

**UP SI MOCK TEST - 51 (SOLUTION)**

81. (C) Rate =  $12\frac{1}{2}\% = \frac{1}{8}$

Amount	Instalment
$\begin{array}{r} 8 \times 9 \\ + 64 \\ \hline 136 \end{array}$	$\begin{array}{r} 9 \times 9 \\ \textcircled{81} \\ \hline \end{array}$
$\begin{array}{r} 136 \\ \downarrow \times 50 \\ \text{₹}6800 \end{array}$	$\begin{array}{r} \text{₹}4050 \\ \downarrow \times 50 \\ \text{₹}4050 \end{array}$

82. (C) Total maximum marks in four subjects =  $120 + 140 + 100 + 180 = 540$

60% of total maximum marks =  $\frac{3}{5} \times 540 = 324$

Marks obtained in three subjects =  $120 \times \frac{2}{5} + 140 \times \frac{11}{20} + 100 \times \frac{9}{20} = 48 + 77 + 45 = 170$

Marks to be obtained in Maths =  $324 - 170 = 154$

83. (C) S.I =  $956 - 800 = \text{₹} 156$

$\therefore$  Rate =  $\frac{S.I \times 100}{\text{Principal} \times \text{Time}}$

=  $\frac{156 \times 100}{800 \times 3} = 6.5\%$  per annum

$\therefore$  New rate = 10.5%

$\therefore$  S.I =  $\frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

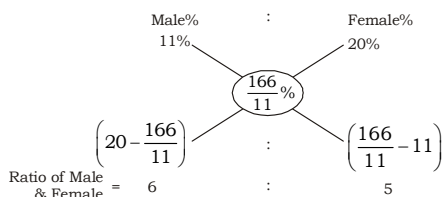
=  $\frac{800 \times 3 \times 10.5}{100} = \text{₹} 252$

Amount =  $800 + 252 = \text{₹} 1052$

84. (A) Population of the village = 5500  
After increment new population of the village = 6330

% increment =  $\frac{(6330 - 5500)}{5500} \times 100$

=  $\frac{830}{55} = \frac{166}{11}\%$



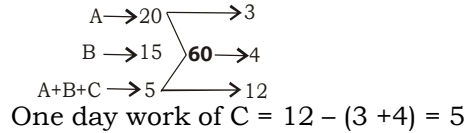
According to the question

11 units = 5500

1 unit = 500

Number of females =  $500 \times 5 = 2500$

85. (D)



$\therefore$  Time Taken by C =  $\frac{60}{5} = 12$  days

86. (B) Total weight of section A =  $42 \times 25 = 1050$  kg

Total weight of group B =  $28 \times 40 = 1120$  kg

Total weight of whole class = 2170 kg

Average weight of whole class

=  $\frac{2170}{70} = 31$  kg

87. (A) C.P. S.P.

100  $\xrightarrow{+33\%}$  133

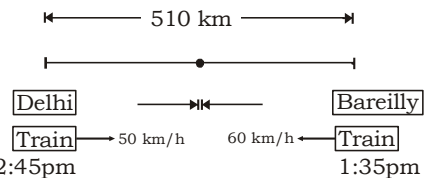
Market price =  $\frac{133}{95} \times 100 = \text{₹} 140$

Hence, percentage above cost price =  $140 - 100 = 40$

88. (C) According to the question,  
Man : Woman : Girl  
Efficiency → 6 : 3 : 1  
money received by (woman + girl)

=  $\frac{10000}{10} \times 4 = \text{₹} 4000$

89. (C)



Let R is a point where both the trains meet.  
Till 2 : 45 pm the distance covered by the second train

=  $\frac{70}{60} \times 60 = 70$  km

Remaining distance =  $510 - 70 = 440$  km

Now relative speed of both trains =  $50 + 60 = 110$  km/h

Required time of meeting =  $\frac{440}{110} = 4$  hours

Distance from Delhi to meeting point R =  $4 \times 50 = 200$  km

90. (C)  $4\% = \frac{1}{25}$ ,  $5\% = \frac{1}{20}$ ,  $6\% = \frac{3}{50}$

25 ——— 26

20 ——— 21

50 ——— 53

25000 ——— 28938

↓ ×2                                      ↓ ×2

50,000                                      57876

CI =  $57876 - 50000 = \text{₹} 7876$

91. (B)  $x + y = 1$

Given,  $(xy)^2 - 2xy = 12$   
 $x^4 + y^4 = (x^2 + y^2) - 2x^2y^2$   
 $= [(x + y)^2 - 2xy]^2 - 2x^2y^2$   
 $= 1 - 4xy + 2x^2y^2$   
 $= 1 + 24 = 25$

