

13/02/19

A/L

Date

384

Date

4 - 8 + 3 - 2 + ~~X~~) - 1 pages

soft skills

(Q) + 7

- Find the no. of pairs in x and y for the given no. should be divisible by 36.

Szx37y

$$Y = \cancel{8}, \cancel{2}, 6$$

$$8 + x + y = 9$$

$$Y=2, X=-1 \quad \times$$

$$8 + x + y = 12$$

$$Y=2, X=8 \quad \checkmark$$

$$Y=6, X=-5 \quad \times$$

$$Y=6, X=4 \quad \checkmark$$

2.

- Find the no. of possible pairs in x and y for that the given no. is divisible by 18

$$18 \leftarrow \begin{matrix} 9 \\ 2 \end{matrix}$$

Szx37y

$$Y = 0, 2, 4, 6, 8$$

$$8 + x + y$$

$$X + y = 1$$

$$x + y = 10$$

$$Y=0, X=1 \quad \checkmark$$

$$Y=0, X=10 \quad \times$$

$$Y=2, X=8 \quad \checkmark$$

$$Y=4, X=6 \quad \checkmark$$

$$Y=6, X=4 \quad \checkmark$$

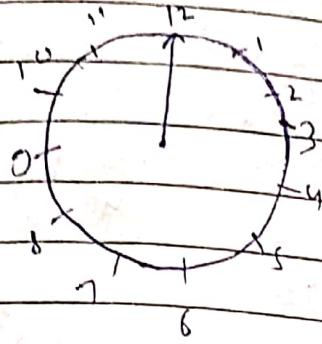
$$Y=8, X=2 \quad \checkmark$$

0.0101010

10111111

10001000

Clock

Hour hand

$$\text{In } 12 \text{ hrs} (720 \text{ min}) \rightarrow 360^\circ$$

$$\text{In } 1 \text{ min} \rightarrow \frac{1}{2}^\circ$$

Minute hand

$$\text{In } 60 \text{ min} \rightarrow 360^\circ$$

$$\text{In } 1 \text{ min} \rightarrow 6^\circ$$

Second hand

$$\text{In } 60 \text{ sec} \rightarrow 360^\circ$$

$$1 \text{ sec} \rightarrow 6^\circ$$

(2) Angle b/w Minute hand and hour hand at given time.

h:m

$$\theta = \left| \frac{11}{2}m - 30h \right|$$

(3):25

$$\theta = \left| \frac{11}{2} \times 25 - 30 \times 3 \right|$$

$$\theta = \left| \frac{275 - 180}{2} \right| = 47.5^\circ$$

$$360 - 47.5^\circ = 312.5^\circ$$

Find the time b/w [3 and 4] at which angle b/w both the hands is 40° .Let the time be $(3:m)$ $3:h$

$$40 = \left| \frac{11}{2}m - 30h \right|$$

$$40 = \left| \frac{11}{2}m - 30 \times 3 \right|$$

$$\theta = \left| \frac{11}{2} m - 30h \right|$$

$$40 = \left| \frac{11}{2} m - 30 \times 3 \right|$$

$$40 = \frac{11}{2} m - 90$$

$$-40 = \frac{11}{2} m - 90$$

$$40 = \left| \frac{11}{2} m - 90 \right|$$

$$40 = \left| \frac{11}{2} m - 90 \right|$$

$$m = \frac{260}{11} = 23 \frac{9}{11} \text{ min}$$

$$m = \frac{160}{11} = 9 \frac{1}{11} \text{ min}$$

③ Mirror Image

Subtract from 11:60

11 → 11
12 → 12
10 → 10
9 → 9
8 → 8
7 → 7
6 → 6

$$9 : 15 \rightarrow 2 : 45$$

- (4) a) How many times does both the hands of the clock coincide in a day, → 22 times
 b) How many times in a day, both the hands of the clock are 180° apart,
 c) How many times in a day, both the hands of the clock are at 90°

Soln →

In 12 hours → 11 times

In 24 hours → 22 times

~~16 times~~

44

22 times

- d) How many times minutes and hour hands overlap each other in the duration of 7 pm to 8 am

