in Dhaka, Bangladesh on 7-8 December 1985 and was attended by president of Bangladesh, Maldives, Pakistan and Sri Lanka, the kings of Bhutan and Nepal, and the prime minister of India.
59. (c) The Bretton Woods Institutions are the World Bank, and the International Monetary Fund (IMF). They were set up at a meeting of 43 countries in Bretton Woods, New Hampshire, USA in July 1944.
60. (c) The price and output under monopoly are determined by equality between marginal cost and marginal revenue and not by the intersection of demand and supply curves.
61. (d) Macroeconomics is a branch of economics dealing with the performance, structure, behavior, and decision-making of an economy as a whole, rather than individual markets. Macroeconomists develop models that explain the relationship between such factors as national income, output, consumption, unemployment, inflation etc.
62. (d) Internal economies arise within the firm because of the expansion of the size of a particular firm. They are called the economies of scale.
63. (c) In a free market economy there is a freedom of choice for the consumers to buy goods and services which suit their tastes and preferences. This is generally called the principle of consumer sovereignty. This means in a market economy the consumers are just like a king or sovereign who dictate what goods and services and what quantities of them are produced.
64. (c) Net national product (NNP) refers to gross national product (GNP), i.e. the total market value of all final goods and services produced by the factors of production of a country or other polity during a given time period, minus depreciation.
- NNP = GNP – Depreciation
65. (b) Zilla Parishad is the apex body of the PR (Panchayati Raj) system located at the district level. Chairpersons/ Presidents of Panchayat Samitis come within its jurisdiction.
66. (c) A parliamentary system is a system of democratic governance of a state in which the executive branch derives its democratic legitimacy from, and is held accountable to the legislature (parliament).
67. (d) Public opinion is important in a democracy because the people are the ultimate source of political power. The legislature in a democratic country can influence public opinion by focusing attention on public issues.
68. (a) Article 56 of the Indian Constitution says that the President shall hold office for a term of five years from the date he takes up his post. He may resign from his office by writing his resignation to the Vice-President of India.
69. (c) Nagaland is a state in Northeast India. The state capital is Kohima. Nagaland became the 16th state of India from 1 December 1963.
70. (a) Mihira Bhoja was a ruler of the Gurjara Pratihara dynasty of India. Bhoja's empire extended to Narmada River in the South, Sutlej River in the northwest, and up to Bengal in the east.
71. (d) Bose appeared at the 1939 Congress meeting and was elected president over Gandhi's preferred candidate Pattabhi Sitaramayya.
72. (c) The Jallianwala Bagh Massacre happened in Amritsar, in 1919. It is named after the Jallianwala Bagh (Garden) at Amritsar. On April 13, 1919, British, Indian Army soldiers started shooting an unarmed gathering of men, women and children.
73. (b) Bahlol Lodi was the founder of the Lodi dynasty. He ruled for long thirty-nine years (1451-89). He was the governor of Lahore and Sirhind during the rule of Muhammad Shah of Sayyid dynasty.
74. (c) Sri Chaitanya Mahaprabhu arrived in the empire at the time of Emperor Prataparudra (Gajapati) and stayed for 18 long years at Puri.
75. (c) The instance heat that prevails in the Indian Sub continent causes a low pressure region over the northern plains. It is intense enough to attract the moisture bearing winds from the Indian Ocean. Thus the south east trade winds from the southern hemisphere are attracted towards India.
76. (d) A river profile is a curve which shows the slope of a river from source to mouth. A stream flowing over irregular terrain may have waterfalls, rapids and lakes along its course. Though the stream will wear away the irregularities to leave a smoothly curving profile called a graded profile.
77. (c) Karst is a landscape formed from the dissolution of soluble rocks including limestone, dolomite and gypsum. It is characterized by sinkholes, caves, and underground drainage systems.