92. (B) EG is angle bisector  $\angle DEF$

$\angle DEG = 55^\circ$ ,  $\angle EFG = 55^\circ$   
 $\angle FAG = (180 - (55 + 90)) = 35^\circ$   
 $\angle GAB = 180^\circ - (110 + 35) = 35^\circ$

93. (A) 
$$\frac{(0.73)^3 + (0.27)^3}{(0.73)^2 + (0.27)^2 - (0.73)(0.27)}$$

$$= \frac{(0.73) + (0.27)[(0.73)^2 + (0.27)^2 - (0.73)(0.27)]}{(0.73)^2 + (0.27)^2 - (0.73)(0.27)}$$
  
 $= 0.73 + 0.27 = 1$

94. (A) a.  $\sin 45^\circ \cdot \cos 45^\circ \cdot \tan 60^\circ = \tan^2 45^\circ - \cos 60^\circ$

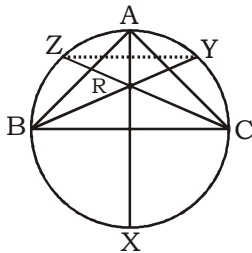
$\Rightarrow a \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} \times \sqrt{3} = 1 - \frac{1}{2}$

$\Rightarrow a \times \frac{\sqrt{3}}{2} = \frac{1}{2} \Rightarrow a = \frac{1}{\sqrt{3}}$

95. (C) Required ratio =  $\frac{550}{1 \times 60} : \frac{33}{3} \times \frac{5}{18}$

$= 3 : 4$

96. (A)



Given  $\angle A = 50^\circ$ ,  $\angle CZY = 30^\circ$

Now,  $\angle BRC = 90 + \frac{\angle A}{2}$   
 $= 90 + 25 = 115^\circ$

Then,  $\Delta RZY$

$\angle R + \angle Z + \angle Y = 180^\circ$

$115 + 30 + \angle Y = 180^\circ$

$\angle Y = 35^\circ$

97. (C) As we know,

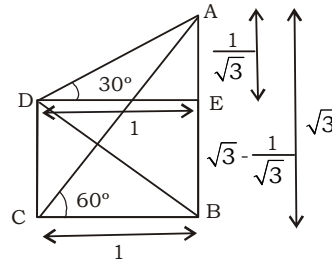
$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$(7)^2 = 21 + 2(ab + bc + ca)$

$\frac{49 - 21}{2} = ab + bc + ca$

$\Rightarrow ab + bc + ca = \frac{28}{2} = 14$

98. (A)



ATQ,

$\sqrt{3}$  units = 60m

1 unit =  $20\sqrt{3}$  m

$\left(\sqrt{3} - \frac{1}{\sqrt{3}}\right)$  units =  $20\sqrt{3} \left(\sqrt{3} - \frac{1}{\sqrt{3}}\right)$  m

$= 20\sqrt{3} \times \frac{2}{\sqrt{3}} = 40$ m

$\therefore$  Height of Tower = 40m

99. (B)  $x^2 - 4x + 1 = 0$

$\Rightarrow x - 4 + \frac{1}{x} = 0$

$\Rightarrow x + \frac{1}{x} = 4$

and,  $\frac{x^6 + 1}{x^3} = x^3 + \frac{1}{x^3} = 64 - 12 = 52$

100. (A)  $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$(a + b + c)^2 = 20 + 2 \times 8$

$= 36 \Rightarrow a + b + c = 6$

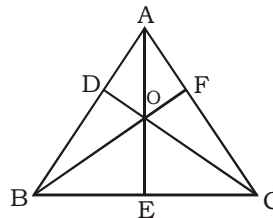
$(a - b)^2 + (b - c)^2 + (c - a)^2 = 2[a^2 + b^2 + c^2 - ab - bc - ca]$

$= \frac{1}{2} \times 6 \times [20 - 8]$

Required value =  $\frac{1}{2} \times 6 \times 2 \times 12 = 72$

101. (A) Rate =  $\frac{280 \times 100}{400 \times 10} = 7\%$

102. (B)



By Ceviaris theorem

$\frac{OE}{AE} + \frac{OF}{BF} + \frac{OD}{CD} = 1$

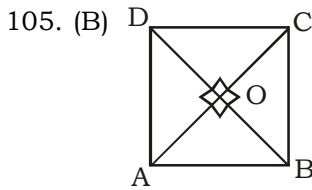
$\frac{4}{11} = \frac{OF}{BF} + \frac{3}{8} = 1$

