

## General Instructions

1. Give numbering to headings
2. Do not write lengthy paragraphs. Write medium-sized paragraphs with headings.
3. Do not use table for comparison and contrast questions.
4. Draw figures/diagram/flowchart where needed.
5. Start new question from fresh page.
6. Write unit of the answer in ability section.
7. Explain mathematical steps and the reasoning for better score.

8. Change colour scheme for references to give them more visibility.

9. Manage time well.

10. Wide page borders are discouraged.

Should be reasonable.

11. Avoid writing wrong references.

12. Give more weightage to expressedly asked parts of the question.

Problem  
Given Data

Ishaq do training job = 6 hours  
- Abas do training job = 4 hours  
- Irfan does training job = 8 hours  
- Ishaq and Abas start doing work  
- Abas leaves after 2 hours and Irfan replaces him

Find

How long would Pt Lalce to complete the work?

Solution

~~Ishaq and Abas work together~~

Ishaq and Abas work together for 2 hours

Ishaq can do training job in 6 hours

Abas does in 4 hours

Let,

Job = J



So,

$$J_1 = \frac{2}{6} + \frac{2}{4}$$

$$= \frac{1}{3} + \frac{1}{2}$$

$$= \frac{2+3}{6}$$

$$J_1 = \frac{5}{6}$$

Irfan can do painting job in 8 hours

$$J_2 = 1 - J_1$$

$$= 1 - \frac{5}{6}$$

$$= \frac{1}{6}$$

Sagid leaves after two hours and Irfan replaces him

$$J(2h) = \frac{1}{6} + \frac{1}{8}$$

$$= \frac{8+6}{48}$$

$$= \frac{14}{48}$$

$$= \frac{7}{24}$$

Therefore, the time required by Irfan and Ishaq to complete work

$$T_2 = \frac{1}{6} \div \frac{7}{24}$$

$$= \frac{\frac{1}{6}}{\frac{7}{24}}$$

$$= \frac{4}{7}$$

Time in minutes

$$= 60 \times \frac{4}{7} = 34.28 \text{ minutes.}$$

Therefore time required by Irfan and Ishaq to complete the work

34 minutes.



The total time required to complete the work by Asha, Anu and Ingan is

2 hours 34 minutes 28 seconds.

Ans-





## QUESTION NO: 7 (b)

**Problem**

**Given Data**

Area of the farm =  $576\text{m}^2$

For building a boundary wall around farm

**To Find**

Area of wall = ? When  
it is 3 meter high on 3 side and 3 meter  
high on one side.

**Solution**

Area of farm =  $576\text{m}^2$

$$\text{side} \times \text{side} = 576\text{m}^2$$

Squaring on both sides

$$\sqrt{\text{side}^2} = \sqrt{576}$$

$$s = 24$$



$$\begin{aligned} \text{Area of wall in three sides} \\ = 3(l \times b) \end{aligned}$$

$$\text{Area of wall in three sides}$$

$$= 3 \times 24 \times 2$$

$$= 72 \text{ m}^2 \times 2$$

=

$$= 144 \text{ m}^2$$

$$\begin{aligned} \text{Area of third wall/side} &= l \times b \\ \text{or} \end{aligned}$$

$$\begin{aligned} \text{Area of wall in third side} &= \\ l \times b \end{aligned}$$

$$\text{Area of wall in third side}$$

$$= 24 \times 3$$

$$= 72 \text{ m}^2$$



total area (surface) =

Area of wall in three sides + Area of wall in

third side

$$\Rightarrow \text{total surface area} = 144 + 72$$

$$= 216 \text{ m}^2.$$

total Area of wall is  $216 \text{ m}^2$ .

Ans.



# QUESTION NO: 7 (C)

Problem

Given Data

Age of 7 students = 18, 18, 19, 19, 19, 21, 21

To Find

(a) Mean, Median, mode, range of their ages.

(b) Define Mean, Median, mode, range.

Solution.

