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Experiment No. 01 Date : 08 09 25

Just a Minute

Abstract :

Just a minute is an activity that uses extempore speaking. speaking skills from the base for selection in interviews and carrer development extempore speaking is possible with good communication skill and knowledge in the specific content. The flow of speach is enabled through fearless and clear presentation.

Aim :

To develop quick thinking together will good speaking good grammar appropirate use of words, using the right words.

Materials : Stopwatch, worksheet

Procedure :

Step 1 : A list of topics for the speach is prepared

Step 2 : The Chosen Speaker is asked to pickup a number and the topic is calloted randomly

Step 3 : The choose speaker is given one minute to talk on a topic choosen by instructor

Step 4 : The speach is presented and the duration is measured by 20 using stop watch.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

step 5 : The speech is crualated on following basis

Content :

The speach should be relavant to the topic and appropirate contents has been presented.

Repetition :

The content of the speach should not be repeated more than one time.

Hesitation :

The speech should be presented without any hesitation. A pause for more than 2 seconds is considering of a sign of hesitation

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Experiment No. 10 | Date : 15 09 25

Seminar with PPt's

Abstract :

A seminar may be defined as a gathering of people for the purpose of discussing a static topic. It is an interactive session where the presenter answers the question of audiance and the instructor

Aim :

The purpose of the seminar is to present the contents on a spefic topic efficiently using the technology.

Procedure :

step 1 : The topics are alloted for the particpant randomly

step 2 : The instructions are given on presentation of Powerpoint presentation. The PPt needs to contain 5 slides

step 3 : The seminar presentation are prepared by the Participents and suitable recommandations are made by the instructors

step 4 : The participant presents the seminar with PPt

step 5 : Questions are posed by the audiance and the instructors at the end of presentation

step 6 : The instructors evulates the presentation and provides feed back.

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Experiment No. 20 | 12 Date : 15 | 09 | 25

Employement Communication

Abstract :

Resume is used to apply for job interviews based on which call letteres are send to candidate. The Resume should convience the Employer to interviewer for a Particular position by demonstrating the revalent qualification. It describes the qualrfication for particular Position in easily readable format

Aim :

The purpose of Resume preparation to create impressive resume for a fresher applying for a particularly Position.

Materials : Any sheet

Procedure :

Step 1 : The participants are presented with different formats for desume

Step 2 : The participants should analyze the skills, knowldge and accomplish by making a list of project Experience, qualrfeation and activites

Step 3 : The participants should prepare Carrer goal Statement.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Step 4 : Prepare a draft of the resume, consider the following headings.

Carrer Objective :

This is a brief statement of the type of Position

Education :

List of colleges you attended and degrees you recived / scored.

Skills :

Include information realted to your strongest skills (or) those most perminant to the job you are speaking popular skills include softskills and Technical skills.

Other information :

There is no limit to the no.of sections you may include on your resumes but keep yolld resume 2(or) 1 pages

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Include : Additional heading such as activities, Presentation, intrest, honors awards.

step 5 : The instructor gives the feed back

step 6 : The Resume is improved further and completed.

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Experiment No. 3.2 Date : 22 09 25

Team Building

Abstract :

Team Building is a collective term for various types of activities used to enhance social relation and define roles with the team. It involves collaborative tasks. Team building Excersices expose and address the importance of interpersonal realtionship

Aim :

The purpose of the team building excersice is to learn the method of achieving the group goals as a team, building effective interpersonal relationship, reducing team conflict and finding solutions to team problems

Materials :

Newspapers

Procedure :

step 1 : participants are divided into teams that consists of 6-8 members

step 2 : The participants of given instructions on building the tallest tower only with the limited resources of newspapers with in the given time. The rule is that the tower should stand on the ground atleast for 5 seconds at the end of the activity.

Experiment No. [ ][ ] Date : [ ][ ][ ][ ][ ][ ]

Step 3 : The team starts building the tower modifications are allowed.

Step 4 : The final tower built is displayed to the instructor and the other participants.

Step 5 : The team that has built is displayed to the tallest tower that stands for 5 seconds in on ground is declared as the winning team.

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Experiment No. [ ][ ] Date : 22 09 25

Creativity

Abstract :

Creativity is the use of imagination or original ideas to create something. It is the process of thinking out of the box creativity exercises and activities improve the creative skils which are requried for carrer development.

Aim :

The purpose of activity is to make the participants come up with the new ideas when trying to develop or improve a product or service.

Materials :- Worksheet

Procedure :

step 1 : The participants are divided into terms

step 2 : The creative brain stroming technique, Scamper is explained to all the participants.

step 3 : An exsiting product or services is assigned to each team to improve upon it.

step 4 : The team discuss the improvements based on scamper principle

step 5 : The creative ideas of the terms are presented by a representative from each team

step 6 : The Instructor gives feedback on the team idea.

