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Class: EM - CLASS 9 | **Subject:** Mathematics - Part 1 (Algebra) | **Time:**3 hrs
Date: 15-02-2025 | **Paper:** Semester 2 (Solution) | **Marks:**40

Q1(A))

(1) Let the mean proportion be x

∴ $(x)^2 = 4 \times 25$

∴ $x^2 = 100$

∴ $x = 10$

(2) Both a and b

(3) 2018 - 19

(4) $\frac{4}{9}$

(B))

(1) 52 : 100 = 52 / 100

= 13 / 25

= 13 : 25

(2) Arrange the given date in the ascending order.

35, 35, 37, 37, 37, 37, 40, 42, 42, 43

The maximum frequency is 4. It is that of 37.

The mode of weight is 37 kg.

(3) Individual : Ms. Mehta

Age : 44

Taxable Income (rs.) : Rs. 5,82,000

Need to pay Income tax because Income is more than Rs.2,50,000 for Individual.

(4) The lower class limit of the class 20-25 is 20.

The upper class limit of the class 20-25 is 25.

Q2(A))

(1) (1) 90% (2) Rs.120 (3) Rs.1200 (4) Rs.1200

(2) (1) 2x + 2y = 22 (2) -5y = -15 (3) 3 (4) 8

(3) (1) 100 (2) $\frac{37}{5}$ % (3) 7.4%

(B))

(1) Let the monthly salary of nayana be x.

She spends 40% of her income

∴ Her saving = 100 - 40 = 60%

But her saving = Rs. 36,000

∴ $36000 = \frac{60}{100} \times x$

∴ $x = \frac{3600x100}{60}$

∴ x = 60,000

∴ Her monthly salary is Rs. 60,000

(2) 8x + 3y = 11

Put x = 1

∴ 8(1) + 3y = 11
8 + 3y = 11
3y = 11 - 8
3y = 3
y = $\frac{3}{3}$
y = 1

(3) Mean of 25 observations = 27
∴ Total sum of 25 observations = 27 × 25 = 675
On including one observation, mean of 25 + 1 = 26
Observations = 27
∴ Total sum of 26 observations = 27 × 26 = 702
∴ Included observation = 702 - 675 = 27

(4) Let the weight of nitrogen compound in 20 kg of fertilizer be x kg.
∴ 18/100 = x/20
∴ x = 18 × 20 / 100 = 3.6
∴ weight of nitrogen compound is 3.6 kg.
The percentage of phosphorous compound is also 18%.
∴ Weight of compound of phosphorous is 3.6 kg.
If we assume the weight of potassium compound y kg then 10/100 = y/20
∴ y = 2
∴ Weight of potassium compound is 2 kg.

(5) 4x + y = 34 ...(1)
x + 4y = 16 ...(2)
By multiplying eq. (2) by 4,
4x + 16y = 64 ...(3)
By subtracting eq. (3) and eq. (1)
4x + y = 34
4x + 16y = 64
- - -
-15y = -30
y = $\frac{-30}{-15}$
y = 2

By substituting y = 2 in eq. (1)
4x + y = 34
4x + 2 = 34
4x = 34 - 2
∴ 4x = 32
x = $\frac{32}{4}$
x = 8
∴ x = 8, y = 2

Q3(A))

(1) (1) 20y - 10x = 0 (2) $\frac{105}{35}$ (3) 3 (4) 2(3) - x = 0 (5) 6 (6) 6

(2) (1) $\frac{20x}{100}$ (2) $\frac{30x}{100}$ (3) Income - Expenditure (4) x - $\left(\frac{20x}{100} + \frac{30x}{100} + \frac{5x}{100}\right)$
(5)1,80,000 x $\frac{20}{9}$ (6) 4,00,000

(B))

(1) Suppose Income of Mr.Shekhar = Rs.x
He spend 60% of Income = Rs. $\frac{60x}{100}$
He Donates = Rs. 300

Total Expense = $\frac{60x}{100}$ + 300
Saving = Rs. 3200
we know, Saving = Income - Expenditure

3200 = x - $\left(\frac{60x}{100}+300\right)$

3200 = x - $\frac{60x}{100}$ - 300

3200 + 300 = $\frac{100x-60x}{100}$

3500 = $\frac{40x}{100}$

x = $\frac{3500x100}{40}$

x = 8750
Income of Mr. Sekhar is Rs. 8750.

