UP SI MOCK TEST – 54 (SOLUTION)

81. **(B)** Let fruit-seller buys $100x$ bananas.
A.T.Q.,
$40x$ SP = $100x$ CP
SP : CP = 5 : 2
Take SP of each banana is 5 and CP is 2.
80% of the remaining bananas

$= \dfrac{80}{100} \times 60x = 48x$

SP of $48x$ will be overall profit of fruit seller since he has realized CP of all bananas by selling 40% of them,
SP of $48x$ bananas $3.5 \times 48x = 168x$ ....
(SP is 3.5 since profit is half of previous)

% profit $= \dfrac{168x}{100x \times 2} \times 100 = 84\%$

82. **(B)** When a value is first increased and then decreased by the same percentage, then initial value is always decreased by

$\dfrac{x^2}{100}\%$ (irrespective of initial value)

So, loss profit

$= \dfrac{(16)^2}{100} = 2.225\%$

83. **(B)** MP of the item

$= ₹ 3402 \times \dfrac{100}{108} \times \dfrac{100}{90} \; ₹ 3500$

84. **(A)** A.T.Q.,

$\dfrac{4000 \times 3 \times x}{100} = \dfrac{5000 \times 12 \times 2}{100}$
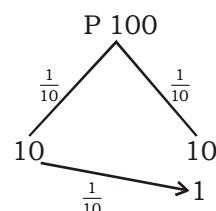
$12000x = 1200000$

$x = 10\%$

85. **(D)** Given amount = ₹ 12100

R% = 10% = $\dfrac{1}{10}$

Time = 2 years

P 100
$\frac{1}{10}$ $\frac{1}{10}$
10   10
$\frac{1}{10}$
1

Total amount for 2 year
= 10 + 10 + 1 + 100 = 121
⇒ 121 units → ₹ 12100
⇒ 1 unit → 100
⇒ Principal = 100 units
= 100 × 100 = 10000

86. **(D)**

729
milk / \ water
7 : 2 — 9 units = 729
567   162 — 1 unit = 81

M : W
Initial → 7 : 2
After adding water   7 : 3   } 1 unit

Always milk will be same
i.e. 1 unit of water will be added = 1 unit ⇒ 81 mili litres

87. **(D)** $a^3 + b^3 + c^3 - 3abc = (a + b + c)[(a + b + c)^2 - 3(ab + bc + ca)]$
$a^3 + b^3 + c^3 - abc = (4)(16 - 3 \times 2)$
$= 4(10) = 40$

88. **(A)** $\sqrt{x} - \dfrac{1}{\sqrt{x}} = \sqrt{6}$

$x + \dfrac{1}{x} = 8$

$x^2 + \dfrac{1}{x^2} = 62$

89. **(D)** ⇒ 0.5A = 0.6B = 0.75C

$\Rightarrow \dfrac{5}{10} \times A = \dfrac{6}{10} \times B = \dfrac{75}{10} C$

$\Rightarrow \dfrac{1}{2} A = \dfrac{3}{5} B = \dfrac{3}{4} C$

⇒ 10A = 12B = 15C
⇒ A : B : C
12×15 : 10×15 : 10×12
⇒ 180 : 150 : 120
⇒ 6x : 5x : 4x
Total = 6x + 5x + 5x = 15x
15x = 1740

$\Rightarrow x = \dfrac{1740}{15} = ₹ 116$

∴ Share of C is = 4x = 4 × 16 = ₹ 464
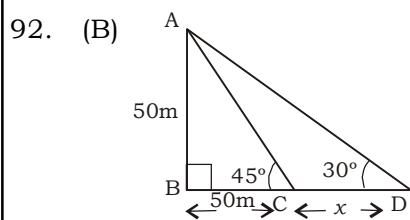
90. **(D)** Let A = 8h

