UP SI MOCK TEST – 47 (SOLUTION)
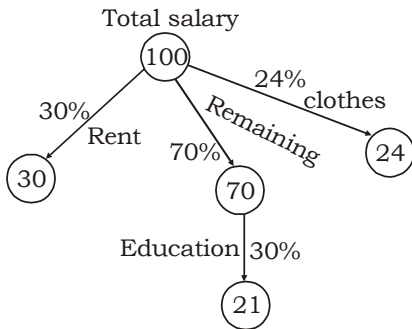
81. (C)

Total spend money = 30 + 21 + 24 = 75
Remaining salary = (100 – 75) = 25
According to the question
25 unit → 2500

$1 \text{ unit} \rightarrow \dfrac{2500}{25} = 100$

Total salary = 100 × 100 = ₹ 10,000

82. (D) Worth of house for A = ₹ 10,000

Cost price of house for B = $\dfrac{10,000 \times 115}{100}$

= ₹ 11,500

New cost price for A = $\dfrac{11500 \times 85}{100}$

= ₹ 9775

Total profit = (11500 – 10000) + (10000 – 9975)
= 1500 + 225 = ₹ 1725

Percentage gain = $\dfrac{1725}{10000}$ × 100 = 17.25%

83. (B) $\dfrac{6}{4} = \dfrac{h}{50}$ (Assuming 'h' be the height of pole)

$\Rightarrow h = \dfrac{50 \times 6}{4}$ = 75 feet

84. (B) The total interest for the two consecutive periods of six month each would be

$= \left(\dfrac{6}{2} + \dfrac{6}{2} + \dfrac{\dfrac{6}{2} \times \dfrac{6}{2}}{100} \right) \%$

$= \left(3 + 3 + \dfrac{3 \times 3}{100} \right) \%$

i.e. 6.09% of the sum
Hence, the amount to be paid after one year would be (100 + 6.09)%

i.e. 106.09% of the sum
∴ Required amount

$= \dfrac{9000 \times 106.09}{100}$ = ₹ 9548.10

85. (A) Train covers 84 m length of platform in 21 – 9 = 12 sec.

∴ Speed of the train = $\dfrac{84}{12}$ = 7 m/sec

= 7 × $\dfrac{18}{5}$ km/hr = 25.2 km/hr

86. (A)

ATQ,
(6 + 4 + 3)units = ₹ 6500
1 unit = ₹ 500
Share of B = 500 × 4 = ₹ 2000

87. (D) Let the cost price of buffalo = ₹ x
Profit = (720 – x)
Loss = (x – 510)
According to the question,
2(720 – x) = (x – 510)
⇒ 1440 – 2x = x – 510
⇒ 3x = 1950
⇒ x = 650
∴ CP of the buffalo = ₹ 650

88. (D) Let the no. of voters be 100
ATQ,
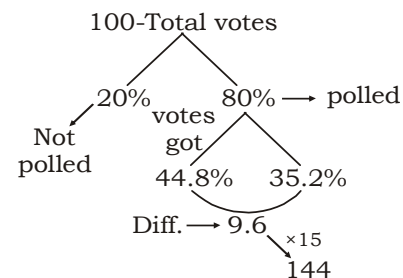
∴ Total voters = 100 × 15 = 1500

89. (C) Let the original fraction be $\dfrac{x}{y}$ then,

$\dfrac{x \times 132\%}{y \times 175\%} = \dfrac{12}{25}$

∴ $\dfrac{x}{y} = \dfrac{12}{25} \times \dfrac{175}{132} = \dfrac{7}{11}$

90. (C) $x = 0.5$ and $y = 0.2$ (Given)

$$\therefore \sqrt{0.6} \times (3y)^x$$

$$= \sqrt{0.6} \times (3 \times 0.2)^{0.5}$$

$$= \sqrt{0.6} \times (0.6)^{\frac{1}{2}}$$

$$= \sqrt{0.6 \times 0.6} = 0.6$$

91. (A) CD||AB

$\therefore \angle AED = \angle PDC = 34°$ (corresponding angle)

$\therefore \angle DEF = 180° - 78° - 34° = 68°$

$\because QD||EF$

$\therefore \angle PDQ = \angle DEF = 68°$ (corresponding angle)