$\frac{OF}{BF} = 1 - \frac{65}{88}$

$\frac{BO}{OF} = \frac{65}{23}$

103. (D)  $l + b + h = 24$  [given]  
 $l^2 + b^2 + h^2 = 225$  [given]  
 $\therefore (l + b + h)^2 = l^2 + b^2 + h^2 + 2(lb + bh + hl)$   
 $\Rightarrow (24)^2 = 225 + 2(lb + bh + hl)$   
 $\Rightarrow 2(lb + bh + hl) = 576 - 225$   
 $= 351$  sq. cm.

104. (C) Relative speed =  $45 - 40 = 5$  km/hr  
 $\therefore$  Required distance =  $\left(5 \times \frac{45}{60}\right)$  km  
 $= \frac{15}{4}$  km = 3 km 750 metre.



In  $\triangle AOB$   
 $OA^2 + OB^2 = AB^2$  ... (i)  
 In  $\triangle BOC$   
 $OB^2 + OC^2 = BC^2$  ... (ii)  
 In  $\triangle COD$   
 $OC^2 + OD^2 = CD^2$  ... (iii)  
 In  $\triangle AOD$   
 $OD^2 + OA^2 = AD^2$  ... (iv)  
 Equation (i) + (ii) + (iii) + (iv)  
 $AB^2 + BC^2 + CD^2 + AD^2 = 4(OA^2 + OB^2 + OC^2 + OD^2)$

106. (C)  $\frac{(2x)^3 - (3y)^3}{2x - 3y} = \frac{(2x - 3y) \times (4x^2 + 9y + 6xy)}{(2x - 3y)}$   
 $= 4x^2 + 9x^2 + 6xy$   
 Comparing  
 $A = 4, B = 6, C = 9$   
 $\Rightarrow 2A + B - C$   
 $= 2(4) + 6 - 9 = 5$

107. (C)  $\tan \theta = \frac{8}{15}$   
 $\sin \theta = \frac{8}{\sqrt{15^2 + 8^2}} = \frac{8}{17}$   
 $\therefore \frac{\sqrt{1 - \sin \theta}}{\sqrt{1 + \sin \theta}} = \frac{\sqrt{1 - \frac{8}{17}}}{\sqrt{1 + \frac{8}{17}}} = \frac{\sqrt{\frac{9}{17}}}{\sqrt{\frac{25}{17}}} = \frac{3}{5}$

108. (C) In the mixture of two casks,  
 Quantity of milk =  $\frac{13}{20} \times 48 + \frac{18}{35} \times 42$   
 $= \frac{156}{5} + \frac{108}{5}$   
 $= \frac{264}{5}$  L

Quantity of water =  $\frac{7}{20} \times 48 + \frac{17}{35} \times 42$

$$= \frac{84}{5} + \frac{102}{5} = \frac{186}{5}$$
 L

When 20 L of water to be added to the mixture.

Quantity of water =  $\frac{186}{5} + 20$   
 $= \frac{186 + 100}{5} = \frac{286}{5}$  L

Thus, required ratio =  $\frac{264}{5} + \frac{286}{5}$   
 $= 12 : 13$

109. (D) Let speed of the current be  $x$  m/min.  
 Then,

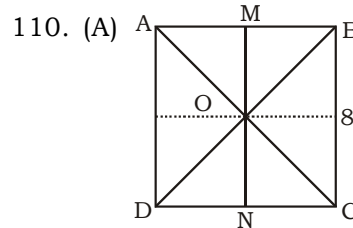
$$\frac{200}{48 - x} - \frac{200}{48 + x} = 10$$

$$\Rightarrow 20(48 + x - 48 + x) = (48 + x)(48 - x)$$

$$\Rightarrow 20 \times 2x = 2304 - x^2$$

$$\Rightarrow x^2 + 40x - 2304 = 0$$

$$\Rightarrow x = 32 \text{ m/min}$$



Area of square ABCD =  $8^2 = 64$

Area of  $\triangle CON = \frac{1}{8} \times 64 = 8$

Hence, area of  $3 \times \triangle CON = 3 \times 8 = 24 \text{ cm}^2$ .

111. (D) Let numbers be  $3x$  and  $4x$   
 Then, 1 cm of  $3x$  and  $4x = 3 \times 4 \times x = 12x$

$$\therefore 12x = 120 \Rightarrow x = 10$$

So, the numbers are  $3x, 4x$  i.e. 30 and 40.

