UP SI MOCK TEST – 49 (SOLUTION)

81. (B) Efficiency of father = Efficiency of two sons
∴ Time taken by father = time taken by two sons

$S_1 \longrightarrow 3$, $S_2 \longrightarrow 6$, 6 → 2 efficiency of S_1, 1 efficiency of S_2

Efficiency of father = 3

Time taken by father $= \frac{6}{3} = 2$ hr

82. (B) Side $= \frac{240}{4} = 60$ m

Height =20m
Area = 60× 20 = 1200m^2

83. (D) Marked price $= \frac{450 \times 100}{\left(100 - \frac{50}{3}\right)}$

$= \frac{450 \times 100 \times 3}{250} =$ ₹ 540

84. (A) 2 (B+C) =9A

$\Rightarrow \frac{A}{B+C} = \frac{2}{9}$

A's Share $= \frac{A}{A+B+C} \times 770$

$= \frac{2}{11} \times 770 =$ ₹ 140

85. (C) C.P. of 4 dozen eggs = 24 ×4 =₹ 96
C.P. of 2 dozen eggs = 32 ×2 = ₹ 64
C.P. of 6 dozen eggs = ₹ 160

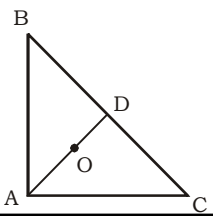
C.P. of one dozen egg =₹ $\frac{160}{6}$

Profit = 20%

Selling price $= \frac{160}{6} \times \frac{120}{100} =$ ₹ 32

86. (B) L.C.M for 4, 6, 10 and 15 = 60
N will be in form of N = 60n + 2
Now,
least six digit number of form 60n (i.e divisible by 60) = 100020
So,
⇒ least six digit number of form N = 100020 + 2 = 100022
⇒ Sum of digits of N = 1+0+0+0+2+2 = 5

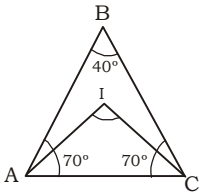
87. (A)



AO : OD = 2 : 1
ATQ,
2 units = 10 cm
1 unit = 5 cm
∴ OD = 5 cm

88. (B) sinA = cosB
⇒ sinA = sin (90° – B)
⇒ A = 90° –B
⇒ A + B = 90
∵ A+B + C = 180°
∴ C = 90°
Then, cos90° = 0

89. (C)



$\angle AIC = 90° + \frac{\angle ABC}{2} = 90 + \frac{40°}{2} = 110°$

90. (B) Radius of circle $= \frac{\sqrt{144+25}}{2}$

$= \frac{13}{2} = 6.5$ cm

91. (A) $\sin\theta \cos\theta = \frac{1}{2}$

$\Rightarrow 2 \sin\theta \cos\theta = 1$
$\Rightarrow \sin 2\theta = 1$
$\Rightarrow \sin 2\theta = \sin 90°$
$\Rightarrow \theta = 45°$
Now, sin45° – cos45°

$= \frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} = 0$

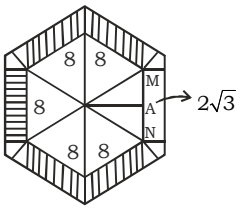
92. (C) Difference = ₹ 86520 – ₹ 20568
= ₹ 65952

93. (B) M.P. $= \frac{119}{85} \times 100 =$ ₹ 140

94. (B) Percentage profit against S.P.

$= \frac{25}{125} \times 100 = 20$

95. (A) A.T.Q,
Internal side = 8cm



$\therefore$ ΔOMN is an equilateral triangle

$AB = \frac{\sqrt{3}}{2} \times 8 = 4\sqrt{3}$

$OA = 4\sqrt{3}$

$OB = 6\sqrt{3}$

OB is become height of the larger hexagon

$\frac{\sqrt{3}}{2}a = 6\sqrt{3}$

a =12

side = 12 cm

Area of shaded region

$= \frac{\sqrt{3}}{4}(12)^2 \times 6 - \frac{\sqrt{3}}{4} \times (8)^2 \times 6$

$= \frac{\sqrt{3}}{4} \times 6[144 - 64] = 120\sqrt{3}$

96. (D) Speed of Sound = $\frac{1700}{25}$ = 68m/s

97. (B) ATQ, $\frac{3000 \times 12 \times T}{100} = 1080$

$\Rightarrow 12T = 36$

$\Rightarrow T = 3$ yrs.

