

UP SI MOCK TEST - 59 (SOLUTION)

81. (C) Let two numbers are, $81x, 81y$

$$x + y = 1215$$

$$x = 8, 15$$

$$x = 8, y = 7$$

$$\Rightarrow \frac{1}{81} \left[\frac{1}{x} + \frac{1}{y} \right] = \frac{1}{81} \left[\frac{1}{8} + \frac{1}{7} \right]$$

$$= \frac{15}{81 \times 56} = \frac{5}{1512}$$

82. (C) Ratio of mangoes

$$\frac{1}{-4\%} : \frac{2}{x\%}$$

$$\text{Over all profit} = 3 \times 30\% = 90\%$$

$$-4\% + 2x\% = 90$$

$$x\% = 47\%$$

$$\text{Selling price} = \frac{147 \times 10,000}{100} = ₹15,700$$

83. (C) Income Expenditure saving

$$100 \qquad 75 \qquad 25$$

$$\downarrow 20\%$$

$$120 \qquad 95 \qquad 25$$

$$\% \text{ Increase is} = \frac{20}{75} \times 100 = 26.66\%$$

84. (B) Train Car
13 6

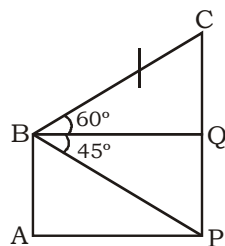
$$\text{Speed of car} = \frac{486}{9} = 54 \text{ km/hr}$$

$$6 \text{ units} \rightarrow 54 \text{ km/hr}$$

$$13 \text{ units} \rightarrow 117 \text{ km/hr}$$

$$\begin{aligned} \text{Hence, total distance cover by train} \\ &= 117 \times 6 \\ &= 702 \text{ km.} \end{aligned}$$

85. (A)



$$AB = 36$$

In $\triangle ABQ$

$$\tan 45^\circ = \frac{PQ}{BQ}$$

$$\Rightarrow BQ = 36$$

Now, in $\triangle CBQ$

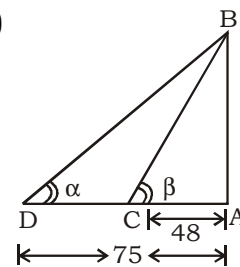
$$\tan 60^\circ = \frac{CQ}{36}$$

$$CQ = 36\sqrt{3}$$

$$\text{Height of street A} = (36 + 36\sqrt{3})$$

$$= 98 \text{ metres}$$

86. (C)

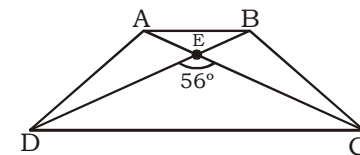


$$h = \sqrt{a \times b}$$

$$= \sqrt{75 \times 48}$$

$$= 60 \text{ metres.}$$

87. (A)



$$\angle CED = \frac{\angle A}{2} + \frac{\angle B}{2}$$

$$\Rightarrow 56^\circ = \frac{49^\circ}{2} + \frac{\angle B}{2}$$

$$\Rightarrow \angle B = 63^\circ$$

88. (B) $SI = \frac{P \times R \times T}{100} = \frac{P \times 16.25 \times 4}{100}$

$$P - 12,600 = \frac{P \times 16.25 \times 4}{100}$$

$$\Rightarrow = ₹36,600$$

89. (B) $\frac{\tan \theta + \sin \theta}{\tan \theta - \sin \theta} = \frac{k+1}{k-1}$

By componendo and dividendo rule

$$\Rightarrow \frac{2 \tan \theta}{2 \sin \theta} = \frac{2k}{2}$$

$$\Rightarrow \frac{1}{\cos \theta} = k \Rightarrow \sec \theta = k \Rightarrow k = \sec \theta$$