92. (B) $x = 3 + 2\sqrt{2}$

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

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

$$= \frac{3 - 2\sqrt{2}}{9 - 8} = 3 - 2\sqrt{2}$$

$$\therefore \left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2 = x + \frac{1}{x} - 2$$

$$\Rightarrow \left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2 = 3 + 2\sqrt{2} + 3 - 2\sqrt{2} - 2 = 4$$

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

93. (A) Area of walls = $2(l + b) \times h$

$= 2(8 + 6) \times 3 = 84$ m²

Area of two windows and a door

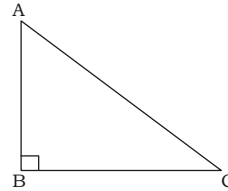$$= 2\left(1\frac{1}{2} \times 1\right) + \left(2 \times 1\frac{1}{2}\right) = 6 \text{ m}^2$$

$\therefore$ Area to be covered = $84 - 6 = 78$ m²

$\therefore$ Area of paper = Area to be covered = 78 m²

$\Rightarrow (l \times b)$ of paper = 78

$$\Rightarrow \text{length of paper} = \frac{78}{50} \times 100 \text{ m}$$

$= 156$ m

$$\therefore \text{cost} = \frac{156 \times 25}{100} = ₹ 39$$

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

$\Rightarrow (4\sqrt{3})^2 = 16 + 2(ab + bc + ca)$

$\Rightarrow 48 = 16 + 2(ab + bc + ca)$

$\Rightarrow 2(ab + bc + ca) = 48 - 16 = 32$

$\Rightarrow ab + bc + ca = 16$

95. (B)

$$\frac{AB}{BC} = \frac{2}{1}$$

$\Rightarrow AB = 2k, BC = k$

$$\therefore AC = \sqrt{(2k)^2 + k^2} = \sqrt{5k^2}$$

$$= \sqrt{5}k$$

$$\therefore \sin A + \cot C = \frac{BC}{AC} + \frac{BC}{AB}$$

$$= \frac{k}{\sqrt{5}k} + \frac{k}{2k}$$

$$= \frac{1}{\sqrt{5}} + \frac{1}{2} = \frac{2 + \sqrt{5}}{2\sqrt{5}}$$

96. (B) $x = 11$

$\therefore x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1$

$= x^5 - (11 + 1)x^4 + (11 + 1)x^3 - (11 + 1)x^2 + (11 + 1)x - 1$

$= x^5 - 11x^4 - x^4 + 11x^3 + x^3 - 11x^2 - x^2 + 11x + x - 1$

When $x = 11$,

$= 11^5 - 11^5 - 11^4 + 11^4 + 11^3 - 11^3 - 11^2 + 11^2 + 11 - 1 = 10$

97. (A) $\tan^2\alpha = 1 + 2\tan^2\beta$

$\Rightarrow \sec^2\alpha - 1 = 1 + 2(\sec^2\beta - 1)$

$\Rightarrow \sec^2\alpha - 1 = 2\sec^2\beta - 1$

$$\Rightarrow \frac{1}{\cos^2\alpha} = \frac{1}{2\cos^2\beta}$$

$\Rightarrow \sqrt{2}\cos\alpha = \cos\beta$

$\therefore \sqrt{2}\cos\alpha - \cos\beta = 0$

98. (A) $\sin 3A = \cos(A - 26°)$

$\Rightarrow \cos(90° - 3A) = \cos(A - 26°)$

$\Rightarrow 90° - 3A = A - 26°$

$\Rightarrow 90° + 26° = 3A + A$

$\Rightarrow 4A = 116°$

$$\Rightarrow A = \frac{116}{4} = 29°$$

99. (B) Are length = 40 cm

Subtend angle = $22\dfrac{1}{2}^{\circ}$

Radius = $\dfrac{40 \times 180}{22\dfrac{1}{2} \times 3.14}$ = 102 cm

100. (A) First discount

= $320 \times \dfrac{10}{100}$ = ₹ 32

∴ Price after first discount
= 320 – 32 = ₹ 288
If the second discount be x%, then

∴ $\dfrac{288 \times x}{100}$ = 288 – 244.80 = 43.2

⇒ x = $\dfrac{43.2 \times 100}{288}$ = 15%

101. (B) Let the minimum score be x
Maximum score = x + 100
∴ 28 × 38 + x + x + 100 = 30 × 40
⇒ 1064 + 2x + 100 = 1200
⇒ 2x = 1200 – 1164 = 36
$\boxed{x = 18}$