(a)

1. Mean

$$\text{Mean} = \frac{\text{Sum of all ages}}{\text{Total no. of ages.}}$$

$$= \frac{18 + 18 + 19 + 19 + 19 + 21 + 21}{7}$$

$$= \frac{135}{7}$$



$$= 19.285$$

Mean of 7 students is 19.285

2. Median

Median is middle term

18, 18, 19, 19, 19, 21, 21

19 is Median

Median of 7 students is 19.

3. Mode

most common occurring.

18, 18, 19, 19, 19, 21, 21

most common occurring is 19.

Mode of 7 students is 19.

4. Range.

Difference between highest and lowest

$$21 - 18 = 3$$

Range of 7 students is 3.



## (b) Definitions.

### Mean

The Mean is the sum of the value of each observation in dataset divided by the number of the observation.

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n}$$

### Median

Mean is a middle value in distribution when the values are arranged in ascending or descending order.

### Mode

Mode is the most occurring value of the data.

### Range

Range is the difference between the highest and lowest value of the data set.



## QUESTION NO: 7 (d)

### Difference

Mental Ability  
Skill

IQ Test

### Defination

Mental ability skill  
is the ability to identify,  
assess, and control the  
emotions of oneself, of  
others, and of groups.

IQ Test is score  
derived from one  
of several standard  
test designed to  
assess intelligence

### Abilities

Identify, evaluate, control  
and express mental  
activities and use them to  
think, understand surroundings.

Ability to learn,  
understand, and  
apply information  
to skills, logical  
reasoning etc

### In The Work Place

Teamwork, leadership,  
successful relation,  
service orientations,  
initiative, collaboration

Success with  
challenging tasks,  
ability to analyze  
data, research and  
development.



## Identifies

leaders, team players,  
individuals who best  
work alone, individual  
with social challenges.

Highly capable  
or gifted individuals  
with mental  
challenges and  
special needs.

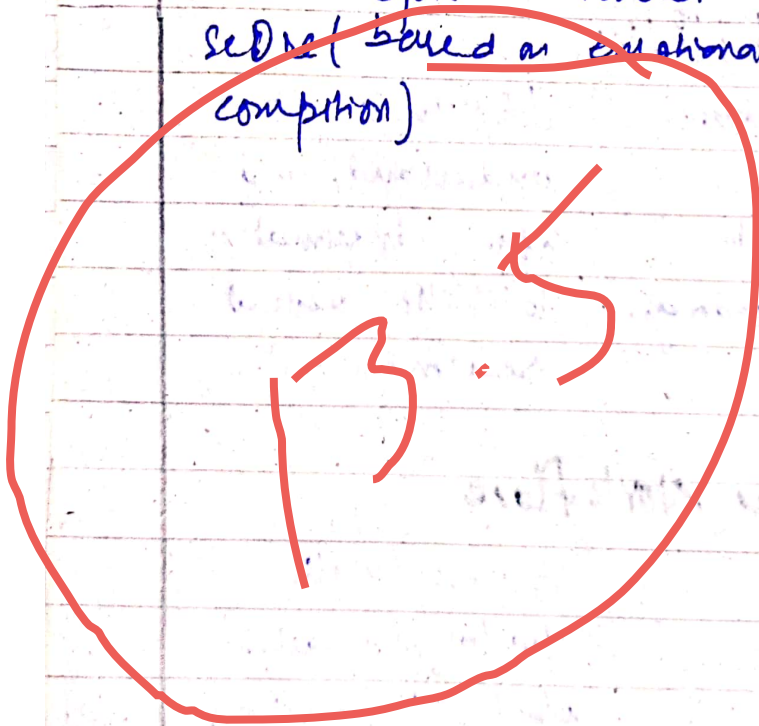
## Popular Test

Mayer-Salovey  
Test (emotion based  
problem solving task)

Daniel Goleman model  
SEL (based on emotional  
competence)

Standard-Binet  
test - /

Weschler Wood-  
cock-Johnson  
Tests of Cognitive  
Abilities.