$B = 4\dfrac{1}{2} h = \dfrac{9}{2} h$

Time required to finish together $= \sqrt{ab}$

$= \sqrt{8 \times \dfrac{9}{2}} = 6 \, h$ d

91. (C) Given that
$\Rightarrow \cos x = \sin y$
$\Rightarrow \cos x = \cos(90° - y)$
Then, $x + y = 90°$........(i)
and, $\cot(x - 40°) = \cot(90° - 50° + y)$
$\Rightarrow x - 40 = 40° + y$
$\Rightarrow x - y = 80°$ ....(ii)
From equ. (i) and (ii)
$x = 85$, $y = 5°$

92. (B)

In $\triangle ABC$,
$AB = BC = 50m$
In $\triangle ABD$,

$\tan 30° = \dfrac{AB}{BD}$

$\Rightarrow \dfrac{1}{\sqrt{3}} = \dfrac{50}{50+x}$

$\Rightarrow 50 + x = 50\sqrt{3}$

$\Rightarrow x = 50(\sqrt{3}-1)$

93. (B) Here $a^3 + b^3 + c^3 - 3abc = 0$
$\Rightarrow a + b + c = 0$
Here, $a = x - 5$
$b = x - 6$
$c = x - 7$
$\Rightarrow x - 5 + x - 6 + x - 7 = 0$
$\Rightarrow 3x - 18 = 0$
$\Rightarrow x = 6$

94. (B)

$\because$ They meet after 6 hours if they walk towards each other i.e. their speed will be added.
$\because$ So their relative speed in opposite direction

$= \dfrac{\text{Distance}}{\text{Time}} = \dfrac{60}{6}$

$\Rightarrow$ Relative speed opposite
$\Rightarrow 10$ km/hr ...(i)
A.T.Q.,

$\Rightarrow \dfrac{2}{3}A + 2B = \dfrac{60}{5}$

$\Rightarrow A + 3B = 18$
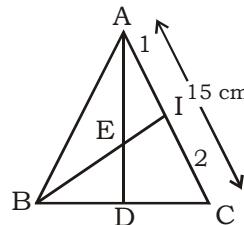
$\Rightarrow$ B's speed $= \dfrac{18 - A}{3}$

$\Rightarrow A + B = 10$

$\Rightarrow A + \dfrac{18 - A}{3} = 10$

$\Rightarrow 3A + 18 - A = 30$

$\Rightarrow 2A = 12$

$\Rightarrow$ A's Speed = 6 km/hr

95. (D) Volume of prism = (area of base × height)
Area of base (i.e. area of triangle)
$\Rightarrow$ Area of base

$= \sqrt{s(s-a)(s-b)(s-c)}$

= (By Hero's formula)

So, S $= \dfrac{13 + 20 + 21}{2} = \dfrac{54}{2} = 27$

$\Rightarrow \sqrt{27(72-13)(27-20)(27-21)}$

$\Rightarrow \sqrt{27 \times 14 \times 7 \times 6}$

$\Rightarrow \sqrt{9 \times 3 \times 2 \times 7 \times 7 \times 2 \times 3}$

$\Rightarrow \sqrt{9 \times 9 \times 7 \times 7 \times 2 \times 2}$

$\Rightarrow 9 \times 7 \times 2$
Volume of prism
= (9 × 7 × 2) × 9 = 1134 cm³.

96. (B)

	A	:	B	:	C
Capital $\rightarrow$	45000:		80000 :		120000
(years)time $\rightarrow$	2		$\frac{3}{2}$		1
Profit $\rightarrow$	90	:	120	:	4
	3	:	4	:	4

Required ratio profit = 3 : 4 : 4

97. (B)

$\because$ I divide AC in 1 : 2

The IC $= \dfrac{15}{3} \times 2$

= 10 cm

98. (D) $P = \dfrac{(C.I - S.I) \times 100 \times 100}{R^2}$

$P = \dfrac{1 \times 100 \times 100}{4 \times 4}$

$\Rightarrow P = ₹625$

99. (D) $\cos^2\theta - 3\cos\theta + 2 = \sin^2\theta$

$\Rightarrow \cos^2\theta - 3\cos\theta + 2 = 1 - \cos^2\theta$

$\Rightarrow 2\cos^2\theta - 3\cos\theta + 1 = 0$

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

$\cos\theta = 1, \dfrac{1}{2}$

$\therefore \theta = 0° \text{ or } 60°$

100. (D) $9^{\frac{1}{3}}$ $20^{\frac{1}{4}}$ $25^{\frac{1}{6}}$

$9^{\frac{1}{3}\times12}$ $20^{\frac{1}{4}\times12}$ $25^{\frac{1}{6}\times12}$

[LCM of 3, 4 & 6 is 12]