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Experiment No. 10 2 Date : 29 09 25

Role play

Abstract :
Role play is a technique that allows students to explore realstic situation by interacting with each other people in a managed way in order to develop experience and trail different strategies in a supported enivornment

Depending on the intention of the activity Participants might be playing a rock similar to their own or could play the opposite part of conversation or interaction

Aim :
The purpose of the role play is to develop the skills of problematic intstactions that may be encountered during the casrer progress. It hep to develop the way of thinking and Empathy

Materials : worksheet

Procedure :

step 1 : Divide the participants into terms
step2 : Each team is given particular role play in a Conversation
step3 : Instructions are given how to act and what to say
step4 : The team member plan for senario by assigning roles writing elialogue and Particing
step 5 : The participants will then act out the senario
step 6 : The Instructor provides the feedback on the roll play.

Experiment No. 2.3 Date : 29 09 25

Time mangement

Abstract :

Time management is the act or process and excering concious control over the amount of time spent on specific activities, espically to increase effiectiveness, efficiency.

Aim :

Time Management helps the students to learn about how to complete a given task in a specfic time frame amidst challenges and tight schedules.

Introduction :

It's organizing, planning how we need to divide our task. A person who does good time management will be in lower stress and greater carrer ahead. Some of the most importance skills related to successfull time management includes :

1. Organisation
2. prioritisation
3. Goal setting
4. Communication
5. Planning
6. Deligation
7. stress Management
8. Flexibility

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Activity conducted to improve time management skills :

How long is one minute, this one is simplest time management training activities, yet a very effective one. It is particular thinking about time.

Materials :

For this activity, you will just need a time keeping device so you know when 1 min has Passed.

Procedure :

step 1 : As participants to standup and close their eyes.

step 2 : Then ask them to sit down quikly {so that the other participants near them] when they think that one minute has gone.

Step 3 : Once every body has sent down, you start the discussion what will happen is that participants will sit down at different time. so, you can point out to them that time depends heavily on

Experiment No. Date :

Perception. By asking participants when time goes faster for seems to task, you can introduce them the idea that person, passion, time and productivity are connected.

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Experiment No. 3.1 Date : 29 09 25

Group Discussion

Abstract :

Group Discussion are a very important ascept of group Communication. Group Discussion are a creative and dynamic activity which stimulates reflective thinking among the members.

Group Discussion may be defined as an activity in which a small number of persons meet face to face and exchange ideas freely.

Aim :

Group Discussion is an important part of MCA selection process. GD topics of MCA includes topics on courrent affairs and even abstract topics to check the creativity of college students.

Material :

Worksheets

Procedure :

Step 1 : The participants are divided into groups

Step 2 : The topics are assigned to each group

Step 3 : A preparation time of 3 to 5 mins is allowed to participants.

Step 4 : The group has to commonse the discussion

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Step 5 : The Instructors observers and evulates the Performance of the participants

Step 6 : Feed back is provided by the instructors

Do's and Dont's of GD :-

* Maintain an accuirate Posture, sit straight and confidently.
* Be natural, Be yourself
* Gather your throughts, evulate the pros and cons of the given subjects and the speak.
* The candidate who initates the conversation, mostly leaves a goal impression on the examiner
* Learn to choose words widely
* Eye contact is a must
* When the other Particpats speaks, keep nodding your head, it shows receptivity
* In order to express a throughs, use real real life, examples, experiences, quotes, facts etc.,

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Experiment No. 3.2 Date : 29 09 25

Mock Interviews

Abstract :

A MOCK interview is one of the very best way to Prepare for an acutal employement interview. The mock interview focuses on how well the candidates known about the industry company and how well can convey the information about self. The mock interview is a self place to pratice your interview skills and gain feedback.

Aim :

The purpose of Mock interviews is to prepare for the interview and to improve upon the skills requried to woin over the interview. It help to reduce the stress of attending interview; boosts confidence and provides constructive feed back. It also provides a frame work to prepare for behavioural based interview questions

Materials :

Worksheets

Procedure :

step 1 : The Instructor gives tips on how to attend the interview effectively.

step 2 : The participants prepare for the mock interview with a preplan for resume,

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

dressing attire, communication and body language.

Step 3 : Mock interview is conducted by the instructor/ resource person for the speific part

Step 4 : Immediate feedback and points to improve is provided to the participant by the interviewer.

Experiment No. 4.1 Date : 06 10 25

Number System

Number system :

Complex numbers

R = Real numbers

Z = Integers

$Q = \frac{P}{q}$, $q \neq 0$

W = whole numbers

Natural numbers

N = 1, 2, 3 .... ∞

0

Rational numbers

$Q^1 = \sqrt{2}, \sqrt{3}$ ...

Π ....

