UP SI MOCK TEST – 56 (SOLUTION)

81. (C) M.R.P = 720, two successive
Discount = 259.20

Discount = $\frac{259.20}{720} \times 100$ = 36%

Two successive Discount

= $- 20 - 20 + \frac{20 \times 20}{100}$

= –40% + 4% = –36%

Two sucessive discount = 20%

82. (B) Let side of the original cube be 'a'.
ATQ.,

Volume of the cube = a^3

$\Rightarrow a = \sqrt[3]{13824} \Rightarrow a = 24$ cm

Now, Let side of the smaller cube be 'a_1'

Volume of the smaller cube = a_1^3

$\Rightarrow 8a^3 = 13824$

$\Rightarrow a_1 = \sqrt[3]{1728} \Rightarrow a_1 = 12$ cm

The ratio of the surface area of the original cube to the sum of the surface area of the three of the smaller cube

= $\frac{6a^2}{3\left(6a_1^2\right)}$ = $\frac{6 \times 24 \times 24}{3(6) \times 12 \times 12}$ = $\frac{4}{3}$

= 4 : 3

83. (A) Let CP = 100 units

CP   SP

100 units $\xrightarrow{15\%loss}$ 85 units $\Big)$ Diff.

100 units $\xrightarrow{9\%gain}$ 109 units $\Big)$ 24 units

24 units $\longrightarrow$ ₹30.60
For 10% profit

110 units $\longrightarrow \frac{30.60}{24} \times 110$

= ₹140.25

84. (A)
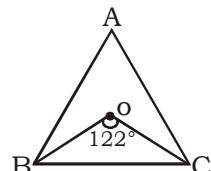
By theorem,

$\angle BOC = 90° + \frac{\angle A}{2}$ (By property)

$\Rightarrow 122° - 90° = \frac{\angle A}{2} \Rightarrow \angle A = 64°$

85. (D) $x^4 + x^4 = 194$

$\Rightarrow x^4 + \frac{1}{x^4} = 194$

$\Rightarrow \left(x^2 + \frac{1}{x^2}\right)^2 - 2x^2 \cdot \frac{1}{x^2} = 194$

$\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{196} = 14$

$\Rightarrow \left(x + \frac{1}{x}\right)^2 - 2 = 14 \Rightarrow x + \frac{1}{x} = 4$

$\Rightarrow \frac{x^2 + 1}{x} = 4 \Rightarrow x^2 - 4x + 1 = 0$

$\Rightarrow x^2 - 4x + 1 + 3 = 0 + 3$

$\Rightarrow (x - 2)^2 = 3$

86. (B) $4 - 2 \sin^2\theta - 5 \cos\theta = 0$

$\Rightarrow 4 - 2(1 - \cos^2\theta) - 5 \cos\theta = 0$

$\Rightarrow 4 - 2 + 2 \cos^2\theta - 5 \cos\theta = 0$

$\Rightarrow 2 \cos^2\theta - 5 \cos\theta + 2 = 0$

$\Rightarrow (2 \cos\theta - 1)(\cos\theta - 2) = 0$

$\Rightarrow \cos\theta = \frac{1}{2} \Rightarrow \theta = 60°$

Then, $\sin 60° + \tan 60°$

$\Rightarrow \frac{\sqrt{3}}{2} + \sqrt{3} = \frac{3\sqrt{3}}{2}$

87. (B)
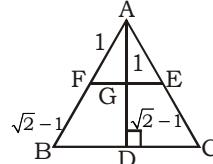
ΔABC and ΔAFE are similar,

then $\frac{ar(\Delta AEF)}{ar(\Delta ABC)} = \left(\frac{AG}{AD}\right)^2$

$\Rightarrow \frac{1}{2} = \left(\frac{AG}{AD}\right)^2 \Rightarrow \frac{AG}{AD} = \frac{1}{\sqrt{2}}$

