

**UP SI MOCK TEST – 52 (SOLUTION)**

81. (D)  $\begin{matrix} A & 10 \\ B & 12 \\ C & 15 \end{matrix} \rightarrow 60 \leftarrow \begin{matrix} 6 \\ 5 \\ 4 \\ \hline 15 \end{matrix}$

Time taken by (A+B+C) =  $\frac{60}{15} = 4$  days

82. (C) Selling Price of TV

$$= \frac{2300 \times (100 - 25)(100 - 10)}{100 \times 100}$$

$$= \frac{2300 \times 75 \times 90}{100 \times 100} = \frac{3105}{2} = ₹ 1552.5$$

83. (C) We know that two triangles are similar if their corresponding sides are proportional.

84. (C) Amount of 3 yrs. = ₹ 5832  
Amount of 2 yrs. = ₹ 5182  
Simple interest for 1 yrs. = 5832 - 5182 = ₹ 650  
∴ Principle = 5182 - (2 × 650) = ₹ 3882

85. (D)  $(\sqrt{3}x)^3 - (\sqrt{2}y)^3 = (\sqrt{3}x + \sqrt{2}y)$

$$(\sqrt{3}x^2 + \sqrt{2}y^2 + \sqrt{6}xy)$$

= A = 3, B = 2, C

$$\Rightarrow \frac{A \times B}{C} = \frac{3 \times 2}{\sqrt{6}} = \frac{6}{\sqrt{6}} = \sqrt{6}$$

86. (D)  $x^3 + y^3 + z^3 - 3xyz = (x^2 + y^2 + z^2 - xy - yz - zx)(x + y + z)$

$$x^3 + y^3 + z^3 - 3 \times 216 = (133 - 114)(x + y + z)$$

$$(x + y + z)^2 = 133 + 2(114)$$

$$= 133 + 228 = 361$$

$$x + y + z = 19$$

$$x^3 + y^3 + z^3 - 58$$

$$x^3 + y^3 + z^3 = 361 + 648$$

$$x^3 + y^3 + z^3 = 1009$$

87. (C) Required remainder =  $\frac{29}{8} = 5$

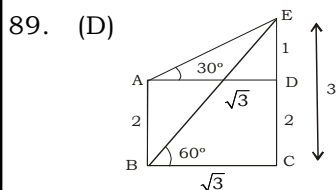
88. (D) M.P.            S.P.            C.P.

$$100 \xrightarrow[20\%]{\text{Discount}} 80 \xrightarrow[25\%]{\text{Profit}} 64$$

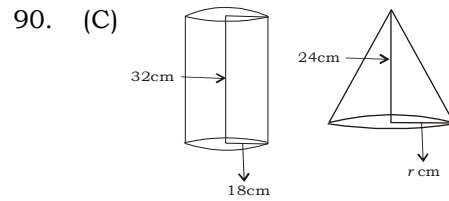
**M.P.**            :            **C.P.**

100                :            64

25                 :            16



AB = Height of building  
CE = Height of Pillar  
ATQ,  
2 units = 20 m  
3 units =  $\frac{20 \times 3}{8} = 30$  m  
∴ Height of pillar = 30 m



A.T.Q.,

$$\pi(18)^2 \times 32 = \frac{1}{3} \pi r^2 \times 24$$

$$r = 36 \text{ cm}$$

91. (B)  $\frac{B}{A+C} = \frac{5}{13}$

A.T.Q.,  
18 units = ₹ 1620  
5 units = ₹ 450  
∴ Share of B = ₹ 450

92. (D) Let  $a = 113, b = 115, c = 117$

$$a^2 + b^2 + c^2 - ab - bc - ca$$

By Multiplying and dividing by '2',

$$= \frac{2a^2 + 2b^2 + 2c^2 - 2ab - 2bc - 2ca}{2}$$

$$= \frac{(a-b)^2 + (b-c)^2 + (c-a)^2}{2}$$

$$= \frac{4 + 4 + 16}{2} = 12$$

93. (D) Net rate for Simple Interest =  $5 \times 4 = 20\%$   
Net rate for Compound Interest = 46.41%  
ATQ,  
(46.41 - 20)% = 26.41%

$$100\% = \frac{26410}{26.41} \times 100 = ₹ 100000$$

∴ Required amount = ₹ 100000

94. (C)

	<b>B<sub>1</sub></b>	<b>B<sub>2</sub></b>
Ratio of speed	45	: 60
	↓	↓
	3	: 4
Ratio of time	4	: 3
	↑	↑
	1 unit	= 5 $\frac{1}{2}$ hrs
	4 units	= 22 hrs

