NTR Government Degree College for Women-Mahabubnagar

Department of Mathematics

Academic Year: 2021-2022

Certificate Course: Arithmetic Aptitude

To:
The Principle
NTR Govt Degree College (W),
Mahaboobnagar.

Sub: Requesting to conduct Certificate Course on **"Arithmetic Aptitude"** for the students of B.A (HEP) II year for the academic year 2021-2022 -reg.

Ref: Resolution of the meeting conducted by the Dept of Mathematics held on 16.04.2022 and Almanac of Palamuru University.

Respected Madam,

With reference to the above based on the resolution of the meeting conducted by the Dept of Mathematics held on 16.04.2022 the department is decided to conduct a certificate course named **"Arithmetic Aptitude"** for the students of B.A (HEP – E/M) II year for the academic year 2021-2022 in the month of April - May.

Hence, I herewith am attaching the complete schedule and syllabus. Requesting you to permit to conduct the certificate course and do the needful in this regard.

16/4/22

Thanking you,

Yours faithfully

(Dr. T. Vijayalaxmi

Asst Prof & HOD, Dept of Mathematics)

NTR GOVT DEGREE COLLEGE (W), MAHABUBNAGAR

DEPARTMENT OF MATHEMATICS

Date: 25.04.2022

NOTICE

It is hereby informed that the Department of Mathematics is going to conduct a certificate course on **"Arithmetic Aptitude"** from 25.04.2022 for the students of B.A (HEP-E/M) II year for the academic year 2021-2022. The interested students can contact Saba Anjum, Lect.in Mathematics, for register their names.

Head of the Department

Principal
25/4/22

PRINCIPAL
N.T.R.G.D.C.(W)
Mahabubnagar.

NTR GOVT DEGREE COLLEGE(W)
MAHABUBNAGAR
DEPARTMENT OF MATHEMATICS

ficate Course

on

"Arithmetic Aptitude"

Teacher:
Dr. T. VIJAYA LAXMI

T.Rajeshwari
G.J.Murali kanth
Ch.ravali
Saba Anjum

Dr. K.Padmavathi

Arithmetic Aptitude

Schedule and Syllabus

Objectives: To enhance the problem solving skills, to improve the basic mathematical skills and to help students who are preparing for any type of competitive examinations.

Outcomes: By the end of the course students with Arithmetic in aptitude will be in a position to analyze and make sense of the given data. They can easily understand different practice technique, can easily tackle any competitive examinations with the knowledge they acquired.

S.No	Month	Week	Number of Hours	Topic Covered/Name of the Topic	Remark
1	April	4th	6	Number Systems Averages	
2	May	1st	5	Percentages Simple and Compound Interest	
3	May	2nd	7	Profit and Loss Partnership Ratio and Proportion	
4	May	3rd	6	Allegations and Mixtures Time, Speed and Distance Time and Work	
5	May	4th	6	Ven Diagrams Pipes and Cisterns Calendars	

PRINCIPAL
N.T.R.G.D.C.(A)
Mahabubnagar.