98. (B) $x^2 = a^2 \cos^2\theta + b^2 \sin^2\theta + 2ab \cos\theta \sin\theta$ ...(i)

$y^2 = b^2 \cos^2\theta + a^2 \sin^2\theta - 2ab \cos\theta \sin\theta$ ...(ii)

By adding equation (i) & (ii),

$x^2 + y^2 = a^2 (\sin^2\theta + \cos^2\theta) + b^2 (\sin^2\theta + \cos^2\theta)$

$\Rightarrow x^2 + y^2 = a^2 + b^2$

99. (B)

	A	:	B
Time	12	:	15
Efficiency	15	:	12
	5	:	4

Share of A = $\frac{A}{A+B} \times 450$

$= \frac{5}{9} \times 450 =$ ₹ 250

100. (D) $x = \sqrt{2} + 1$ ...(i)

$\frac{1}{x} = \frac{1}{\sqrt{2}+1} \times \frac{\sqrt{2}-1}{\sqrt{2}-1} = \sqrt{2} - 1$ ...(ii)

By adding and subtracting (i) & (ii),

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

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

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

$\Rightarrow x^2 + \frac{1}{x^2} = 4 + 2 = 6$

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

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

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

$= 24\sqrt{2}$

101.(A) $3x + 4y = 6$

Squaring both sides,

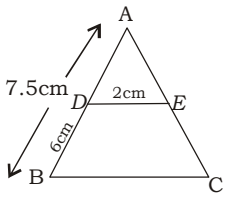
$\Rightarrow 9x^2 + 16y^2 + 24xy = 36$

$\Rightarrow 60 + 24xy = 36$

$\Rightarrow 24xy = -24$

$\Rightarrow xy = -1$

102. (C)



In Δ ABC,

DE $\parallel$ BC (given)

$\therefore \frac{AD}{AB} = \frac{DE}{BC}$

$\frac{1.5}{7.5} = \frac{2}{BC}$

$\Rightarrow$ BC = 10 cm

103. (B)

Initial	Present
100	103
40	41
20	21
80,000	88683
↓×2	↓×2
1,60,000	1,77,366

Hence, Present population = 1,77,366

104. (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

105. (A) ATQ,

Work done by A in 1 day = Work done by B in 3 days

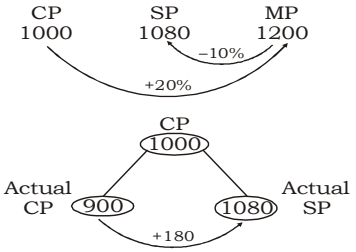
	A	:	B
Time	1	:	3
Efficiency	3	:	1

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

106. (A) A + B + C earns in one day = $\frac{2700}{18}$
= ₹ 150
A + C earns in one day = ₹ 94
B + C earns in one day = ₹ 76
∴ earning of A = 150 – 76
= ₹ 74
∴ earning of C = 94 – 74
= ₹ 20

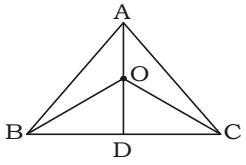
107. (C) Let the initial price = ₹ 1000 the price of 1 gm weight is ₹ 1
ATQ,



Percent profit = $\frac{180}{900}$ × 100 = 20%

108. (A) Area of kite = Area of square + Area of equilateral triangle
= $\frac{1}{2}$(diagonal)^2 + $\frac{\sqrt{3}}{4}$ × (side)^2
= $\frac{1}{2}$ × 32 × 32 + $\frac{\sqrt{3}}{4}$ × 8 × 8
= 512 + 16 × 1.732
= 512 + 27.712 = 539.712 cm^2

109. (C) BO is bisector of ∠B



∠ODB = 90°
∠BOD = 15°
∠OBD = 180° – 90° – 15° = 75°
∠ABC = 2 × 75° = 150°

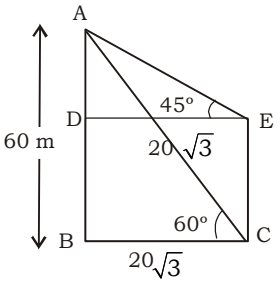
110. (B) ATQ,
$\pi r^2 + \pi(14 - r)^2 = 130\pi$
$\Rightarrow \pi[(r^2 + (14 - r^2)] = 130\pi$
$\Rightarrow [r^2 + 196 + r^2 - 28r] = 130$
$\Rightarrow 2r^2 - 28r - 66 = 0$
$\Rightarrow r^2 - 14r - 33 = 0$
$\Rightarrow r^2 - 11r - 3r - 33 = 0$
$\Rightarrow r = 3, 11$