9^4 20^3 25^2

$\downarrow$ $\downarrow$ $\downarrow$

65 61 8000 625

Ascending order is

$\sqrt[6]{25} < \sqrt[2]{9} < \sqrt[4]{20}$

101. (D) From figure

$\angle APC = 2\angle ABC$

$\angle APC = 2 \times 35$

$= 70°$

In $\triangle APC$

$AP = PC$ (radius)

$\therefore \angle PAC = \angle PCA$

$\therefore \angle PCA = \dfrac{(180 - 70)}{2}$

$= \dfrac{110}{2} = 55°$

102. (D) $r\sin\theta = 1$

$r\cos\theta = \sqrt{3}$

$\Rightarrow \dfrac{r\sin\theta}{r\cos\theta} = \dfrac{1}{\sqrt{3}} \Rightarrow \tan\theta = \dfrac{1}{\sqrt{3}}$

$\Rightarrow \sqrt{3}\ \tan\theta = 1$

(add 1 both sides)

$\Rightarrow \sqrt{3}\tan + 1 = 1 + 1$

$\Rightarrow 2$

103. (A) DABC~DDEF

$\dfrac{\text{Area of }\triangle ABC}{\text{Area of }\triangle DEF} = \dfrac{BC^2}{EF^2}$

$\dfrac{64}{121} = \dfrac{BC^2}{(15.4)^2}$
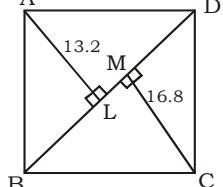
BC = 11.2 cm.

104. (C) Distance = S × T = 80 × 7

= 560 km

105. (C) Total C.P → 25 × 12 → ₹ 300

Total SP → (25+5)×10.40 = ₹ 312

Profit % = $\dfrac{(312 - 300)}{300} \times 100 = 4$

106. (D)

CM = 16.8 cm AL = 13.2 cm

BD = 64 cm

Area of $\triangle ABCD$

$= \dfrac{1}{2} \times BD\ (AL + CM)$

$= \dfrac{1}{2} \times 64 \times (13.2 + 16.8)$

= 32 × 30

= 960 cm².

107. (D) $\sin\theta = \dfrac{\sqrt{3}}{r}$

$\Rightarrow \sin^2\theta = \dfrac{3}{r^2}$ ...(i)

$\cos\theta = \dfrac{1}{r}$

$\Rightarrow \cos^2\theta = \dfrac{1}{r^2}$ ...(ii)

From equation (i) and (ii),

$\sin^2\theta + \cos^2\theta = \dfrac{3}{r^2} + \dfrac{1}{r^2}$

$\Rightarrow 1 = \dfrac{4}{r^2}$

$\Rightarrow r^2 = 4$

$\Rightarrow r = 2$

$\therefore \sin\theta = \dfrac{\sqrt{3}}{2}$

$\Rightarrow \sin\theta = \sin 60°$

$\theta = 60°$

108. (B) Let the Average of half of the students is x

Then,

60 × 65 = (30 × 85) + (30 × x)

$\Rightarrow$ 60 × 65 = 30 (85 + x)

$\Rightarrow$ 130 = 85 + x

$\Rightarrow x = 45$

109. (A) AO : OD : 4 : 3

By property of cevian's we know

$\dfrac{ar(\triangle BOC)}{ar(\triangle ABC)} = \dfrac{OD}{AD}$

$\dfrac{ar(\triangle BOC)}{ar(\triangle BOC)} = \dfrac{3}{4}$

$$\frac{ar(\Delta \text{BOD}) + ar(\text{COD})}{ar(\Delta \text{ABC})} = \frac{3}{4}$$
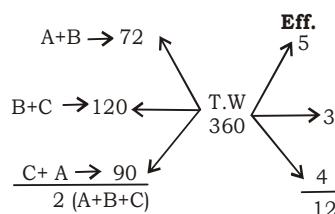
$$\frac{39}{ar(\Delta \text{ABC})} = \frac{3}{4}$$

ar (ΔABC) = 52 cm^2.