S.No.	Roll Number	Name of the Student	25/04/22	26/04/22	5/5/22	6/5/22	7/5/22	10/5/22	11/5/22	12/5/22	13/5/22	17/5/22	18/5/22	19/5/22	23/5/22	24/5/22	25/5/22
1	200330301290012	Afsaainda	1	2	3	3	4	5	6	6	7	8	9	10	10	11	12
2	002	Amseen Begum	–	1	2	3	3	4	5	6	6	7	8	9	9	10	11
3	003	Arshiya Samseen	1	1	2	3	4	4	5	6	7	8	8	9	10	11	12
4	004	A. Shivaleela	1	2	3	4	5	6	7	8	8	9	10	11	12	13	14
5	005	Ayeshatabassum	1	2	2	3	4	5	6	7	7	8	9	10	11	12	13
6	006	B. Jayalaxmi	–	1	2	3	4	5	6	6	7	8	9	9	10	11	12
7	010	G. Chaitanya	1	2	3	4	5	5	6	7	8	9	10	11	12	13	14
8	012	G. Shireesha	1	1	2	3	3	4	5	6	6	7	8	9	10	10	11
9	013	Jaza Mehroz	1	2	2	3	4	4	4	5	6	7	8	8	9	10	10
10	018	K. Shireesha	1	2	3	4	5	6	7	8	9	10	10	11	12	13	14
11	019	Maheshwari	–	–	1	2	3	3	4	5	6	7	7	8	9	9	10
12	023	M. Prakruthi	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
13	024	M. Prasannakumari	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
14	025	Nehabegum	1	1	2	3	4	5	6	7	7	8	9	10	11	12	13
15	027	Nishath Fatima	1	2	3	4	5	6	6	7	8	9	10	11	11	11	12
16	030	P. Durga	1	1	2	3	3	4	5	6	7	8	9	10	11	12	13
17	031	P. Nageshwari	1	2	3	4	5	6	7	8	9	10	11	12	12	13	14
18	032	P. Nageshwari	1	2	3	4	5	6	7	8	8	9	9	10	10	10	11
19	034	Rahmathi Begum	1	1	1	2	3	4	5	6	6	7	8	8	9	10	10
20	035	R. Prashanti	1	2	3	4	5	6	7	8	9	10	11	12	13	13	14
21	041	S. Shilpa	1	2	3	4	4	5	6	7	8	9	9	10	11	12	13
22	045	B. Vaishnavi	1	2	3	4	5	6	6	7	8	9	10	10	11	12	12
23	046	V. Shireesha	1	2	3	4	5	5	6	7	7	8	8	9	10	11	11
24	048	Vadithyavath.	–	–	1	2	3	3	4	5	5	6	7	7	8	9	10
25	049	V. Anitha.	1	2	3	4	4	5	6	7	8	9	10	11	12	13	14

Signature
H.T.R.G.D.C.(W)
Mahabubnagar

NTR GOVT. DEGREE COLLEGE(W), MAHABUBNAGAR

CERTIFICATE OF PARTICIPATION

THIS IS TO CERTIFY THAT SRI./SMT./DR./MS.**B.JAYA LAXMI,** **20033030129006, HEP(E/M)** HAS SUCCESSFULLY COMPLETED THE CERTIFICATE COURSE ON **ARITHMETIC APTITUDE**- ORGANIZED BY DEPARTMENT OF MATHEMATICS WITH THE 90% MARKS.

Counselor
Dr.T.Vijaya laxmi
NTR Govt. Degree College(W)

Dr. K Padmavathi
Principal
NTR Govt. Degree College(W)

Dt: 25-4-2021

The number system

→ The number system which is being discussed in this chapter is Indo-Arabic or Indian system of numbers

In Indian system, any number can be expressed by means of symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9, These symbols are known as digits

All digits except "0" are known as significant digit and "0" is known as insignificant digit

→ A number can be either a single digit number or a combination of two or more digits

→ Representation of a number in the form of figures is called a notation of the number ex: 640, 72, 13 etc

→ Any number which is represented in the form of words is called as a numeration

→ To write a number, to express a number or to perform operations on numbers we should know about the face value and place value of a digit

→ **Rules for Divisibility by Numbers:**

A number is divisible by 2 when the digit at unit place is 0, 2, 4, ex: 3582, 460 ... are divisible by 2

→ A number is divisible by 3, when sum of all digits of a number is a multiple of 3 ex: 453 = 4+5+3 = 12, Here 12 is divisible by 3

→ Dt: 26-5-2021

(Q) In a parking area, the total number of wheels of all the cars and scooters/motorbikes is 100 more than twice the number of parked vehicles The number of cars parked is

(a) 35 (b) 45 (c) 50 (d) 51

Sol:- Let total number of cars parked be x and total number of scooter parked be y, Then total and number of wheels

$= x \times 4 + 2 \times y = 4x + 2y$

and total number of vechicles parked $= x + y$

According to the Question $4x + 2y = 2(x+y) + 100$

$2x = 100 \Rightarrow x = 50$

Q. While Ashok had to do a multiplication, instead of taking 35 as one of the multipliers he took 53, As a result the product went up by 540, what is the new product

(a) 1050 (b) 1590 (c) 1440 (d) None

Ans:- Suppose one of the multipliers be x Then

$$53x - 35x = 540$$

$$18x = 540 \Rightarrow x = 30$$

$\therefore$ New multiplicands $= 30 \times 53 = 1590$

Q. If a piece of rods is 3000 m and we have to supply some lamp-posts, one lamp-post is at each end and distance between two consecutive lamp-posts is 75 m Then find the number of lamp-posts required

(a) 41 (b) 34 (c) 40 (d) 36

Ans:- Number of lamp-posts required $= \frac{3000}{75} + 1 = 40 + 1 = 41$.