102. (D) A → 12 days ⟍ 12 units/day
B → 16 days — $\begin{smallmatrix}9\\6\end{smallmatrix}$ — (144) Total work units
C → 24 days ⟋
D → 36 days ⟋ 4 units/day

Work done on first day = 12 units
On second day = 12 + 9 = 21 units
On third day = 21 + 6 = 27 units
On fourth day = 27 + 4 = 31 units
On fifth day = 31 units and so on.
∴ Work done in five days = 91 + 31
= 122 units
Remaining work = 144 – 122 = 22 units

Total time = $5\dfrac{22}{31}$ days

103. (D) Required no. of students
⇒ L.C.M of 6, 8, 12 and 16
= 96

104. (B) S.I. = $\dfrac{6000 \times 5 \times 2}{100}$ = ₹ 600

C.I. = $5000\left[\left(1 + \dfrac{8}{100}\right)^2 - 1\right]$

= $5000\left[\left(\dfrac{27}{25}\right)^2 - 1\right]$

= $5000\left[\left(\dfrac{729 - 625}{625}\right)\right]$

= $5000 \times \dfrac{104}{625}$ = ₹ 832

Difference = 832 – 600 = ₹ 232

105. (D) Second square root = $\sqrt{24010000}$
= 4900
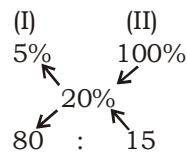Fourth square root = $\sqrt{4900}$
= 70

106. (B) Let x be amount husk to added
Applying away which husk

(I)　　　(II)
5%　　　100%
↘　20%　↙
80　:　15

16　:　3 = 20 : x
x = 3.75

107. (D) SP = ₹ 27692

Loss% = 14% = $\dfrac{7}{50}$

CP = ₹27692 × $\dfrac{50}{43}$ = 32200

SP new = ₹ 37352

Profit % = $\dfrac{37352 - 32200}{32200}$ = 16%

108. (D) ∵ Sum of opposite angles of a cyclic quadrilateral are equal.
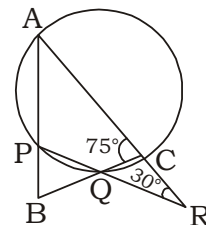
∴ ∠ACQ + ∠APQ = 180°
⇒ 75° + ∠APQ = 180°
⇒ ∠APQ = 105°
∵ ∠APQ + ∠BPQ = 180°
∴ 105° + ∠BPQ = 180°
or, ∠BPQ = 180° – 105° = 75°
∵ ∠ACQ is an exterior angle of ΔRCQ

$\therefore \angle ACQ = \angle CRQ + \angle COR$

$\Rightarrow 75° = 30° + \angle COR$

$\Rightarrow \angle COR = 45°$

In ΔBPQ, $\angle B = 180° - 75° - 45° = 60°$

109. (B) $\because a^3 - b^3 = (a - b)(a^2 + b^2 + ab)$

$\therefore 56 = 2(a^2 + b^2 + ab)$

$\Rightarrow 28 = a^2 + b^2 + ab = (a - b)^2 + 3ab$

$\Rightarrow 28 = 4 + 3ab$

$\Rightarrow ab = 8$

Now, $a^2 + b^2 = (a - b)^2 + 2ab = 2^2 + 2 \times 8 = 20$

110. (A) Expression = $\dfrac{8\sin\theta + 5\cos\theta}{\sin^3\theta + 2\cos^3\theta + 3\cos\theta}$

Dividing numerator and denominator by $\cos\theta$,

= $\dfrac{8\tan\theta + 5}{\tan\theta . \sin^2\theta + 2\cos^2\theta + 3}$

= $\dfrac{8\tan\theta + 5}{2\sin^2\theta + 2\cos^2\theta + 3}$ $\quad (\because \tan\theta = 2)$

= $\dfrac{8 \times 2 + 5}{2(\sin^2\theta + \cos^2\theta) + 3} = \dfrac{21}{5}$

111. (C) Volume of solid cylinder = $\pi r^2 h$

Volume of cone = $\dfrac{1}{3}\pi r^2 h$

Difference = $\pi r^2 h - \dfrac{1}{3}\pi r^2 h$

= $\dfrac{2}{3}\pi r^2 h = \dfrac{2}{3} \times \dfrac{22}{7} \times 5 \times 5 \times 12$

= 628.57 cu.cm.