Irrational Numbers

I - Imagnary numbers

$i = \sqrt{-1}$

$= \sqrt{-3}$

$-\infty$ - .... -3-2-1

Prime numbers :

A number which has two factors and divisble by 1 and itself is called a prime numbers.

Factors :

If $N = p^a q^b r^c$, where p, q, r are primes then number of factors of $N = (a+1)(b+1)(c+1)$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Divisibility rule :

for 2 : The given number must be even
for 3 : Sum of the digits of the given number must be divisble by 3
for 4 : A number formed by the last 2 digits must be divisible by 4
for 5 : units must be '0' & '5'
for 6 : The given number must be divisible by 2 and 3
for 7 : Operators = 2 ; operation = -
for 8 : A number formed by the last 3 digit must be divisible by 8.
for 9 : sum of digit must be divisible by 9.
for 10 : units place must be zero
for 11 : The difference between sum of digits in the even places and odd placess must be divisible by 11
for 12 : The number must be divisble by 3 and 4
for 13 : operator = 4 ; operation = +
for 14 : Number must be divisible by both 2 and 7
for 15 : Number must be divisible by both 3 and 5
for 16 : A number formed by the last 4 digits divisble by 4.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

for 17 : Opereator = 5 ; opereation = Substraction
for 18 : Must be divisible by both 2 and 9
for 19 : operator 2, operation = addition
for 20 : A number must be divisible by 4 and 5

1. 6, 14, 36, 98, ?

A) 276, B) 275 C) 220 D) 274

Ans : A

Explanation :

$6 = 1^1 + 2^1 + 3^1$

$14 = 1^2 + 2^2 + 3^2$

$36 = 1^3 + 2^3 + 3^3$

$98 = 1^4 + 2^4 + 3^4$

Thus the next number will be

$1^5 + 2^5 + 3^5 = 276$

2. 4, −8, +16, 32, 64, ?

A) 128 B) −128 C) 192 D) −192

Ans : B

Explanation :

Each number is the processing number multiplied By −2 so the required number is −128.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

3. N is the Smallest number that has five factors. How many factors does $(N-1)$ have ?

Ans : $N-1$ has 4 factors.

Explanation :

$=5 ⇒ $N has five factors which is the smallest number $(N-1) ⇒ (5-1) = 4 factors

4. which of the following number will completely divide $(4^{61} + 4^{62} + 4^{63} + 4^{64})$

Ans : $(4^{60} * 340)$ which divides By 10

Explanation :

$(4^{61} + 4^{62} + 4^{63} + 4^{64}) = 4^{61}(1 + 4 + 4^2 + 4^3) ⇒ 4^{60} + 4 * 85$

$= 4^{60} + 4 * 85$

$= 4^{60} * 340)$

which is divided by 10

5. If $\sqrt{15} = 3.88$ then what is the value of $\sqrt{5}/3$.

A) $\sqrt{19}/2$ b) $\sqrt{20}/2$ c) $\sqrt{15}/3$ D) $\sqrt{16}/3$

Ans = $\sqrt{15}/3$

Explanation :

$\sqrt{5}/3 = \sqrt{5 \times 3}\sqrt{3 \times 3} = \sqrt{15}/3$

6. A Box Contain 140 Icecreams 30% of which are strawberry two-seveths are choclate 5% are mangoes are the rest of venila. How many icecreams are vennila flavored

A) 14 B) 49 C) 25 D) 51

GOPI

Ans : 51

Explanation :

No. of strawbeery Ice creams = 140

30% of strawbeery = 30/10 * 140 = 42

Chocolate icecreams = $\frac{2}{7}$ of 140 = $\frac{2}{7}$ * 140 = 40

Mango icecreams = 5% of 140 = 5/100 x 140 = 7

No. of venila = 140 − (42+40+7) = 51

7) How many 3 digit numbers are divisible by 6 in all

A) 149 B) 150 C) 151 D) 166

Ans :

B

Explanation :

Required number are 102, 108, 114 996

This is an A.P which a = 102, d = 6, and l = 996

$a + (n-1)d = 996$

$102 + (n-1) \times 6 = 996$

$6(n-1) = 894 \Rightarrow n-1 = 149 \Rightarrow n = 150$

8). How many natural numbers are three Betwem 23 and 100 which are exactly divisble By 9 ?