Now, GD = AD – AG

$\Rightarrow$ GD = $\sqrt{2} - 1$

$\Rightarrow \frac{GD}{AG} = \frac{\sqrt{2} - 1}{1}$

Hence, GD : AG = $\left(\sqrt{2} - 1\right) : 1$

88. (B) Let the number = x
ATQ,

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

$\therefore x = 1$

89. (B) Average Salary

$$=16000+ \frac{(20,000-16,000)}{20}$$

$$= 16000 + \frac{4000}{20} = ₹ 16200$$

90. (A) A.T.Q.,

Putting $x = 2$ and $y = 1$ then, it is divisible by 72.

Hence, $4x - 3y = 4×2 - 1×3$

$$= 5$$

91. (B)

$$2000 \xrightarrow{\text{2 yrs}} 4000 \xrightarrow{\text{2 yrs}} 8000$$

Time = 4 yrs
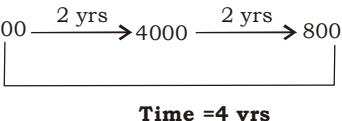
92. (A)
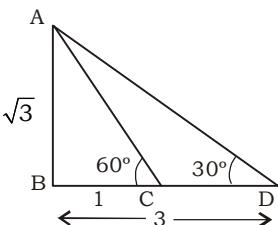
A.T.Q.,

$\sqrt{3}$ units = 1500 m

$(3 - 1) = 2$ units $= \frac{1500}{\sqrt{3}} \times 2$

$$= 1000\sqrt{3}$$

∴ The distance between ships

$$= 1000\sqrt{3} \text{ m}$$

93. (A) Present age of baby

$$= (17 × 6) - (17 × 5 + 15)$$

$$= 102 - 100$$

$$= 2 \text{ yrs.}$$

94. (D)
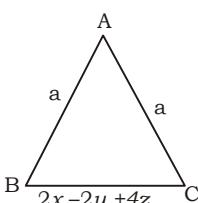
ATQ,

$\Rightarrow a + a + 2x - 2y + 4z = 4x - 2y + 6z$

$\Rightarrow 2a = 4x - 2y + 6z - 2x + 2y - 4z$

$\Rightarrow 2a = 2x + 2z$

$\Rightarrow a = x + z$

95. (B) $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 1$

$\Rightarrow \frac{xy + yz + zx}{xyz} = 1$

$\Rightarrow xy + yz + zx = xyz$

$\Rightarrow xy + yz + zx = -1$ [∵ $xyz = -1$]

$x + y + z = 1$

Squaring both sides,

$\Rightarrow x^2 + y^2 + z^2 + 2(xy + yz + zx) = 1$

$\Rightarrow x^2 + y^2 + z^2 = 1 + 2 = 3$

Now, $x^3 + y^3 + z^3 - 3xyz = (x + y + z) [x^2 + y^2 + z^2 - (xy + yz + zx)]$

$\Rightarrow x^3 + y^3 + z^3 + 3 = 1 (3 + 1)$

$\Rightarrow x^3 + y^3 + z^3 = 4 - 3 = 1$

96. (C) New Speed $= \frac{60 \times 15}{12} = 75$ km/hr

97. (C) Let M.P. = 100

then, S.P. $= 100 \times \frac{85}{100} \times \frac{85}{100} \times \frac{75}{100}$

$$= 51$$

∴ Equivalent discount $= 100 - 51$

$$= 49\%$$

98. (A) $x = \sqrt{a} + \frac{1}{\sqrt{a}}$

$\Rightarrow x^2 = a + \frac{1}{a} + 2$

$y = \sqrt{a} - \frac{1}{\sqrt{a}}$

$\Rightarrow y^2 = a + \frac{1}{a} - 2$

$x^2 - y^2 = 4$

$\Rightarrow (x^2 - y^2)^2 = 16$

$\Rightarrow x^4 + y^4 - 2x^2y^2 = 16$

99. (B) $\tan (5x - 10°) = \cot (5y + 20°)$

$\Rightarrow \tan (5x - 10°) = \tan (90° - 5x - 20°)$

$\Rightarrow 5x - 10° = 90° - 5y - 20°$

$\Rightarrow 5x + 5y = 80°$

$\Rightarrow x + y = 16°$

100. (C)