78. (d) Kerala is famous for the cultivation of coconut, tea, coffee, cashew and spices.
79. (a) The Trans-Siberian Railway is the longest railway line in the world. It has a length of 9,289 km which connects Moscow to Vladivostok.
80. (d) Photoperiodism is the physiological reaction of organisms to the length of day or night. It occurs in plants and animals. It affects Flowering, Vegetative growth and fruiting in plants.
81. (d) The correct match is as follows:
Ascorbic acid- Vitamin C
Chlorophyll- Photosynthetic pigment
Carotenoid- Quencher
Superoxide dismutase- Enzyme
82. (b) Allantois is a part of a developing amniote's conceptus which primarily involved in nutrition and excretion, and is webbed with blood vessels.
83. (d) Haliotis belongs to Mollusca.
84. (a) Although most DNA is packaged in chromosomes within the nucleus, mitochondria also have a small amount of their own DNA. This genetic material is known as mitochondrial DNA or mtDNA
85. (c) First class proteins contain all the essential amino acids in sufficient amounts. Animal proteins are obtained from milk, egg, fish, meat etc. are first class proteins. These are also called adequate proteins.
86. (b) Needle exerts more pressure than nail on the balloon.
87. (c) The speed of sound is greater in moist air than in dry air.
88. (b) X rays are frequently used to check the defects in Diamonds and other precious stones.
89. (a) When ice is kept on saw dust then it does not melt quickly as it's an insulator of heat and air does not circulate in good insulators. So, it prevents ice from melting quickly.
90. (c) A parity bit, or check bit is a bit added to the end of a string of binary code that indicates whether the number of bits in the string with the value one is even or odd. Parity bits are used as the simplest form of error detecting code.
91. (c) Memory management is the process of controlling and coordinating computer memory, assigning portions called blocks to various running programs to optimize overall system performance. It involves components that physically store data, such as RAM (random access memory) chips, memory caches, and flash-based SSDs (solid-state drives).
92. (a) When a drop of Glycerol is added to crushed KMnO_4 spread on a paper there is a violent explosion.
93. (c) A bleaching agent is a material that lightens or whitens a substrate through chemical reaction. The most common bleaching agents generally fall into two categories: chlorine and its related compounds (such as sodium hypochlorite) and the peroxygen bleaching agents, such as hydrogen peroxide and sodium perborate.
94. (a) Alpha particles are the least penetrating as they are the most densely ionizing. The penetrating power of nuclear radiation depends upon the ionizing power of the radiation. The more localised the ionization the less penetrating power it will possess.
95. (a) Hydrogen- peroxide is an effective sterilizing agent. Water results when it readily loses active oxygen.
96. (c) The maximum fixation of solar energy is done by green plants. The energy is stored in the plants as carbohydrates for their metabolic activities as growth, respiration etc.
97. (a) The term 'brown air' is used for photochemical smog. The brown color is caused by the presence of various Nitrous Oxides.
98. (c) One of the Major objectives and advantages of rainwater harvesting is to reduce run off loss.
99. (c) Peroxyacetyl nitrate is a secondary pollutant present in photochemical smog. It is thermally unstable and decomposes into peroxyethanoyl radicals and nitrogen dioxide gas.
100. (b) Brahmaputra River is one of the largest rivers in the world. The origin of Brahmaputra River is in southwestern Tibet as the Yarlung River.

QUANTITATIVE APTITUDE

101. (c)



$$\text{Area of } \triangle ABD = \frac{1}{2} \times BD \times AD$$

$$60 = \frac{1}{2} \times 4x \times AD \quad \dots (1)$$

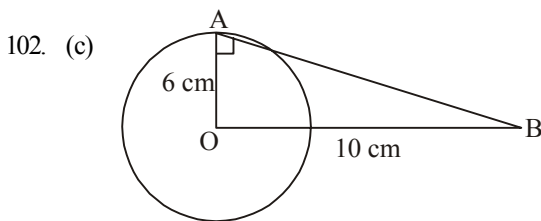
$$\text{Area of } \triangle ADC = \frac{1}{2} \times DC \times AD$$

$$\text{Area of } \triangle ADC = \frac{1}{2} \times 5x \times AD \quad \dots (2)$$