→ 9 times

19/8/19

Soft skills (clocks)

Date _____
Page _____

Angle b/w both hands	No. of occurrence in a day	Exceptions
(a) 0°	22	meet for once during 11 to 1' o'clock at 12' o'clock
(b) 180°	22	6' o' clock 5 to 7 → one time at 6' o'clock
(c) $0 < \theta < 90^\circ$	44	

Q10 2 : m

$$20 = \left| \frac{11}{2}m - 30 \times 2 \right|$$

$$-20 = \frac{11}{2}m - 60$$

$$20 = \frac{11}{2}m - 60$$

$$m = \frac{160}{11} = 14 \frac{6}{11}$$

$$m = 7 \frac{3}{11}$$

10 hours

8 AM

6 PM

-1 min

↓

2 min again

2 min → 10 hours

1 min → 5 hrs

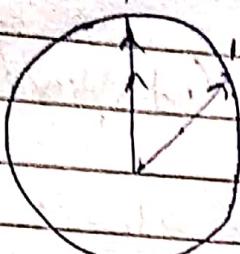
$$\text{So, } 8 \text{ AM} + 5 \text{ hrs} \\ = 1 \text{ PM}$$

20/03/19

Soft skills Chalks

Date _____
Page _____

(12)



$$0 = \left| \frac{\pi}{2}m - 30 \right|$$

$$0 = \frac{\pi}{2}m - 30 \quad |+30$$

$$0 = 0$$

$$m = 60$$

|11

$$\frac{\pi}{2}m = 30$$

$$r = \frac{30 \times 2}{\pi}$$

$$60 + \frac{60}{11}$$

$$= 720 \text{ min}$$

$$\frac{720 \text{ min}}{11} = 64$$

$$70 - \frac{720}{11} \rightarrow \text{in } 70 \text{ minutes}$$

$$50 \text{ minute in } 70 \text{ minutes}$$

|11

$$\frac{50}{11 \times 70} \text{ in 1 minute}$$

$$\frac{50}{11 \times 70} \times 60 \text{ in 1 hr.}$$

$$\frac{50}{11 \times 70} \times 60 \times 24 \rightarrow 7200 \text{ min} \rightarrow 0.3 \frac{39}{77} \text{ min}$$

(13)

$$-3.5$$

$$+2.5$$

$$2.5 - (-3.5) \rightarrow 6 \text{ min in 1 hour.}$$

In 1 hour → 6 min

$$\therefore \text{In 6 hours} \rightarrow 36 \text{ min}$$

(4 pm to 10 pm)

10)

-2

↓

S8

↓

250 min (4 to 3 : 50)

3

↓

S7

↓

$$\frac{S7}{S8} \times 250 \rightarrow 285 \text{ min.}$$

∴ it will show 9:45

10B)

~~$60 \text{ sec} \rightarrow 360^\circ$~~

~~$1 \text{ sec} \rightarrow 6^\circ$~~

~~$\frac{40}{60} \leftarrow 240^\circ$~~

~~$\rightarrow 40 \text{ sec.} \leftarrow 2 \text{ min}$~~

$1 \text{ min} \rightarrow 6^\circ$

$\frac{2}{3} \text{ min} \rightarrow \frac{2}{3} \times 6 \rightarrow 4^\circ$

$10 \times \frac{6}{60} = 1$

10.

6.

50

-15

95

$6 \rightarrow 10$

$10 \rightarrow 10$

$10 - \frac{10}{10} \times 10 = 0$

$10 \times 2 = 20$

$25 \text{ min} - 50$

$10 \times 2 = 20$

$1 \text{ m}^2 = 2 \text{ h}$

odd days

For a year to be a leap year, non century year must be divisible by 4
 century year must be divisible by 400

$$\frac{9}{7} \rightarrow 2 \text{ odd days}$$

$$\frac{31}{7} \rightarrow 3 \text{ odd days}$$

$$\frac{30}{7} \rightarrow 2 \text{ odd days}$$

$$\frac{28}{7} \rightarrow \cancel{\text{odd}} \quad \cancel{\text{odd}} \quad \cancel{\text{odd}}$$

$$\frac{29}{7} \rightarrow 1 \text{ odd day}$$

Q on a planet, a week consists of 10 days and the no. of days in a year are 539. If the first day of the year is Monday. What will be the last day of the year.