|	A	:	B
Efficiency	2	:	3
Time	3	:	2
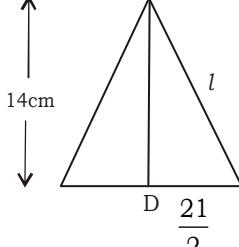
101. (C)

$l = \sqrt{(14)^2 + \left(\frac{21}{2}\right)^2}$

$= \sqrt{196 + \dfrac{441}{4}} = \sqrt{\dfrac{1225}{4}} = \dfrac{35}{2}\,m$

Total cost = CSA × cost of 1m²

$= \dfrac{22}{7} \times \dfrac{35}{2} \times \dfrac{21}{2} \times 6 = ₹3465$

102. (A)
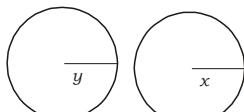
$W = \pi y^2 \qquad A = \pi x^2$

ATQ,

$\pi y^2 - \pi x^2 = w'$

$\Rightarrow w - \pi x^2 = w'$ (putting $\pi y^2 = w$)

$\Rightarrow \pi x^2 = w - w'$

$\dfrac{\pi x^2}{\pi y^2} = \dfrac{w - w'}{w}$

$\Rightarrow \dfrac{x}{y} = \sqrt{1 - \dfrac{w'}{w}}$

103. (A) Speed of man = 8 km/h

Speed of stream = x km/h

Then,

$x + 8 = \dfrac{44}{4} = 11$

$x = 3$ km/h

speed upstream = 8 – 3 = 5 km/h

∴ Required time = $\dfrac{25}{5}$ = 5 hours.

104. (B) Pankaj → 20 days

Let the total work = 20 units

Then, 25% = $\dfrac{1}{4}$

Remaining work = $20 \times \dfrac{3}{4}$ = 15 units

15 units done by Neha in 10 days

20 units (Total work) done by Neha

$= \dfrac{10}{15} \times 20 = \dfrac{40}{3}$ days

Pankaj → 20 days ⟍ 2

(40) Total work

Neha → $\dfrac{40}{3}$ days ⟋ 3
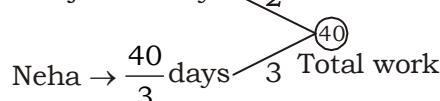
Time required for Pankaj and Neha to complete the work = $\dfrac{40}{5}$ = 8 days

105. (C) Relative speed = 45 – 40 = 5 km/hr

∴ Required distance = $\left(5 \times \dfrac{45}{60}\right)$ km

$= \dfrac{15}{4}$ km

= 3 km 750 metre.

106. (A) C.P. = ₹1800

S.P. = 1800 × $\dfrac{11}{10}$ = ₹1980

Increase in profit = $\dfrac{2070 - 1980}{1800}$

$= \dfrac{90}{1800} \times 100$ = 5%

107. (C) Product of numbers = LCM × HCF

Let other number be x

Then,

$x \times 32 = 160 \times 16$

∴ Required sum = 80 + 16 = 96

108. (B) Let the speed of boat in still water and the speed of current be x km/h and y km/h.

$x + y = 20$

$\Rightarrow x = 20 - 5 = 15$ km/h

Upstream speed,

$x - y = 15 - 5 = 10$ km/h

Upstream time = $\dfrac{20}{10}$ = 2 hrs

109. (D) Time taken by all the three pipes to fill the

$= \dfrac{1}{10} + \dfrac{1}{12} - \dfrac{1}{6}$ = 60 min

Time taken to fill the two-third part of tank

$= \dfrac{60}{1} = \dfrac{x}{\frac{2}{3}}$ = **40 minute**

110. (D) Let the quantity of acid be added be x gm.