Ans :

13

Explanation :

Required numbers are 24, 30, 36, 42.... 96 this is an A.P which a = 24, d = 6 and l = 96

Let the no. of terms int be n then

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

$t_n = 96$

$a+(n-1)d = 96$

$24 + (n-1) \times 6 = 9 \Rightarrow 6(n-1) = 12 \quad = n-1 = 12$

$n = 13$

9). $1397 \times 1397 = ?$

Ans. $= (1397)^2$

$= 1951609$

Explanation :

$(1397)^2 = (1400-3)^3 = (1400)^2 + 3^2 - (2 * 1400 \times 3)$

$= 196000 + 9 - 8400$

$= 196009 - 8400$

$= 1951609$

10). The least number which divided by 12, 15, 20 and 54 leaves in each case a remainder of 815

Ans. 548

Explanation :

Required number = LCM of (12, 15, 20, 54) + 8

$= 540 + 8 = 548.$

11). It is being given that $(2^{32}+1)$ is completly divisble by a whole number. which of the following number is compleetely divisible by this numbers ?

A) $(2^{16}+1)$ B) $(2^{16}+1)$ C) (7×2^{23}) D) $(2^{96}+1)$

GOPI

Ans. D) (29^6+1)

Explanation:

let $2^{32}=x$, Then $(2^{32}+1)=x+1$

let $(x+1)$ be completely divisble by the natural number N

Then $(2^{96}+1)=[(2^{32}+1)=x^3+1]$

$(x+1)$ (x^2x+1) which is completely divisble By N. since $(x+1)$ is divisble by N.

12). The price of 250gm of Mango's is 7.50 what is the price of 5kg of mangas

Ans = 150

Explanation:

$250gm = \frac{250}{100} = 0.25g$

Price of 0.25kg of Mangoes = RS. 750

Price of 1kg of Mangoes = (7.50/0.25)

Price of 5kg of Mangoes = 30 * 5

= 150

13) The convere? 137 into Binary number

Ans. 10001001

2 | 137
2 | 68-1
2 | 34-0
2 | 17-0
2 | 8-1
2 | 4-0
2 | 2-0
1

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

14. The 6 digit no. of 543221 A is divisble by 9, where A is single digit whole no find A.

Ans : 3

Explanation :

sum of the given numbers is divisible by 9

So $(5+4+3+2+1+A)/9$

$15+A$ is divisble by 9

place $A=3$ then $15+3=18$

since, 18 is divisble by 9, the solution for the value of A is 3.

Experiment No. 4.2 Date : 06 10 25

Fractions

- Proper fractions :

  In $\frac{a}{b}$, if $a<b$, then it is called a proper fraction

  Ex : $\frac{2}{5}, \frac{3}{6}, \ldots$

- Improper fractions :

  In $\frac{a}{b}$ if $a>b$, then it is called an Improper fraction

  Ex : $\frac{3}{2}, \frac{6}{5}, \ldots$

1. If $13+23+\ldots\ldots+93 = 2025$, the value of $(0.11)^3+(0.22)^3+\ldots$ $\ldots+(0.99)^3$ is close to

Sol. $=(0.11)^3+(0.22)^3+\ldots+(0.99)^3$

$=(0.10)^3+(0.22)^3+\ldots\ldots+9^3$

$= 0.001331 \times 2025$

$= 2.695275$

$= 2.695$

2. The value of $(0.96)^3-(0.1)^3$ is ?

Sol. $=(0.96)^2+(0.096)+(0.1)^2$

$= a^3-b^3 \quad (\because a^2+ab+b^2)$

$= a-b$

$= 0.96-0.1$

$= 0.86$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

3. Bean has a price of wood that is 3/4 of a foot in lengeth he needs to cut pieces that are 1/6 of a foot long .How many pieces can dean cut.

Sol. $\frac{3}{4} / \frac{1}{16} \Rightarrow \frac{3}{4} \times \frac{16}{1} \Rightarrow \frac{48}{4} \Rightarrow 12$ Pieces

4. The price commonly x increases By 40 paise every year, while the price of Commodity x increases By 15 Paise every year. If in 200 the price of commodity year Commodity x will cost 40 paise more than the Commodity.

sol. Suppose commodity x will cost 40 Paise more than x after 'z' years

then $(4.20 + 0.40z) - (6.30 + 0.16z) = 0.40$

$0.25z = 0.40 + 2.10$

$z = 2.50/0.25 = 10$

5. Find the sum of the largest and smallest fraction on 3/7, 11/13, 6/11, 7/8, 5/9.

sol. Given fractions are

$\frac{3}{7} = 0.428$; $\frac{11}{13} = 0.846$; $\frac{6}{11} = 0.545$; $\frac{7}{8} = 0.875$;

$\frac{5}{9} = 0.555$.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

In decimal 0.875 is largest and 0.428 is smallest fraction now, required sum $= (\frac{7}{8}) + (\frac{3}{7})$