Dividing eqn. (1) and (2)

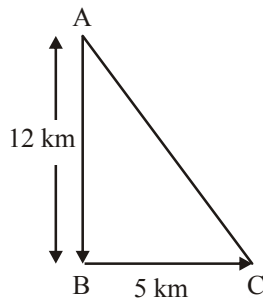
$$\frac{60}{\text{Area of } \triangle ADC} = \frac{\frac{1}{2} \times 4x \times AD}{\frac{1}{2} \times 5x \times AD}$$

$$\Rightarrow \text{Area of } \triangle ADC = \frac{5x \times 60}{4x} = 75 \text{ cm}$$



$$\begin{aligned} AB^2 + OA^2 &= OB^2 \\ AB^2 &= (10)^2 - (6)^2 \\ &= 100 - 36 = 64 \\ AB &= 8 \text{ cm} \end{aligned}$$

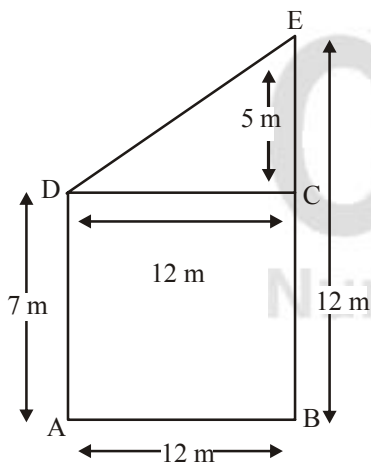
103. (c) Given, $AB = 12 \text{ km}$, $BC = 5 \text{ km}$



Straight way distance of ship

$$AC = \sqrt{AB^2 + BC^2} = \sqrt{12^2 + 5^2} = \sqrt{169} = 13 \text{ km}$$

104. (a)



Let DE be the distance between the poles
Distance between poles top

$$DE = \sqrt{DC^2 + CE^2} = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = 13 \text{ m}$$

105. (a) The maximum value of $\sin^4\theta + \cos^4\theta$ is 1.
106. (a) $\tan 4^\circ \tan 43^\circ \tan 47^\circ \tan 86^\circ$
 $\tan(90^\circ - 86^\circ) \times \tan(90^\circ - 47^\circ) \times \tan 47^\circ \times \tan 86^\circ$
 $\Rightarrow \cot 86^\circ \times \cot 47^\circ \times \tan 47^\circ \times \tan 86^\circ$
 $\Rightarrow 1$

107. (c) Let four numbers are a, b, c, d, then

$$\begin{aligned} a + b + c + d &= 48 && \dots(i) \\ \text{and } a + 5 &= b + 1 && \dots(ii) \\ \text{or, } a &= b - 4 && \dots(iii) \\ \text{and } c - 3 &= d - 7 && \dots(iv) \\ c &= d - 4 && \dots(v) \end{aligned}$$

Substituting equation (iii) and (v) in equation (i) we get

$$b - 4 + b + d - 4 + d = 48$$

$$b + d = 28 \quad \dots(6)$$

But we know,

$$b + 1 = d - 7$$

$$\therefore b = d - 8$$

Substituting in equation (vi) we get

$$d - 8 + d = 28$$

$$d = 18$$

Solving this way we get $a = 6$, $b = 10$, $c = 14$ and $d = 18$

108. (a) Number has to be less than 27. Let the number be x. On Dividing 2055 by 27, we get remainder as 3

$$\text{Now, } 3 + x = 27$$

$$\therefore x = 24$$

109. (b) A and B can complete work in 6 days

A can complete in 18 days

Let B can complete in x days

\therefore One day work be equal to

$$\frac{1}{6} = \frac{1}{18} + \frac{1}{x}$$

$$\frac{1}{6} = \frac{x + 18}{18x}$$

$$3x = x + 18$$

$$x = 9 \text{ days}$$

110. (d) Work done by A in one hour = $\frac{1}{x}$

$$\text{Work done by B in one hour} = \frac{1}{y}$$

Both A & B together in work one hour

$$= \frac{1}{x} + \frac{1}{y} = \frac{y + x}{xy}$$

Both A & B fill tank in $\frac{xy}{y + x}$ hours.

