KD Campus
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1997, OUTRAM LINE, KINGSWAY CAMP, DELHI - 110009

UP SI MOCK TEST – 58 (SOLUTION)

81. (A) Let ₹ x be lent at 10% per annum.
$\therefore$ ₹ (1500 – x) is lent at 7% per annum

Now, $\frac{x \times 10 \times 3}{100} + \frac{(1500 - x) \times 7 \times 3}{100} = 396$

$\Rightarrow 30x + 31500 - 21x = 39600$

$\Rightarrow 9x = 39600 - 31500$

$\Rightarrow x = \frac{8100}{9} =$ ₹ 900

82. (D)

A	:	B	:	C	:	D
2	:	3	:	3	:	3
4	:	4	:	3	:	3
2	:	2	:	2	:	3
16	:	24	:	18	:	27 → 85
		↓×60		↓×60		↓×60
		1440		1620		5100

Total B + D = ₹ 3060

83. (A) ATQ,
Work done by A in 1 day = Work done by B in 3 days

	A	:	B
Time	1	:	3
Efficiency	3	:	1

Now total work = 3 × 2 + 9 × 1 = 15 units
Required time for A to complete the work

$= \frac{15}{3} = 5$ days

Required time for B to complete the work

$= \frac{15}{1} = 15$ days

84. (A)

	CP (100 – Discount) (100 – 4)	:	SP (100 + Profit) (100 + 35)
Total number of article ←	$\frac{96}{16}$	:	$\frac{135}{15}$
	6	:	9
Ratio of cost of 1 article ←	2	:	3

85. (A) Le the rate = r
ATQ,

$\frac{400 \times 3 \times r}{100} + \frac{500 \times 4 \times r}{100} = 160$

$\Rightarrow 32r = 160$

$\Rightarrow r = 5\%$

86. (A) P + Q → 90 Minutes
Q + R → 60 Minutes
P + R → 45 Minutes
2 units/min, 3, 180 Total capacity (in units), 4 units/min

Efficiency of (P + Q + R) = $\frac{2+3+4}{2}$

= 4.5 units/min
Efficiency of P = (4.5 – 3) = 1.5 units/min
Efficiency of Q = (4.5 – 4) = 0.5 units/min
Efficiency of R = (4.5 – 2) = 2.5 units/min

Required time for P = $\frac{180}{1.5}$ = 120 min

Required time for Q = $\frac{180}{0.5}$ = 360 min

Required time for R = $\frac{180}{2.5}$ = 72 min

87. (D) Simple interest of 2 years = 20%
Compound interest of 2 years = 21%
Diff. between simple and compound interest
= 1%
↓×130
130
$\therefore$ Principal = 130 × 100
= ₹13000

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

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

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

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

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

Difference = 832 – 600 = ₹232

89. (D) A → 12
B → 16
C → 24
D → 36
12, 9, 6, 4 → 144

1st day	2nd day	3rd day	4th day
(12)	2 + 9	12+9+6	12+9+6+4

Total work in 4 days
= 12 + 21 + 27 + 31
= 33 + 58
= 91 units
In 4 days total
Work done A (B, A), (A + B) and (A+B+C +D)
Remaining work = 144 – 91 = 53

Remaining work done by (A+B+C+D) in $\frac{53}{31}$

Total time taken 144 units

Work = 5 $\frac{22}{31}$ days.

90. (B) $\because$ Distance between 21 posts
= (21 – 1) × 50 = 1000 m
$\therefore$ Speed of train = 1 km/min = 60 km/h

91. (B) SI = $\frac{15000\times9\times2}{100}$ = ₹ 2700

$$CI = 12000\left[\left(1+\frac{8}{100}\right)^2-1\right]$$

$$= 12000\left[\left(\frac{27}{25}\right)^2-1\right]$$

$$= 12000\left[\frac{729-625}{625}\right]$$

$$= 12000\times\frac{104}{625} = ₹\ 1996.8$$

$\therefore$ Total interest earned
= ₹ (2700 + 1996.8) = ₹ 4696.8

92. (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

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

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

$$=\frac{30\times9\times9}{100} = 24.3 \text{ litres}$$

93. (B) Let the number of boys be x and that of girls be y.
Then, total score of boys = 71 x
and total score of girls = 73 y

$$\therefore \frac{71x+73y}{(x+y)} = 71.8$$

$$\Rightarrow 71x + 73y = 71.8x + 71.8y$$

$$\Rightarrow 0.8x = 1.2y \Rightarrow \frac{x}{y} = \frac{1.2}{0.8} = \frac{3}{2}$$

$\therefore$ Percentage of girls in the class

$$= \frac{2}{5}\times 100 = 40\%$$

94. (C) Let the work is completed in x days.