$= ((7\times7)(8\times7) + (8\times8)(7\times8))$

$= (49/56) + (24/56)$

$= 73/56$ of $117/56$

6. 0.09 / ? = 0.01

Sol. Let $0.09/x = 0.01$

$x = 0.099 / 0.01$

$= 0.9/1 = 0.9$

$\frac{0.009}{0.9} = 0.01$

7. An Integer is 10 more than its one third part the integer is

Let Integer, be m

$m - \frac{m}{3} = 10$

$m = 15$

8. 3889 + 12.952 ? = 3854.002

A) 47.095 B) 47.752 C) 47.932 D) 47.95

Sol D) 47.95

Explanation :- Let $3889 + 12.952 - x = 3854.002$

Then $x = (3889 + 12.952) - 3854.002$

$= 3.901.952 - 3854.002 = 47.95$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

9. A trailer has 37.5 meters of cloth and he has to make 8 pieces out of a meter of cloth how may Pieces can be make out of this cloth.

sol. length of each piece $= (\frac{1}{8})m$

$= 0.125m$

Requried number of pieces $= (37.5/0.125)$

$= (370 * 100/125)$

$= 300$

10. which of the following fractions in greater than $\frac{3}{4}$.

Ans. 4/5

So Explanation

$\frac{3}{4} = 0.75$, $\frac{5}{6} = 0.833$, $\frac{1}{2} = 0.5$, $\frac{2}{3} = 0.66$, $\frac{4}{5} = 0.8$, $\frac{9}{10} = 0.9$

Clearly 0.8 lies between 0.75 and 0.833 4/5 lies b/w 3/4 and 5/6

11. How many digits will be there to the right of the decimal point in that product of 95.75 and 0.025541

Ans - 6

Explanation:

Sum of decimal places = 7

since the last digit to the extreme right will

be zero so there will be significant digit to the right of the decimal right.

12. If $(\frac{1}{3} \cdot 718) = 0.2689$ then find the value of $(\frac{1}{0} \cdot 00^{\circ}3718)$

Ans. 2689

Explanation : $(\frac{1}{0} \cdot 0003718) = (10000 / 3.718)$

$= (10000 * (\frac{1}{3} \cdot 718))$

$= (10000 * 0.2689)$

$= 2689$

13. Arrange the fractions $\frac{5}{8}, \frac{7}{12}, \frac{13}{10}, \frac{16}{29}, \frac{23}{99}$ in ascending order of magnitude

Ans. $\frac{16}{29} < \frac{7}{12} < \frac{5}{8} < \frac{3}{9} < \frac{13}{16}$

Explanation :

converting each of the given fractions into decimal form we get $\frac{5}{4} = 0.625$, $\frac{7}{12} = 0.5833$, $\frac{13}{10} = 0.8125$,

$\frac{16}{9} = 0.5517$, $\frac{3}{4} = 0.75$

so, $\frac{16}{29} < \frac{7}{12} < \frac{5}{8} < \frac{3}{9} < \frac{13}{16}$

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Autonomous

CHITTOOR.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

14. Convert 0.0155 into fractions.

A) 21/2900 B) 17/2700 C) 23/3500 D) 31/2000

Explanation :

The Decimal form = 0.0155

write it as a fraction = 0.155/1000 (01)

155/10000

To simply 155/1000 to its lowest term find LCM (least Common Multiple) for 155 & 1000

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Experiment No. 4.3 Date : 06 10 25

Simplifcation, Square roots, Avereages

Simplifications :-

BBODMAS

B - Bar

B - Brackets

O - of

D - Division

A - Addition

S - Subtraction

Pascal's triangle :

$1 \longrightarrow (a+b)^0$

$1\ 1 \longrightarrow (a+b)^1$

$1\ 2\ 1 \longrightarrow (a+b)^2 = a^2+b^2+2ab$

$1\ 3\ 3\ 1 \longrightarrow (a+b)^3 = a^3+3a^2b+3ab^2+b^3$

$1\ 4\ 6\ 4\ 1 \longrightarrow (a+b)^4 = a^4+4a^3b+6a^2b^2+4ab^3+b^3$

$1\ 5\ 10\ 10\ 5\ 1 \longrightarrow (a+b)^5 = a^5+5a^4b^2+10a^3b^2+10a^2b^3+5b^4+b^5$

$(a+b)^n = ((10)^n)a^nb^0 + (1)^n a^{n-1}b^1 + (a^1)\,a^{n-2}b^2 + \ldots\ldots$

1. The value of $60 \div (2\times6) + 5\times2^3 - 15$ equal to

A) 49 B) 36 C) 31 D) 61

Formula : order of opereation (PEMDAS/BOBMAS) :

PEMDAS : Parenthesis / Brackets, Exponial / orders,

Experiment No. Date :

Multiplication and Division (left to right). Add & sub (left to right)