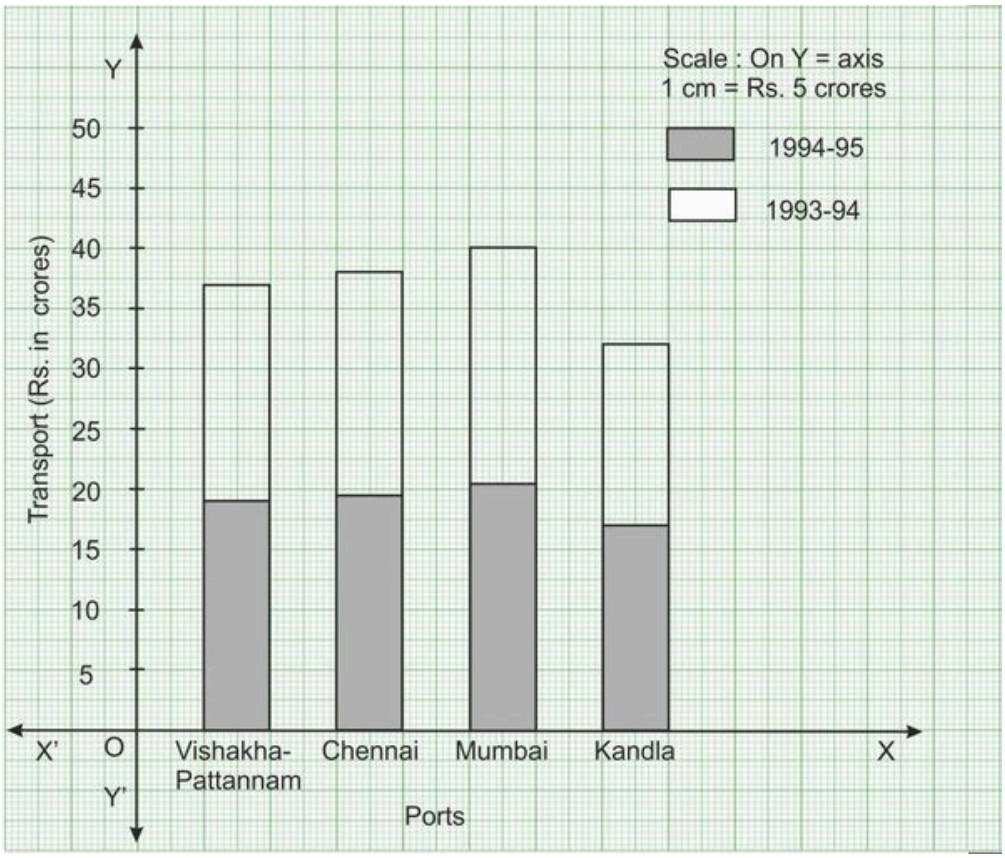
(2)

Class (Weight in gm)	Tally marks	Frequency
110 - 120	|||	3
120 - 130	𝍸 ||	10
130 - 140	𝍸 ||	11
140 - 150	𝍸 𝍸 ||||	14
150 - 160	𝍸 ||	10
	Total	48

(3) Let the remaining number be x and 26 - x
As per given condition;
∴ $(12)^2$ = (x) (26 - x)
∴ 144 = 26x - x^2
∴ x^2 - 26x + 144 = 0
∴ x^2 - 18x - 8x + 144 = 0
∴ x(x - 18) - 8 (x - 18) = 0
∴ (x - 18) (x - 8) = 0
∴ x = 18 or x = 8

(4)

Ports	Vishakhapattanam	Chennai	Mumbai	Kandla
Approx. transport	16	18	20	15
Actual transport i. 1994 - 95 ii. 1993- 94	 18 18	 19.5 18.5	 20.2 20	 17 15
Total	37	38	40.2	32



Q4)

(1) Let the mother's today's age be x years and son's today's age be y years.

From the first condition, x + y = 45 ...(1)

From the second condition, 2x - y = 54 ...(2)

Adding equations (1) and (2)

3x + 0 = 99

3x = 99

$x = \frac{99}{3}$

x = 33

Substituting x = 33 in equation (1),

33 + y = 45

y = 45 - 33

y = 12

Today's age of mother = 33 years and today's age of son = 12 years.

(2) (1) Total Yearly income = 12,00,000 rupees.

(2) Total savings under section 80C.

Savings	**Amount of Savings (rupees)**
Insurance premium	90,000
Provident Fund	25,000
Public Provident Fund	15,000
National Savings Certificate	20,000
Total	1,50,000

According to section 80C, a maximum deduction of Rs. 1,50,000 is permissible.

(3) ∴ Taxable Income = Total Yearly income - Total saving
= 12,00,000 - 1,50,000
= 10,50,000

(4) We shall use Table I to calculate Mr. Mhatre's total income tax.

Mr. Mhatre's taxable income = Rs. 10,50,000 which is greater than ten lakh rupees.

∴ According to Table (I) Income tax = Rs. 1,12,500 + 30% (of total income minus 10 lakh)

∴ 10,50,000 - 10,00,000 = 50,000

∴ Income tax = 1,12,500 + 50,000 × $\frac{30}{100}$

∴ = 1,12,500 + 15,000 = 1,27,500

We must also include 2% education cess and 1% secondary and higher education cess.