Mon Tue Wed Thu Fri Sat Sun Jan, Feb, March

$$\frac{538}{10} = 9$$

$$\begin{array}{r} 53 \\ 50 \cancel{3} \\ \downarrow 3 \\ 30 \end{array}$$

$$0 \cancel{3} = 5 \times 01$$

$$0 \cancel{3} - 0 \cancel{1} = 0 \cancel{2}$$

odd days

4
Date
Page 
1) 100
50
20
20
—

~~by 4
100~~

Jan → 3

Feb → 0 or 1

Mark → 3

April 2 (30)

~~play~~ → 3

Tane → 2 (30)

July 3

Aug → 3

Sep → 2 (30)

~~OK - 3~~
~~new - 2~~

See → |

卷之三

100
4 → 24 leap + 75 ordinary

↓ *↓* *↓*

48 odd

6

100

60

16

$\rightarrow S$

$$0 \rightarrow 3$$

first 100 \rightarrow s_{odd}

$$\underline{101 - 200} \rightarrow 3 \text{ odd}$$

$$201 \rightarrow 300 \rightarrow \text{5 odd}.$$

$$301 - 400 \rightarrow 0 \text{ odd}$$

last day of the century year cannot be Tues, Thursday, Sat

Calendar

-1 → Tuesday.

17 Sept 1993 → Friday
30th June 1989

(31)

17 Sept 1993 → 17th Sept 1989

↓
Friday

(9 years back)

↓
So 9 days.

(17)

So Friday - 5 days → Sunday

Now, + 30th June

$$1 + 3 + 3 + 2 \rightarrow 9 \rightarrow \frac{9}{7} \rightarrow 2 \text{ days}$$

∴ Sunday - 2 days = Friday.

60

1st April 1963 → 1st April 1959

(Monday) - 5 = Wednesday.

August 1959

1st April 1959 → 1 Aug 1959

$$\begin{aligned} & \text{April } 29 \text{ days} \\ & \text{for } 5 \text{ days} \\ & \frac{29}{7} + 3 + 2 + 3 + 1 \rightarrow 1 \text{ Aug } \text{ for } \text{detach } \& \text{the hair} \\ & = 13 \quad 55 \quad \text{Wednesday} + 3 \\ & \rightarrow \text{Saturday} \end{aligned}$$

87

Oct 1994

Sunday

$$\begin{array}{ccc} 1609 & 300 & 93 \\ \downarrow & \downarrow & \downarrow \\ 0 & 1 & \end{array}$$

93

$$\begin{array}{c} 5 \\ 11 \\ 5 \end{array}$$

70 ordinary

1st April - 1963 → mon. 23 leap

$$\begin{array}{ccccc} 1559 & 13 & & & 10 \\ \downarrow & \downarrow & & & \downarrow \\ 1662 & 15 & & & 4 \end{array}$$

-1878

A-1

M-3

J-2

J-3

A-1

$$\begin{array}{c} 3-5 \\ \hline 10 \end{array}$$

$$\begin{array}{c} 3-5 \\ \hline 2 \end{array} \text{ Jan = 1 Oct 94}$$

$$3+0+3+2+8+1+8+5+1+1$$

$$3+2+1 = 6 \rightarrow \text{Saturday}$$

2002

Calendar repetition

only for
every 4 years
After 6 add
Krene + par 2 leap years → to 11 each add Krene
After 6 add
Krene + par 1 leap year → 6 add Krene
rare After 6 add Krene + par 0 leap year → 12 add Krene

for leap years

28 years or 40 years.

27/08/19

Date
Page

Soft skills (Calendar)

19)

23rd April 2006 → Sunday

28th April → 2106

23rd April 2106 (100 years mean 5 odd days)

← Friday ←

20) 6)

265

No. of days in an ordinary year = 365

1st Jan → 31st Dec.



