

Name : Fahad Bashir
LMS : 37252
Paper : GSA



{SECTION-I}

QUESTION # 2.

a. Implementing AI in healthcare poses both benefits and challenges.

→ POTENTIAL BENEFITS:

AI has following benefits in the field of healthcare;

- i. Improved diagnostic accuracy
- ii. Early disease detection
- iii. Personalized treatment plans
- iv. Efficient administrative tasks
- v. 24/7 Virtual assistance

→ CHALLENGES OF AI IMPLEMENTATION IN HEALTHCARE:

Following challenges are to be

faced after implementing AI in healthcare;

- i. Data privacy & security
- ii. Lack of human judgement
- iii. High implementation cost.
- iv. Resistance from Healthcare workers
- v. Regulatory and legal issues.

→ IMPACT OF AI ON PATIENT CARE AND MEDICAL DIAGNOSIS :

By implementing AI in healthcare, there will be following impacts on patient care and medical diagnosis.

→ AI will enhance accuracy by reducing diagnostic errors using data.

→ AI will provide faster turnaround by enabling quicker decision-making

→ AI will improve patient monitoring, alerting medical staff to emergencies before

they can escalate.

→ AI will offer accessibility

→ AI will enable patients to understand their conditions much better.

While AI has the potential to revolutionize the healthcare but it also has to face some challenges. It must be implemented with caution.

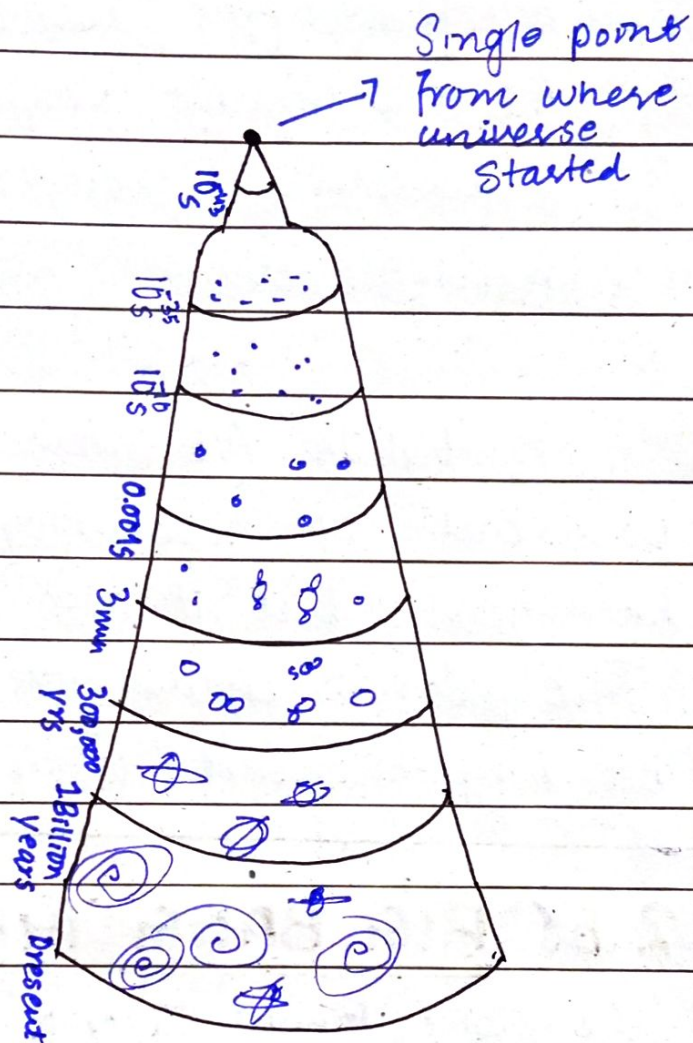
2.b. BIG BANG THEORY

The Big Bang theory is the most widely accepted theory about the origin of Universe.

According to this theory,

"The universe began about 13.8 billion years ago from a single, extremely hot, and dense point, and it has been expanding ever since."

Big bang theory talks about the concept of singularity.



→ SIGNIFICANCES OF BIG BANG THEORY:

Following are the significances of Big Bang Theory.

- i. Explains the Origin of the Universe:

It answers about the origin of the universe that from where did the universe originated.

ii. Foundation of Modern Cosmology:

This theory forms the basis of understanding about modern cosmology. It tells that how stars, galaxies, and planets were formed over billion years ago.

iii. Supports Universal Expansion:

It helps scientists explain and understand that universe is not static. It is expanding continuously.