~~06-5-2022~~

Percentage :-

In mathematics a percentage is a number or ratio expressed as a fraction of 100 Percentage is an abbreviation for the latin word "per centum"

→ $x\%$ means x per hundred or $\frac{x}{100}$ so any percentage can be converted into fraction simply dividing by 100 ex: $50\% = \frac{50}{100} = \frac{1}{2}$

→ Some Important Conversions:

$5\% = \frac{1}{20}$, $10\% = \frac{1}{10}$, $12\frac{1}{2}\% = \frac{1}{8}$, $15\% = \frac{3}{20}$ $20\% = \frac{1}{5}$, $25\% = \frac{1}{4}$

→ $40\% = \frac{2}{5}$, $50\% = \frac{1}{2}$, $60\% = 3/5$ $70\% = \frac{7}{10}$, $75\% = 3/4$, $80\% = 4/5$

→ If we have to find $x\%$ of y Then

$$x\% \text{ of } y = \frac{x}{100} \times y.$$

→ If 35% of a number is 112 Then the number is

Ans: Let the number be x

Then 35% of $x = 112$

$$\Rightarrow \frac{35}{100} \times x = 112 \quad \Rightarrow x = \frac{112 \times 100}{35} = 320$$

→ (9) candidates in a competitive examination consisted of 60% men and 40% women 70% men and 75% women cleared the qualifying Test and entered the Final Test where 80% men and 70% women were successfull

which of the following is correct

(a) sucess rate is higher for women

(b) overall sucess rate is below 50%.

(c) more men cleared the examination than women

(d) both a and b.

An: Let there are 100 persons in which 60 men and 40 women

Number of men who cleared the qualifying Test $= 70 \times \frac{60}{100} = 42$

Number of women who cleared the Qualifying Test $= 42 \times \frac{4}{5} = 33.6$

Number of women who get sucess in Final Test $= 30 \times \frac{70}{100} = 21$

Here more men cleared the examination than women.

→ A student is required to secure atleast 50% marks in order to pass an examination, he secured 50 marks which were less than the minimum passing marks by 50 the maximum marks of the paper are

(a) 200 (b) 250 (c) 275 (d) 300

An: minimum passing marks $= 50 + 50 = 100$

Let the total marks be x

Then 50% of $x = 100$

$\therefore x = \frac{100}{50} \times 100 = 200$

→ A shopkeeper sells two tubs at 1500 each he earned a profit of 20% on one tube and suffered a loss of 20% on the another tube, Net profit or loss in this deal is

(a) 4% Loss (b) 4% profit (c) 10% Loss (d) 10% profit

An: Here $a = 20$ and $b = -20$

$\therefore$ Profit or loss per cent $= \left(a + b + \frac{ab}{100}\right)\%$

$= \left(20 - 20 + \frac{20 \times -20}{100}\right)\%$

$= -4\%$.

Thus seller losses 4% in the deal.

pt: 6 session

Profit Loss and Discount:

→ Cost Price:- Cost Price of an article or a product is the price at which it is Purchased or it is simply the money paid to buy a Product. (CP)

When a article is purchased at some price and some money is spend both repair or transportation or labour or commission etc, Then these expenses are added to the cost price. Such expenses are called overhead expenses

Actual Cost Price = cost Price + overhead expenses

→ Selling Price:

Selling price of an article or a product is the price at which it is sold or the money obtained after selling the article to other. (SP)

→ Profit or Gain

If the Selling price of an article is more than the cost price of the article Then it is said to a Profit is earned. Thus

Profit = SP − CP (SP > CP)

Problems:-

(a) A man sold an article at a loss of 25%. If he sells the article for Rs 21 more Then he could have got a gain of 10%. The CP of the article is

(a) 56 (b) Rs 84 (c) Rs 60 (d) Rs 92

Ans: Let CP be x Then $\left(\frac{110}{100}x\right) - \left(\frac{75}{100}x\right) = 21$

$35x = 2100$

x = Rs 60

(b) If a person makes a Profit of 10% on 1/4th of the Quantity sold and a loss of 20% on the rest Then what is his average percent Profit or loss ?