112. (D) Let third proportional be  $x$

$$9 : 27 : x$$

$$\therefore 9x = 27^2$$

$$x = 81$$

113. (A) Let radius =  $5x$  cm and height =  $12x$  cm

$$V = \frac{1}{3} \pi \times (5x)^2 \times 12x$$

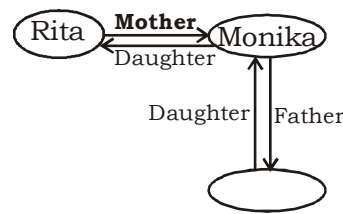
$$314 = \frac{1}{3} \times 3.14 \times 25 \times 12 \times x^3$$

$$\frac{300}{25 \times 12} = x^3$$

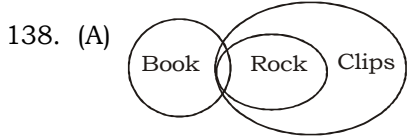
$$x = 1$$

$$l = \sqrt{h^2 + r^2} = \sqrt{5^2 + 12^2} = 13 \text{ cm}$$

114. (C)  $\frac{1}{\operatorname{cosec}^2 51^\circ} + \sin^2 39^\circ + \tan^2 51^\circ - \frac{1}{\sin^2 51^\circ \cdot \sec^2 39^\circ}$
- $$\sin^2 51^\circ + \sin^2 39^\circ + \tan^2 51^\circ - \frac{\cos^2 39^\circ}{\sin^2 51^\circ}$$
- $$\sin^2 51^\circ + \cos^2 51^\circ + \tan^2 51^\circ - \frac{\sin^2 51^\circ}{\sin^2 51^\circ}$$
- $$= 1 + \tan^2 51^\circ - 1$$
- $$= \tan^2 51^\circ$$
- $$= \cot^2 39^\circ$$
- $$= \operatorname{cosec}^2 35^\circ - 1$$
- $$= x^2 - 1$$
115. (C)  $\frac{(n-2) \times 180^\circ}{n} = \frac{5 \times 360^\circ}{n}$
- $$n - 2 = 5 \times 2$$
- $$n = 12$$
116. (D) Let the radius of bigger and smaller cylinder be  $r_1$  and  $r_2$  respectively.
- $$2\pi h(r_1 - r_2) = 44 \quad \dots(i)$$
- $$\pi h(r_1^2 - r_2^2) = 99 \quad r_1 = ?$$
- From equation (i)
- $$r_1 - r_2 = \frac{44}{2\pi h} = \frac{44}{2 \times \frac{22}{7} \times 14} = \frac{1}{2}$$
- Also,  $\frac{22}{7} \times 14 (r_1 + r_2) (r_1 - r_2) = 99$
- $$44(r_1 + r_2) \frac{1}{2} = 99$$
- $$r_1 + r_2 = \frac{99}{22} = \frac{9}{2}$$
- We have,  $r_1 + r_2 = \frac{9}{2}$
- $$r_1 - r_2 = \frac{1}{2}$$
- $$2r_1 = 10$$
- $$\Rightarrow r_1 = 5 \text{ cm}$$
117. (B) Required ratio
- $$\Rightarrow \frac{(400 + 400 + 450 + 500)}{4} :$$
- $$\frac{(200 + 250 + 300 + 250)}{4} = 7 : 4$$
118. (C) Required percentage
- $$= \frac{(700 - 550)}{550} \times 100 = 27.27$$
119. (C) Required percentage =  $\frac{450}{1300} \times 100 = 34.61$