Education cess = 1,27,500 × $\frac{2}{100}$ = 2550 rupees

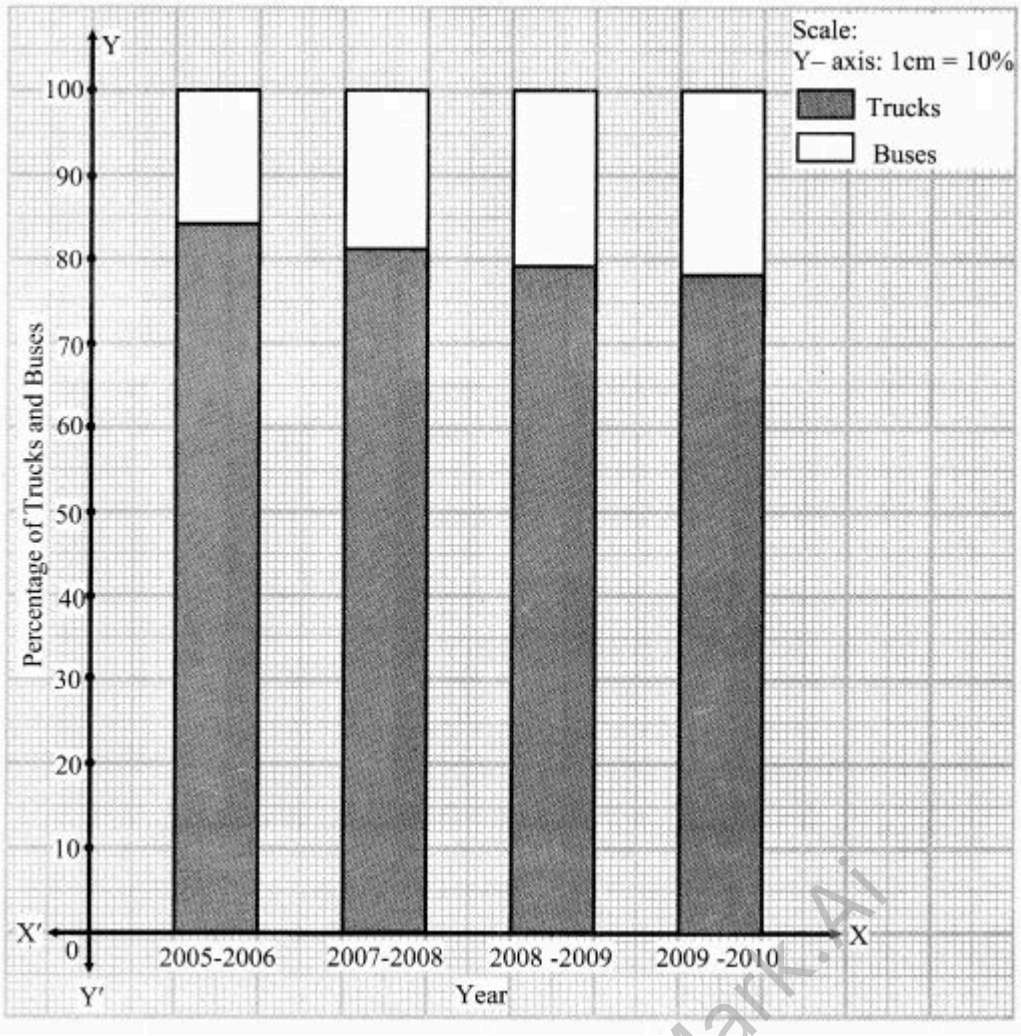
Secondary and higher education cess = 1,27,500 × $\frac{1}{100}$ = 1275 rupees

∴ Total income tax = 1,27,500 + 2550 + 1275 = 1,31,325 rupees

Mr. Mhatre's tax payable = 1,31,325 rupees

(3)

Year	**2005-06**	**2007-08**	**2008-09**	**2009-10**
Number of trucks	47	56	60	63
Number of buses	9	13	16	18
Total	56	69	76	81
Percentage of trucks	$\frac{47}{56}$ × 100 = 83.93 ≈ 84	$\frac{56}{69}$ × 100 = 81.16 ≈ 81	$\frac{60}{76}$ × 100 = 78.95 ≈ 79	$\frac{63}{81}$ × 100 = 77.78 ≈ 78
Percentage of buses	100 - 84 = 16	100 - 81 = 19	100 - 79 = 21	100 - 78 = 22



Q5)

(1)

Class (Number of saplings)	Tally marks	Frequency (f)
3	𝍸 𝍸	10
4	𝍸 𝍸 |	11
5	𝍸 𝍸 |	11
6	𝍸 ||	7
7	𝍸 |	6
		N = Σ f = 45

(2) Supposed here, monthly Income of Sameera = x

She spent 90% of Income = $\frac{90x}{100}$

She donated 3% of Income = $\frac{3x}{100}$

∴ Total Expanse = $\frac{90x}{100}$ + $\frac{3x}{100}$ = $\frac{93x}{100}$

Saving = 1750

we know Saving = Income - Expenditure

$\therefore$ 1750 = x - $\frac{93x}{100}$

$\therefore$ 1750 = $\frac{7x}{100}$

$\therefore$ x = $\frac{1750x100}{7}$

x = 25,000

$\therefore$ Monthly Income of Sameera is Rs.25,000.

All the Best