90. (B)
$$\frac{2(x^3 - 8)}{(x^2 - x - 2)} \times \frac{(x^2 + 2x + 1)}{(x^2 - 4x - 5)} \div \frac{(x^2 + 2x + 4)}{3x - 15}$$

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

$$= \frac{6(x-2)(x+1)^2}{(x-2)(x+1)(x+1)} = 6$$

91. (B)
$$\frac{3a+4b}{3c+4d} = \frac{3a-4b}{3c-4d}$$

$$\Rightarrow \frac{3a+4b}{3a-4b} = \frac{3c+4d}{3c-4d}$$

By applying componendo & dividendo

$$\Rightarrow \frac{3a+4b+3a-4b}{3a+4b-3a+4b} = \frac{3c+4d+3c-4d}{3c+4d-3c+4d}$$

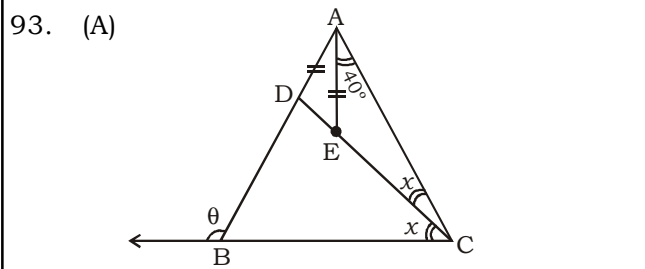
$$\Rightarrow \frac{6a}{8b} = \frac{6c}{8d}$$

$$\Rightarrow ad = bc$$

92. (C) Correct Average

$$= 71 + \frac{(56+50-65-24)}{17}$$

$$= 71 + \frac{(106-89)}{17} = 71 + \frac{17}{17} = 72$$

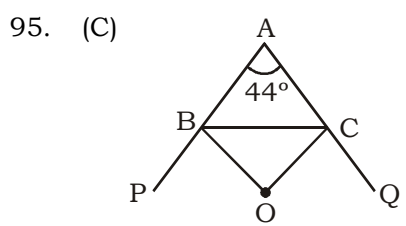


In $\triangle AEC$
 $\angle E = \angle A + \angle C$
 $= 40^\circ + x$
 $\angle E = x + 40^\circ$
 In $\triangle ADE$
 $AD = AE$
 $\Rightarrow \angle D = \angle E = x + 40^\circ$
 $\angle A = 180^\circ - [(x + 40^\circ) + (x + 40^\circ)]$
 $= 100^\circ - 2x$
 In $\triangle ABC$
 $\angle B = \angle A + \angle C$
 $= 100^\circ - 2x + 40 + 2x$
 $\angle B = 140^\circ$
 Hence, $Q = 140^\circ$

94. (C)
$$SI = \frac{P \times R \times T}{100} = \frac{8400 \times 8.75 \times T}{100}$$

$$11,046 - 8,400 = \frac{8400 \times 8.75 \times T}{100}$$

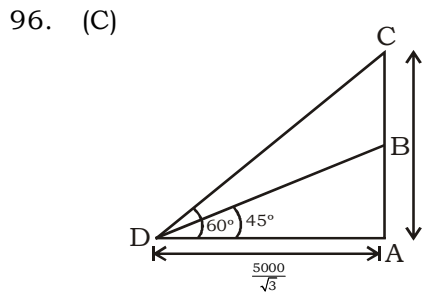
$$= ₹3,024$$



$$\angle BOC = 90 - \frac{\angle A}{2}$$

$$\frac{1}{2} \angle BOC = \frac{68}{2}$$

$$= 34^\circ$$



In $\triangle ADB$
 $\tan 45^\circ = \frac{AB}{500} \rightarrow AB = \frac{500}{\sqrt{3}}$
 $BC = 5000 - \frac{500}{\sqrt{3}}$
 $= 50000 \frac{(\sqrt{3}-1)}{\sqrt{3}}$
 Hence, vertical distance between aeroplanes
 $5,000 \frac{(\sqrt{3}-1)}{\sqrt{3}}$