110. (B) As we know,

$a^3 + b^3 + c^3 - 3abc = (a + b + c)((a^2 + b^2 + c^2) - 3(ab + bc + ca))$

$a^3 + b^3 + c^3 - 3abc = 10(102 - 3 \times 32)$

= 10 (100 − 96)

= 40

111. (A)

Efficiency of A = 6 − 3 = 3

Required no. of days = $\frac{360}{3}$

= 120 days

112. (D) Let the initial radius = r

A.T.Q.,

$4\pi(r + 2)^2 - 4x\,r^2 = 352$

$4\pi[(r + 2)^2 - r^2] = 352$

$r^2 + 4 + 4r - r^2 = \frac{352 \times 7}{22 \times 4}$

$4r + 4 = 28$

$4r = 24$

$r = 6$

113. (C) $\dfrac{2\tan 53°}{\cot 37°} - \dfrac{\cot 80°}{\tan 10°}$

$\Rightarrow \dfrac{2\tan 53°}{\tan 53°} - \dfrac{\cot 80°}{\cot 80°}$

$\Rightarrow 2 - 1 = 1$

114. (C) Let N is largest among all sides and 24 is smallest side.

$10^2 + 24^2 > N^2$

$676 > N^2$

$26 > N$ ...(i)

$10^2 + N^2 > 24^2$

$N^2 > 576 - 100$

$N > 21$ ...(ii)

From equation (i) and (ii)

$21 < N < 26$

115. (D) Let the numbers of natural number are = n

∵ The average of some natural number is = 15

⇒ Sum of these natural number = 15 × n = 15

∵ 30 is added and 5 is subtracted

So, Now addition of these numbers

= $15n + 30 - 5 = 15n + 25$

A.T.Q.,

$\Rightarrow \dfrac{15n + 25}{n} = 17.5$

$\Rightarrow 15n + 25 = 17.5n$

$\Rightarrow 2.5n = 25$

$\Rightarrow n = 10$

Therefore, the number of natural number n = 10

116. (D) $x - 5\sqrt{x} = 1$

Divide by $\sqrt{x}$

$\sqrt{x} - 5 = \dfrac{1}{\sqrt{x}}$

$\sqrt{x} - \dfrac{1}{\sqrt{x}} = 5$

$x + \dfrac{1}{x} = 27$

$x^2 + \dfrac{1}{x^2} = 729 - 2$

= 727

117. (A) Required ratio =

$$\frac{3.3 + 2.5 + 1.6 + 1.6 + 1.6 + 1.1}{3.3 + 2.5 + 1.6 + 1.6 + 1.6 + 1.1 + 22.6 + 12.5 + 12.1 + 10.6}$$

$= \dfrac{11.7}{69.5} \cong \dfrac{1}{6}$
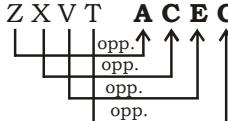
118. (D) UAE

119. (B) Required Ratio = 35.2 : 68.8

$\cong$ 35 : 69
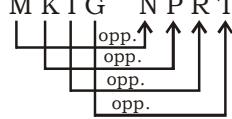
120. (C) Approximate 10 times

121. (B)

122. (B) As, Z X V T   **A C E G**

Similarly, M K I G   N P R T

123. (A) As, 4 + 5 + 7 + 8 + 9 + 10 $\Rightarrow$ 61 = 7

Similarly,

1 + 5 + 6 + 7 + 8 + 3 + 2 + 9 $\Rightarrow$ 41 = 5

124. (D) Giant : Dwarf :: Genius : **Idiot**

125. (A) Except QRP all contain middle letter as a vowel.