Work done by (P + Q) in 1 day = $\frac{1}{10}$ work

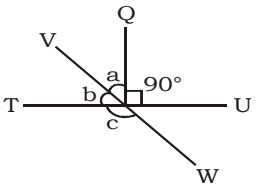
Work done by (Q + R) in 1 day = $\frac{1}{18}$ work

P's 5 day's work + Q's 10 day's work + R's 15 day's work = 1
(P + Q)'s 5 day's work + (Q + R)'s 5 day's work + R's 10 day's work = 1

$$\frac{5}{10}+\frac{5}{18}-\frac{10}{x} = 1$$

$$\Rightarrow x = 45$$

95. (D)



$\angle a = 36°$
$\angle b = 54°$
$\therefore$ value of $\angle c = 180° - \angle 54$
$\angle c = 126°$

96. (C) AB || CD || PQ (Given)
Let AB = a, PQ = b, CD = c

$$\therefore \frac{1}{b} = \frac{1}{a} + \frac{1}{c}$$

$$\Rightarrow \frac{1}{b} = \frac{1}{12} + \frac{1}{18}$$

$$\Rightarrow \frac{1}{b} = \frac{3+2}{36}$$

$$\Rightarrow \frac{1}{b} = \frac{5}{36} \Rightarrow b = \frac{36}{5} \text{ cm}$$

97. (C) 5 tan θ = 4

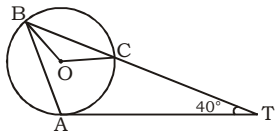
$$\tan\theta = \frac{4}{5}$$

$$\therefore \frac{5\sin\theta-3\cos\theta}{5\sin\theta+3\cos\theta} = \frac{\frac{5\sin\theta-3\cos\theta}{\cos\theta}}{\frac{5\sin\theta+3\cos\theta}{\cos\theta}}$$

$$= \frac{5\tan\theta - 3}{5\tan\theta + 3} = \frac{5\times\frac{4}{5} - 3}{5\times\frac{4}{5} + 3}$$

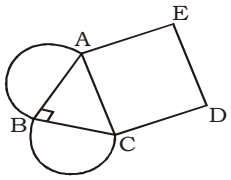
$$= \frac{4-3}{4+3} = \frac{1}{7}$$

98. (A)



$\angle CAT = 44°$
$\angle BTA = 40°$
$\angle ACT = 180° - 44° - 40° = 96°$
$\angle CAT = \angle CBA = 44°$
$\angle BAC = 180° - 84° - 44° = 52°$
$\therefore$ Angle on Arc = BC = $2 \times 52° = 104°$

99. (B)



Let AB = BC = x
then AC = $\sqrt{2}x$
But AC = $\sqrt{128} = 8\sqrt{2}$ cm
$\sqrt{2}x = 8\sqrt{2}$
$\Rightarrow x = 8$ cm
Areas of semicircles

$$= \frac{1}{2}\pi\left(\frac{x}{2}\right)^2 + \frac{1}{2}\pi\left(\frac{x}{2}\right)^2$$

$$= \frac{1}{2}\pi\ (2 \times 16)$$

$= 16\ \pi\ cm^2$

100. (B) Let $a = b = c = 2$, then $2s = 6$
$s = 3$
$\therefore (s-a)^3 + (s-b)^3 + 3(s-a)(s-b)c$
$= (3-2)^3 + (3-2)^3 + 3(3-2)(3-2) \times 2$
$= 1 + 1 + 3 \times 2 = 8$
$= c^3$

101. (D) Assume $\theta = 45°$

$$\text{then } 4\text{ m} = 1 \times \left(1 + \frac{1}{\sqrt{2}}\right)$$

$$m = \frac{\sqrt{2}+1}{4\sqrt{2}} \text{ and } n = \frac{\sqrt{2}-1}{4\sqrt{2}}$$

$$\therefore m^2 - n^2 = \frac{1}{32}\left[(\sqrt{2}+1)^2 - (\sqrt{2}-1)^2\right]$$

$$= \left[\frac{1}{32}(4\sqrt{2})\right] = (m^2 - n^2) = \frac{1}{32}$$

from options-

$$mn = \frac{\sqrt{2}+1}{4\sqrt{2}} \cdot \frac{\sqrt{2}-1}{4\sqrt{2}} = \frac{1}{32}$$