## QUESTION NO: 8. (a)

Problem:

Given Data

During first half of journey car's speed = 40 km/h

During 2nd half of journey car's speed = 60 km/h

To Find

Average speed of car ?

Solution.

Let the total distance be  $2x$

For first half journey

$$\text{Time 1} = \frac{x}{\text{speed}} \quad (\because \text{speed} = 40)$$

$$\text{Time 2} = \frac{x}{40}$$



For second half journey.

$$\text{time 2} = \frac{x}{\text{speed}}$$

$$\text{speed} = 60 \text{ km/hr}$$

$$\text{time 2} = \frac{x}{60}$$

Total time in both journey

$$= \frac{x}{40} + \frac{x}{60}$$

$$= \frac{3x}{120} + \frac{2x}{120}$$

$$= \frac{5x}{120}$$

$$= \frac{x}{24}$$

$$\text{total time} = \frac{x}{24}$$



Now,

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

$$\text{average speed} = \frac{2x}{\frac{x}{24}}$$

$$= 2 \times 24$$

$$= 48 \text{ km/hr.}$$

Average speed of car is 48 km/hr.

Ans.



# QUESTION NO: 8 (b)

Given Data:

ROSE CHAIR

~~PREM~~

6821

73456

961473

To Find:

B SEARCH

----- ?

Solution

From above Data

$$R = 6$$

$$S = 2$$

$$E = 1$$



$$A = 4$$

$$R = 6$$

$$C = 7$$

$$H = 3$$

So,

S	E	A	R	C	H
2	1	4	6	7	3

Ans.



# QUESTION NO: 8 (c)

## Given Data

A is brother of B

B is sister of C

C is father of D

## To Find.

How D is related to A, where D is male member.

## Solution.

A is brother of B

lets draw / assign symbol.

□ male \* Couple.

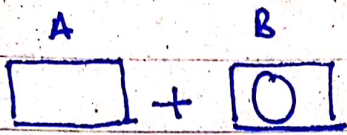
○ Female

+ Siblings

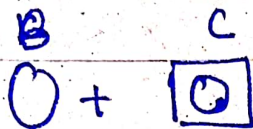
↓ Father / Mother



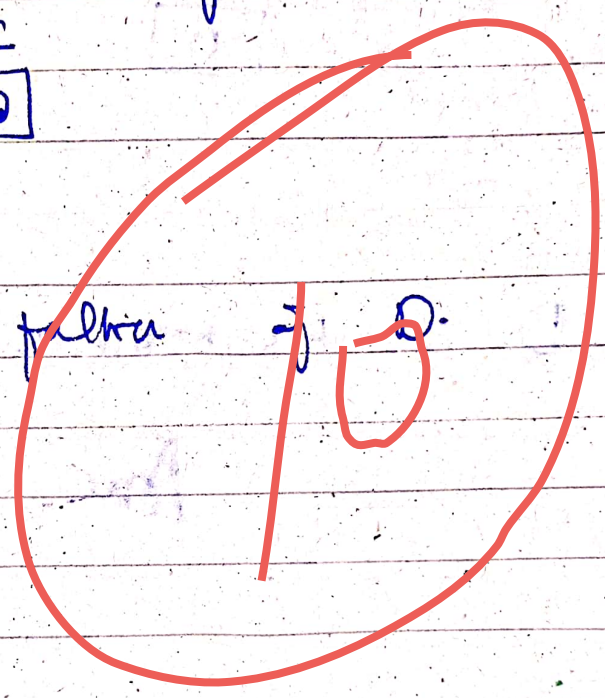
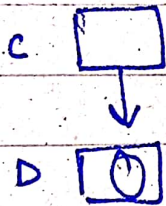
A is brother of B



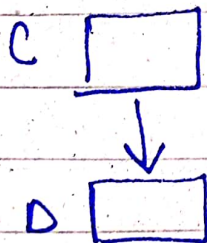
B is sister of C



C is father of D

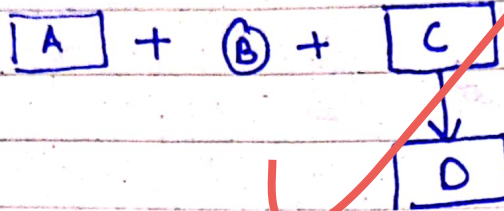


D is male member.