97. (D)
$$\frac{PRT}{100} = SI$$

 If SI is same in both cases

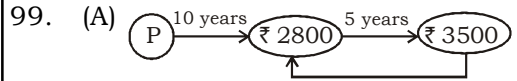
$$PR \propto \frac{C}{RT}$$

$R_1 \times T_1 : R_2 \times T_2$
 $16 \times 18 : 22 \times 15$
 Principal $22 \times 15 : 16 \times 18$
 $55 : 48$
 7 units $\rightarrow ₹4200$
 1 unit $\rightarrow ₹600$
 103 units $\rightarrow ₹600 \times 103$
 Hence principal ₹61800

98. (A) P : A
9 : 17
After 27.5 years ratio become
15 : 43
In both ratio principal are same
Now, P : A
45 : 85
And, 45 : 129 (After 27.5 years)
27.5 years → 44 units

$$1 \text{ year} \rightarrow \frac{44}{27.5} \text{ units}$$

$$\frac{44}{27.5} = \frac{45 \times R \times 1}{100} \Rightarrow R = 3\frac{5}{9}$$



$$2800 : 3500$$

$$4 : 5$$

$$\sqrt[5]{4} : \sqrt[5]{5}$$

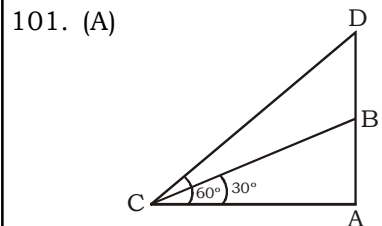
$$R = \frac{\sqrt[5]{5} - \sqrt[5]{4}}{\sqrt[5]{4}} \times 100$$

$$= \frac{1.38 - 1.32}{1.32} \times 100$$

$$= 4.54\%$$

$$\Rightarrow ₹ 2800 = P \left(1 + \frac{4.54}{100}\right)^{10}$$

100. (A) P = ₹1792
 $x = (164)^{169} + (333)^{337} - (727)^{726}$
 Unit digit of $4^{169} = 4$
 Unit digit of $3^{337} = 3$
 Unit digit of $7^{726} = 9$
 (4 + 3 - 9) it should be carry 1 from 10th place digit
 So, unit digit of (4 + 3 - 9) = 8



In $\triangle ACD$

$$\tan 60^\circ = \frac{x}{300} \Rightarrow 300\sqrt{3}$$

Now, again in $\triangle ACB$

$$\tan 30^\circ = \frac{x}{300} \Rightarrow x = 100\sqrt{3}$$

Hence, increase height = $300\sqrt{3} - 100\sqrt{3}$
 $= 200\sqrt{3} = 346$ metres.

102. (C) $\frac{25,00 \times R \times 2}{4 \times 100} + \frac{18,750 \times 2 \times (R + 4)}{100}$
 $= ₹4125$
 $R = 6.66\%$

103. (A) $12\frac{1}{2}\% = \frac{1}{5}$

$$8 \times 9 = 9 \times 9$$

$$\frac{64}{136} \quad \frac{81}{162}$$

CI = 26 units
 26 units → ₹7020

$$81 \text{ units} \rightarrow ₹ \frac{7020 \times 51}{26}$$

$$136 \text{ units} \rightarrow ₹ \frac{7020 \times 136}{26}$$

$$= ₹36720$$

Installment ₹21,870 and principal ₹36720

104. (C) Let r the be the radius and H be the height of the cylinder
 A.T.Q.,

$$\frac{\pi r^2 H}{2\pi r H} = \frac{924}{264} \Rightarrow \frac{r}{2} = \frac{7}{2} \Rightarrow r = 7 \text{ cm}$$