126. (A)

127. (C) Except (C) all are part of Entrepreneur.

128. (A) 60, 69, 85, 110, 146
$+(3)^2$ $+(4)^2$ $+(5)^2$ $+(6)^2$
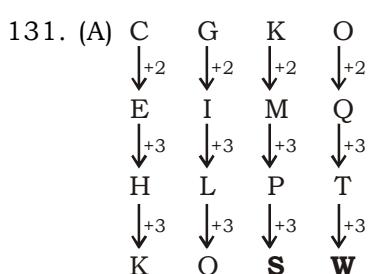
129. (B) As, (6 × 5) + (3 × 3) = 39
(7 × 5) + (4 × 4) = 51
Similarly,
(5 × 5) + (3 × 4) = 37
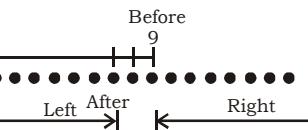
130. (C) 2, 12, 60, **240**, 720, 1440
×6 ×5 ×4 ×3 ×2

131. (A)
C	G	K	O
+2	+2	+2	+2
E	I	M	Q
+3	+3	+3	+3
H	L	P	T
+3	+3	+3	+3
K	O	**S**	**W**

132. (D) More than 29.

133. (B)
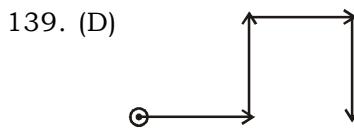
134. (C) **t**wi**n**/**t**wi**n**/t**w**i**n**/**t**wi**n**

135. (C)
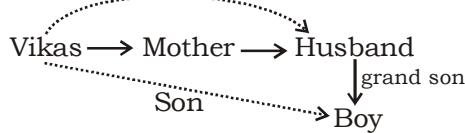
136. (C) PROMINENT

137. (B) MARINE
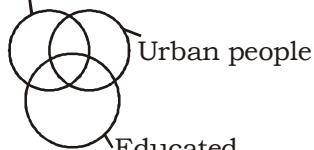
138. (D) Neither conclusion I nor conclusion II follows

139. (D)

140. (A)

141. (C)

142. (B) When Rahul was born, his brother's age = 6 years;
His father's age = (6 + 32) years = 38 years,
His mother's age = (38 – 3) years = 35 years;
His sister's age = (35 – 25) years = 10 years.

143. (B) It is mentioned in the statement that most people are forced to live under Governments which refuse them from personal liberty and the right to dissent. This means that they are not indifferent to these rights but have a desire for them. So, only I follows.

144. (D) 'T' Represents students who study both physics and chemistry but not mathematics.

145. (A) F3M → F is the wife of M
M5K → M is the father of K
Therefore, F is the mother of K.

146. (B) Number of families, who have cars = 30% of 60 = 18
Remaining number of families = 60–18 =42
Number of families, who have motor cycle = 50% of 42 = 21
So number of families, who have bicycle = 42 – 21 = 21.

147. (C)

148. (D) As,
G I V E $\Rightarrow$ V I E G
a b c d   c b d a
O V E R $\Rightarrow$ E V R O
a b c d   c b d a
Similarly, D I S K $\Rightarrow$ **S I K D**
     a b c d   c b d a
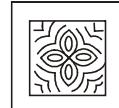
149. (C)

150. (A)

151. (B) 4 × 4 ÷ 2 + 2 – 6 = 4
$\Rightarrow$ 8 – 4 = 4
$\Rightarrow$ **4 = 4**
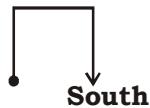
152. (B) 18Q12P4R5S6
After putting the signs as per the given details,
18 × 12 ÷ 4 + 5 – 6
= 53

153. (C)

South
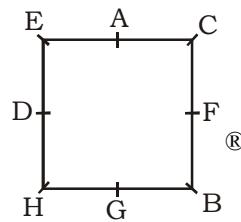
154. (A) Square of the required number = 11^2
= 121

155. (B) STORY

Direction (156 – 160): Answer

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

UP SI ANSWER KEY - 54

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