$\therefore (m^2 - n^2) = mn$

102. (B) Let the length of train be L
ATQ,

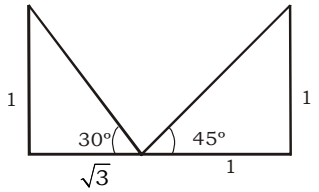
$$\frac{L}{40 \times \frac{5}{18}} = 9$$

$$\Rightarrow L = \frac{9\times 40\times 5}{18}\ m$$

$\Rightarrow$ L = 100m

103. (B) N = $270 \times 126 \times 324 \times 55$
$= 2^4 \times 3^9 \times 5^2 \times 7 \times 11$
$\therefore$ maximum value of m = 9

104. (B)



ATQ,
1 unit = 2.5m
$(\sqrt{3}+1)$ units = 2.5 $(\sqrt{3}+1)$
$= 2.5 \times 2.73$
= 6.825 m
$\therefore$ Width of the river = 6.83m

105. (C) Let Speed of the boat = x km/h
and, Speed of stream = y km/h

$$\begin{array}{r} x + y = 8 \\ x - y = 4 \\ \hline 2x = 12 \end{array}$$

$\Rightarrow x = 6$ km/h

106. (B) $\sin A = 1 - \sin^2 A = \cos^2 A$
$\Rightarrow \sin^2 A = \cos^4 A$
and $\cos^2 A + \cos^4 A$
$\cos^2 A + \sin^2 A = 1$

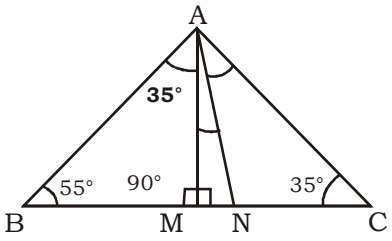
107. (C) Let the speed = x km/hr
A.T.Q.,

$$\frac{11}{2} \times x = (x+6) \times 5$$

$$\frac{1}{2} \times x = 30$$

$x = 60$ km/hr

108. (A)



In ΔABM,
∠ABM + ∠BMA + ∠MAB = 180°
⇒ 55 + 90 + ∠MAB = 180°
⇒ ∠MAB = 35°
In ΔABC,
55 + 35 + ∠BAC = 180°
⇒ ∠BAC = 90°
AN bisects of ∠A, then
∠BAN = ∠CAN = 45°
Now, ∠BAM + ∠MAN = 45°
⇒ 35+∠MAN = 45°⇒ ∠MAN =10°

109. (C) Let the speed of boat along the current and against the current be x km/hr and y km/hr respectively.
A.T.Q.,

$$x + y - 16$$
$$\frac{x - y = 10}{2x = 26}$$

$x = 13$, $y = 3$.
∴ Speed of current = 3 km/hr.

110. (B) Let the age of mother and son be x and y respectively.
A.T.Q.,

$$\frac{x-10}{y-10} = \frac{5}{3} \Rightarrow 3x - 5y = 20 \quad \text{....(i)}$$

and, $\frac{x-10}{y-10} = \frac{3}{1} \Rightarrow x - 3y = -20$ ....(ii)

From eq(i) and eq (ii)
$x = 40$ and $y = 20$.
∴ Required ratio = $y : x = 20 : 40$
$= 1 : 2$

111. (D) Let the quantity of acid be added be x gm.
A.T.Q.,

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

⇒ 480 + 2x = 600 + x
∴ Required quantity x = 600–480
= 120 gm

112. (B) $\frac{6x}{2x^2 + 5x - 2} = 1$
On dividing by x in numerator and denominator,

$$\Rightarrow \frac{6}{2x + 5 - \frac{2}{x}} = 1$$

$$\Rightarrow 2x + 5 - \frac{2}{x} = 6 \Rightarrow 2\left(x - \frac{1}{x}\right) = 1$$

$$\Rightarrow x - \frac{1}{x} = \frac{1}{2}$$

Now, $x^2 + \frac{1}{x^2} = \left(\frac{1}{2}\right)^2 + 2$

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

$$\Rightarrow x^2 + \frac{1}{x^2} = \frac{9}{4}$$

$$\Rightarrow x^2 + \frac{1}{x^2} + 2 = \frac{9}{4} + 2$$

$$\Rightarrow \left(x + \frac{1}{x}\right)^2 = \frac{17}{4} \Rightarrow x + \frac{1}{x} = \frac{\sqrt{17}}{2}$$