Monday

No. of odd days from 1st Jan to 31st Dec = $\frac{364}{7} = 0$ (excess)

∴ 31st Dec will also be a Monday.

25)

Friday

Percentage

$$\frac{x}{100} \times 100$$

$$\frac{xy}{100}$$

Q 1 * is what % of y? $\Rightarrow \frac{xy}{100}$

Q 2 x is what % of y? $\Rightarrow \frac{x}{y} \times 100$

$$\frac{P \times T}{100}$$

Q 3 By what percent, x is greater or less than y?

$$\frac{\text{diff}}{y} \times 100$$

Successive changes

Value of an article is increased by x%. Then decreased by y%. Find out % age change.

~~$$\text{Net change} = \frac{+x + y - xy}{100}$$~~

+ $\rightarrow \uparrow$
- $\rightarrow \downarrow$

Q 4 $C = A \times B$

Expenditure = quantity consumed \times

Percentage change for two quantities will be given.

Election based questions

The price of an article is increased by 14.28%. Find the final decreased % age if its price is reduced to its original value.

Percentage ~~$\frac{x}{y} \times 100$~~

(1) x is what % of y ? $\Rightarrow \frac{xy}{100}$

(2) x is what % of y ? $\Rightarrow \frac{x}{y} \times 100$

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

$$= \frac{P}{100}$$

(3) By what percent, x is greater or less than y ?

$$\rightarrow \frac{\text{diff}}{y} \times 100$$

(4) Successive changes

Value of an article is increased by $x\%$. Then decreased by $y\%$. Find out % age change.

~~$\text{Net change} = +x + y - \frac{xy}{100}$~~

(5) $C = A \times B$

Expenditure = quantity consumed \times

Percentage change for two quantities will be given.

(6) Election based questions.

The price of an article is increased by 14.28% . Find the % decrease in its price if its price is reduced to its original value.

initial $\rightarrow x$

$$\% \uparrow \rightarrow \frac{x \times 14.28}{100} = \frac{x}{7}$$

$$\text{New price} \rightarrow \frac{x}{7} + x = \frac{8x}{7}$$

$$\text{Percentage decrease} \Rightarrow \frac{8x - x}{7} \times 100 = \frac{7x}{7} \times 100 \\ \frac{8x}{7} = 12.5\%$$

OR
 $\frac{1}{7}$ ↑ increase with \rightarrow repay main
 initial \rightarrow \downarrow repay badde.

Initial $\rightarrow 8$ ~~(7+1)~~ $(9+1)$

$$\frac{1}{9} = 11.11\%$$

$\frac{1}{10}$ Salary of A is 10% less than salary of B. By what percentage salary of B is greater than salary of A.

$$\frac{1}{10}$$

$$B \rightarrow 10$$

$$A \rightarrow 9$$

$$\Rightarrow \frac{1}{9} = 11.11\%$$

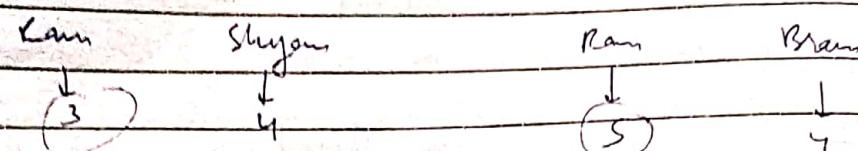
1/09/18

Soft skills

Percentage

Date

Page



3 aur 5 ka L.C.M = 15.

$$5 \times 3 \quad 5 \times 4 \quad 3 \times 5 \quad 3 \times 4$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$15 \quad 20 \quad 15 \quad 12$$

$$20 - 12 = 8$$

$$\frac{8}{20} = \frac{2}{5} \rightarrow 4\%$$

Type 4: \rightarrow Successive change

Price

$$\begin{array}{ccccccc} \downarrow & & 10\% \uparrow & 20\% \downarrow & 10\% \uparrow \\ \text{Let } 100 & \rightarrow & 110 & \rightarrow 88 & \rightarrow 98.8 \end{array}$$

$$\text{Net \% change} = + \cancel{10\%} - 3.2\%$$

Net % change

$$x\% \uparrow \quad y\% \downarrow$$

$$\text{Net \% change} = \frac{+x + y - xy}{100}$$

Q) What is the net % age change if the price of an article is first increased by 20% and then decreased by 25%.

