

SECTION - II

Question No. 7:

PART A GIVEN:

Two numbers A and B

Equation from statement:

$$5\%A + 4\%B = \frac{2}{3} (6\%A + 8\%B)$$

TO FIND:

$$\text{Ratio} = \frac{A}{B} = ?$$

SOLUTION:

As from the statement.

$$5\%A + 4\%B = \frac{2}{3} (6\%A + 8\%B)$$

$$\Rightarrow \frac{5A}{100} + \frac{4B}{100} = \frac{2}{3} \left(\frac{6A}{100} + \frac{8B}{100} \right) \quad \therefore \% = \frac{1}{100}$$

$$\frac{5A + 4B}{100} = \frac{2}{3} \left(\frac{6A + 8B}{100} \right)$$

$$5A + 4B = \frac{2}{3} (6A + 8B)$$

$$3(5A + 4B) = 2(6A + 8B)$$

$$15A + 12B = 12A + 16B$$

or

$$15A - 12A = 16B - 12B$$

$$3A = 4B$$

A	= 4
B	3

so,

the ratio A:B is 4:3

X=====X**PART B**

Date: _____

Given:

Assumed two digit number. having 'x' at ten's digit and 'y' as units digits i.e.

Assumed number $A = 10x + y$ where $y = x + 2$

Equation from the statement.

$$A \times (x + y) = 144$$

To find:

The actual two-digit number = ?

Solution:

As given in statement,

$$A \times (x + y) = 144$$

putting value of $A = 10x + y$ in above.

$$(10x + y)(x + y) = 144$$

$$\Rightarrow (10x + x + 2)(x + x + 2) = 144 \quad \because y = x + 2 \text{ (given)}$$

$$(11x + 2)(2x + 2) = 144$$

opening the equation.

$$22x^2 + 22x + 4x + 4 = 144$$

$$22x^2 + 24x + 4 - 144 = 0$$

$$22x^2 + 24x - 140 = 0$$

Dividing the whole equation by 2.

$$11x^2 + 12x - 70 = 0$$

$$11x^2 + 12x - 70 = 0$$

Applying quadratic equation formula to above equation; $ax^2 + bx + c = 0$ where

$$a = 11 \quad ; \quad b = 12 \quad \text{and} \quad c = -70$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

putting values, we get

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(11)(-70)}}{2(11)}$$

$$x = 2(11)$$

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$$x = \frac{-12 \pm \sqrt{144 + 3080}}{22}$$

$$x = \frac{-12 \pm \sqrt{3224}}{22}$$

$$x = -12 \pm 56.7$$

PART C:

Given:

Money distribution ratio

$$A : B : C : D$$

$$5 : 2 : 4 : 3$$

$$C = 1000 + D.$$

Find:

B's share, B = ?

Solution:

Let the share of

$$A = 5x \quad \text{Total share} = 14x$$

$$B = 2x$$

$$C = 4x$$

$$D = 3x$$

so according to the statement, share of C is

$$C = 1000 + D$$

$$4x = 1000 + 3x$$

$$4x - 3x = 1000$$

$$x = 1000$$

Putting value of x in B's share.

$$B = 2x = 2 \times 1000 = 2000$$

so

B's share is 2000

PART D:Age Problem

According to father's statement, let the current age of father be 'F' and that of son be 'x'

Age of father at the time of birth of his son

$$F - x = x$$

Age of father now = $F = 38$ yrs

Find:

Son's age five yrs back = ?

Solution:

According to Father's statement

$$F - x = x \quad ; \quad F = 38$$

so,

$$38 - x = x$$

$$\text{or } x + x = 38$$

$$2x = 38$$

$$x = \frac{38}{2} = 19$$

or

$x = 19$

So, the current age of son is 19 yrs.

Son's age five years back = $x - 5$

$$= 19 - 5 = 14 \text{ years}$$

So, five years back, son was 14 yrs old.