111. (D) $\tan(\alpha - \beta) = 1$
$\Rightarrow \tan(\alpha - \beta) = \tan 45°$
$\Rightarrow \alpha - \beta = 45°$.....(i)
$\sec(\alpha + \beta) = \frac{2}{\sqrt{3}}$
$\Rightarrow \sec(\alpha + \beta) = \sec 30°$
$\Rightarrow \alpha + \beta = 30°$.....(ii)
From (i) & (ii),
$\alpha = 37.5°$

112. (C) $4r = h + \sqrt{r^2 + h^2}$
$\Rightarrow 4r - h = \sqrt{r^2 + h^2}$
$\Rightarrow 16r^2 + h^2 - 8rh = r^2 + h^2$
$\Rightarrow 15r^2 = 8rh$
$\Rightarrow \frac{r}{h} = \frac{8}{15}$
$\therefore r : h = 8 : 15$

113. (A) For every $n \geq 4$;
n! will be divisible by 8
$\Rightarrow$ remainder will be zero
[becomes for $n \geq 4$, 8 will be a factor of n!]
So, remainder of 1! + 2! + 3! + 4! ..... + 100! will be equal to the remainder of 1! + 2! + 3! only
1! + 2! + 3! = 1 + 2 + 3
and $\frac{9}{8}$; R = 1

114. (C)



In Δ ABC,
$\tan 60° = \frac{AC}{BC}$
$\Rightarrow \frac{60}{BC} = \sqrt{3}$
$BC = 20\sqrt{3}$
In ΔADE,
$\tan 45° = \frac{AD}{DE}$
$\Rightarrow 1 = \frac{AD}{20\sqrt{3}}$

$\Rightarrow AD = 20\sqrt{3}$

$\therefore BD = CE = 60 - 20\sqrt{3}$

$= 20(3 - \sqrt{3})$m

$\therefore$ Height of Pole $= 20(3 - \sqrt{3})$m

115. (C) $\left(1+\frac{R}{100}\right)^2 = \frac{11664}{10,000}$

$\Rightarrow \left(1+\frac{R}{100}\right)^2 = \left(\frac{54}{50}\right)^2$

$\Rightarrow 1 + \frac{R}{100} = \frac{54}{50}$

$\Rightarrow \frac{R}{100} = \frac{4}{50}$

$\Rightarrow R = 8\%$

116. (B) I : II

25 : 100

1 : 4

3 units

3 units = 12

1 unit $= \frac{12}{3} = 4$

4 units = 4 × 4 = 16

$\therefore$ Larger number = 16

117. (A) Female percentage in 1991

$= \frac{41}{85} \times 100 = 48.23$

118. (C) No. of males in 1971 per thousand females $= \frac{28}{26} \times 1000 = 1077$

119. (D) Ratio of the no. of female in 1961 per thousand male to in 1991 per thousand females

$= \frac{21}{23} \times 1000 : \frac{44}{41} \times 1000$

$= 913 : 1073$

120. (B) Percentage increased from 1981– 1991 is -

$= \frac{17}{68} \times 100 = 25\%$

$\therefore$ Population of India in 2001

$= 85 \times \frac{125}{100} = 106.25$ cr.

121. (D) Students are in college and patients are in hospital.

122. (A) As, DHL → PTX (+12)

Similarly, BFJ → **NRV** (+12)

123. (C) 37, 65, 50, **82**

6^2+1, 8^2+1, 7^2+1, 9^2+1

(+2, +2)

124. (B) Ampere is the unit of electric current and Kilogram is the unit of weight.

125. (D) 46, 52, 56, 62, 66, 72, **76**, **84**

(+6, +6, +6, **+8**)

126. (D) J F U Q P L **X** **S**

(−4, −4, −4, **−5**)

127. (C) Except diameter, others are instrument.

128. (C) CBA, FED, IHG, LKJ, **ONM**

(+3, +3, +3, +3)

129. (C) $(20-9)^2 = 121$

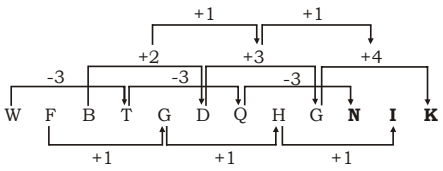
$(24-11)^2 = 169$

$(32-17)^2 =$ **225**

130. (B) 6, 12, 36, 144, 720, 4320, **30240**

(×2, ×3, ×4, ×5, ×6, ×7)

131. (B)



132. (C) Total numbers of triangles = 18

133. (C) Wednesday

134. (C) From figure (iii) and (iv), we have,

Y B **O**

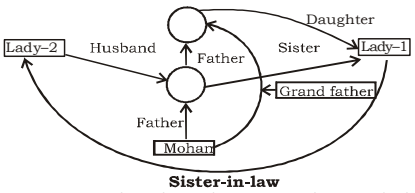
Y W **G**

$\therefore$ "Orange" color is opposite to the green color in the given cubes.