→ EVIDENCES FOR BIG BANG

THEORY:

i. Red Shift of light from distant galaxies:

According to the Big Bang Theory, Universe is expanding over time. There are two phenomena Red Shift and Blue Shift. If object moves away from earth, light shifts to longer wavelength and red shift occurs and vice versa. Now,

light from distant galaxies is red shifted which means that they are moving away. This supports Big Bang Theory.

ii. Cosmic Microwave Background Radiation:

These radiations were discovered by Wilson and Arno. These radiations were thought to be residual heat from initial explosion.

It's the left over heat from the Big Bang-like a faint glow filling the universe.

iii. Abundance of Light Elements:

Big Bang Theory accurately predicts the amount of Hydrogen, Helium found in universe. These matches the prediction of Big Bang Theory.



C. GLOBAL WARMING

Global warming is the rapid increase in the temperature of earth's surface, mainly due to rise in greenhouse gases in the atmosphere.

→ PRIMARY CAUSES OF GLOBAL WARMING

Following are the causes of global warming:

i. Greenhouse Gas Emission:

Greenhouse gases are one of the major contributing factor towards global warming. These are;

- CO_2
- Methane (CH_4)
- Nitrous Oxide (N_2O)

These gases trap earth's heat in atmosphere, leading to increase in the surface temperature.

ii. Deforestation:

Deforestation means cutting trees. Forests are known as "Carbon dioxide sinks" as they absorb CO_2 . But due to deforestation, CO_2 cannot be absorbed and eventually becomes the contributor to increase surface heat.

iii. Industrialization and Urbanization:

Factories, vehicles, and power plants release massive amounts of heat-trapping gases due to which global warming occurs.

iv. Agricultural Practices:

Use of chemical fertilizers and raising livestock increases CH_4 and N_2O level in the environment.

→ EFFECTS OF GLOBAL WARMING:

Following are the major effects of global warming.

i. Rising Temperature:

Due to global warming, the temperature of earth increases,

Summer becomes hotter, and weather pattern changes.

ii. Melting Glaciers & Rising Sea Level:

Due to increase in temperature, glaciers are melting all around the world and the sea level is increasing.

iii. Threat to Biodiversity:

Increase in temperature forces animals and plants to lose their habitat and may go extinct.

iv. Health Risks:

Global warming is also contributing towards increased health risks due to increase in heat related diseases and food insecurity.

→ ROLE OF HUMAN ACTIVITIES:

Humans are the key drivers of global warming through:

- Burning fossil fuels excessively.
- Cutting forests for own use.

- Mass production and over-consumption
- Wasteful lifestyle that increases Carbon footprints

→ STRATEGIES TO MITIGATE GLOBAL WARMING:

Global warming can be mitigated by following measures:

i. Shift to Renewable Energy:

Renewable energy must be prioritized so that we can reduce dependence on fossil fuels that are major source of C.

ii. Reforestation and Aforestation:

Deforestation should be discouraged and Aforestation or Reforestation should be encouraged to increase global forest cover.

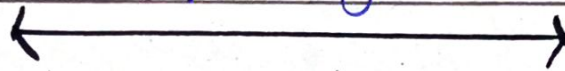
iii. Sustainable Agriculture:

Organic farming should be promoted and chemical fertilizers should be avoided.

iv. Carbon Pricing & Environmental Laws:
Governments should impose carbon
taxing and strict pollution controls.

v. Public Awareness:

Awareness in public should be
spread to encourage people to
adopt eco-friendly habits.



d. DISASTER MANAGEMENT

Disaster Management is the process
of planning, preparing, responding
to, and recovering from disasters.

→ KEY COMPONENTS:

Following are the key components
of disaster management.

i. Risk Assessment:

It is the first component that
identifies potential hazards and
vulnerable areas and population.

ii. Preparedness:

In this, early warning system,
evacuation plans are developed.

iii. Response:

It is the immediate action during or after disaster that includes rescue activities.

iv. Recovery:

Normal life is to be restored by building infrastructure, providing psychological support, and restoring services.

→ IMPORTANCE OF PREPAREDNESS, RESPONSE & RECOVERY

i. Preparedness:

Preparedness for Disasters helps minimizing loss of life and property. It ensures faster and more quick response.

ii. Response:

It includes rescue teams, NGOs, medical aid etc. It helps in saving the human lives and stabilizing communities.

iii. Recovery:

Recovery prevents long-term social

and economic disruption. It is vital for helping people rebuild their lives.