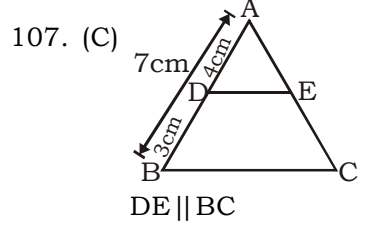
putting r = 7, then $2\pi r H = 264$

$$\Rightarrow H = \frac{264 \times 7}{22 \times 14} = 6 \text{ cm}$$

Required ratio = $\frac{\text{Radius}}{\text{Height}} = \frac{7}{6} = 7 : 6$

105. (B) LCM of 5, 6, 7, 8 = 840
 Required number → 840k + 3
 For k = 2
 $840 \times 2 + 3 = 1683$
 ∴ Required number = 1683

106. (A) $(2(a + b))^3 + (a - b)^3$
 $= (2a + 2b + a - b)(4(a + b))^2 + (a - b)^2 - 2(a^2 - b^2)$
 $= (3a + b)(4a^2 + 4b^2 + 8ab + a^2 - b^2 - 2ab - 2a^2 + 2b^2)$
 $= (3a + b)(3a^2 + 7b^2 + 6ab)$
 $A = 3, B = 6, C = 7$
 $= A + B - C = 3 + 6 - 7 = 2$



DE || BC

$$\therefore \frac{BC}{DE} = \frac{AB}{AD}$$

$$\frac{BC}{DE} = \frac{7}{4} = \frac{3.5}{2}$$

108. (B) $4x^2 - 12x + k$ is perfect square
 $(2x)^2 - 2 \times 2x \times \sqrt{k} + (\sqrt{k})^2$
 $\therefore -4x \sqrt{k} = -12x$
 $\Rightarrow k = 9$

109. (C) $p^3 - q^3 = (p - q) [(p - q)^2 + xpq]$
 $p^3 - q^3 = (p - q) [p^2 + q^2 + (x - 2)pq] \dots(i)$
 But, $p^3 - q^3 = (p - q) (p^2 + q^2 + pq) \dots(ii)$
 By comparing (i) & (ii)
 $x - 2 = 1$
 $\Rightarrow x = 3$

110. (B) $(2x - y)^2 + (3y - 2z)^2 = 0$
 $2x - y = 0$
 $\Rightarrow \frac{x}{y} = \frac{1}{2}$
 $3y - 2z = 0 \Rightarrow 3y = 2z \Rightarrow \frac{y}{z} = \frac{2}{3}$
 $\therefore x : y : z$
 $1 : 2 : 3$

111. (B) $3\sin\theta = 2\cos^2\theta$
 $\Rightarrow 3\sin\theta = 2(1 - \sin^2\theta)$
 $\Rightarrow 3\sin\theta - 2 + 2\sin^2\theta = 0$
 $\Rightarrow (2\sin\theta - 1)(\sin\theta + 2) = 0$
 $\Rightarrow 2\sin\theta - 1 = 0 \Rightarrow 2\sin\theta = 1$
 $\Rightarrow \sin\theta = 1/2 \Rightarrow \theta = 30^\circ$
 Now, $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$
 $\Rightarrow (\tan^2 30^\circ + \sec^2 30^\circ - \operatorname{cosec}^2 30^\circ)$
 $\Rightarrow \left(\frac{1}{3} + \frac{4}{3} - 4\right) = -\frac{7}{3}$

112. (B) A.T.Q.,
 Let the number are $11x$, and $13x$
 $\frac{11x - 12}{13x - 12} = \frac{7}{9}$
 $\Rightarrow 99x - 108 = 91 - 84$
 $\Rightarrow 8x = 108 - 84$
 $8x = 24 \Rightarrow x = 3$
 Number are, 33 and 39.