Now, $x^3 + \frac{1}{x^3} \Rightarrow \left(\frac{\sqrt{17}}{2}\right)^3 - 3 \times \frac{\sqrt{17}}{2}$

$$\Rightarrow \frac{17\sqrt{17}}{8} - \frac{3\sqrt{17}}{2} = \frac{5\sqrt{17}}{8}$$

113. (C) Cost of 1 kg of mangoes = $\frac{456}{19}$ = ₹24
Cost of 1 kg of apples = 2 × 48 = ₹96
Cost of 1 kg of almonds = $\frac{50 \times 96}{8}$ = ₹600
Cost of 3 kg of almonds and 4 kg of apples = 3 × 600 + 4 × 96 = ₹2184

114. (B) Putting x = 3, y = 7, number 67127y76x2 is divisible by 88.
Now, 7x – 7y = 7 × 3 – 2 × 7
⇒ 7x – 7y = 21 – 14 = 7

115. (B) A.T.Q,

$$= \sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{4 + 3\sqrt{3}}}}$$

$$= \sqrt{-\sqrt{3} + \sqrt{3 + 8\left(2 + \sqrt{3}\right)}}$$

$$= \sqrt{-\sqrt{3} + \sqrt{3 + 16 + 24\sqrt{3}}}$$

$$= \sqrt{-\sqrt{3} + 4 + \sqrt{3}}$$

$$= 2$$

116. (A) Volume of sphere = $\frac{4}{3}\pi(6)^3$

$= 288\pi$ cm^3

Let the radius of wire be r

volume of wire = πr^2. 144 × 100

ATQ, $288\pi = 144 \times 100 \times \pi r^2$

$\Rightarrow \frac{2}{100} = r^2$

$\Rightarrow r = 0.2$ cm

117. (A) The required average

$= \frac{2250}{5} = 450$

118. (A) The required Percent $= \frac{340}{2010} \times 100$

$= 16.9\%$

119. (A) The required ratio $= \frac{370+250}{420+430}$

$= \frac{620}{850} = \frac{62}{85} = 62 : 85$

120. (C) The required percent

$= \frac{430}{(310+370+420)} \times 100$

$= \frac{430}{1100} \times 100 = 39.1\%$

121. (D) As, grain store in warehouse similarly, water store in dam.

122. (A) As, BDFH YWUS (Reverse)

Similarly,

JLNP **QOMK** (Reverse)

123. (C) $18 \Rightarrow (18\times2)-6=30$

$36 \Rightarrow (36\times2) - 6 = 66$

124. (B) Being erudite is a trait of a professor and being imaginative is a trait of an inventor.

125. (B) W V U N M L H G F (−1 −1 each)

D B A (−2 −1)

126. (D) $1629 \Rightarrow 1 + 6 + 2 = 9$

$3418 \Rightarrow 3 + 4 + 1 = 8$

$2349 \Rightarrow 2 + 3 + 4 = 9$

$1834 \Rightarrow 1 + 8 + 3 \neq 4$

127. (A) Except "High-up", others are antonym of each other.

128. (B) C A R G C O K E L Q G I **S I F** (−3 −3 −3 −3; +4 +4 +4 +4; +2 +2 +2 +2)

129. (A) 100 50 52 26 28 **14** 16 8 (÷2 +2 ÷2 +2 ÷2 +2 ÷2)

130. (B) As, (17 + 19) ÷ 6 = 6

and, (42 + 36) ÷ 6 = 13

Similarly, (64 + 50) ÷ 6 = 19

131. (C) $7 \times 2 - 1 \rightarrow 13$

$13 \times 2 - 1 \rightarrow 25$

$25 \times 2 - 1 \rightarrow 49$

$49 \times 2 - 1 \rightarrow 97$

$97 \times 2 - 1 \rightarrow 193$

132. (C) Total number of triangle is 28.

133. (D)

C E A B **D** F

Hence, D is sitting left of F.