111. (a) Work done by 1st tap in one minute = $\frac{1}{30}$

$$\text{Work done by 2nd tap in one minute} = \frac{1}{45}$$

$$\text{Both tap one minute work} = \frac{1}{30} + \frac{1}{45} = \frac{45 + 30}{1350}$$

$$= \frac{75}{1350} = \frac{1}{18}$$

Both tap will empty the tank in 18 minutes.

112. (b) Perimeter of one face, $4a = 20 \text{ cm}$

Therefore, side of cube, $a = 5 \text{ cm}$

$$\text{Volume of cube} = a^3 = 5^3 = 125 \text{ cm}^3$$

113. (a) Area of circle, $A = \pi r^2$... (i)

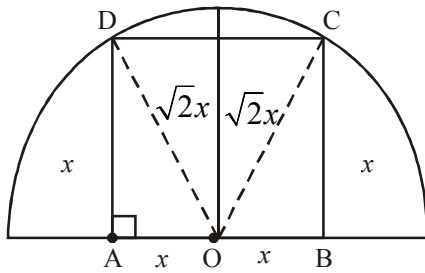
Circumference of circle, $C = 2\pi r$... (ii)

Multiplying eq. (i) by 2, we get, $2A = 2\pi r^2$

Multiplying eq. (ii), by 'r', we get $rC = 2\pi r^2$

$$\therefore rC = 2A$$

114. (d)



$$OA = AD = x$$

$$\therefore OD = \sqrt{x^2 + x^2} = \sqrt{2}x$$

So (d) option is correct.

115. (d) Successive discount can be given by $= x + y + \frac{xy}{100}$

$$= -10 - 20 + \frac{(-10 \times -20)}{100}$$

$$= -30 + 2 = 28\%$$

Hence, the successive discount is equal to 28%

116. (c) Let the second discount be $x\%$. Then

$$(100 - x)\% \text{ of } 90\% \text{ of } 720 = 550.80$$

$$\Rightarrow \frac{100 - x}{100} \times \frac{90}{100} \times 720 = \frac{55080}{100}$$

$$\Rightarrow (100 - x) = \frac{55080 \times 100}{90 \times 720} = 85$$

$$\Rightarrow x = 100 - 85 = 15\%$$

117. (c) S.P. of an article = 20% and 15% successive discount \times marked price of an article

$$3060 = \frac{80}{100} \times \frac{85}{100} \times \text{marked price of an article}$$

$$\therefore \text{Marked of an article} = \frac{3060 \times 100 \times 100}{80 \times 85} = 4500$$