⇒ $60 \div (2 \times 5) + 5 \times 23 - 15$

⇒ $60 \div (10) + 5 \times 23 - 15$

⇒ $6 + 5 \times 8 - 15$

⇒ $6 + 40 - 15$

⇒ $46 - 15$

⇒ 36

2. $\frac{5^2+15}{8} + 3 \times 6 - 2$ of 3 is equal to

A) 29 B) 27 C) 32 D) 17

$= (52 + 15) / 8 + 36 \times 6 - 2$ of 3

$= 40/8 + 3 \times 6 - 2$ of 3

$= 5 + 3 \times 6 - 6$

$= 17$

3. The value of $\sqrt{\sqrt{1600} + \sqrt{81}}$ is equal to

A) 40 B) 9 C) 7 D) 49

$= \sqrt{1600} = 40$

$= \sqrt{81} = 9$

$= \sqrt{40+9} = \sqrt{49}$

$= 7$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

4. What is the value of $12\frac{1}{2} + 12\frac{1}{3} + 12\frac{1}{6}$?

A) 36 B) 37 C) 39 D) 38

$\Rightarrow 12\frac{1}{2} + 12\frac{1}{3} + 12\frac{1}{6}$

$\Rightarrow \frac{25}{2} + \frac{37}{3} + \frac{73}{6}$

$\Rightarrow ((75+74)+73)/16$

$= \frac{222}{6}$

$= 37$

5. Find the value of x

$2^3 \times 3^4 \times 1080 \div 15 = 6^x$

A) 4 B) 6 C) 8 D) 2

$2^3 \times 3^4 \times 1080 \div 15 = 6^x$

$\Rightarrow 2^3 \times 3^4 \times 72 = 6^x$

$\Rightarrow 2^3 \times 3^4 \times (2 \times 6^2) = 6^x$

$\Rightarrow 2^4 \times 3^4 \times 6^2 = 6^x$

$\Rightarrow (6)^4 \times 6^2 = 6^x$

$= 6^{(4+2)} = 6^x$

$= 6^6 = 6^x$

$\boxed{x = 6}$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

6. Given expression $(81.84+118.16)\div 5^3 = 1.2\times 2+ ?$

A) 0.8 B) -0.8 C) 0.6 D) -0.8

$(81.84+118.16)\div 5^3 = 1.2\times 2+ ?$

$200\div 5^3 = 1.2\times 2 + ?$

$200\div 125 = 1.2\times 2+ ?$

$1.6 = 2.4 + ?$

$1.6-2.4 = ?$

$? = -0.8$

Square Roots :-

$1^2 = 1$
$2^2 = 4$
$3^2 = 9$
$4^2 = 6$
$5^2 = 5$
$6^2 = 6$
$7^2 = 9$
$8^2 = 4$
$9^2 = 1$

Units place	Squares
1	1.9
4	2.8
9	3.7
6	4.6
5	5
0	0

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Cube roots

$1^3 = 1$

$2^3 = 8$

$3^3 = 7$

$4^3 = 4$

$5^3 = 5$

$6^3 = 6$

$7^3 = 3$

$8^3 = 2$

$9^3 = 9$

$2 \leftrightarrow 8$

$3 \leftrightarrow 9$

1. The cube root of .000216 is

A) 6 B) 0.6 C) 77 D) 87

$$(.000216)^{1/3} = \left[\frac{216}{10^6}\right]^{1/3} = \left[\frac{6\times6\times6}{10^2\times10^2\times10^2}\right]^{1/3} = \frac{6}{10^2} = \frac{6}{100}$$

$= 0.06$

2. The least perfect square, which is divisible by each of 21, 36, 66 is ....?

A) 213444 B) 214344 C) 214434 D) 231444

LCM of 21, 36, 66 = 2772

Now, $2772 = 2\times2\times3\times3\times7\times11$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

To make it a perfect square, it must be multiplied by $7\times11 = 2^2\times3^2\times7^2\times11^2 = 21344$

3. The square root of $(7+3\sqrt{5})(7-3\sqrt{5})$ is

A) $\sqrt{5}$ B) 2 C) 4 D) $3\sqrt{5}$

$= \sqrt{(3\times3\sqrt{5})(7-3\sqrt{5})}$

$= \sqrt{(7+3\sqrt{5})(7-3\sqrt{5})}$

$= \sqrt{(7)^2-(3\sqrt{5})^2}$

$= \sqrt{49-45}$

$= 4$

4. If $a = 0.1039$ then the value of $\sqrt{49^2-4a+1+3a}$ is

A) 0.1039 B) 0.2078 C) 1.1039 D) 2.1039

$\sqrt{49^2-49+1+3a} = \sqrt{(1)^2+(2a)^2-2\times1\times2a+3a}$

$= \sqrt{(1-2a)^2+3a} = \sqrt{(1.2a)^2+3a}$

$= (1-2a)+3a$

$\Rightarrow 1-2a+3a = 1+a$

$= (1+0.1039)$

$= 1.1039$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Averages :

Case -1 :