A, B, and C are siblings



Nephew

So, D is A's brother's son.

Done.



# QUESTION NO: 8 (d)

## Problem

## Given Data

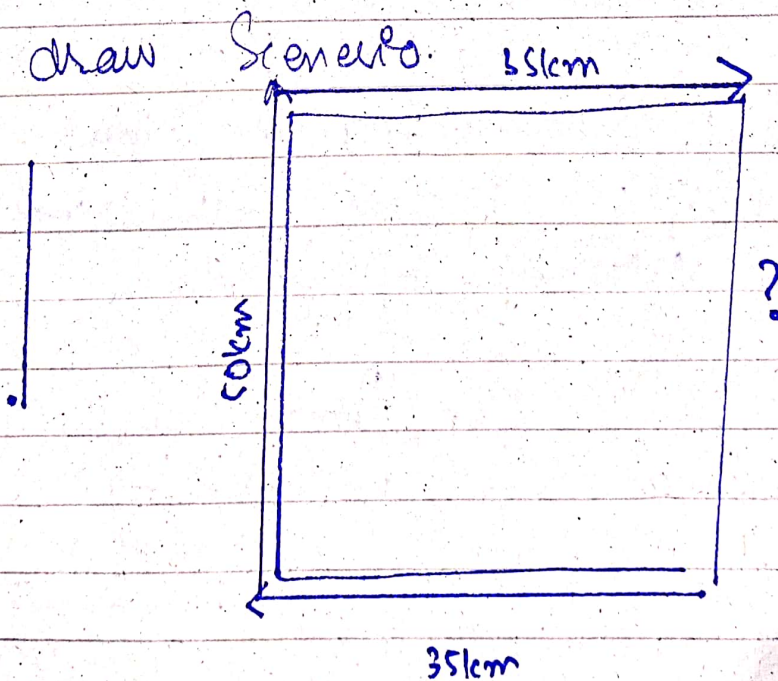
- Kashmala travels 35 km to West
- Takes right and travel 50 km move
- Takes another right and travel 35 km in that direction.

## To Find.

How far from her original place.

## Solution.

Let's draw Scenario.





These 2 aspects

1. displacement travel by her

2. Distance travel by her

Displacement is the shortest distance from initial position and final position.

Distance: total distance travel by her.

If we consider displacement then she is 50km far from her initial position.

If we consider distance then she is  $35 + 35 + 10 = 120$ km far from her original position.

Am.



## SECTION - A.

### QUESTION NO: 4 (a)

#### Solid Waste Management.

##### 1. Definition

Solid waste management (SWM) refers to the systematic management of the generation, collection, transfer, treatment, recycling, recovery, and disposal of solid waste. Where a solid waste refers to waste material.

##### 2. National Solid Waste Management Strategy in Pakistan.

Pakistan has proper scientific solid waste management right from collection of solid to waste. Following are ways of solid waste management of Pakistan.



a) Waste Generation  
Activities in which material  
no longer consider value.

b) Waste Handling and Processing  
at the source, including sorting  
and storage.

Mentioned all the activities  
associated with the management  
of waste which they are gathered  
or placed in bags or storage  
containers for collection.

c) Collection

Primary and secondary collection  
gather and transport of solid waste  
by means of vehicle where collection  
vehicle is emptied.

d) Transfer and Transport

Transfer and Transport to a  
flung area.

e) Waste Disposal

Final placement of waste  
to a landfill where it remains.



## Methods to Improve SWM of Pakistan.

Although Pakistan has proper SWM system but it is inadequate and outdated. Following are the ways through which we can improve SWM system of Pakistan.

a) ~~Aware~~ People for Reduce, Reuse, Recycle.