(a) 12.5% Profit (b) 11.25% Loss (c) 11.75% Profit (d) 12.5% Loss

Ans:- Let CP be Rs 100 Then

Gain of Rs 25 = $\frac{25 \times 10}{100}$ = Rs 2.50

SP = 25 + 2.50 = 27.50

Loss of Rs 75 = $\frac{75 \times 20}{1000}$ = Rs 15

SP = 75 − 15 = Rs 60

total SP = 27.50 + 60 = 87.50

Loss = 100 − 87.50 = Rs 12.50

Loss percent = $\frac{100 - 87.50}{100} \times 100\%$ = 12.50%

Q) Ram bought 800 eggs, at Rs 3.75 per dozen he sold 450 of them at 2 for Rs 1 and remaining at 5 for Rs 2 His gain %. is ?

(a) 28%. (b) 46%. (c) 36%. (d) 14%.

Ans The total cp $\left(\frac{3.75}{12} \times 800\right) = \left(\frac{375}{1200} \times 800\right) =$ Rs 250

total sp $= \left(\frac{1}{2} \times 450 + \frac{2}{5} \times 350\right)$

$= (225 + 140) =$ Rs 365

Gain $= (365 - 250) =$ Rs 115

Gain percentage $= \left(\frac{115}{100} \times 400\right)\% =$ ~~Rs 0.75~~ $= 46\%$.

~~Dt: 7-5-2022~~

Time & work:

Concept of work and time:

→ It is assumed that, if a person does a work in n days or a pipe fills reservoir in n days Then equal amount of work on each of those days i.e workdone in a day is equal to 1/n.

Also, number of days to complete a work $= \frac{1}{\text{workdone in one day}}$.

→ If a man does a work in 10 days Then workdone in a day by that man $= \frac{1}{10}$

Problem 1

Q) If X, Y and Z can finish a work in 12, 15 and 18 days, respectively Then all Three together can finish that work in how many days ?

(a) $4\frac{32}{37}$ days (b) 5 days (c) $5\ 1/37$ days (d) $5\frac{5}{37}$ days

Ans: Here X's one day work $= 1/12$

Y's " " $= 1/15$

Z's " " $= 1/18$

Their one day work, if working together $= \frac{1}{12} + \frac{1}{15} + \frac{1}{18}$

$= \frac{15+12+10}{180} = \frac{37}{180}$

Hence time taken all to complete the work, working together $= \frac{1}{37/180}$

$= \frac{180}{37} = 4\frac{32}{37}$ days

Q) If A and B together can do a piece of work in 12 days and A alone can do it in 24 days, Then in how many days B alone can do this work

(a) 25 days (b) 24 days (c) 31 days (d) 28 days

Ans: (A+B)'s one day work = $\frac{1}{12}$

A's one day work = 1/24

$\therefore$ B's one day work = $\frac{1}{12} - \frac{1}{24} = \frac{2-1}{24} = \frac{1}{24}$

Here B alone can complete the work in 24 days.

Q. A woman can weave a basket in 6 days but with the help of her daughter, she can complete the work in 4 days, In what time can the daughter alone do the work?

(a) 12 days (b) 16 days (c) 8 days (d) 10 days

Ans) $\because$ woman's 1 day work = $\frac{1}{6}$

$\Rightarrow$ (woman + daughter)' 1 day work = $\frac{1}{4}$

$\therefore$ Daughter 1 day work = $\frac{1}{4} - \frac{1}{6} = \frac{1}{12}$

Here the daughter can do work in 12 days.