112. (A) $x + \dfrac{1}{x} = 5$

On squaring both sides,

$x^2 + \dfrac{1}{x^2} + 2 = 25$

$\Rightarrow x^2 + \dfrac{1}{x^2} = 25 - 2 = 23$ \qquad ...(i)

Expression

= $\dfrac{x^4 + 3x^3 + 5x^2 + 3x + 1}{x^4 + 1}$

= $\dfrac{x^4 + 1 + 3x^3 + 3x + 5x^2}{x^4 + 1}$

= $\dfrac{x^2\left(x^2 + \dfrac{1}{x^2}\right) + 3x^2\left(x + \dfrac{1}{x}\right) + 5x^2}{x^2\left(x^2 + \dfrac{1}{x^2}\right)}$

= $\dfrac{\left(x^2 + \dfrac{1}{x^2}\right) + 3\left(x + \dfrac{1}{x}\right) + 5}{x^2 + \dfrac{1}{x^2}}$

= $\dfrac{23 + 3 \times 5 + 5}{23} = \dfrac{43}{23}$

113. (C) $x = \sqrt[3]{a + \sqrt{a^2 + b^3}} + \sqrt[3]{a - \sqrt{a^2 + b^3}}$

Cubing both sides,

$x^3 = \left(\sqrt[3]{a + \sqrt{a^2 + b^3}}\right)^3 + \left(\sqrt[3]{a - \sqrt{a^2 + b^3}}\right)^3$

$+ 3\left(\sqrt[3]{a + \sqrt{a^2 + b^3}}\right)3\left(\sqrt[3]{a - \sqrt{a^2 + b^3}}\right)$

$\left(\sqrt[3]{a + \sqrt{a^2 + b^3}} + \sqrt[3]{a - \sqrt{a^2 + b^3}}\right)$

$\Rightarrow x^3 = a + \sqrt{a^2 + b^3} + a - \sqrt{a^2 + b^3} +$

$+ 3\left(\dfrac{\left(a + \sqrt{a^2 + b^3}\right) \times}{\left(a - \sqrt{a^2 + b^3}\right)}\right)^{\frac{1}{3}} x$

$\Rightarrow x^3 = 2a + 3\left(a^2 - a^2 - b^3\right)^{\frac{1}{3}} x$

$\Rightarrow x^3 = 2a + (-3bx)$

$\therefore x^3 + 3bx = 2a$

114. (C) Since, point of intersection of medians is "centroid".

$\therefore$ co-ordinates of centroid

= $\left(\dfrac{0 + 5 + 7}{3}, \dfrac{6 + 3 + 3}{3}\right)$

= $\left(\dfrac{12}{3}, \dfrac{12}{3.}\right) = (4, 4)$

115. (D) $\dfrac{\sin 12°}{\sin 48°} - \dfrac{\cos 78°}{\cos 42°}$

$$= \frac{\sin 12°}{\sin 48°} - \frac{\cos(90° - 12°)}{\cos(90° - 48°)}$$

$$= \frac{\sin 12°}{\sin 48°} - \frac{\sin 12°}{\sin 48°} = 0$$

116. (A) Students enrolled in NCC activities

$$= \frac{1200 \times 15}{100} = 180$$

117. (C) Total students in HRD & Debating club

$$= 1200 \times \frac{(13 + 11)}{100} = 288$$

118. (D) Required percent

$$= \frac{22}{21} \times 100 = 104.76\%$$
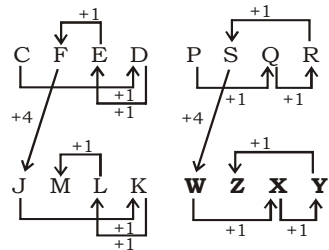
119. (A) Required ratio
= (18 + 21) : 13
= 39 : 13 = 3 : 1

120. (A) Eco-club : Human resource development club
= 22 : 11 = 2 : 1

121. (D) Devotion is the characteristic of a monk whereas **wanderlust** is the characteristic of a Nomad.