118. (b) Let the A's age and B's age was $8x$ and $13x$

According to question

$$\frac{8x + 18}{13x + 18} = \frac{5}{7}$$

$$\Rightarrow 56x + 18 \times 7 = 65x + 18 \times 5$$

$$\Rightarrow 65x - 56x = 18 \times 7 - 18 \times 5$$

$$\Rightarrow 9x = 18 \times 2$$

$$\Rightarrow x = 4$$

Hence, the present age of A

$$= 8 \times 4 + 18 = 50 \text{ yrs.}$$

119. (d) Quantity of milk = $\frac{7}{9} \times 729 = 567 \text{ ml}$

$$\text{Quantity of water} = \frac{2}{9} \times 729 = 162 \text{ ml}$$

Let 'x' be the quantity that should be added to make the ratio 7 : 3

According the question

$$\frac{567}{162 + x} = \frac{7}{3}$$

$$\Rightarrow 1701 = 1134 + 7x$$

$$\Rightarrow 7x = 1701 - 1134$$

$$\Rightarrow x = 81 \text{ ml}$$

120. (b) Let the average weight of 15 Oarsmen at the start = $x \text{ kg}$

Let the new man's weight = $y \text{ kg}$

According to question

$$15x - 42 = 15(x + 1.6) - y$$

$$15x - 42 = 15x + 24 - y$$

$$y = 24 + 42 = 66 \text{ kg}$$

121. (a) Arithmetic mean of first 'n' natural number

$$= \frac{\text{Sum of 'n' natural number}}{\text{Number of observations}}$$

$$= \frac{(n)(n+1)}{2 \times n} = \frac{n+1}{2}$$

122. (a) Solving by alligation

$$\begin{array}{cc} 70 & 70.75 \\ & \times \\ 30 & 20 \end{array}$$

$$x = \frac{70 \times 30 + 70.75 \times 20}{50} = \frac{2100 + 1415}{50} = 70.3$$

$$\text{Hence, cost price} = 70.3 \times 50 = ₹ 3515$$

$$\text{Selling price} = 80.5 \times 50 = ₹ 4025$$

$$\text{Required gain} = 4025 - 3515 = 510$$

123. (d) Population 3 yrs. ago = $\frac{9261}{\left(1 + \frac{5}{100}\right)^3}$

$$= \frac{9261 \times 20 \times 20 \times 20}{21 \times 21 \times 21} = 8000$$

124. (b) Let the distance travelled as foot be $x \text{ km}$.

Then, distance travelled by bicycle = $(61 - x) \text{ km}$

$$\text{So, } \frac{x}{4} + \frac{61 - x}{9} = 9$$

$$9x + 4(61 - x) = 9 \times 36$$

$$9x - 4x = 324 - 244$$

$$5x = 80$$

$$x = 16 \text{ km}$$

125. (b) When distance is constant, then speed is inversely proportional

$$S_1 : S_2 = T_2 : T_1$$

$$4 : 16.5 = T_2 : 165$$

$$\text{or } \frac{4}{16.5} = \frac{T_2}{165}$$

$$T_2 = \frac{165 \times 4}{16.5} = 40 \text{ min}$$

126. (d) Let x be the principal amount
' y ' be the time to double the money.
Then interest will also be ' x '.

$$\therefore x = \frac{x \times 25 \times y}{4 \times 100}$$

$$400 = 25y$$

$$y = 16 \text{ years}$$

127. (d) Intercept can represent in the form of $\frac{x}{a} + \frac{y}{b} = 1$

To get x and y intercept, we have

$$3x + 4y = 12$$

$$\frac{x}{4} + \frac{y}{3} = 1$$

So, triplets of 3, 4 and 5.

Hence, 5 is the length of portion of straight line.

$$128. (c) \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{3-\sqrt{8}}$$

$$\Rightarrow \frac{1}{\sqrt{7}-\sqrt{6}} \times \frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}+\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} \times \frac{\sqrt{6}+\sqrt{5}}{\sqrt{6}+\sqrt{5}} + \frac{1}{\sqrt{5}-2}$$

$$\times \frac{\sqrt{5}+2}{\sqrt{5}+2} - \frac{1}{\sqrt{8}-\sqrt{7}} \times \frac{\sqrt{8}+\sqrt{7}}{\sqrt{8}+\sqrt{7}} + \frac{1}{3-\sqrt{8}} \times \frac{3+\sqrt{8}}{3+\sqrt{8}}$$

$$\Rightarrow \frac{\sqrt{7}+\sqrt{6}}{7-6} - \frac{(\sqrt{6}+\sqrt{5})}{6-5} + \frac{\sqrt{5}+2}{5-4}$$

$$- \frac{(\sqrt{8}+\sqrt{7})}{8-7} + \frac{3+\sqrt{8}}{9-8}$$

$$\Rightarrow \sqrt{7} + \sqrt{6} - \sqrt{6} - \sqrt{5} + \sqrt{5} + 2 - \sqrt{8} - \sqrt{7} + 3 + \sqrt{8}$$