∴ Distance = 22 × 45 = 990 km

95. (D)  $x = a + \frac{1}{a}, y = a - \frac{1}{a}$

Put  $a = 1$

$\Rightarrow x = 2$

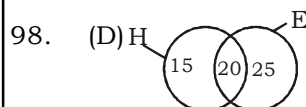
$\Rightarrow y = 0$

$\Rightarrow \sqrt{x^4 + y^4 - 2x^2y^2}$

$= \sqrt{2^4} = 4$

96. (A)  $x^4 + x^2 + y^2 + 6x - 2xy + 9 = 0$   
 $(x^2 + 6x + 9) + (x^2 + y^2 - 2xy) = 0$   
 $(x + 3)^2 + (x - y)^2 = 0$   
 $\Rightarrow x = -3, x = y$   
 $\Rightarrow 4(-3)^3 - (-3)^3 + (3)^4$   
 $\Rightarrow -27 \times 3 + 81$   
 $\Rightarrow 0$

97. (A)  $3000 \xrightarrow[2 \text{ times}]{2 \text{ yrs}} 6000 \xrightarrow[2 \text{ times}]{2 \text{ yrs}} 12000$   
 Compound Interest =  $12000 - 3000$   
 $= ₹ 9000$



Total fail =  $15 + 25 + 20 = 60\%$   
 The % of students up to passed in both subject =  $100 - 60 = 40\%$

99. (A) Average speed =  $\frac{\text{Total Distance}}{\text{Total time taken}}$   
 $= \frac{50 + 40 + 90}{\frac{50}{25} + \frac{40}{20} + \frac{90}{15}} = \frac{180}{10} = 18 \text{ km/hr}$

100. (B)  $a + \frac{1}{a} = 3$

$a^2 + \frac{1}{a^2} = 7$

$a^4 + \frac{1}{a^4} = 49 - 2 = 47$

101. (B) As we know,  
 $(a + b + c)^2 = (a^2 + b^2 + c^2) + 2(ab + bc + ca)$   
 $(2)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$   
 $4 = 26 + 2(ab + bc + ca)$   
 $ab + bc + ca = -11$   
 $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$   
 $\Rightarrow a^3 + b^3 + c^3 - 3abc = (2)(26 + 11)$   
 $\Rightarrow 2 \times 37 = 74$

102. (A)  $\tan \alpha = 2$   
 $P = 2, B = 1$   
 $H = \sqrt{5}$

$\operatorname{cosec} \alpha = \frac{\sqrt{5}}{2}, \sec \alpha = \frac{\sqrt{5}}{1}$

$\frac{\operatorname{cosec}^2 \alpha - \sec^2 \alpha}{\operatorname{cosec}^2 \alpha - \sec^2 \alpha}$

$= \frac{4 - 5}{\frac{4}{5} + 5} = \frac{-1}{\frac{25 + 4}{5}} = \frac{-5}{29}$

$= -\frac{3}{5}$

103. (D) Volume of copper sphere =  $\frac{4}{3} \pi r^3$

$= \frac{4}{3} \times \pi \times (12)^3 \text{ cu.cm}$

$\Rightarrow$  Volume of cylindrical rod =  $\pi R^2 H$   
 $= \pi R^2 \times 16$

$\therefore \pi R^2 \times 16 = \frac{4}{3} \pi \times 12 \times 12 \times 12$

$\Rightarrow R^2 = \frac{4}{3} \times \frac{12 \times 12 \times 12}{16}$

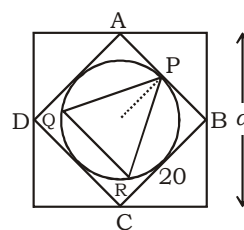
$\Rightarrow R = 12 \text{ cm}$

$\therefore$  Surface area of sphere =  $4\pi r^2 = 4\pi \times (12)^2 \text{ sq. cm}$

Total surface area of the rod =  $2\pi R(R + H)$

$\therefore$  Required ratio =  $\frac{2\pi \times 12 \times 28}{4\pi \times 12 \times 12} = \frac{7}{6}$

104. (D)



$AB = \sqrt{\frac{a^2}{4} + \frac{a^2}{4}} = \frac{a}{\sqrt{2}}$

Radius =  $OP = \frac{1}{2} \left( \frac{a}{\sqrt{2}} \right) = \frac{a}{2\sqrt{2}}$