113. (C) Let = x speed of boat
 Time down stream + Time up stream = 6 hour
 So, $\frac{5 \text{ km}}{(x+2)\text{km/hr}} + \frac{5 \text{ km}}{(x-2)\text{km/hr}} = \text{hours}$
 $\Rightarrow x = 3 \text{ km/hr (from options)}$

114. (B) $\therefore 8$ men complete a piece of job in 40 days
 $\therefore 1$ man complete a piece of job in 40×8 days
 $\therefore 10$ men complete a piece of job in
 $\frac{40 \times 8}{10} = 32$ days.

115. (C) $\frac{1 + \sqrt{2}}{\sqrt{5} + \sqrt{3}} + \frac{1 - \sqrt{2}}{\sqrt{5} - \sqrt{3}}$
 $= \frac{(1 - \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - 3} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$
 $= \frac{\sqrt{5} - \sqrt{3} + \sqrt{10} - \sqrt{6} + \sqrt{5} + \sqrt{3} - \sqrt{10} - \sqrt{6}}{2}$
 $= \frac{2(\sqrt{5} - \sqrt{6})}{2} = \sqrt{5} - \sqrt{6}$

116. (A) $x = 2 - \sqrt{3}$

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

$$x - \frac{1}{x} = -2\sqrt{3}$$

$$x^3 - \frac{1}{x^3} = -24\sqrt{3} + 2(-2\sqrt{3})$$

$$= -24\sqrt{3} - 6\sqrt{3} = -30\sqrt{3}$$

117. (A) Required Number of accidents
 $= 70 + 80 + 30 = 180$ thousand
 $= 180000$

118. (D) Required Ratio = $30 : 40$
 $= 3 : 4$

119. (B) Required Ratio = $40 : 50 : 30$
 $= 4 : 5 : 3$

120. (B) Required Ratio
 $= \frac{30 + 60 + 10}{3} : \frac{40 + 20 + 20}{3}$
 $= 5 : 4$

121. (C) As Microphone makes sound louder similarly Microscope makes the object magnified.

122. (C) As $Z \xrightarrow{-8} R \xrightarrow{+7} Y \xrightarrow{-8} Q$

$$K \xrightarrow{-8} C \xrightarrow{+7} J \xrightarrow{-8} B$$

Similarly,

$$P \xrightarrow{+7} W \xrightarrow{-8} O \xrightarrow{+7} V$$

$$E \xrightarrow{+7} L \xrightarrow{-8} D \xrightarrow{+7} K$$

123. (A) $9 = (3)^2 \Rightarrow 8 = (3 - 1)^3$
 $16 = (4)^2 \Rightarrow ? = (4 - 1)^3 = 27$

124. (A) As, Lawyer works in court. Similarly, waiter works in Restaurant.

125. (B) $\begin{matrix} +2 & +4 & +8 \\ \text{C} & \text{E} & \text{I} & \text{Q} \end{matrix}$ $\begin{matrix} +2 & +4 & +6 \\ \text{G} & \text{I} & \text{M} & \text{S} \end{matrix}$

$$\begin{matrix} +2 & +4 & +8 \\ \text{D} & \text{F} & \text{J} & \text{R} \end{matrix}$$
 $\begin{matrix} +2 & +4 & +8 \\ \text{L} & \text{N} & \text{R} & \text{Z} \end{matrix}$

126. (D) Except **981** all others number are perfect square.

127. (D) Except **Grasshopper** all others are reptiles.

128. (D) $\begin{matrix} \downarrow +3 & \downarrow +3 & \downarrow +3 & \downarrow +3 \\ \text{AN} & \text{CQ} & \text{ET} & \text{GW} & \text{IZ} \\ \uparrow +2 & \uparrow +2 & \uparrow +2 & \uparrow +2 & \uparrow +2 \end{matrix}$

129. (A) $\begin{matrix} 3 & 12 & 27 & 48 & 75 & 108 & 147 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 3 \times 1^2 & 3 \times 2^2 & 3 \times 3^2 & 3 \times 4^2 & 3 \times 5^2 & 3 \times 6^2 & 3 \times 7^2 \end{matrix}$