A.T.Q.,

$\dfrac{600 \times \frac{2}{5} + x}{600 + x} = \dfrac{1}{2}$

$\Rightarrow 480 + 2x = 600 + x$

∴ Required quantity x = 600 – 480

= **120 gm**

111. (B) $\cos^2\alpha + \cos^2\beta = 2$

$= 1 - \sin^2\alpha + 1 - \sin^2\beta = 2$

$= \sin^2\alpha + \sin^2\beta = 0$

$= \sin\alpha = \sin\beta = 0$

$= \alpha = \beta = 0$

$\therefore \tan^3\alpha + \sin^5\beta = 0$

112. (A)
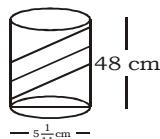
When we open it
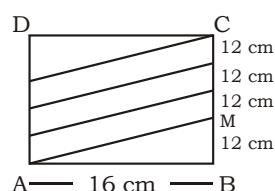
The base circumference

$= 2\pi r = 2 \times \dfrac{22}{7} \times \dfrac{56}{11} \times \dfrac{1}{2} = 16$ cm

$\therefore$ AM = length of one complete turn

$= \sqrt{16^2 + 12^2}$

$= 20$ cm

$\therefore$ total length = $4 \times 20 = 80$ cm

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

$\Rightarrow a^2 + b^2 + c^2 - ab - bc - ca = 0$

Multiply *by* "2" on both sides,

$2a^2 + 2b^2 + 2c^2 - 2ab - 2bc - 2ca = 0$

$\Rightarrow (a-b)^2 + (b-c)^2 + (c-a)^2 = 0$

$\therefore a = b = c$

$\therefore$ The triangle is equilateral

114. (A) $\sqrt{8} + 2\sqrt{32} - 3\sqrt{128} + 4\sqrt{50}$

$= 2\sqrt{2} + 8\sqrt{2} - 3 \times 8\sqrt{2} + 4 \times 5\sqrt{2}$

$= 2\sqrt{2} + 8\sqrt{2} - 24\sqrt{2} + 20\sqrt{2}$

$= (2 + 8 - 24 + 20)\sqrt{2}$

$= 6\sqrt{2} = 6 \times 1.414 = 8.484$

115. (C) Suppose a container contains x units of liquid from which y units are taken out and replaced by water. After n operations, the quantity of pure liquid

$= x\left(1 - \dfrac{y}{x}\right)^n$ units

Remaining water $= \left(1 - \dfrac{3}{30}\right)^2 = 30$

$= \dfrac{30 \times 9 \times 9}{100} = 24.3$ litres

116. (B) Let the total profit = 100 units

Remaining profit after donation

$\therefore$ Share of X = $\dfrac{95}{(3+2)} \times 3$ = 57 units

A.T.Q.,

57 units ₹8550

1 unit = $\dfrac{8550}{57}$

100 units = $\dfrac{8550}{57} \times 100 = $ ₹15000

117. (A) Required angle

$= \dfrac{60}{39 + 45 + 54 + 60 + 72} \times 360° = 80°$

118. (D) Total production of B type of cars in 2013, 2014, 2015 and 2017

$= 39 + 45 + 54 + 72 = 210$

Production of all types of cars in 2017 = $36 + 72 + 45 + 47 + 55 = 255$

$\therefore$ Required % = $\dfrac{255 - 210}{255} \times 100$

$= 17.64$

119. (A) Total production of C and E type cars in the years 2013

$= 52 + 36 = 88$

Total production of D in 2014 and 2016 and E in 2017

$= 42 + 46 + 55 = 143$

$\therefore$ Required ratio = $88 : 143 = 8 : 13$

120. (C) Total production of A type cars in year 2015 and C type cars in 2013 = $48 + 52 = 100$