Also,  $OP = \frac{2}{3} \times \frac{\sqrt{3}}{2} \times (\text{side of } \Delta PQR)$

$\Rightarrow \frac{a}{2\sqrt{2}} = \frac{2}{3} \times \frac{\sqrt{3}}{2} \times (\text{sides of } \Delta PQR)$

$\Rightarrow (\text{side of } \Delta PQR) = \frac{\sqrt{3}a}{2\sqrt{2}}$

Hence,

$$\begin{aligned} \text{Area of } \Delta PQR &= \frac{\sqrt{3}}{4} \times \left( \frac{\sqrt{3}a}{2\sqrt{2}} \right) \\ &= \frac{3\sqrt{3}}{32} a^2 \end{aligned}$$

105. (A) Let the initial investments of A, B and C be ₹ 5x, 4x and 3x, respectively.

$$\begin{aligned} \text{Investment of C} &= 3x \times 8 + 4(3x + 2000) \\ &= 24x + 12x + 8000 \\ &= 36x + 8000 \\ \text{Investment of A} &= 5x \times 12 = 60x \\ \text{Investment of B} &= 4x \times 4 + 8(4x + 1000) \\ &= 16x + 32x + 8000 \\ &= 48x + 8000 \end{aligned}$$

Ratio of their profits = 15 : 14 : 11  
A.T.Q.,

$$\frac{36x + 8000}{60x(48x + 8000) + 36x + 800} = \frac{11}{15 + 14 + 11}$$

$$\frac{9x + 2000}{36x + 400} = \frac{11}{40}$$

$$\begin{aligned} 396x - 360x &= 80000 - 44000 \\ 36x &= 36000 \\ x &= 1000 \end{aligned}$$

$$\begin{aligned} \therefore \text{investment of C} &= 3x \\ &= 3 \times 1000 = ₹ 3000 \end{aligned}$$

106. (A) L.C.M. of 12, 18, 21 and 28 = 252

$$\begin{array}{r} 252 \overline{)9999} \phantom{(} 39 \\ \underline{9828} \\ 171 \end{array}$$

$$\therefore \text{The required number} = (9999 - 171) + 3 = 9931$$

107. (D) In  $\Delta ABC$

$$\begin{aligned} AC &= DC \\ \angle DAC &= \angle ADC \\ \angle DAC &= \frac{180^\circ - 44^\circ}{2} = 68^\circ \end{aligned}$$

$$\begin{aligned} \angle ADB &= \angle C + \angle DAC \quad \text{external angle} \\ \angle ADB &= 44^\circ + 68^\circ \\ &= 112^\circ \end{aligned}$$

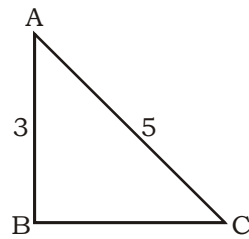
In  $\Delta ADB$

$$\begin{aligned} AD &= BD \\ \angle ABD &= \angle BAD \end{aligned}$$

$$\angle BAD = \frac{180^\circ - 112^\circ}{2} = 34^\circ$$

$$\begin{aligned} \angle A &= \angle BAD + \angle DAC \\ &= 34^\circ + 68^\circ \\ &= 102^\circ \end{aligned}$$

108. (A)



In right angle  $\Delta ABC$

$$\begin{aligned} BC &= \sqrt{AC^2 - AB^2} \\ &= \sqrt{25 - 9} = \sqrt{16} = 4 \end{aligned}$$

Radius of internal circle

$$\begin{aligned} \frac{AB + BC - AC}{2} \\ \Rightarrow \frac{3 + 4 - 5}{2} \end{aligned}$$

$$\Rightarrow \frac{2}{2} \Rightarrow 1 \text{ cm.}$$

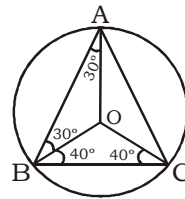
109. (B)  $\left[ \sqrt[3]{6\sqrt{5^9}} \right]^4 \left[ \sqrt[6]{3\sqrt{5^9}} \right]^4$

$$= \left[ 5^{9 \times \frac{1}{6} \times \frac{1}{3}} \right]^4 \left[ 5^{9 \times \frac{1}{6} \times \frac{1}{3}} \right]^4$$

$$= \left[ 5^{\frac{1}{2} \times 4} \right] \left[ 5^{\frac{1}{2} \times 4} \right]$$

$$= 5^2 \times 5^2 = 5^4$$

110. (B)