→ EXAMPLE OF EFFICIENT

DM:

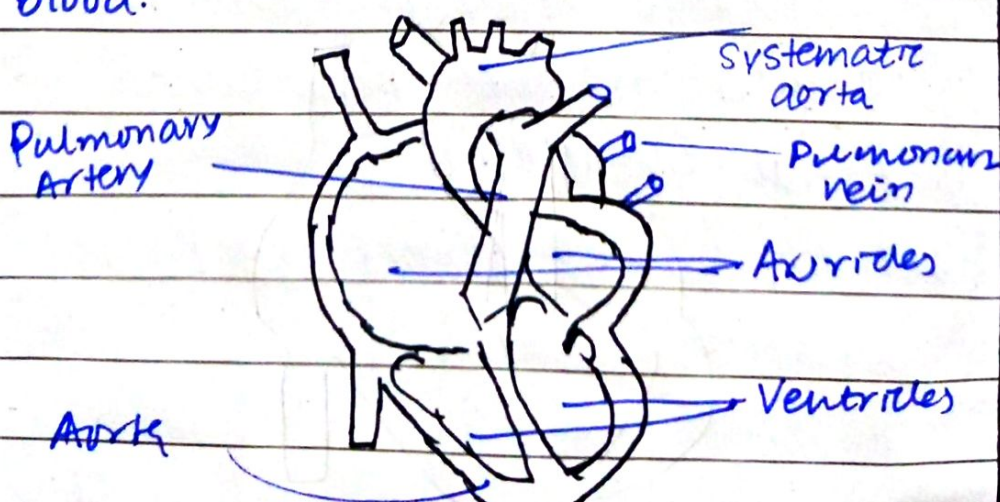
The best example of efficient disaster management is of Japan earthquake-resistant infrastructure.

← → QUESTION # 3

Part (a)

STRUCTURE AND FUNCTION OF HUMAN HEART:

Human heart is the most vital organ in body as it pumps blood.



Human heart is a muscular fat sized organ. It is made of cardiac muscles. It is divided into four chambers

- 1) Right Atrium
- 2) Right Ventricle
- 3) Left Atrium
- 4) Left Ventricle.

FUNCTIONS:

Following are the functions of human heart.

- 1) Pump the blood to body
 ↳ Send Oxygen-rich blood to ^{the} body and oxygen-poor to lungs.

CARDIAC CYCLE:

The cardiac cycle is the sequence of events in one heartbeat.

1. Atrial Systole:

Both Atria contract → blood pushed to ventricles.

ii. Ventricular Systole:

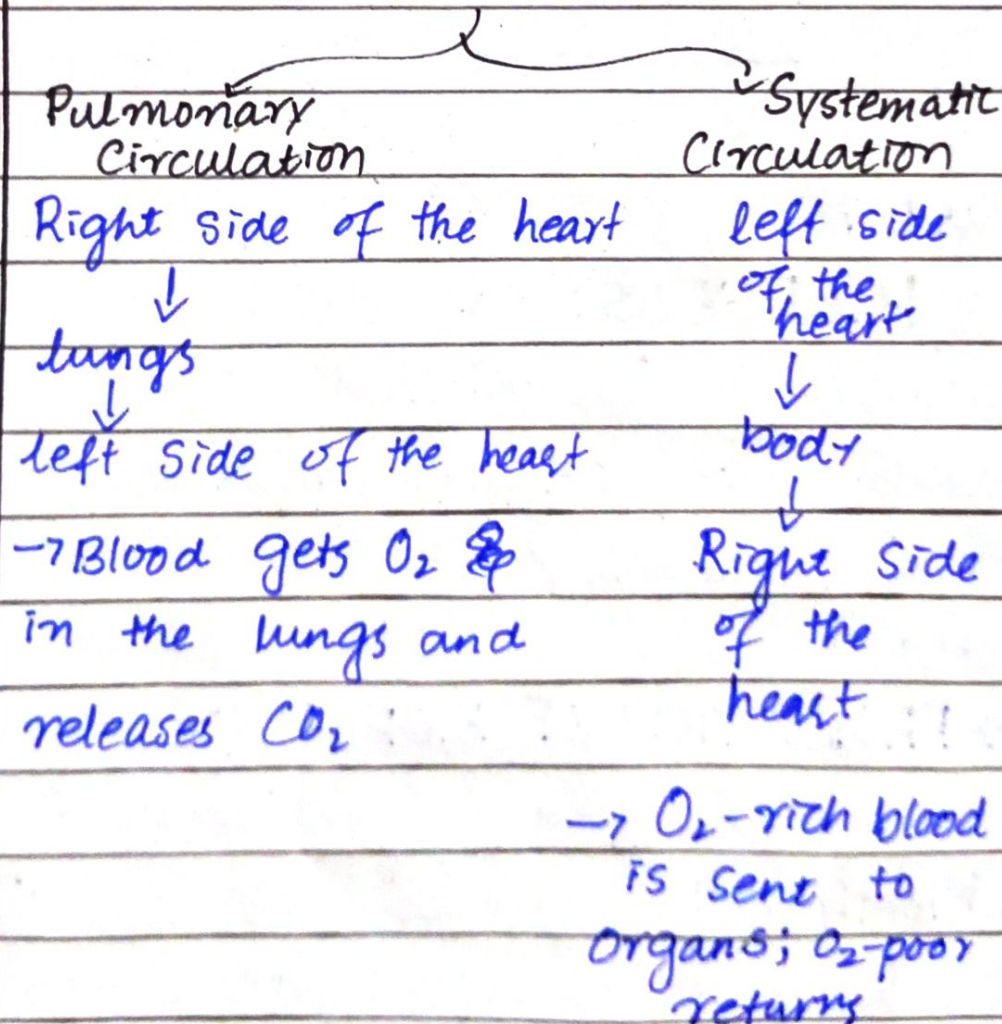
Both ventricle contracts → right
Sends blood to lungs and
left to body

iii. Diastole:

All chambers relax → blood
flows into atria from veins.

Role of Heart in Blood Circulation:

Heart has two main circuits



Regulation of the Blood Pressure by Heart:

Heart helps maintain BP through

i. Cardiac Output (CO)

$$CO = \text{Heart Rate} \times \text{Stroke Volume}$$

Higher cardiac output = Higher BP

ii. Autonomus Nervous System

Sympathetic nerves increase heart rate and BP

Parasympathetic slow downs heart rate and BP.



Part b.

BIOFUELS:

Biofuels are renewable fuels made from organic material such as plants, agricultural waste; or animal fats.

→ PRODUCTION OF BIOFUELS:

Mainly produced in two forms.

i. Bioethanol:

Made by fermenting sugars from crops like sugarcane, corn or wheat.

____/____/202

→ They are commonly blended with petrol (10% ethanol)

ii. Biodiesel:

→ Made by reacting vegetable oils or animal fats with alcohol.

→ Can be used in diesel engines

→ Advantages:

→ It is a renewable source.

→ It reduces GHGs.

→ It is biodegradable.

→ It supports farmers and rural communities.

→ It can use waste material

→ Disadvantages:

→ It competes with food production.

→ It requires land and lot of water.

→ It is not completely carbon free.

→ Deforestation risks are there.

→ HOW BIOFUELS REDUCE GHGS EMISSION

→ The production process is

carbon-neutral cycle.

→ It replaces high-emission fossil fuels.

→ It turns waste to energy.



Part (C)

KEY FACTORS DETERMINING FOOD QUALITY

Food quality refers to the characteristics of food that affect its value to the consumer.

Following factors determine its quality:

- 1) Sensory Attributes
- 2) Nutritional value
- 3) Freshness
- 4) Purity and Composition
- 5) Hygiene Standard

→ IMPORTANCE OF FOOD SAFETY:

Food safety ensures that food is free from harmful substances. It is important because:

- It prevents foodborne illness.
- It protects public health.
- It builds consumer trust.

→ ROLE OF FOOD QUALITY CONTROL MEASURES:

Food quality ^{control} involves regular checks and standards to ensure food is safe, consistent, and meets legal requirements.

Key measure includes:

- 1) Inspection and Testing.
- 2) Hazard Analysis and Critical Control Points.
- 3) Proper labeling of nutrients.
- 4) Temperature and storage monitoring.
- 5) Government regulations.

→ HOW CONSUMERS CAN ENSURE SAFE AND HEALTHY FOOD?

- By checking labels.
- By buying from reputable sources.
- By storing food properly.
- By cooking thoroughly.