Total production of D type cars in five years

$= 50 + 42 + 45 + 46 + 47 = 230$

$\therefore$ Required% = $\dfrac{100}{230} \times 100$

$= \dfrac{1000}{23} \approx 43.5\%$

121. (B) $12 = 3 \times 4$,   **$14 = 2 \times 7$**

$56 = 7 \times 8$, $30 = 5 \times 6$

122. (B)
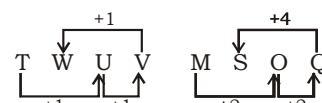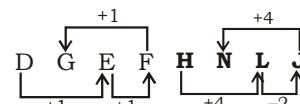
123. (A)   124. (A)

125. (D) As,

$$4 = 2 \times 2 \qquad 2^3 \times 2^2 = 8 \times 4 = 32$$

Similarly,

$$6 = 3 \times 2 \qquad 3^3 \times 2^2 = 27 \times 4 = 108$$

126. (D)

127. (B) 3   7   16   35   **74**   153
         ×2+1 ×2+2 ×2+3 ×2+4 ×2+5

128. (C) 98   95   86   82   66   **61**   36
         −3   −3²   −4   −4²   −5   −5²
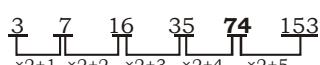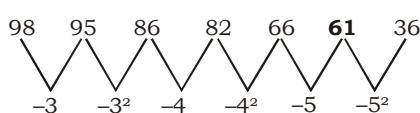
129. (D)   130. (D)

131. (C) As, C O M P U T E R

O C R E P M T U

Similarly,

D A U G H T E R

A D R E G U T H

132. (C)
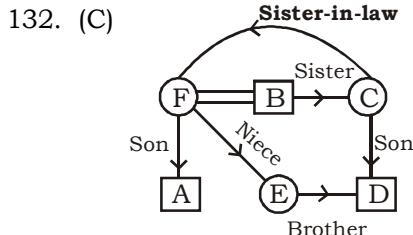
133. (D) The required ratio = $\dfrac{\dfrac{2}{3}+\dfrac{4}{9}}{\dfrac{1}{3}+\dfrac{5}{9}}$

$= \dfrac{10/9}{8/9} = 5 : 4$

134. (C)   135. (D)

136. (A) As, FLOWER = (Total alphabet+1) × 2

⇒ (6 + 1) × 2 = 14

And, DISTASTE = (8 + 1) × 2 = 18

Similarly,

BUREAUCRAT = (10 + 1) × 2 = 22

137. (A) ac**b**/dd**d**b/**a**cb/dd**b**/a**c**b/ddb

138. (C)
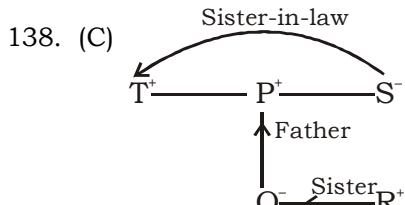
139. (B) Except (B), in all others options the country name and its currency name are given.

140. (C)

141. (C)

Conclusion:

I. (×)   II. (×)
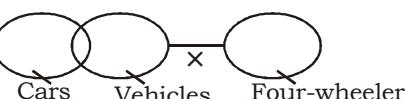
III. (✓)

∴ Only conclusion III follows.

142. (D)

143. (D)