In  $\Delta ABO$  and  $\Delta OBC$

$$\begin{aligned} OA &= OB & OC &= OB \\ \text{Radius} & & \text{Radius} & \end{aligned}$$

$$\angle AOB = \angle OBA = 30^\circ$$

$$\angle OCB = \angle OBC = 40^\circ$$

$$\therefore \angle AOC = 2\angle ABC$$

$$\angle AOC = 140^\circ$$

111. (A) Let the price of 1 gm is ₹ 1

Actual price : New price

$$\begin{array}{ccc} 10 & \xrightarrow{+20\%} & 12 \\ \times 100 & & \times 100 \\ \hline 1000 & \longrightarrow & 800 \end{array} +400$$

Required percentage profit

$$= \frac{(1200 - 800)}{800} \times 100 = 50\%$$

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112. (C) A's 70 days work = B's 42 days work,  
Ratio of the time = 70 : 42  
efficiency = 3 : 5  
 $\downarrow \times 80$   
Total work 240  
Time =  $\frac{240}{8} = 30$  days

113. (A) AC = BC  
 $\angle CAB = \angle ABC$   
 $\angle ACB = \frac{1}{2} \text{ AOB} = 60^\circ$   
 $\angle CAO = \angle CAB - \angle BAO$   
 $= 60^\circ - 30^\circ = 30^\circ$

114. (C) Water Poured by the man =  $\frac{4}{3}$  litres/min  
Water Poured by the woman =  $\frac{3}{4}$  litres/min  
Required time to fill 200 litres of water  
 $= \frac{200}{\frac{4}{3} + \frac{3}{4}} = \frac{200 \times 12}{25}$   
 $= 96 \text{ min} = 1 \text{ hour } 36 \text{ min.}$

115. (B) Number of diagonals in isosceles  
 $= \frac{n(n-3)}{2}$   
Here  $= \frac{n(n-3)}{2} = 14$   
 $n(n-3) = 14$   
 $n = 7$

Interior angle =  $\frac{(n-2)}{n} \times 180$   
 $= \frac{5 \times 180}{7} = 128 \frac{4}{7}^\circ$

116. (A) AO : OD = 4 : 3  
By property of cevian's we know  
 $\frac{ar(\Delta BOC)}{ar(\Delta ABC)} = \frac{OD}{AD}$   
 $\frac{ar(\Delta BOC)}{ar(\Delta BOC)} = \frac{3}{4}$   
 $\frac{ar(\Delta BOD) + ar(\Delta COD)}{ar(\Delta ABC)} = \frac{3}{4}$   
 $\frac{39}{ar(\Delta ABC)} = \frac{3}{4}$   
 $ar(\Delta ABC) = 52 \text{ cm}^2.$

117. (B) Required number of donors  $\frac{100.8}{360} \times 150$   
 $= 42$

118. (A) Required number of persons  
 $= \frac{(129.6 + 72) \times 150}{360} = 84$

119. (C) Required percentage =  $\frac{57.6}{360} \times 100$   
 $= 16$

120. (D) Required ratio = 72:  $\frac{288}{3} = 3 : 4$

121. (A) Bismillah Khan is a Clarinetist, whereas Birju Maharaj is a Kathak Dancer.

122. (A)  $\begin{matrix} Z & H & Y & G \\ +2\uparrow & +2\uparrow & +2\uparrow & +2\uparrow \\ X & F & W & E \end{matrix}$   
Similarly,

$\begin{matrix} W & E & V & D \\ +2\uparrow & +2\uparrow & +2\uparrow & +2\uparrow \\ U & C & T & B \end{matrix}$

123. (B) 2 : 3 :: 23 : ?

2  $\rightarrow$  next prime number is 3.  
23  $\rightarrow$  next prime number is 29.

124. (A) One who collects stamps is called Philatelist. Similarly, one who collects Coins in called Numismatist.

125. (D) The other three numbers are divisible by 11, while 300 is not.

126. (A) Here in the three options, the first and the third and the second and the 4th letters of alphabet are in a consecutive order (of alphabets).

127. (B) All the rest reflect the positive qualities of human beings, while Guilty reflects his negative quality.