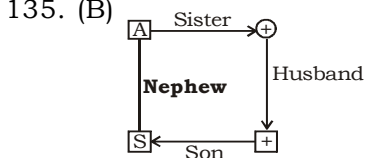
130. (C) $\begin{matrix} 3 & 15 & 35 & 63 & 99 & 143 & 195 & 255 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 1 \times 3 & 3 \times 5 & 5 \times 7 & 7 \times 9 & 9 \times 11 & 11 \times 13 & 13 \times 15 & 15 \times 17 \end{matrix}$

131. (B) $64 \rightarrow 288 = (8)^2 \rightarrow 8 \times 6 \times 6$
 $36 \rightarrow 216 = (6)^2 \rightarrow 6 \times 6 \times 6$
 $16 \rightarrow 144 = (4)^2 \rightarrow 4 \times 6 \times 6$
 $9 \rightarrow 108 = (3)^2 \rightarrow 3 \times 6 \times 6$

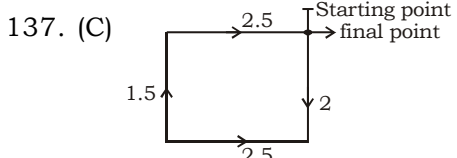
132. (C) Total number of triangle is 31.

133. (B) $42 \div 6 + 124 - 9 \times 12$
After changing sign
 $= 42 \div 6 + 124 - 9 \times 12$
 $= 7 + 124 - 108$
 $= 23$

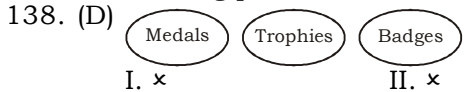
134. (C) mno onm nom mon omn nmo



136. (A) Let present age of Ashok = $2x$
and, present age of Krishna = x
 $(x + 7) = 4$ (Kartik is age)
 $\Rightarrow (x + 7) = 4 \times 12$
 $\Rightarrow x = 41$
 \therefore Ashok's age = $2x$
 $= 82$ years



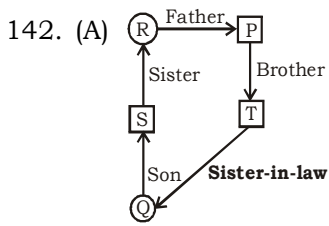
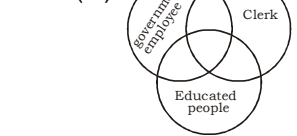
So, leopard is 0.5 km (South) from his starting point.



I. \times II. \times
So, neither conclusion I nor conclusion II follows.

139. (B)

140. (A) N R O P M

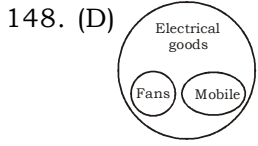
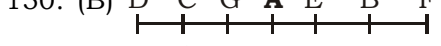


143. (D) $255 \div 15 \times 9 - 142 = 11$
 $\Rightarrow 17 \times 9 - 142 = 11$
 $\Rightarrow 153 - 142 = 11$
 $\Rightarrow 11 = 11$

144. (D)

145. (C)

146. (B)



I. \times II. \times
Neither I nor II follows.

149. (B)

150. (B)

151. (A) Let age of person = $10x + y$
Age of wife = $10y + x$
A.T.Q.,

$$10x + y - 10y - x = \frac{1}{11} (10x + y + 10y + x)$$

$$\Rightarrow 9x - 9y = x + y$$

$$\Rightarrow 8x = 10y$$

$$\Rightarrow \frac{x}{y} = \frac{5}{4}$$

\therefore Age of person = $10 \times 5 + 4 = 54$ years

152. (D)

153. (D) $255 \div 15 \times 9 - 142 = 11$
 $\Rightarrow 17 \times 9 - 142 = 11$
 $\Rightarrow 153 - 142 = 11$
 $\Rightarrow 11 = 11$

154. (B)