144. (B)
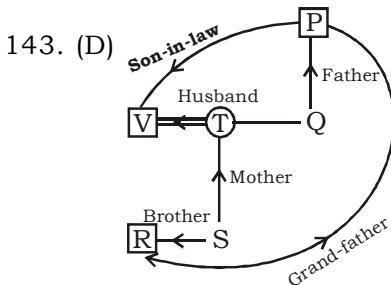
145. (B) 10 years ago,

Let, Son's age = x years

his father's age = $\dfrac{7}{2}x$ years

ATQ.,

$\left(\dfrac{7x}{2} + 20\right) = \dfrac{9}{4}(x + 20)$

$\Rightarrow \dfrac{7x + 40}{2} = \dfrac{9x + 180}{4}$

$\Rightarrow 14x + 80 = 9x + 180$

$\Rightarrow 5x = 100 \Rightarrow x = 20$

At present

Son's age = 20 + 10 = 30 years

His father's age = $\dfrac{7}{2} \times 20 + 10$

= 80 years

The required sum = 80 + 30

= 110 years
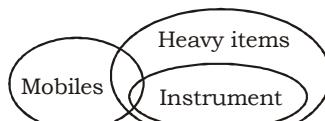
146. (D)

I. ✓   II. ×   III. ✓

147. (C) ATQ,

Before		After
÷	⟶	+
+	⟶	–
–	⟶	×
×	⟶	÷

$54 \times 6 - 7 \div 8 + 2$

After changing the signs,

$= 54 \div 6 \times 7 + 8 - 2$

$= 63 + 8 - 2 = 69$

148. (A) Illness → Doctor → Diagnosis

Prescription → medicine → Recovery

149. (A) cb**a**db**c**cba**d**bc**c**bad**b**c

150. (B) ATQ.,

$15 - 9 \div 6 \times 10 + 5 = 25$

Form option (B)

$\Rightarrow 15 + 9 \div 6 \times 10 - 5$

$\Rightarrow 15 + \dfrac{3}{2} \times 10 - 5$

$\Rightarrow 15 + 15 - 5$

$\Rightarrow 25$

151. (D) As, V I C T O R V

$\overset{\text{C I V S Y R O}}{\underset{-1}{\diagdown}}$
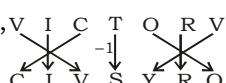
Similarly, T R A I T O R

A R T H R O T
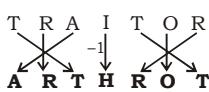
152. (A)

153. (D)

154. (C) $A = \dfrac{1}{2}(B + C) \Rightarrow \dfrac{A}{B + C} = \dfrac{1}{2}$

$\Rightarrow \dfrac{A}{A + B + C} = \dfrac{1}{3} \times \dfrac{5}{5} = \dfrac{5}{15}$

and $B = \dfrac{1}{4}(A + C) \Rightarrow \dfrac{B}{A + C} = \dfrac{1}{4}$

$\Rightarrow \dfrac{B}{A + B + C} = \dfrac{1}{5} \times \dfrac{3}{3} = \dfrac{3}{15}$

∴ A : B : C = 5, 3, 7

C's share more than that of

$A = \dfrac{75}{15} \times 1875 = \dfrac{2}{15} \times 1875$

$= 2 \times 125 = ₹250$

155. (D)

156. (B) $9 + 3^2 = 9 + 9 = 18$

$18 + 3^2 = 18 + 9 = 27$

$27 + 3^2 = 27 + 9 = 36$

157. (B)
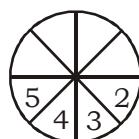
In half part of circle digit are increasing in ascending order i.e. 2, 3, 4, 5

In the half part of circle digits are increasing in ascending order in odd number if,

5, 7, 9, 11

158. (C) In figure I

$(15 \times 6 \times 4) \div 36$

$= 360 \div 36 = 10$

In figure II

$(6 \times 7 \times 5) \div 21$

$= 210 \div 21 = 10$

In figure III

$(50 \times 10 \times 10) \div x = 10$

$x = 5000 \div 10$

$x = 500$

159. (B) In row I

$14 + 19 + 12 = 45$

In row II

$13 + 15 + 17 = 45$

So, In row III

$18 + 11 + x = 45$

$29 + x = 45$

$x = 45 - 29$

$x = 16$

160. (D) In these question

in row → YDR

in column → EDO

Then complete word is REDOUBT and HYDRANT.

UP SI ANSWER KEY - 56

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