Q. A and B can do a piece of work in 45 days and 40 days respectively. They began to do the work together but A left after some days and then B completed the remaining work in 23 days, The number of days after which A left the work is

(a) 7 days (b) 8 days (c) 9 days (d) 10 days

Ans: B's 1 day work = $\frac{1}{40}$

$\therefore$ B's 23 day work = 23/40

Remaining work = $1 - \frac{23}{40} = \frac{17}{40}$

(A+B)' 1 day work = $\frac{1}{45} + \frac{1}{40} = \frac{8+9}{360} = 17/360$

Since (A+B) do $\frac{17}{360}$ work in 1 day

So (A+B) will do $\frac{17}{40}$ work = $\frac{17}{40} \times \frac{360}{17} = \frac{36}{4} = 9$ days

$\therefore$ Required time = 9 days

10-5-2021

Simple Interest :-

If P = Principal, R = Rate per cent per annum, T = Number of years

SI = Simple interest and A = Amount Then,

→ $SI = \frac{P \times T \times R}{100}$ → $R = \frac{100 \times SI}{P \times T}$

→ $P = \frac{100 \times SI}{R \times T}$ → $T = \frac{100 \times SI}{P \times R}$

→ $A = P + SI$

$= P + \frac{P \times T \times R}{100} = P\left(1 + \frac{RT}{100}\right)$

Problems:-

(1) Find SI if P = Rs 1000, R = 20% per annum T = 4 yr

(a) 400 (b) Rs 600 (c) Rs 800 (d) Rs 850

Ans: Here P = Rs 1000, R = 20% and T = 4 yr

$SI = \frac{P \times R \times T}{100} = \frac{1000 \times 20 \times 4}{100} = Rs\ 800$

(2) Find the amount if P = Rs 2460, R = $6\frac{2}{3}$ per annum and T = $3\frac{1}{2}$ yr

(a) Rs 3000 (b) Rs 3034 (c) Rs 2460 (d) None

Ans: Here P = Rs 2460 $R = 6\frac{2}{3}\% = \frac{20}{3}\%$

and $T = 3\frac{1}{2} = \frac{7}{2}$ yrs

$\therefore A = P\left[1 + \frac{RT}{100}\right]$

$= 2460\left[1 + \frac{\frac{20}{3} \times \frac{7}{2}}{100}\right]$

$= 2460\left(1 + \frac{7}{30}\right) = 2460 \times \frac{37}{30} = Rs\ 3034$

Dt: 11-5-2021

→ formula-2

When a sum becomes n times of itself in T yr at a rate of R% per annum

Then $RT = (n-1) \times 100$

$T = \frac{(n-1) \times 100}{R}$

→ A sum of money becomes 4 times in 20 yrs at SI Find the rate of interest

(a) 10% (b) 15% (c) 12% (d) 16%

Ans:- We know that $RT = (n-1) \times 100$

Here $T = 20$ and $n = 4$

$R \times 20 = (4-1) \times 100$

$R = \frac{300}{20} = 15\%$

Formula: when a simple interest on a sum at R% per annum in T yr is $\frac{x}{y}$ of the sum, Then $R = T \Rightarrow T = R = \sqrt{\frac{x}{y} \times 100}$

→ The simple interest on a sum of money is 4/9 of the Principal and the number of years is equal to the rate per cent per annum The rate per annum is

(a) 5% (b) $6\frac{2}{3}$% (c) 8% (d) $7\frac{1}{5}$%.

Ans:- we know that, when interest is $\frac{x}{y}$ times the Principal and number of years is equal to rate per cent

$R = T = \sqrt{\frac{x}{y} \times 100}$ (here $x/y = 4/9$)

$= \sqrt{\frac{4}{9} \times 100} = \frac{2}{3} \times 10 = \frac{20}{3} = 6\frac{2}{3}$%.