120. (D) Required percentage
- $$= \frac{(1450 - 1200)}{1200} = 20.83$$
121. (D) Liberty is opposite to Slavery and Danger is opposite to **safety**.
122. (A)  $\begin{matrix} M & K & Q & O \\ -1 \downarrow & +3 \downarrow & -1 \downarrow & +3 \downarrow \\ L & N & P & R \end{matrix}$
- Similarly,
- $$\begin{matrix} Y & S & U & W \\ -1 \downarrow & +3 \downarrow & -1 \downarrow & +3 \downarrow \\ X & V & T & Z \end{matrix}$$
123. (B)  $29 : 62 :: 218 : 341$
- $$\begin{matrix} \downarrow & \downarrow & \downarrow & \downarrow \\ 3^3 + 2 & 4^3 - 2 & 6^3 + 2 & 7^3 - 2 \end{matrix}$$
124. (A) Magazine is related to editor and drama is related to director.
125. (A) Only in **232**, a digit is repeated.
126. (D)  $\begin{matrix} & +2 & & +2 & & +2 & & +2 \\ & \swarrow & \searrow & \swarrow & \searrow & \swarrow & \searrow & \swarrow & \searrow \\ B & E & G & K & N & P & W & Z & B & J & L & N \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +3 & & & +3 & & & +3 & & & +2 & & \end{matrix}$
127. (A) All except **mechanic** help in building a house.
128. (A)  $\begin{matrix} \underline{DCB} & \underline{HGF} & \underline{LKJ} & \underline{PON} \\ \uparrow & \uparrow & \uparrow & \uparrow \\ +4 & +4 & +4 & \end{matrix}$
129. (C)  $9 \times 3 \times 3 = 81$   
 $11 \times 4 \times 4 = 176$   
 $13 \times 7 \times 5 = 455$
130. (A)  $\begin{matrix} 4 & 9 & 16 & 25 & 36 & 49 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 2^2 & 3^2 & 4^2 & 5^2 & 6^2 & 7^2 \end{matrix}$
131. (C)  $\begin{matrix} \underline{WYV} & \underline{PRO} & \underline{IKH} & \underline{BDA} \\ \uparrow & \uparrow & \uparrow & \uparrow \\ -7 & -7 & -7 & \end{matrix}$
132. (C) Total numbers of triangles = 18
133. (D) As month begins on Saturday, so 2<sup>nd</sup>, 9<sup>th</sup>, 16<sup>th</sup>, 23<sup>rd</sup>, 30<sup>th</sup> days will be Sundays. While 8<sup>th</sup> and 22<sup>nd</sup> days are second Saturdays. Thus, there are 7 holidays in all.
- Hence, no. of working days =  $30 - 7 = 23$
134. (C)
135. (C) From position I and III common face with % is in the same position. Hence according to rule (3) opposite is X.
136. (D) 

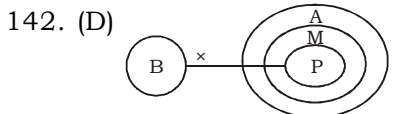
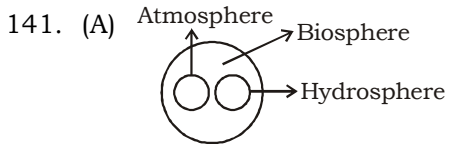
137. (C)  $B < A < C$   
 $A < D < E$   
 $B < A < C < D < E$   
 $\therefore$  Highest marks was obtained by E



I.  $\checkmark$                       II.  $\times$   
 $\therefore$  Only Conclusion I follows.

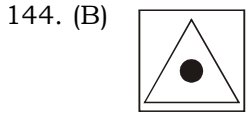
139. (B)  $(10C_4) A (4C_4) B 6$   
 After taking the signs as per the given details,  
 $(10 \times 4) + (4 \times 4) - 6$   
 $= 40 + 16 - 6 = 50$

140. (D) Required position =  $15 - 3 - 8 + 1$   
 $= 16 - 11$   
 $= 5^{\text{th}}$

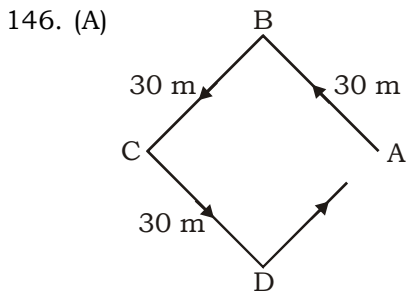


I.  $\checkmark$                       II.  $\checkmark$

143. (A) **defd/cefd/eeef**



145. (A) 1, 4 and 7 are quadrilaterals.  
 2, 5 and 8 are three-dimensional figures.  
 3, 6 and 9 are triangles.



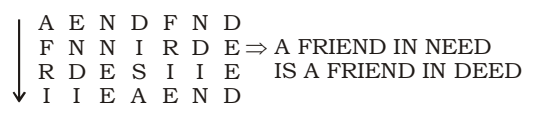
The movements of the girl are as shown in Fig.  
 (A to B, B to C, C to D, D to A).  
 Clearly, she is finally moving in the direction DA i.e. **North east**.