Most of the people do not care about the pollution caused by waste they must be aware of the strategy of Reduce, Reuse and Recycle.

b) Update System

Government should work on to improve the SWM system in modern era requirement. As China is making energy from waste.

c) ~~with~~ Aware people through Media.

Advertisement should make in order to spread the awareness regarding solid waste. As most of the waste come from domestic level.



## QUESTION NO: 4 (b)

### Geographic Information System (GIS)

#### Definition

A GIS is an organized collection of computer hardware, software, geographic data and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

GIS is relatively a new concept. Therefore many people offer different definition of GIS.



## Components of GIS.

GIS contains 5 components.  
Procedure.

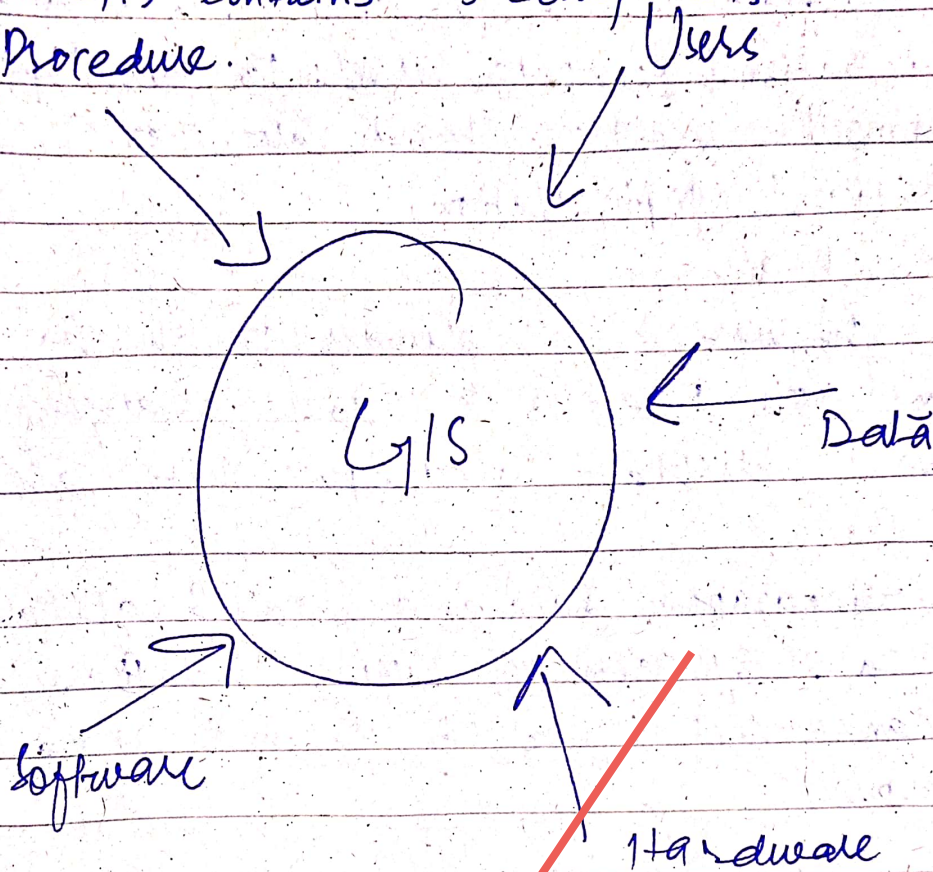


Figure: Physical diagram of components of GIS

A working GIS integrates five key components

1. Hardware
2. Software
3. Data
4. People
5. Procedure.



1. Hardware  
computer in which GIS operates. They can be centralized computer servers to desktop computers used in stand alone or network configuration.

2. Software  
Software of GIS provides the functions and tools needed to store, analyze and display geographic information.

3. Data  
Geographic data and related tabular data. GIS can use DBMS (Data Base Management System) to organise data properly.

4. People / Users

People who manage the system and develop plans for applying it to real world problems.

5. Procedures

Well designed processes and Business rules, which are the models and operating practices unique to each organization.



