TOOBA GUL
GSA
Test: 3

Q. 1 (a)

Solution:

To find three consecutive prime numbers that add up to 97, list the prime numbers less than 97:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, and 97.

Now, if following three prime numbers are added from this list, 97 will be the result.
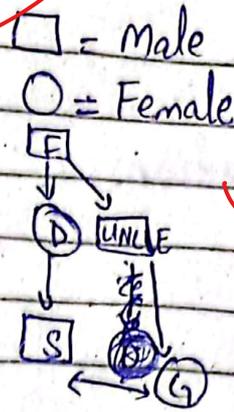
$$29 + 31 + 37 = 97$$

Answer: 29, 31, 37

Q.1 (b)

Solution:

The given relation statement states that girl's uncle has

a father whose daughter has a son, introduced as boy. It implies that daughter is the sister of uncle and mother of girl also. In this way, girl is the sister of boy.

□ = Male
O = Female

Q1(c)

Solution:

Formula:

$$Probability = \frac{No. \text{ of ways of occurence of an event}}{Total \text{ possible outcomes}}$$

Dice 1	Dice 2	Product	
1	2	2	
2	2	4	
3	4	12	
4	2	8	
5	6	30	
6	3	18	

Total number of ways = 6
Total outcomes = 6 × 6 = 36
Probabity (even numbers) = $\frac{6}{36} = \frac{1}{6}$ Answer

Q.2-(D)

solution:

Given:
Average Number of visitors in library on sunday = 510
Average visitors on other days = 240

Average number of visitors per day in a month of 30 days beginning with a Sunday = ?

Solution:

Number of visitors in Sundays (30days)
= 510 visitors

Other 25 days = 240 visitors

Total visitors in 5 Sundays (30days)

$$510 - 240 = 270$$

∴ In a month of 30days there are 5 Sunday

$$= 240 + \frac{270 \times 5}{30}$$

$$= 240 + 45$$

$$= \mathbf{285 \ visitors}$$

Q. No. 3
(a)

Given:

A works = 15 days
B works = 20 days
Together they work = 4 days
work left = ?

Solution:

Formula:

$$\text{Efficiency} = \frac{\text{useful energy transfered}}{\text{total energy supplied}}$$

By taking LCM of A and B, we get

Total = 60
energy

$$\begin{array}{r|l} 3 & 15 - 20 \\ 5 & 5 - 20 \\ 4 & 1 - 4 \\ \hline & 1 - 1 \\ & 60 \end{array}$$

$A = $ Efficiency $= \frac{15}{60} = \frac{1}{4}$ or 4

B efficiency $= \frac{20}{60} = \frac{1}{3}$ or 3

$4 + 3 = 7$

Total work = 60 unit

Work = Time × efficiency

(A+B) work = 7 × 4 = 28 unit

Fraction of work left $= \dfrac{60 - 28}{60}$

$= \dfrac{32}{60} = \dfrac{8}{15}$ unit

Q3. 4 (c)

Given:

Average weight of A, B, C = 45 kg

Average weight of A and B = 40 kg

Average weight of B and C = 43 kg

weight of B = ?

Solution:

$$Average = \dfrac{Sum\ of\ all\ observations}{Total\ number\ of\ observations}$$

$\Rightarrow 45 = \dfrac{A+B+C}{3}$

$A+B+C = 45 \times 3 = 135 \quad —①$

$\Rightarrow 40 = \dfrac{A+B}{2}$

$A+B = 40 \times 2 = 80 \quad —②$

$\Rightarrow 43 = \dfrac{B+C}{2}$

$B+C = 43 \times 2 = 86 \quad —③$

Put eq ③ into eq ①

$$A + 86 = 135$$
$$A = 135 - 86$$
$$A = 49$$

Put A in eq ②

$$49 + B = 80$$
$$B = 80 - 49$$
weight of **B = 31 Kg**

Q 3 (D)

Find the missing series terms

i- 2, 3, 6, 4, 5, 20, ____ 3, 18

In the given series the following pattern continues.

$$2 \times 3 = 6$$
$$4 \times 5 = 20$$
$$x \times 3 = 18$$

So, according to the above pattern x should be **6**.

ii- 1, 3, 9, 15, 25, 4' , 49

The sequence of given series is:

$(1)^2 = 1$
$(2)^2 = 4 - 1 = 3$
$(3)^2 = 9$
$(4)^2 = 16 - 1 = 15$
$(5)^2 = 25$
$(6)^2 = 36 - 1 = 35$
$(7)^2 = 49$

Therefore, the missing number will be 35.

iii- 2, 7, 10, 22, 18, 37, 26, ___

In the given series, all the odd numbers are add by 5 and even numbers are added by 15

2 + 5 = 7   7, 22, 37 (37 + 15)
7 + 3 = 10   = 52
10

iv- 5, 7, 11, ___ 17, 19

The following pattern continues in the given series
5 + 3 = 7
7 + 5 = 11

$$11+2=14$$
$$11+2=13$$
$$13+5=17$$
$$17+2=19$$

So, the missing number is **13**

Q3.b

Solution:

Let the numbers be $3x$ and $5x$

According to the given condition, if 9 is subtracted from each, new numbers are 12:23

$$\therefore \quad 3x-9=12 \qquad\qquad 5x-9=23$$
$$3x=12+9 \qquad\qquad 5x=23+9$$
$$=\frac{21}{3} \qquad\qquad 5x=32$$
$$x=7 \qquad\qquad\qquad x=\frac{32}{5}$$

$$3x-9:5x-9=\frac{12}{23}$$

$$\frac{3x-9}{5x-9}=\frac{12}{23}$$

$$23(3x-9) = 12(5x-9)$$

$$69x - 207 = 60x - 108$$

$$69x - 60x = -108 + 207$$

$$9x = \cancel{815}\ 99$$

$$x = 11$$

Now the ~~sum~~ smaller number.

$$3(11) = 33 \text{ Answer}$$