Group - I
Qty = 5 kg
Avg
amt = Rs 100

Total
$ma = 5 \times 100 = 500$

Group - II
Qty = 10 kg
avg
amt = Rs 50

Total
$nb = 10 \times 50 = 500$

Qty = 15 kg
Avg = 500 + 500
$= ma + nb$

$Avg = \frac{1000}{5}$ → $\frac{ma+nb}{m+n}$

Case - II

Group I
Qty = 15 kg
avg cost =
Rs-50/Per kg

Group - II
Qty - 5 kg
Avg cost
RS = 150 per kg

Qty = 15 - 5
$= m - n = 10$
Remaining cost
$= ma - nb$
$= 1500 - 750$
$= 750$

$\frac{750}{10} = 75$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Average speed

→ Same distance

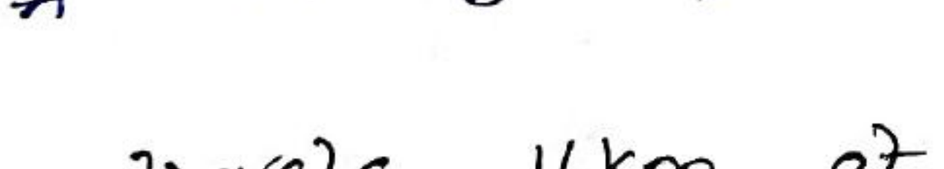
avg speed

$\Rightarrow \frac{2S_1 S_2}{S_1+S_2}$

S_1 = speed

A ← B

→ Different speed avg speed = $\frac{S_1 S_2 (d_1+d_2)}{S_1 d_2 + S_2 d_1}$



1) Anu travels 16km at an avg speed of 5km/h while the remaining 34 km is convered by her at an avg speed 10km/h. What is Anu's average speed during the entire journey

A) 159 25/19 km/h B) 150/19 km/h C) 250/33 km/h D) $\frac{150}{n}$ km/h

Average speed = $\frac{\text{Total distance}}{\text{Total time}}$

$T_1 = \frac{16}{5}$ $T_2 = \frac{34}{10}$

Total time = $\frac{16}{5} + \frac{34}{10} = \frac{66}{10}$

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Total distance = 16+34 = 50km

Avg speed = $\frac{50}{66/10}$

$= 50 \times 10/66 \Rightarrow \frac{250}{33}$ km/h

2) A man walking at the speed of 12km/h covers a certain distance in 2hours and 45 minutes. If he covers the same distance by cycle in 3hrs. What is the speed of cycle.

A) 15km/h B) 9km/h C) 11km/h D) 8km/h

Distance = Speed x Time

$Speed = \frac{Distance}{time}$

Distance covered by walking = 12km/hr x 275 hrs

Speed of the cycle = $\frac{Distance}{time}$

speed of the cycle = $\frac{33km}{3hrs}$

Speed of the cycle C = 11km/hr

3. A man travels from A to B at a speed of 36km/hr in 74 minutes and he travels a distanee from B to C with a speed of 45km/h in 111 minetes. Find the avg speed of whole journery.

A) 41.4 km/hr B) 39.8 km/hr C) 40.8 km/hr D) 36.2 km/hr.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

A. Time taken = 74min : 111 min

ration of time taken = 2:3

$$\text{Avg speed} = \frac{36 \times 2 + 45 \times 3}{2+3}$$

$$\text{Avg speed} = \frac{207}{5}$$

Avg = 41.4 km/hr

4. one person travels on through the sides of an equliteral triangle at a speed of 12km/h, 24kmph and 8kmph. Find the avg speed of it (In kmph)

A) 14 B) 13 C) 12 D) 4

$$\text{Average speed} = \frac{\text{Total Distance}}{\text{Total Time}}$$

$$12\text{kmphr} = \frac{x}{12\text{hrs}}$$

$$24\text{kmph} = \frac{x}{24\text{hr}}$$

$$8\text{kmph} = \frac{x}{8\text{hr}}$$

Total distance covered the distance $= (x+x+x) = 3x$

$$= \left(\frac{x}{12} + \frac{x}{24} + \frac{x}{8}\right)$$

$$\text{Avg speed} = \frac{3x}{\frac{x}{12} + \frac{x}{24} \times \frac{1}{8}}$$

$$\Rightarrow \frac{3x}{\frac{x+2x+3+}{24}} \Rightarrow \frac{3x}{(6x/24)} \Rightarrow \frac{1}{2} \times 24 \Rightarrow 12\text{kmph}$$

Experiment No. 4.5 Date : 6.10.25

Rations and Proportions

Ratio :

A ratio is a way to compare two (or) more quantities of the same kind

The ratio can be represented in three different from such as

→ a to b
→ a ÷ b
→ a/b

Proportions :

Proportions is an equations that defines that the two given rations are equilent to each other

Proportions are denoted by symbol ':::' (or) '='

Ex : a/b = c/d (or) a:b::c:d

Compound Ratio :

A compound ratio is a method for comparing two (or) more ratios by multiplying the antecedents and consequents of the ratios :

The compound ratio of two ratios m:n and p:q is mp : nq

mean proportions :

→ The mean proportions of two numbers is the square root of product of 2 numbers.