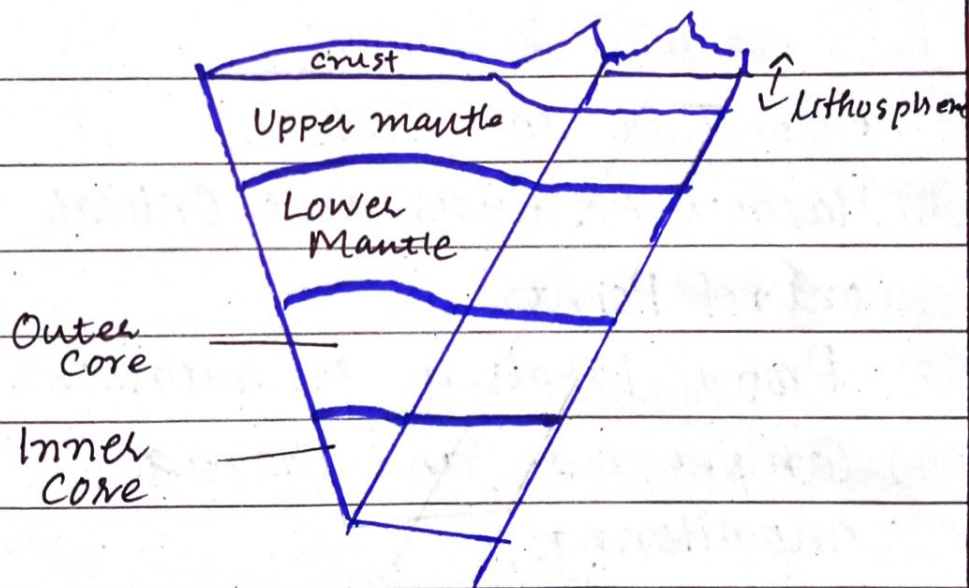


Part (d):

STRUCTURE OF EARTH'S INTERIOR:

The earth is made up of 4 main layers.

- 1) Crust (outer layer)
- 2) Mantle
- 3) Outer Core
- 4) Inner Core



→ Differences b/w Oceanic and Continental Crust:

- i) Oceanic crust is beneath oceans while continental is beneath continents.
- ii) Oceanic is 5-10Km thin while continental is 30-70Km thick.
- iii) Oceanic crust is denser while

continental is less dense.

iv) Oceanic is mainly dark volcanic rock while Continental is mainly lighter rock.

The earth's crust is broken into larger plates known as tectonic plates that float on mantle.

The plate movement causes following events:

- 1) Earthquakes
- 2) Volcanoes
- 3) Mountain formation
- 4) Oceanic Trenches
- 5) Continental Drifts.



(SECTION-II)

{QUESTION # 5}

a. Given Data:

20% of Students are below 8 year age.

Students of 8 year age = 48

Students above 8 year of age =
 $\frac{2}{3} \times 48 = 32$

Let, total no. of Students = x

So,

Students below 8 years = 20% of x
 $= 0.2x$

Student of 8 years = 48

Student above 8 years = 32

So,

Total Students = Below 8 years +
 of 8 years + above 8 years

$$x = 0.2x + 48 + 32$$

$$x = 0.2x + 80$$

$$x - 0.2x = 80$$

$$0.8x = 80$$

$$x = 80 / 0.8$$

$$\boxed{x = 100}$$

So, Total no. of Students in
 the School is 100.



B. GIVEN DATA:

Father age = 3 times Rashid age

After 8 years = 2.5 times Rashid age

Sol:

Let's Rashid current age = x

Father's current age = $3x + x$

So,

Father's Age = $x + 3x = 4x$

So,

After 8 years

Rashid's age = $8 + x$

Father's age = $4x + 8$

$$4x + 8 = 2.5(x + 8)$$

$$\text{So, } 4x + 8 = 2.5x + 20$$

$$4x - 2.5x = 20 - 8$$

$$1.5x = 12$$

$$x = 12 / 1.5$$

$$x = 8$$

Now as Rashid's age is x so

$$x = 8$$

and Father's age = $4x = 4(8) = 32$

So, After another 8 years (16 years)

Rashid = $8 + 16 = 24$

Father = $32 + 16 = 48$

$$\frac{\text{Father's age}}{\text{Rashid's age}} = \frac{48}{24} = \boxed{2}$$

So, Father's age will be of 2 times than Rashid.