## QUESTION NO: 4 (c)

### Overview on Population of Pakistan

Recently, Pakistan was ranked as 8th most populated country of the world. Despite having economic crisis, food and water problems the population has been increasing with less nutritious children and less skilled youth which became another major problem of Pakistan.

### Causes of Population in Pakistan

Following are the major causes of population in Pakistan.

1. High Birth rate and low Death rate.

Imbalance between two is a major cause of over-population in Pakistan.

2. Early marriages

Early marriages is one of the root major problem of



Pakistan over population:

3. Unaware about the proper use of contraceptive.

Most of the rural people do not aware of using contraception in Pakistan.

4. Desire for male child.

This is one of the major issue of patriarchal society of Pakistan that is

contributing to the over population.

5. Failure of government population planning policies.

Government population policies are not effective this cause population to increase.



# Measures to Control Population

1. Family Planning and Contraception.

Do Family Planning and use required type of contraceptives.

2. Fertility Awareness

Understand the women cycle of menstrual cycle to avoid pregnancy.

3. Permanent Contraception.

Use of permanent contraception for those who have more than 2 children.

4. Effective Government Policies to implement them.

Effective and efficient government policies must be introduced in order to get rid of population growth.



## QUESTION NO: 4 (d)

### Montreal Protocol

The Montreal Protocol on substances that deplete the ozone layer is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.

Montreal Protocol was agreed on 1987 because of the risk posed by ozone depletion.

Since 1987, 191 nations have ratified the landmark environment treaty.

Protocol chief aim is to reduce and virtually eliminate the production and use of man made ozone depleting substances (ODS)



# Kyoto Protocol.

Kyoto Protocol is an international agreement under the United Nations Framework Convention on Climate Change (UNFCCC), which commits parties by setting international binding emission reducing target.

Protocol has Annex I, parties who are major contributors to carbon emission, provide assistance to Annex II, which face consequences of climate change but does not contribute as much as Annex I.

The objective of Kyoto Protocol is to control emissions of the main greenhouse gases.

Kyoto Protocol was adopted in 1997, 192 parties of UN accepted this protocol.



# Carbon Market

Parties with commitments under Kyoto Protocol have accepted targets for limiting or reducing emissions. Their targets are expressed as levels of allowed emissions as assigned amounts over the commitment period.

Emission trading as set out in Art 17 of the Kyoto Protocol allows countries that have emissions under their spare - emissions permitted than but not used to sell their excess capacity to countries that are over their targets.

Since, carbon dioxide is a greenhouse gas hence people speak simply trading of carbon. Carbon is now traded like traded like any other commodity. It is known as carbon trading.



# QUESTION NO: 5 (a)

## Networking.

### Definition

A networking is a group of two or more computers that intelligently share resources.

### Advantages of Networking.

It reduce hardware cost by sharing expensive printer and other peripheral among multiple users, network provide other benefits to user as well.

### Classification of Networking.

There are main 3 types of Networking

#### 1. Local Area Network. (LAN)

A computer network spanned inside a building and operated under single administrative system.



2. Metropolitan Area Network (MAN)  
A large computer network that spans a metropolitan area or campus.

3. Wide Area Network (WAN)  
It covers a wide area which may span across provinces and even a whole country.

## Internet Standards.

Internet is the computer based global information system. The Internet is composed of many interconnected computer networks. Each network may include some, hundred, or even thousands of computers, enabling them to share information and processing power. The Internet has made it possible for people all over the world to communicate with one another effectively and inexpensively.



## Working of Internet Standards.

All information is transmitted across the Internet in small units of data called packets. Software on the sending computer divides a large document into many packets for transmission. Software on the receiving computer re-groups incoming packets into the original document.

The set of protocols TCP - Transmission Control Protocol and IP Internet Protocol enable the Internet to automatically correct transmission - problems.

Protocols also ensure that data arrives complete and intact. If any packets are missing or damaged, protocol on the receiving computer signals the sender to resend.