The correct order is :

135. (C) Advertisement → Application → Interview → Selection → Appointment → Probation

136. (D)



137. (D) Let x and y be the number of deer and peacocks in the Zoo respectively.

Then,

$x + y = 80$ ...(i) and

$4x + 2y = 200$ or $2x + y = 100$ ...(ii)

Solving (i) and (ii), we get $x = 20$, $y = 60$.

So, the number of peacocks in a Zoo is 60.

138. (D) According to the statement, 80% of the total runs were made by spinners. So, I does not follow. Nothing about the opening batsmen is mentioned in the statement. So, II also does not follow.

139. (C) 28 D 6 S 34 M 2 A 8 D 6

After changing the signs as per the given details,

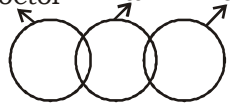
$28 \times 6 + 34 \div 2 - 8 \times 6$

$= 168 + 17 - 48 = 185 - 48 = 137$

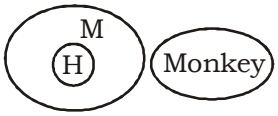
140. (A) A $\xrightarrow{20m}$ C $\xrightarrow{30m}$ E $\xrightarrow{20m}$ D $\xrightarrow{20m}$ B

∴ Required Distance = 20 m right.

141. (C) Doctor Man Actor



142. (A)



I. ×

II. ✓

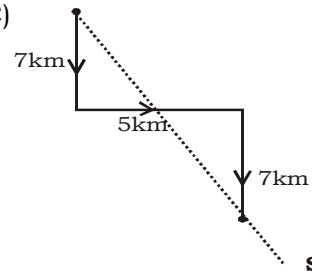
Only conclusion I follows.

143. (C) **p**qr**s**/srq**p**/p**q**rs/**sq**p

144. (B)

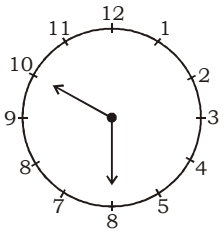
145. (D)

146. (C)



South-East

147. (B)



Hour hand point towards the North-West.

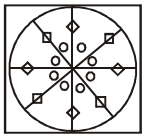
148. (B) As,

M	O	T	H	E	R
+1 ↓	+1 ↓	+1 ↓	−1 ↓	−1 ↓	−1 ↓
N	P	U	G	D	Q

Similarly,

O	R	A	N	G	E
+1 ↓	+1 ↓	+1 ↓	−1 ↓	−1 ↓	−1 ↓
P	S	B	M	F	D

149. (D)



150. (C) Let ascent of the monkey in 1 hour = (30 – 20) = 10 feet.

So, the monkey ascends 90 feet in 9 hours i.e., 5 p.m.

Clearly, in the next 1 hour i.e., till **6 p.m**. the monkey ascends remaining 30 feet to touch the flag.

151. (A) Let the age of son before two years = x

Then, Age of Aadhya = $3x$

ATQ,

$2(3x + 4)=5\ (x + 4) \Rightarrow x = 12$

The Present age of Aadhya

= (12×3)+2=38 years

152.(A) 107 – 3 ⊕ 64 α 8 ⊕ 2 – 9

After changing the signs as per the given details,

= 107 × 3 – 64 ÷ 8 – 2 × 9

= 321 – 8 – 18 = 321 – 26 = 295

153. (B) "B" represents the "Men who are healthy but not old".

154. (C) 48 * 4* 6 * 3 * 30

After changing the signs as per the given details,

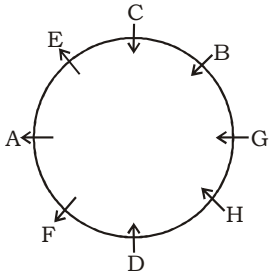
48 ÷ 4 + 6 × 3 = 30

⇒ 12 + 18= 30 ⇒ 30 = 30

155. (B)

156. (C) The correct order is : Mercury → Venus → Earth → Mars → Jupiter

Direction (157 - 160): Answer



157. (C) 158. (A)

159. (D) 160. (B)

UP SI ANSWER KEY - 49

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