$$\Rightarrow 5$$

$$129. (d) m^3 - 3m^2 + 3m + 3n + 3n^2 + n^3$$

$$\Rightarrow (-4)^3 - 3(-4)^2 + 3(-4) + 3(-2) + 3(-2)^2 + (-2)^3$$

$$\Rightarrow -64 - 48 - 12 - 6 + 12 - 8$$

$$\Rightarrow -126$$

130. (b) For no solution, $a = b$

$$\frac{2}{6} = \frac{-k}{-12}$$

$$k = \frac{-12 \times 2}{-6} = 4$$

131. (c) By squaring the given relations, we get (i) and (iii) are incorrect relations from the given statement.

132. (a) Using the formula,

$$x^3 + y^3 + z^3 - 3xyz = \frac{1}{2} \times (x+y+z)$$

$$\left[(x-y)^2 + (y-z)^2 + (z-x)^2 \right]$$

$$\Rightarrow \frac{1}{2} \times (332 + 333 + 335) \times$$

$$\left[(332 - 333)^2 + (333 - 335)^2 + (335 - 332)^2 \right]$$

$$\Rightarrow \frac{1}{2} \times 1000 \times [(-1)^2 + (-2)^2 + (-3)^2]$$

$$\Rightarrow \frac{1}{2} \times 1000 \times [1 + 4 + 9]$$

$$\Rightarrow \frac{1}{2} \times 1000 \times 14 = 7000$$

$$133. (d) 2 + x\sqrt{3} = \frac{1}{2 + \sqrt{3}}$$

$$(2 + x\sqrt{3})(2 + \sqrt{3}) = 1$$

$$4 + 2x\sqrt{3} + 2\sqrt{3} + 3x = 1$$

$$2x\sqrt{3} + 3x = 1 - 4 - 2\sqrt{3}$$

$$= -3 - 2\sqrt{3}$$

$$x(2\sqrt{3} + 3) = -(3 + 2\sqrt{3})$$

$$x = -1$$

134. (b)

135. (b) Let 'x' be the measure of an angle.

According to question

$$3x + x = 180^\circ$$

$$4x = 180^\circ$$

$$x = \frac{180}{4} = 45^\circ$$

136. (d) Let sides of Δ be $3x, 4x, 5x$

$$s = \frac{a+b+c}{2} = 6x$$

$$\text{Area of } \Delta = \sqrt{s(s-a)(s-b)(s-c)}$$

$$7776 = \sqrt{6x \cdot 3x \cdot 2x \cdot x}$$

$$7776 = 6x^2$$

$$\therefore x = 36$$

Sides of Δ will be 108, 144 and 180

Perimeter of Δ is $108 + 144 + 180 = 432 \text{ cm}$

137. (a)

138. (d) $P = 4Q$

$$P + Q = 180^\circ$$

$$4Q + Q = 180^\circ$$

$$Q = \frac{180}{5} = 36^\circ$$

So, $R = 180^\circ - 36^\circ = 144^\circ$

139. (a) Given $\sin\theta + \sin^2\theta = 1$

$$1 - \sin^2\theta = \sin\theta$$

$$\text{Then, } \cos^2\theta + \cos^4\theta \Rightarrow \cos^2\theta + (\cos^2\theta)^2$$

$$\Rightarrow (1 - \sin^2\theta) + (1 - \sin^2\theta)^2$$

$$\Rightarrow \sin\theta + \sin^2\theta = 1$$

140. (c) Clock started at 12 pm

$$\text{Angle turned by hour hand in one hour} = \frac{360}{12} = 30^\circ$$

$$\text{Angle turned by hour hand in one minute} = \frac{30}{60} = \frac{1}{2}^\circ$$

Angle turned by hour hand in 3 hour 45 minutes

$$= 3 \times 30^\circ + 45 \times \frac{1}{2} = 112 \frac{1}{2}$$

141. (a) $\frac{\cos^2 45^\circ}{\sin^2 60^\circ} + \frac{\cos^2 60^\circ}{\sin^2 45^\circ} - \frac{\tan^2 30^\circ}{\cot^2 45^\circ} - \frac{\sin^2 30^\circ}{\cot^2 30^\circ}$