X X

QUESTION NO. 6PART B

Date: _____

Given

$$\text{Pay of } X \text{ \& } Y = X + Y = 550$$

$$\text{Pay of } X = 120\% \text{ of } Y$$

$$\text{or } X = \frac{120}{100} Y$$

To Find:

$$\text{Pay of } Y \text{ per week} = Y = ?$$

Solution:

As

$$X + Y = 550$$

putting $X = \frac{120}{100} Y$ into above.

$$\frac{120}{100} Y + Y = 550$$

Taking LCM = 100 on left hand side.

$$\frac{120}{100} Y + Y \times \frac{100}{100} = 550$$

$$\frac{120Y + 100Y}{100} = 550$$

$$\frac{220Y}{100} = 550$$

$$\Rightarrow 220Y = 550 \times 100$$

$$Y = \frac{550 \times 100}{220}$$

$$Y = 50 \times 5$$

$$\boxed{Y = 250} \text{ Ans}$$

so

pay of Y is 250 rupees per week.

PART C:

Given:

Date: _____

Ratio b/w Perimeter and breadth

$$\frac{\text{Perimeter}}{\text{Breadth}} = \frac{P}{b} = \frac{5}{1}$$

Area of rectangle $= A = 216 \text{ m}^2$

To Find:

length of rectangle $= l = ?$

Solution:

Perimeter of a rectangle is

$$P = 2(l+b)$$

and as given

$$\frac{P}{b} = \frac{5}{1}$$

$$\text{or } \frac{2(l+b)}{b} = \frac{5}{1} \quad (\because P = 2(l+b))$$

$$\frac{2l+2b}{b} = \frac{5}{1}$$

By cross multiplication we get.

$$2l+2b = 5b$$

$$2l = 5b - 2b$$

$$2l = 3b$$

$$\text{or } 3b = 2l$$

$$b = \frac{2l}{3} \quad \text{--- (1)}$$

Now, area of rectangle is $A = l \times b$ and
as given

$$\text{Area} = 216$$

$$l \times b = 216$$

$$b = \frac{216}{l} \quad \text{--- (2)}$$

Now,

$$\text{Breadth} = \text{Breadth}$$

$$\frac{2l}{3} = \frac{216}{l}$$

Cross multiplication gives us-

$$(2l)l = 3(216)$$

$$2l^2 = 648$$

$$l^2 = \frac{648}{2}$$

$$l^2 = 324$$

$$l = \sqrt{324}$$

Taking ' $\sqrt{\quad}$ ' on both sides.

$$\sqrt{l^2} = \sqrt{324}$$

$$l = \sqrt{324}$$

$$l = 18 \text{ m} \quad \text{Ans}$$

So,

length of rectangle is 18 meters.

PART D

Given:

Total number of tickets = $n = 20$

To Find:

Probably if the drawn card is a multiple of 3 or 5 = $P_{3 \text{ or } 5} = ?$

Solution:

Multiples of 3 less than 20 are 3, 6, 9, 12, 15, 18, i.e., total 6 cards.

Multiples of 5 in 20 are 5, 10, 15 and 20, that is, total 4 cards. But one card is a multiple of 3 and 5 i.e. 15.

So total cards having multiple of 3 or 5 are = $6 + 4 - 1 = 9$.

Probability that the ticket drawn can be a multiple of 3 or 5 is

$$A \quad P_{3 \text{ or } 5} = \frac{9}{20}$$

$$\text{or } \boxed{P_{3 \text{ or } 5} = 0.45} \quad \text{Answer.}$$

X ——— X

PART A:

Given:

Let Cost Price = C.P

Selling Price = S.P

Profit = P

New selling Price = 2SP

New Profit = 3P.

To Find:

Profit in percent = P% = ?

Solution:

As Profit = Selling Price - Cost Price.

$$\text{i.e. } P = SP - CP \quad \text{--- (1)}$$

and according to given statement.

$$3P = 2SP - CP \quad \text{--- (2)}$$

Taking equation (1)

$$P = SP - CP$$

$$\text{or } CP = SP - P$$

Putting value of CP in equation (2)

$$3P = 2SP - (SP - P)$$

$$3P = 2SP - SP + P$$

$$3P - P = SP$$

$$2P = SP \quad \text{--- (3)}$$

so value of new selling price is 2P.