122. (C)

$$\begin{array}{cccc} & +1 & & +1 \\ C & F E D & P S Q R \\ +4 & +1 & +4 & +1 \\ & +1 & & +1 \\ J & M L K & \mathbf{W Z X Y} \\ & +1 & & +1 \\ & +1 & & +1 \end{array}$$

123. (C) As, $23^2 + 23 = 552$ Similarly, $30^2 + 30 = 930$

124. (C) Generally, shoes is made by leather. Similarly, highway is made by gravel.

125. (D) In all the numbers, the middle digit is sum of digits of the product of two other digits.
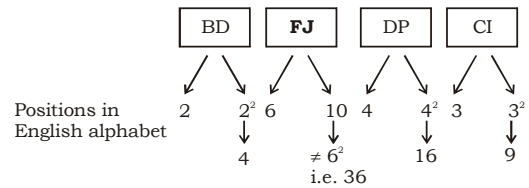Now, 9 × 2 = 18, 1 + 8 = 9 (middle digit in 992)
7 × 3 = 21, 2 + 1 = 3 (middle digit in 733)
8 × 5 = 40, 4 + 0 = 4 (middle digit in 845)
But, 9 × 7 = 63, 6 + 3 = 9 ≠ 4. Hence 947 is different from others.

126. (B)

$$\begin{array}{cccc} \boxed{BD} & \boxed{\mathbf{FJ}} & \boxed{DP} & \boxed{CI} \end{array}$$

Positions in English alphabet
2   2^2 6   10 4 4^2 3 3^2
↓   ↓   ↓   ↓   ↓
4   ≠ 6^2 16   9
     i.e. 36

127. (A) Except Iron box, all need some type of energy to function.

128. (D) 12 × 8 – 7 = 96 – 7 = 89,
15 × 4 – 12 = 60 – 12 = 48,
25 × 3 – 13 = 75 – 13 = **62**

129. (C) $\sqrt{25 \times 9} = 5 \times 3 = 15$
and $\sqrt{36 \times 81} = 6 \times 9 = 54$
Therefore $\sqrt{16 \times 169} = 4 \times 13 = $ **52**

130. (B) 14 + 23 + 48 = 19 + 15 + 51 = 12 + 37 + **36**
The sum in each case = 85.

131. (C)
2   9   28   65   126
↓   ↓   ↓   ↓   ↓
1^3+1 2^3+1 3^3+1 4^3+1 5^3+1

132. (A)

133. (C)
           345
9   19   40   83   170   **344**
×2 + 1 ×2 + 2 ×2 + 3 ×2 + 4 ×2 + 5

134. (A) 714 = 51 × 14
915 = 61 × 15
1136 = 71 × 16
1377 = 81 × 17

135. (D)

136. (A)

Top Face	∴	⠿	:
Bottom Face	∴	⠿	·

[Take '∴' (3) points as common and move in a clockwise direction.]

We can observer that "::" (4) points is missing. So, four (4) points will be top when three (3) points are at bottom.

137. (A) Anupam's son-in-law is the brother of the lady who was sitting in the car. Hence, the husband is also the **son-in-law** of Anupam.
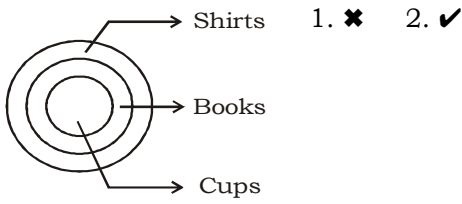
138. (A) From options
A → 13 : 170 → 13 : $13^2 + 1$
B → 11 : 120 → 11 : $11^2 - 1$
C → 5 : 24 → 5 : $5^2 - 1$
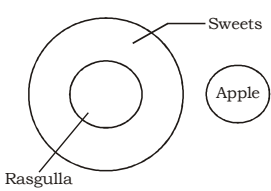D → 7 : 48 → 7 : $7^2 - 1$

139. (B)

Shirts 1. ✗ 2. ✔
Books
Cups

140. (B) $5 \div 20 - 4 + 10 \times 8$

After interchanging the sign as per given details,

$5 \times 20 \div 4 - 10 + 8$

$= 25 - 10 + 8 = \mathbf{23}$
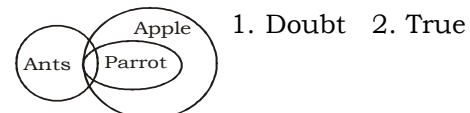
141. (C) Shyam's position from left

$= 9 - (4 - 2)$

$= 9 - 2 = \mathbf{7^{th}}$

142. (A)

Sweets
Apple
Rasgulla

Rasagulla is one of the sweets, while apple is different from these.