128. (C)

129. (A)  $\frac{12}{3} = 4$  and  $4 + 9 = 13$

$\frac{6}{2} = 3$  and  $3 + 10 = 13$

$\frac{8}{1} = 8$  and  $8 + 5 = 13$

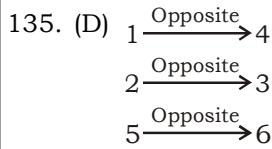
130. (C)  $\begin{matrix} 5 & 7 & 11 & 19 & 35 & 67 & 131 & 159 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +2 & +4 & +8 & +16 & +32 & +64 & +128 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \times 2 & \times 2 & \times 2 & \times 2 & \times 2 & \times 2 \end{matrix}$

131. (B)  $\begin{matrix} & +7 & & +7 & & +7 & & & \\ & \downarrow & & \downarrow & & \downarrow & & & \\ D & F & I & K & M & P & R & T & W & Y & A & D \\ & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \\ & +7 & & +7 & & +7 & & & & & & \\ & \downarrow & & \downarrow & & \downarrow & & & & & & \\ & +7 & & +7 & & +7 & & & & & & \end{matrix}$

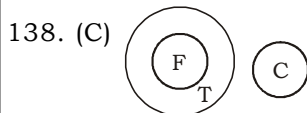
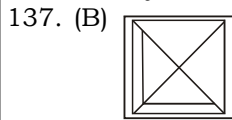
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132. (D) Total numbers of triangles = 33  
 133. (A)  
 134. (D) River → Dam → Power house → Electricity → Lights



136. (D) Uncle's father = Grandfather  
 Grandfather's daughter = My mother  
 My mother's son = My brother



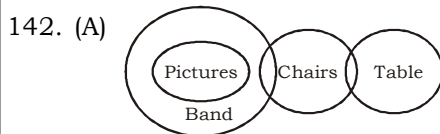
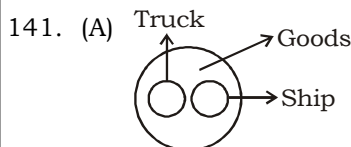
I. ✓ II. ✓

∴ Both conclusions (i) and (ii) follow.

139. (B)  $J_o > K_i$  &  $C_a$   
 $K_i > S_a$   
 $K_i > S_a > N_a$   
 $C_a > S_a$

So, Nancy is the shortest among all.

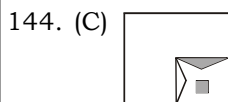
140. (C) Number of boys to the left of Deepak =  $(40 - 31) = 9$ .  
 So, Deepak is 10th from the left end.  
 Shreya is third to the right of Amit.  
 Clearly, Shreya is fourth to the right of Deepak.



**Conclusion:**

I. × II. × III. ×

143. (B)  $200/220/200/220/200$



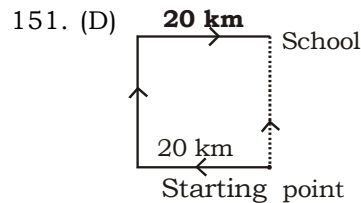
145. (A) A.T.Q.,  
 $\frac{11x - 15}{13x - 15} = \frac{17}{21}$   
 $\Rightarrow 231x - 315 = 221x - 255$   
 $\Rightarrow 10x = 60$   
 $\Rightarrow x = 6$   
 Present age of Rahul =  $11 \times 6 = 66$  years

146. (C) Summit  
 147. (B) If 5th date falls on Tuesday  
 So, 1st Friday falls on 1st,  
 2nd Friday falls on 8th,  
 3rd Friday falls on 15th.  
 So, three days after 3rd Friday will be 19.

148. (B) As, V A R A N A S I    W B S B O B T J  
 +1 Series

Similarly, B M J S B H I    C N K T C I J  
 +1 Series

149. (B)  
 150. (D) Birth of Sohan will be either 8 or 9.



∴ The school of Rahul is 20 km in north.

152. (A)  $100 + 5 - 10 \times 250 \div 200 = 100$   
 After changing sign,  
 $100 \times 5 \div 10 + 250 - 200 = 100$   
 $\Rightarrow 100 = 100$

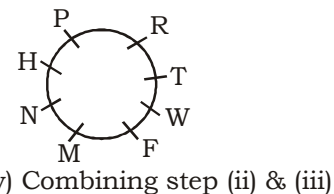
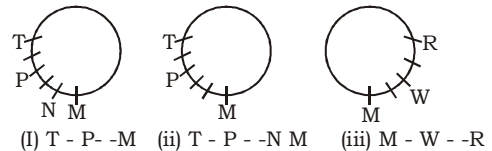
153. (B) 13

154. (D)

155. (C)

156. (D)  $343 \div 7 \times 15 - 335 = 400$   
 $\Rightarrow 49 \times 15 - 335 = 400$   
 $\Rightarrow 735 - 335 = 400$   
**400 = 400**

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



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

**UP SI ANSWER KEY - 52**

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

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**NARRATION**  
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