Now finding cost price

$$CP = SP - P$$

$$= 2P - P$$

$$CP = P \quad \text{--- (4)}$$

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Formula for profit percentage is

$$P\% = \frac{\text{Profit}}{\text{Cost Price}} \times 100$$

$$= \frac{SP - CP}{CP} \times 100$$

putting values of SP & CP from equations
(3) & (4) in above-

$$P\% = \frac{2P - CP}{P} \times 100$$

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

$$P\% = 100\% \text{ Ans}$$

So the profit percentage is 100%

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SECTION - I

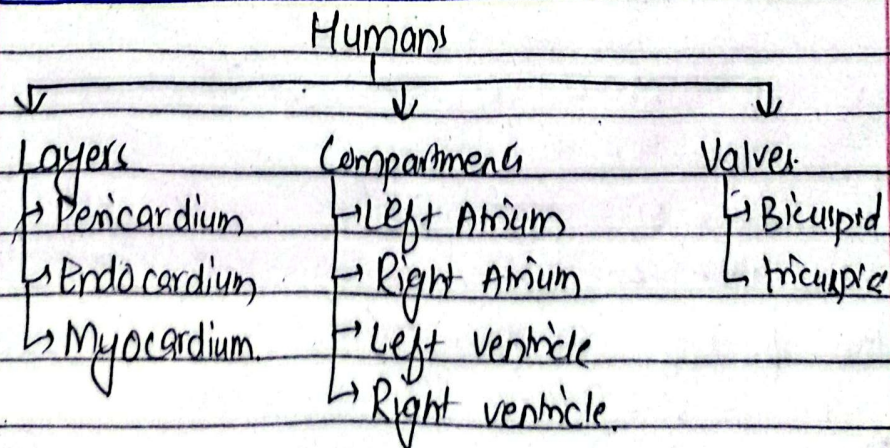
QUESTION #3

PART A:

HUMAN HEART

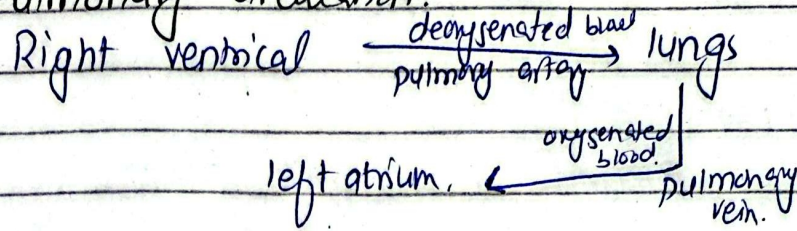
1- HEART: Heart is the primary pumping organ of human body. It is located in chest cavity slightly to the left. Its function is to ensure smooth regulation and pumping of blood through out body.

2- STRUCTURE OF HUMAN HEART:

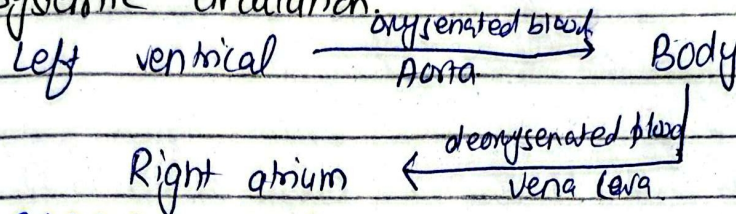


Date: _____

Pulmonary circulation:

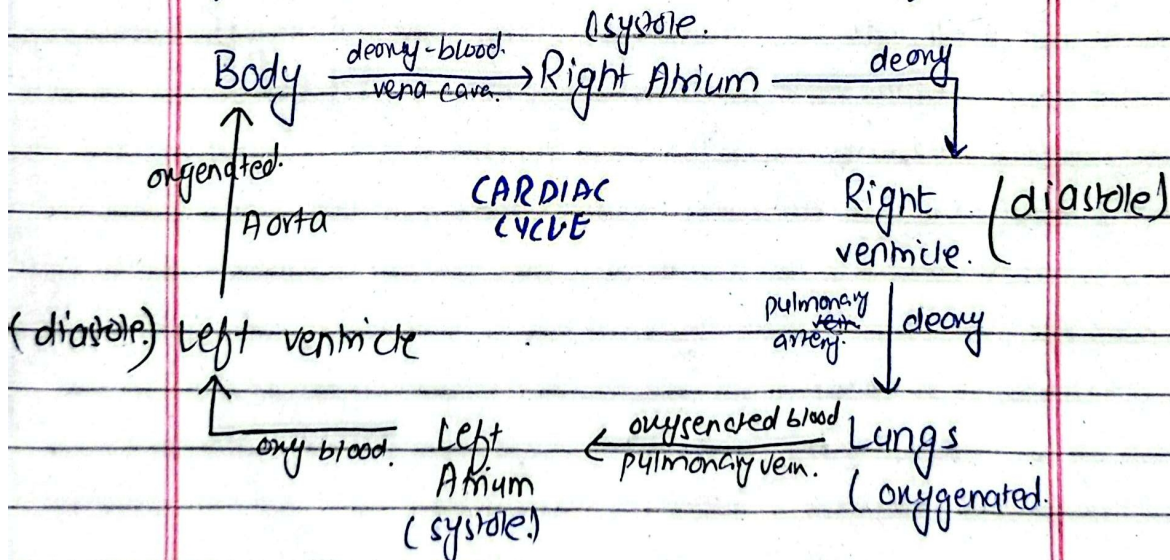


Systemic circulation:



4- CARDIAC CYCLE:

Cardiac cycle is the full sequence of one pump carried by Heart. It has 2 main phase systole (contraction of ventricle) and diastole (relaxation of ventricle).



5- REGULATION OF BLOOD PRESSURE BY HEART

The heart regulate blood pressure through heart rate and volume of blood being pumped. Moreover, hormones and autonomic nervous system also play role in increasing and decreasing heart rate.

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Date: _____

PART B BIOFUELS

1- BIOFUELS:

Biofuels are renewable energy resource that are produced from organic matter like plants, decaying animal, animal waste etc. They are used as an alternative to fossil fuels. Major categories of biofuels include bioethanol, biogas and biodiesel.

Bio fuels are mostly used for heating, electricity generation and transport.

2- PRODUCTION OF BIO FUELS:

Production

↓	↓	↓
Bio ethanol	Biodiesel	Biogas
- made from fermentation of corn, sugarcane etc.	- made from transesterification of vegetable oils like soybean & palm oil.	- generated through anaerobic digestion of organic waste. (food, manure)
- Starch is broken down into sugar and fermented by yeast into ethanol. This ethanol is then distilled for use.	Alcohol is made to react with vegetable oil and animal fats resulting in biodiesel and glycerol.	Through anaerobic digestion, microbes produce methane gas.

3- ADVANTAGES OF BIOFUELS:

- a- They are renewable sources of energy.

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- b- Biofuels produce lower level of carbon emission.
- c- Extensive use of biofuels can replace the consumption of fossil fuels.
- d- No sophisticated machinery or process is required for producing bio-fuels.
- e- They are environmental friendly.
- f- By using animal waste, decaying plants and food scraps, biofuels lower the overall pollution.

4- DISADVANTAGES OF BIOFUELS:

- i- Biofuels have high production costs.
- ii- The resources required to make biofuels are costlier than fossil fuels.
- iii- To establish a set for biofuel generation, land is required and this creates land use issues as it can cause deforestation or use of arid land.

5 CONTRIBUTION OF BIOFUELS TO REDUCE GHG EMISSIONS:

- Biofuels can be helpful in reducing greenhouse gas emission by
- i- being a substitute for fossil fuels
 - ii- inherently emitting less carbon in atmosphere
 - iii- being energy efficient.

X ————— X