134. (C) w**x**y/wx**x**/**y**wx/xx**y**

135. (B) (24+20) – 2 (24–20) = 44 –8 = 36

(15 +11) – 2 (15–11)= 26 – 8 = 18

(55 + 40) – 2(55–40) = 95–30= 65

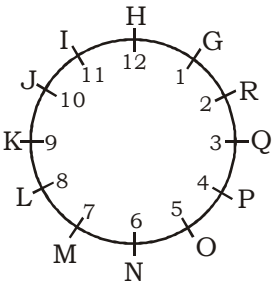
136. (A) Total number of odd days since 25 June to 15 August.

= 5 + 31 + 15 = 51

Remaining = $\frac{51}{7}$ = 2

Hence, Manoj birth day will be Friday.

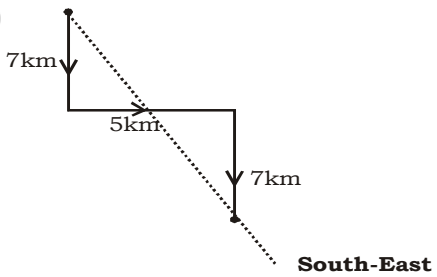
137. (B)



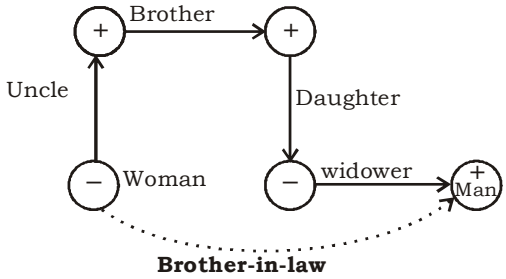
Hence, In place of 9 at K.

138. (D) Neither conclusion I nor II follow.

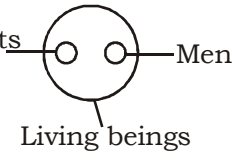
139. (C)



140. (A)



141. (C)



142. (A) Let peacocks y and x deers

$x + y = 120$

$\Rightarrow y = 120\text{-}x$ .....(i)

and,

$4x + 2y = 320$ .... (ii)

From eq. (i) and (ii)

$4x + 2(120- x) = 320$

$\Rightarrow 4x + 240 - 2x = 320$

$\Rightarrow 2x = 80$

$\Rightarrow x = 40$

and, $y = 80$

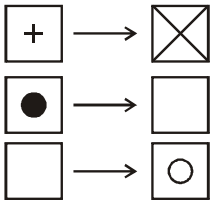
Hence, total number peacocks = 80

143. (D)

144. (B) "2" Represents those teachers who are social workers.

145. (A)

146. (A) Opposite faces are



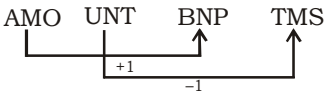
Option (A) and be formed by folding.

147. (D) $672 \div 12 + 17 \times 21 - 400 = 13$

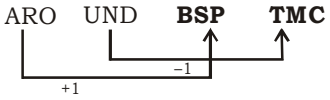
$\Rightarrow 56 + 357 - 400 = 13$

$\Rightarrow 13 = 13$

148. (C) As,



Similarly,



149. (C)

150. (B)

151. (D) Happy birth day either 12 or 13.

152. (D) Let the age of the wife = x

Then, the age of the man = $x + 3$

Age of the son= $\frac{x+3}{4}$

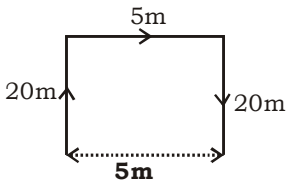
A.T.Q,

$\frac{x+3}{4} + 3 = 15$

$x = 45$

$\therefore$ Age of his wife = 45 years

153. (C)



154. (D)

155. (A) Required angle = $\left|30 \times 3 - \frac{24 \times 11}{2}\right|$

$= |90 - 132|$

$= 42°$

Hence, required angle = 42°

156. (A) S.P = ₹4140, P% = 15

CP = $4140 \times \frac{100}{115}$ = ₹3600

New S.P. = 3600 × 1.25 = ₹4500

157. (B) c d **d** ab **b**/cd **d** abb/**c** dda **b** d

158. (B)

159. (A) $\underset{\div 3-1}{27} : \underset{}{8} :: \underset{\div 3-1}{\mathbf{12}} : \underset{}{\mathbf{3}}$

160. (A)

UP SI ANSWER KEY - 58

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