20%↑

25%↓

$$\text{Net \% change} = 20 - 25 - \frac{20 \times 25}{100} = -10\% \rightarrow 10\% \downarrow$$

- Q) Find the net % change of an article if it is increased by 10%, then decreased by 20%. and finally decreases by 30%.

10%↑, 20%↑, 30%↓

$$I_1 = 10 + 20 + \frac{10 \times 20}{100}$$

$$= 30 + 2$$

~~$$= 32\% \rightarrow 32 \times \frac{100}{100} = 32$$~~

~~$$32\% \rightarrow 30\% \downarrow$$~~

~~$$32 - 30 = 32 \times \frac{100}{100} \times \frac{100}{100} = 2\% \rightarrow 2\% \times 80$$~~

~~$$= 2 - 9.6$$~~

~~$$= -7.6\%$$~~

~~$$= 7.6\% \downarrow$$~~

 ~~$R_1 = R_1\% \uparrow, R_2\% \uparrow, R_3\% \downarrow$~~

$$\text{Final} = \text{Initial} \left(1 + \frac{R_1}{100} \right) \left(1 + \frac{R_2}{100} \right) \left(1 - \frac{R_3}{100} \right)$$

$$50000 = I \left(\frac{112}{100} \right) \left(\frac{90}{100} \right)$$

~~$$I = 50100$$~~

13)

21.11.1. ↓ , 10% ↓ , 12.5% ↑

Date / /
Page

$$\frac{\text{Final}}{\text{Initial}} = \left(1 - \frac{11}{100}\right) \left(1 - \frac{10}{100}\right) \left(1 + \frac{12.5}{100}\right)$$

$$= \left(1 - \frac{1}{9}\right) \left(1 - \frac{1}{10}\right) \left(1 + \frac{1}{8}\right)$$

$$\frac{F}{I} = \cancel{\frac{8}{9} \times \cancel{\frac{9}{10}} \times \frac{9}{8}}$$

$$\frac{F}{I} = \frac{9}{10}$$

(i) $\frac{10}{9}$

(ii) $\frac{F}{I} = \frac{9}{10} \rightarrow \frac{1}{10} = 10\%, \downarrow$

Types → Expenditure based

$$E = \text{Rate} \times \text{Quantity}$$

(R) (Q)

$$\frac{E_1}{E_2} = \frac{R_1}{R_2} \times \frac{Q_1}{Q_2}$$

OLS

$$E = R \times Q$$

$$\begin{aligned} & \downarrow \text{let} \downarrow \\ & = 6 \times 1 \rightarrow 1 + \frac{1}{5} \times 6 \\ & \downarrow \frac{6}{5} \times 6 \quad 20\% = \frac{1}{5} \\ & 15 \rightarrow \frac{1}{6} \text{ kanchanai} \end{aligned}$$

→ 16.66%. ↓

$$1 = 6 \times x$$

$$x = \frac{5}{6}$$

original is 1,

(i) $I = I(x)$

 $\frac{1}{T_0}$

$\frac{11}{T_0} = \frac{6}{5} \times n$

$$n = \frac{\frac{11}{T_0} \times \frac{5}{6}}{2} = \frac{11}{12} \uparrow 1 \text{ kg decrease}$$

8.33% , decrease

(ii) $I = I(x)$

$\frac{9}{T_0} = \frac{6}{5} \times n$

$$n = \frac{\frac{9}{T_0} \times \frac{5}{6}}{2} = \frac{3}{4} \rightarrow \frac{1}{4} = 25\%$$

decrease.

18) Type 6 → election based question

Total voters = $100x$

 $80x \Rightarrow$ value cent

8% of $80x - 44\% \text{ of } 80x = 144$

$80x \times \frac{56}{100} - 44 \times 80x = 144$

$x = \frac{60}{4} = 15$

$$\therefore \text{Total values} = 100x = 100 \times 15 \\ = 1500$$