143. (B)

Apple
Ants Parrot

1. Doubt 2. True

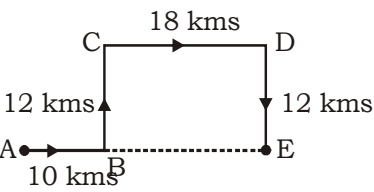**144. (C)** The series is a**b**c**c**ab/b**c**aa**b**c/**a**bc**c**ab.

145. (B) ATQ,

Arun : Bablu = 4 : 7
Bablu : Ram = 1 : 2
Ram : Deep = 4 : 1
Deep : Ankit = 1 : 9

So,

Arun : Bablu: Ram : Deep : Ankit
16 : 28 : 56 : 14 : 126

∴ Deep < **Arun** < Bablu

146. (C)   **147.(D)**

148. (C)

18 kms
C   →   D
12 kms ↑   ↓ 12 kms
A •—→•————•E
  10 kms B

Required distance = AE = AB + BE

(∵ BE = CD)

$= 10 + 18$

$= 28$ kms.

149. (D) Angle between clock hands when opposite in direction = 180°
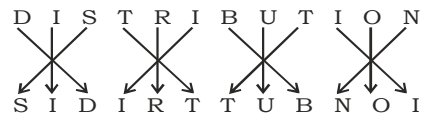
We have

Angle $= \dfrac{11}{2}$ m $- 30 \times 4$

or, $180 = \dfrac{11}{2} \times$ m $- 30 \times 4$
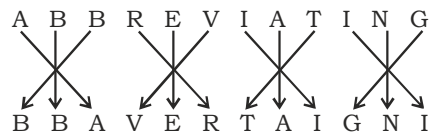
$\Rightarrow 180 + 120 = \dfrac{11}{2}$ m

$\Rightarrow$ m $= \dfrac{600}{11} = 54\dfrac{6}{11}$ min

∴ Required time $= 4 : 54\dfrac{6}{11}$

150. (C) As,

D I S T R I B U T I O N
S I D I R T T U B N O I

Similarly,

A B B R E V I A T I N G
B B A V E R T A I G N I

151. (A)

152. (A) There are 130 employees.
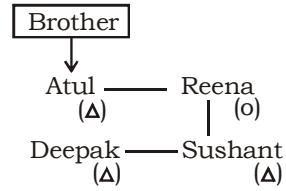

Tea 21
Coffee 9
22
5
18   20
Juice 20
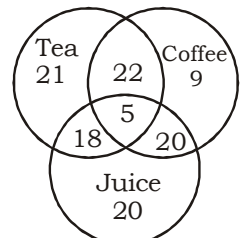
21 employees drink only the.

15 employees do not drink any beverage.

153. (D) Clearly, while counting the numbers associated to the thumb will be 1, 9, 17, 25, ...

Here, Numbers are in the form of $(8n + 1)$.

Since $1994 = 249 \times 8 + 2$, so 1993 shall correspond to the thumb and 1994 is the **index finger** while counting.

154. (B)

Brother
↓
Atul ——— Reena
(Δ)   (o)
Deepak ——— Sushant
(Δ)   (Δ)

155.(A) 15th August, 2010 = 2009 years + from 1.1.2010 to 15.8.2010)

odd days in 2000 years = 0

Remaining 9 years = 2 leap years + 9

odd days

= 11 odd days = **4**

odd days

Now from 1.1.2010 to 15.8.2010 = 227 days

= 32 weeks + 3 days = **3 odd days**

Total odd days = 4 + 3 = 7 odd days.

= 0 odd days.

So, Given day is Sunday.

156. (C) The order is:

Literary → Literature → **Litter** → Little → Littoral

157. (B)

158. (C) $4 \times 5 - 24 \div 12 + 8 = 14$

$\Rightarrow 4 \times 5 + 24 \div 12 - 8$

$\Rightarrow 20 + 2 - 8$

$\Rightarrow 14$

Hence, option (C) satisfies the given equation.

159. (D)

160. (A) Idea → Writing → Book → Seller → Reader → Feedback.

UP SI ANSWER KEY - 47

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