155. (C) Hour hand move 360° in 12 hours
12 hours $\rightarrow 360^\circ$
1 hour $\rightarrow 30^\circ$
60 minutes $\rightarrow 30^\circ$

1 minutes $\rightarrow \left(\frac{1}{2}\right)^\circ$
Total angle move by hour hand

$$= 7 \times 30 + 15 \times \frac{1}{2} = \left(217\frac{1}{2}\right)^\circ$$

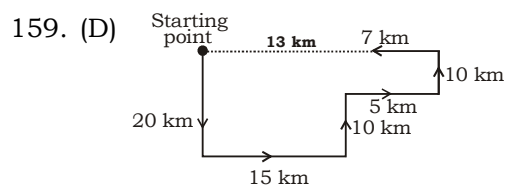
Minutes hand move 360° in 60 minutes
60 minutes $\rightarrow 360^\circ$
1 minute $\rightarrow 6^\circ$
15 minutes $\rightarrow 90^\circ$

$$\Rightarrow \left(217\frac{1}{2} - 90\right) \times \frac{\pi}{180} = \frac{17\pi}{24}$$

156. (D)

157. (B) mrffs/mrffs/mrffs

158. (A)



Hence, displacement = 13 km and in East direction.

160. (D) $(3 \times 2) + (4 \times 8) = 38$
 $(4 \times 3) + (2 \times 3) = 18$
 $(6 \times 7) + (3 \times 4) = 54$

UP SI ANSWER KEY - 59

1. (A)	21. (C)	41. (D)	61. (A)	81. (C)	101. (A)	121. (C)	141. (D)
2. (A)	22. (B)	42. (C)	62. (D)	82. (C)	102. (C)	122. (C)	142. (A)
3. (D)	23. (B)	43. (C)	63. (B)	83. (C)	103. (A)	123. (A)	143. (D)
4. (B)	24. (A)	44. (B)	64. (A)	84. (B)	104. (C)	124. (A)	144. (D)
5. (B)	25. (A)	45. (A)	65. (C)	85. (A)	105. (B)	125. (B)	145. (C)
6. (B)	26. (A)	46. (D)	66. (B)	86. (C)	106. (A)	126. (D)	146. (B)
7. (C)	27. (A)	47. (B)	67. (D)	87. (A)	107. (C)	127. (D)	150. (B)
8. (B)	28. (A)	48. (A)	68. (D)	88. (B)	108. (B)	128. (D)	148. (D)
9. (A)	29. (D)	49. (A)	69. (A)	89. (B)	109. (C)	129. (A)	149. (B)
10. (C)	30. (A)	50. (B)	70. (C)	90. (B)	110. (B)	130. (C)	150. (B)
11. (C)	31. (A)	51. (A)	71. (C)	91. (B)	111. (B)	131. (B)	151. (A)
12. (C)	32. (A)	52. (C)	72. (A)	92. (C)	112. (B)	132. (C)	152. (D)
13. (B)	33. (D)	53. (A)	73. (B)	93. (A)	113. (C)	133. (B)	153. (D)
14. (C)	34. (D)	54. (D)	74. (D)	94. (C)	114. (B)	134. (C)	154. (B)
15. (B)	35. (C)	55. (D)	75. (C)	95. (C)	115. (C)	135. (B)	155. (C)
16. (A)	36. (D)	56. (D)	76. (D)	96. (C)	116. (A)	136. (A)	156. (D)
17. (B)	37. (C)	57. (B)	77. (A)	97. (D)	117. (A)	137. (C)	157. (B)
18. (D)	38. (C)	58. (B)	78. (C)	98. (A)	118. (D)	138. (D)	158. (A)
19. (C)	39. (C)	59. (A)	79. (B)	99. (A)	119. (B)	139. (B)	159. (D)
20. (A)	40. (C)	60. (D)	80. (D)	100. (A)	120. (B)	140. (A)	160. (D)