147. (B) As,  $2 + 4 + 6 \Rightarrow 6 \times 4 \times 2 = 48$

$3 + 2 + 8 \Rightarrow 8 \times 2 \times 3 = 48$   
 Similarly,  $2 + 5 + 7 \Rightarrow 7 \times 5 \times 2 = 70$

148. (C) The letters at the third and sixth places are repeated thrice alternately to code BOMBAY as MYMYMY. Similarly, the letters at the third and sixth places are repeated thrice alternately to code DISPUR as **SRSRSR**.

149. (C)  
 150. (A) Write the letters in four rows for example :



151. (B) Let the Present age of son =  $x$   
 Then, the present age of father =  $4x$   
 A.T.Q.,  
 $4x - 4 = 8(x - 4)$   
 $\Rightarrow 4x - 4 = 8x - 32$   
 $\Rightarrow 4x = 28$   
 $\Rightarrow x = 7$   
 $\therefore$  Present age of son = 7 years

152. (A)  $20 - 4 + 6 \div 9 \times 4 = 25$   
 After changing the signs as per the given details,  
 $20 \div 4 \times 6 - 9 + 4 = 25$   
 $\Rightarrow 5 \times 6 - 9 + 4 = 25$   
 $\Rightarrow 30 - 9 + 4 = 25$   
 $\Rightarrow 25 = 25$   
 $\therefore$  Option (1) is the right answer.

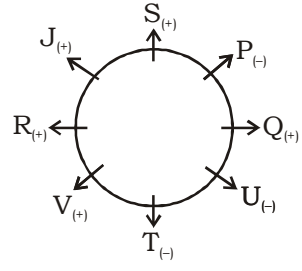
153. (D) GA

154. (C) Wednesday

155. (C)

156. (D) ORANGE

**Direction (157 - 160): Answer**



$R_{(+)}[\text{Lawyer}] \leftrightarrow J_{(-)}$   
 $V_{(+)}[\text{Scientist}] \leftrightarrow T_{(-)}$   
 $Q_{(+)}[\text{Lecturer}] \leftrightarrow U_{(-)}$   
 $S_{(+)}[\text{Doctor}] \leftrightarrow P_{(-)}$

157. (D) 158. (A)                      159. (B)                      160. (C)

**UP SI ANSWER KEY - 51**

1. (C)	21. (A)	41. (A)	61. (A)	81. (C)	101. (A)	121. (D)	141. (A)
2. (B)	22. (C)	42. (B)	62. (B)	82. (C)	102. (B)	122. (A)	142. (D)
3. (C)	23. (A)	43. (A)	63. (B)	83. (C)	103. (D)	123. (B)	143. (A)
4. (C)	24. (B)	44. (B)	64. (C)	84. (A)	104. (C)	124. (A)	144. (B)
5. (A)	25. (C)	45. (A)	65. (A)	85. (D)	105. (B)	125. (A)	145. (A)
6. (A)	26. (A)	46. (A)	66. (C)	86. (B)	106. (C)	126. (D)	146. (A)
7. (C)	27. (C)	47. (D)	67. (C)	87. (A)	107. (C)	127. (A)	147. (B)
8. (C)	28. (A)	48. (B)	68. (C)	88. (C)	108. (C)	128. (A)	148. (C)
9. (A)	29. (D)	49. (A)	69. (A)	89. (C)	109. (D)	129. (C)	149. (C)
10. (D)	30. (B)	50. (C)	70. (D)	90. (C)	110. (A)	130. (A)	150. (A)
11. (C)	31. (D)	51. (B)	71. (D)	91. (B)	111. (D)	131. (C)	151. (B)
12. (D)	32. (B)	52. (D)	72. (B)	92. (B)	112. (D)	132. (C)	152. (A)
13. (D)	33. (D)	53. (D)	73. (B)	93. (A)	113. (A)	133. (D)	153. (D)
14. (C)	34. (B)	54. (A)	74. (B)	94. (A)	114. (C)	134. (C)	154. (C)
15. (C)	35. (D)	55. (B)	75. (A)	95. (C)	115. (C)	135. (C)	155. (C)
16. (C)	36. (C)	56. (A)	76. (D)	96. (A)	116. (D)	136. (D)	156. (D)
17. (B)	37. (D)	57. (D)	77. (A)	97. (C)	117. (B)	137. (C)	157. (D)
18. (A)	38. (C)	58. (C)	78. (A)	98. (A)	118. (C)	138. (A)	158. (A)
19. (D)	39. (B)	59. (A)	79. (C)	99. (B)	119. (C)	139. (B)	159. (B)
20. (C)	40. (C)	60. (C)	80. (A)	100. (A)	120. (D)	140. (D)	160. (C)