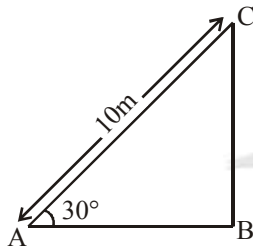
$$\Rightarrow \frac{\left(\frac{1}{\sqrt{2}}\right)^2}{\left(\frac{\sqrt{3}}{2}\right)^2} + \frac{\left(\frac{1}{2}\right)^2}{\left(\frac{1}{\sqrt{2}}\right)^2} - \frac{\left(\frac{1}{\sqrt{3}}\right)^2}{(1)^2} - \frac{\left(\frac{1}{2}\right)^2}{(\sqrt{3})^2}$$

$$= \frac{1}{2} \times \frac{4}{3} + \frac{1}{4} \times \frac{2}{1} - \frac{1}{3} - \frac{1}{4} \times \frac{1}{3}$$

$$\Rightarrow \frac{2}{3} + \frac{1}{2} - \frac{1}{3} - \frac{1}{12} \Rightarrow \frac{8+6-4-1}{12} = \frac{9}{12} = \frac{3}{4}$$

142. (a)

143. (c)



$$\cos 30^\circ = \frac{AB}{AC}$$

$$AB = AC \times \cos 30^\circ$$

$$= 10 \times \frac{\sqrt{3}}{2}$$

$$= 8.65 \text{ m}$$

144. (c) Production of electronic items is highest in 2011
i.e. $13,000 + 9,000 = 22,000$

145. (a) Production of LCD in 2011 = 9,000
Production of LCD in 2013 = 12,000

$$\text{Ratio} = \frac{9,000}{12,000} = \frac{3}{4}$$

146. (d) Total production of TV from 2009 to 2012 = 39,000
Average of TV production = 9,750
Total production of LCD = 35,400
Average of TV production = 8,850
Their difference = $9,750 - 8,850 = 900$

147. (c) Ratio of production of TV = $\frac{6,000}{9,000} = 2 : 3$

148. (c) Amount of product = 4910 crores
Amount to be collected
= 4910 crores + 10% of 4910 crores
= $4910 + 491 = 5401$ crores

149. (c) External assistance received = 9695 crores
Total required = 11486 crores
Shortage of external assistance = $11486 - 9695$

$$= 1791 \text{ crores}$$

Previous Market borrowings = 29952 crores

$$\% \text{ increase in market borrowing} = \frac{1791}{29952} \times 100 = 6\%$$

150. (c) Total of sources of funds = $11486 + 5252 + 4910$
 $+ 6000 + 29952$
 $= 57600$ crores

Central angle corresponding to market borrowing

$$= \frac{29952}{57600} \times 360 = 187.2$$

ENGLISH COMPREHENSION

151. (c) At one's wit's end means at the limits of one's mental resources. Example: I'm at my wit's end with choosing the subject in my graduation. I cannot figure it out. Anju could do no more. She was at her wit's end.

152. (c) All thumbs means very awkward and clumsy, especially with one's hands. Poor Sam can't play the piano at all. He's all thumbs. Pamela is all thumbs when it comes to gardening.

153. (b) To rise with the lark entails to rise very early in the morning.

154. (b) Wild-goose chase means a worthless hunt or chase; a futile pursuit. I wasted all evening on a wild-goose chase. Raj was angry because he was sent out on a wild-goose chase.

155. (a) Make a beeline for someone or something means heading straight toward someone or something. John came into the kitchen and made a beeline for the cookies. After the game, we all made a beeline for Dhoni, who just played the winning run.

156. (b) If you say it's high time that something happened, you mean that it should already have been done. His parents decided it was high time he started behaving himself. (often + that) It's high time that workers were given better pay and conditions.