(8) A sum of Rs 4000 is lent out in two parts, one at 8% simple interest and other at 10% simple interest if the annual interest is Rs 352, Then the sum lent at 8% is (a) 1600 (b) Rs 2400 (c) Rs 1800 (d) Rs: 2800

Ans:- Let the money interest at 8% interest be Rs: x

Then the money interest at 10% interest = Rs (400 − x)

According to the Question

$$\frac{x \times 8 \times 1}{100} + \frac{(400-x) \times 10 \times 1}{100} = 352$$

$$\Rightarrow 8x + 4000 - 10x = 35200$$

$$4000 - 35200 = 2x$$

$$x = 4800/2 = \text{Rs } 2400$$

~~08/12/2021~~

LCM and HCF

Factors: Any composite number N, which can be expressed as $N = x^a \times y^b \times z^c \times \ldots$, where x, y and z are different Prime Factors of N and a, b, c are positive Integers If a given number can be Factorised upto its prime number Then these factors are called Prime Factors

e.g: 729 has factors 9×9×9 but 3×3×3×3×3×3 are Prime factors of 729

→ Total number of factors of N including 1 and number (N) itself

$= (a+1)(b+1)(c+1)$

e.g: $120 = 2^3 \times 3^1 \times 5^1$

∴ Number of factors = (3+1)(1+1)(1+1) = 4×2×2 = 16

→ **Multiples**

The number X which can be completely divided by a number N is said to be the multiple of N.

ex: multiple of 5 are 10, 15, 20, 25 and 30 etc

Common Multiple:-

A common multiple of two numbers is a number which is exactly divisible by each of the given numbers

ex: 30 is a common multiple of 2, 3, 5, and 6

~~DL 13-5-2021~~

Problem: The LCM of 8, 12 and 15 is

(a) 150 (b) 100 (c) 120 (d) 180

Step 1 writing down the standard form of number factors of 8 = $2\times2\times2 = 2^3$

Factors of 12 = $2\times2\times3 = 2^2\times3^1$

Factors of 15 = $3\times5\times1 = 3^1\times5^1$

Step 2: writing down all the prime factors that appears atleast once in any of the number 2, 3, 5

Step 3: Raise each of the prime factors to the highest available power.

∴ LCM = $2^3\times3^1\times5^1 = 120$.

Problem:- what is the LCM of 36, 48, 64 and 72?

(a) 576 (b) 476 (c) 572 (d) 540

2	36	48	64	72
2	18	24	32	36
2	9	12	16	18
2	9	6	8	9
2	9	3	2	9
3	9	3	1	9
3	3	1	1	3
	1	1	1	1

∴ LCM = 2×2×2×2×2×2×3×3 = 576

Q. The LCM of two numbers is 48, If the numbers are in ratio 2:3 Then find sum of the numbers

(a) 28 (b) 32 (c) 40 (d) 64

Ans: Let the number be $2x$ and $3x$

Then their LCM $= 6x$

However the LCM is given as 48

$6x = 48 \Rightarrow x = 8$

So the number are 16 and 24

Hence their sum is 40

Dt: 17-5-2022

Ratio, Properties, Partnership and Mixture :-

Ratio compares two or more quantities of same kind with each other by method of division.

→ If a and b are two quantity of the same kind Then a/b is known as the ratio of a and b it is clear that the ratio of two quantities is equivalent to the fraction of one quantity to the other

Then a to b is the ratio (a/b), written as $a:b$

→ The first term of the ratio is called antecedent while the second is called consequent

Ratio between 30 kg and 50 kg is 3:5

eg: $4:3$ is the same as $(4\times10):(3\times10)$

$40:30$

Problems :-

Q. total number of students in a class is 95 If the total number of girls in the class is 45 Then the ratio of total number of boys to total number of girls is

(a) 9:10 (b) 7:8 (c) 10:9 (d) 9:11

Ans: Let the total number of boys in the class be x Then

according to the question $x + 45 = 95$

$x = 95 - 45 = 50$

Hence the required ratio of total number of boys to total number of girls $= B : G = 50 : 45 = 10 : 9$

Dt: 18-5-2021

Classification of Ratio's

Ratio's are classified as given below

→ Duplicate ratio: $a^2 : b^2$ is called duplicate ratio of $a:b$

Ex: Duplicate ratio of $6:11$ is $36:121$

→ triplicate ratio: $a^3 : b^3$

ex: $3:5$ is $27:125$

→ sub duplicate ratio: $\sqrt{a} : \sqrt{b}$ is called sub-duplicate ratio of $a:b$

Ex: $25:36$ is $5:6$

→ sub triplicate ratio: $\sqrt[3]{a}, \sqrt[3]{b}$ is called sub-triplicate ratio of $a:b$

$216:343$ is $6:7$

Q) The sum of squares of three numbers is 532 and the ratio of the first to the second and also ratio of the second to the third is $3:2$ what is the second number?