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

→ The mean proportion : $\sqrt{pq}$

Problem :

1) If a:b = 5:9 and b:c = 7:4 then find a:b:c
we should have the common term 'b' equal in both ratios

→ so, we multiply the first ratio by 7 and the second ratio by 9

a:b = 35:63 and 6:c = 63:36

a:b:c = 35:63:36.

2) Divide Rs.981 in ratio 5:4

Given ratio is 5:4

Sum of numbers in ratio = 5+4 = 9

we divide Rs.981 into 9 parts

$$\frac{981}{9} = 109$$

Rs.981 in ratio 5:4 = (5x109) : (4x107) = 545 : 436

3) If 18:13.5 :: 16:x and (x+y):y :: 18:10, then what is the value of y

18:13.5 :: 16:x

18 * x = 13.5 * 6

Experiment No. Date :

$X = (13.5 * 16)/18$

$x = 12$

Now, $(x+y) : y :: 18 : 10$

$(12+y) : y :: 9 : 5$

$5(12+y) = 9y$

$60 + 5y = 9y$

$4y = 60$

$y = 15$

4. Mr. John divides Rs. 1573 such that 4 times the 1st share, thrice the 2nd share and twice the third share amount to the same. Then the value of the 2nd share is.

Let share of A, B & C is A : 3B : 2C

$A : B : C = \frac{1}{4} : \frac{1}{3} : \frac{1}{2} \Rightarrow 3 : 4 : 6$

The value of 2nd share $= \left(\frac{4}{13}\right) \times 1573 =$ Rs. 484

5. A sum of money is to be distributed among A, B, C, D in Proportion of 5 : 2 : 4 : 3 If B gets Rs. 1000 more than D. what is B share.

Let the share of A, B, C, & D be Rs. $5x$, Rs. $2x$, Rs. $4x$ and Rs. $3x$ respectively

Then $4x - 3x = 1000 \quad x = 1000$

B's share $=$ Rs. $2x$ $=$ Rs (2×1000) $=$ Rs. 2000

Experiment No. 4.7 Date : 13 10 25

Ages

Defenition :

In Arthmetic & Reasoning Age problems are a type of linear Equation application that involve comparing the ages of two (or) more people

Terms releated to age:

→ Present age : current age of person
→ future age : Age of person after certain no-of-years
→ Past age : person's age certain number of years ago
→ Age difference : The difference in ages b/w two people
→ Sum of age : The combined ages of two/more people
→ Age Ratio : Relationship between the ages of two people Expressed as a ratio.

Tips to slove age problems :

→ If the current age is x, then n times the age in nx.
→ If the age is x, then the age after n years is x+n
→ If the current age is x, then the age befor n years is x-n
→ The age in a ratio a:b are ax & bx
→ If the current age is x, then 1/n of age is x/n

Genereal steps to slove Age problems :

→ Understand the problem
→ Assign Variable

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

→ form Equation
→ Slove Equations
→ verify the solutions.

1. If ratio of present age of Bhanu and Vishal is 9:4 and their sum of present age is 52 years then find the present age of Vishal

a) 15yrs b) 16yrs c) 10yrs d) None

Let age of Bhanu be 9x and
The age of Vishal be 4x
then both ages = 9x+14x = 13x

Given the sum of their present age = 52

$13x = 52$

$x = \frac{52}{13} \Rightarrow 4$ (4×4 = 16 years)

$x = 4$ years [∴ x=4]

The vishal age is 4x

2. What is Nani's present age, if after 20years his age will be 10times his ages 10 years back

a) 6.2 yrs b) 7.7 yrs c) 13.3 yrs D) 10yrs

Let Nani's age is x
before 10yrs = (x-10)
After 20yrs = (x+20)

Experiment No. ☐☐ Date : ☐☐ ☐☐ ☐☐

Nani's age after 20yrs $(x+20)$ is 10 times his age 10 years back $(x-10)$

$\therefore (x+20) = 10(x-10)$

$x+20 = 10x-100$

$20+100 = 10x-x$

$120 = 9x$

$x = \frac{120}{9}$

$x = 13.3$ years

$\therefore$ The Nani's present age is 13.3 years

3. Babu is 50 years old and Keerthi is 40 years old How long ago was the ratio of their ages 3:2?

a) 20yrs b) 30yrs c) 40yrs D) 25yrs

Let x is your age

Babu present age = 50 yrs

Long ago Babu age $= (50-x)$

Keerthi present age = 40yrs