157. (d) Habit is a particular practice, custom, or usage: the habit of shaking hands.

158. (a) 'He lacks common sense' is a meaningful sentence. Others are not.

159. (a) A single person or thing; a unit: This is the one I like best. Of his many movies, the best ones are the last two.

160. (c) Experience may be gotten, acquired or gathered; hence, option c is correct.

161. (d) Ingestion is the process of taking food into the body through the mouth (as by eating); hence, option d.

162. (d) The adverb far showing distance indicates at, to, or from a great distance in space or time:

Ex: How far is it from Australia to New Zealand? He doesn't live far from here.

163. (c) If someone or something is famous, a lot of people know their name or have heard about them. Ex: The town of Moradabad is famous for brassware. Alexander Fleming, the Scot famous for discovering penicillin.
164. (b) If you talk, you are having a conversation with other people. Ex: They were all talking and laughing together. We were talking about you just last night.
165. (c) A tag question is one where a statement is made, but the speaker wants a response from the listener. The given sentence is in simple present with third person, so response will be 'doesn't he?'
166. (d) A compulsion to steal having no relation to need or the monetary value of the object. Pneumonia is a disease; insomnia is an inability to sleep; chronic sleeplessness while nymphomania is an abnormally intense sexual desire in women.
167. (d) A false accusation of an offence or a malicious misrepresentation of someone's words or actions.
168. (a) A usually short narrative making an edifying or cautionary point and often employing as characters animals that speak and act like humans.
169. (a) The branch of medicine that deals with the diagnosis and treatment of diseases and disorders of the skin.
170. (c) The practice of requiring excessive paperwork and tedious procedures before official action can be considered or completed; also called red-tapery or red-tapist.
171. (b) Intruder is someone who intrudes, especially into a building with criminal intent.
172. (c) Inedible is something that is not suitable for food or eating.
173. (b) Aquarium
174. (a) Facsimile
175. (b) A person naturally expresses his anger by responding aggressively.
176. (b) Our feelings place limits on how far we can take our anger.
177. (a) People should deal with their anger by expressing it assertively.
178. (c) According to author, being assertive means to be respectful of yourself and others.
179. (a) One, according to author, can suppress his anger by holding his anger.
180. (b) The passage throws light on how a well-means invention can be misunderstood.
181. (c) The crowd was protesting against the newly invented sewing machine.
182. (d) The aim of the crowd was to destroy the sewing machines.
183. (d) People thought they would be deprived of their livelihood.
184. (c) Shutters were being closed because the shopkeepers feared their shops would be destroyed.
185. (b) This part of the sentence should be 'to be with you.'
186. (a) I really do regret not having learnt to play the violin..... should be the correct structure.
187. (c) Injure cannot be an intransitive verb. You do not say, for example, 'He injured in a car accident'. You say 'He was injured in a car accident'. Fifty workers were injured in the collapse of the building.'
188. (b) 'I shall have been working in this college' is the right construction.
189. (d) No error
190. (d) Pursue means carry out or participate in an activity; be involved in or go in search of or hunt for something. Ex: She pursued many activities.
191. (c) Making is in singular; hence, 'is' the correct helping verb.
192. (d) If something is infested, it means the insects or animals are present (in a place or site) in large numbers, typically so as to cause damage or disease. Ex: The house is infested with cockroaches.
193. (d) On foot means running or walking using the feet. My car won't work so I have to travel on foot. We go everywhere around the campus on foot. He went there on foot.
194. (a) Up and about means no longer in bed (after sleep or an illness).
195. (d) 'Devout' means deeply religious or pious.
196. (d) 'Predilection' means a predisposition in favour of something; A strong liking; preference.
197. (a) Effigy means a representation of a person (especially in the form of sculpture); hence, dummy.
198. (a) Tremulous means unsteady; hence, steady is the opposite.
199. (b) The opposite of fake is real.
200. (a) Disconsolate means sad beyond comforting; incapable of being consoled; hence, Joyous is the opposite.