(a) 2 (b) 6 (c) 12 (d) None

Ans: Let the three numbers be a, b and c respectively

Then $a:b = 3:2$

$b:c = 3:2$

$a:b:c = 3\times3 : 2\times3 : 2\times2$

$= 9:6:4$

Dt: 19-5-2021

Q) A bag contains 25 paise, 10 paise and 5 paise coins in the ratio $1:2:3$ if their total value is Rs 60, Then the number of 5 paise coins is

(a) 10 (b) 50 (c) 30 (d) 40

Ans: Let the number of 25 paise, 10 paise and 5 paise coins be x, $2x$ and $3x$ respectively Then

$x + 2x + 3x = 60$

$x = 10$

∴ The number of 5 paise coins $= 3\times10 = 30$

Q) some money is divided amongst three workers A, B and C such that 5 times, A's share is equal to 12 times, B's share which is equal to 6 times C's share, The ratio between the shares of A, B and C is

(a) $5:10:12$ (b) $12:5:10$ (c) $10:12:5$ (d) $5:12:10$

Ans: let $5A = 12B = 6C = K$ Then

$$A = \frac{K}{5}, \quad B = \frac{K}{12} \text{ and } C = \frac{K}{6}$$

$$\therefore A : B : C = \frac{K}{5} : \frac{K}{12} : \frac{K}{6}$$

$$= 12 : 5 : 10$$

(Q) The ratio of expenditure and savings of a person is 26 : 3 if his monthly income is Rs 7250 Then what is his monthly savings?

(a) Rs 290 (b) Rs 350 (c) Rs 750 (d) Rs 780

Ans:- Let the expenditure and savings be $26x$ and Rs $3x$ respectively

Then according to the Question

$$26x + 3x = 7250$$

$$29x = 7250$$

$$x = 7250/29 \qquad x = 250$$

So, his monthly Savings is (250×3) i.e 750

Average:

$$\text{Average} = \frac{\text{Sum of all observations}}{\text{Number of observations}}$$

let $x_1, x_2 \ldots x_n$ be the set of n observations then

$$\text{Average} = \frac{x_1 + x_2 + x_3 + \ldots + x_n}{n}$$

Ex: Average of

$$3, 5, 10 \text{ and } 14 = \frac{3+5+10+14}{4} = \frac{32}{4} = 8.$$

Date 23-5-2021

Problems:-

(Q) find the average of 308, 142, 160, 245 & 25

(a) 176 (b) 178 (c) 175 (d) 174

Ans: Sum of observations $= 308 + 142 + 160 + 245 + 25 = 880$

$$\text{Average} = \frac{880}{5} = 176$$

(Q) A man bought 20 cows in Rs 20,000 if the average cost of 12 cows is Rs 12,500, what will be the Average cost of remaining cows?

(a) Rs 6000 (b) Rs 6150 (c) Rs 6250 (d) Rs 6300

Ans: Total cost of 20 cows = Rs 20,000

and total cost of 12 cows = 12 × 12500 = Rs 15000

∴ total cost of Remaining 8 cows = Rs 20000 − Rs 15000

= 5000

Now Average cost of remaining 8 cows = $\frac{5000}{8}$ = Rs 6250

(Q) A cricketer has a certain average for 10 innings in the eleventh innings he scored 216 runs there by increasing his average by 12 runs find out his new average

(a) 96 (b) 84 (c) 47 (d) 87

Ans:- let average after 10th innings be x

Then according to the Question

$10x + 216 = 11(x+12)$

$10x + 216 = 11x + 132$

$\Rightarrow x = 84$

∴ New Average = 84 + 12 = 96

(Q) The average age of all the members in a family is 25yr, The Average age of males is 30yr while the average age of females is 20yrs. If the number of females in the family is 15, Then findout the number of males

(a) 20 (b) 30 (c) 15 (d) 18

Ans:- Let number of males be x

Then According to the Question

$30x + 15 \times 20 = 25(x+15)$

$5x + 300 = 375$

$5x = 75 \Rightarrow x = 15$

Dt: 24-5-2021

(Q) The average age of ~~all~~ members in a family is 25yr, The ~~average age of~~ Dinesh and mahesh is 16yr, The average age of mahesh and rahul is 13yr and the average age of Dinesh and Rahul is 14yrs Then what is the age of mahesh ?.

(a) 15yr (b) 20yr (c) 58yr (d) 16yr

Ans: Let ages of Dinesh, Mahesh and Rahul be D, M and R respectively. Then according to the question,

$$D+M = 2\times 16 = 32$$

$$M+R = 2\times 13 = 26$$

$$D+R = 2\times 14 = 28$$

on adding eqn (i), (ii), & (iii), we get

$$2(D+M+R) = 86$$

$$D+M+R = 43$$

on subtracting eq (iii) from eq (i), we get-

$$M = 43-28 = 15 yrs$$

(Q) The mean marks of 30 students in a class is 58.5 Later on it was found that 75 was wrongly recorded as 57. find the correct mean

(a) 57.4 (b) 57.5 (c) 58.9 (d) 59.1

Ans:-

$$\text{correct mean} = \frac{30\times 58.5 - 57 + 75}{30}$$

$$= \frac{1755+18}{30} \quad = \frac{1773}{30}$$

$$= 59.1$$

(Q) A car travels the first one third of a certain distance with a speed of 10 km/h The next one-third of distance with a speed of 20 km/h and the last one-third distance with a speed of 60 km/h The average speed of the car for the whole journey is

(a) 18 km/h (b) 24 km/h (c) 30 km/h (d) 36 km/h.

Ans: The total distance be d

First $\frac{1}{3}$rd distance i.e $\frac{d}{3}$ km is covered at speed of 10 km/h

$\therefore$ time taken $= \frac{d/3}{10} = \frac{d}{30}$ h

Second $\frac{1}{3}$rd distance i.e $d/3$ km is covered at speed of 20 Km/h

$\therefore$ time taken $= \frac{d/3}{20} = \frac{d}{60}$ h.

Dt: 25-5-2022

Last $\frac{1}{3}$rd distance i.e $\frac{d}{3}$ km is covered at speed of 60 km/h

$\therefore$ time taken $= \frac{d/3}{60} = \frac{d}{180}$ h

average speed = $\frac{\text{total covered distance}}{\text{total taken time}}$

$$= \frac{d/3 + d/3 + d/3}{d/30 + d/60 + d/180}$$

$$= \frac{3d/3}{\frac{6d+3d+d}{180}}$$

$$= \frac{3d \times 180}{3 \times 10d} = \frac{180}{10}$$

So average speed = 18 km/h.

(q) The average temp of the first three days of the week is 25°c and that of the next three days is 27°c if the Average of the whole week is 26.5°c Then the temp of the last day of a week is

(a) 31.5°c (b) 29.5°c (c) 21°c (d) 27.5°c

Sol:- Let the temp on the last day of the week be x°c

Then according to the Question

$$\frac{3 \times 25 + 3 \times 27 + x}{7} = 26.5$$

$$= 3 \times 25 + 3 \times 27 + x = 7 \times 26.5$$

$$156 + x = 185.5$$

$$x = 29.5$$

So the Temperature on the Last day of the week is 29.5°c.

(13) Mumbai gets wheat from different regions if it gets 1200 kg from Nasik at the rate of 30 per kg, 1500 kg from Rajasthan at the rate of 25 per kg and 2000 from Kolhapur at the rate of Rs 32 per kg Then find the average cost of wheat Procured by mumbai

(a) Rs 29 per kg (b) Rs 29.25 kg

(c) 29.50 per kg (d) Rs : 29.75 per kg

Sol:- Since, The Quantities Procured from various regions are different
The weighted average of the cost is to be found

$$\text{weighted average cost} = \frac{w_1x_1 + w_2x_2 + w_3x_3}{1200 + 1500 + 2000}$$

$$= \frac{137500}{4700}$$

$$= 29.25 \text{ per kg.}$$