C. DICES ... ?

As each dice has 6 outcomes,
So total no. of possible outcomes
are:

$$6 \times 6 = 36$$

The possible prime no. are

2, 3, 5, 7, 11

And following combinations give
prime totals;

• 2 (1, 1) $\rightarrow$ 1 way

• 3 (1, 2) (2, 1) $\rightarrow$ 2 ways

• 5 (1, 4) (2, 3) (4, 1) (3, 2) $\rightarrow$ 4 ways,

• ~~7 (1, 6) (2, 4) (3, 3) (6, 1) (4, 1)~~

• 7 (1, 6) (2, 5) (3, 4) (4, 3) (5, 2) (6, 1) $\rightarrow$ 6 ways

• 11 (5, 6) (6, 5) $\rightarrow$ 2 ways

So, total favorable outcomes

$$1 + 2 + 4 + 6 + 2 = 15$$

$$\text{Probability} = \frac{\text{Favorable outcomes}}{\text{Total outcomes}} = \frac{15}{36} = \boxed{\frac{5}{12}}$$

d. Given Data:

- Captain's age = 26
- Wicket Keeper's age = $26 + 3 = 29$
- Remaining 9 players $\rightarrow$ average age is $x - 1$ years

So, total age of remaining 9 players = $9(x - 1)$

Sol:-

Total age of Team = Captain's age + WK's age + Total age of remaining 9 players.

$$11x = 26 + 29 + 9(x - 1)$$

$$11x = 55 + 9x - 9$$

$$11x - 9x = 46$$

$$2x = 46$$

$$x = 46/2$$

$$x = 23$$

So, the average age of the team is 23.



QUESTION # 6

a. If the Cost...

Let the Cost price be x
and original S.P be y

Then, original profit will be

$$\text{Profit} = y - x$$

Now, S.P is doubled, so $SP = 2y$
and new profit becomes triple

So,

$$2y - x = 3(y - x)$$

$$2y - x = 3y - 3x$$

$$2y + 3y = -3x + x$$

$$+y = +2x$$

$$y = 2x$$

So,

$$\text{Original } SP = y = 2x$$

$$\text{Original profit} = y - x = 2x - x = x$$

$$\text{Profit \%} = \frac{\text{Profit}}{\text{C.P}} \times 100 = \frac{x}{x} \times 100\%$$

$$\boxed{\text{Profit} = 100\%}$$



b. Two Servants - ?

Let the amount paid to Y be y

Amount paid to X is 120% of y ;

$$X = 120\% \text{ of } y$$

$$X = \frac{120}{100} \times y = 1.2y$$

Total amount paid to both
is Rs 550. So,

$$X + Y = 550$$

$$1.2y + y = 550$$

$$2.2y = 550$$

$$y = \frac{550}{2.2}$$

$$\boxed{y = 250}$$

It means Y is paid 550.



C. Given Data:

Ratio of Perimeter: Breadth = 5:1

$$\text{Area} = 216 \text{ cm}^2$$

Let, breadth = b

So,

$$\text{Perimeter} = 5b$$

$$\text{As Perimeter of rectangle} = 2(l+b)$$

So,

$$2(l+b) = 5b$$

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

$$l = \frac{5b}{2} - b$$

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

Area of rectangle:

$$\text{Area} = l \times b = 216$$

$$\Rightarrow \frac{3b}{2} \times b = 216$$

$$\frac{3b^2}{2} = 216$$

$$3b^2 = 216 \times 2$$

$$3b^2 = 432$$

$$b^2 = \frac{432}{3}$$

$$b^2 = 144$$

Taking " $\sqrt{\quad}$ " on b.s, we get

$$b = 12 \text{ cm}$$

$$\text{So, } l = \frac{3b}{2} = \frac{3 \times 12}{2} = \frac{36}{2} = 18$$

d. Given Data:

- Tickets no. from 1 to 20
- Ticket drawn random
- Find probability that no. is multiple of 3 or 5.

As. Total outcomes = 20

No. of favorable outcomes

→ Multiples of 3

(3, 6, 9, 12, 15, 18) → 6 numbers

→ Multiple of 5

(5, 10, 15, 20) → 4 no.

15 is common so,

Total favorable outcomes =

$$(6 + 4) - 1 = 9$$

$$\text{Probability} = \frac{\text{Favorable Outcomes}}{\text{Total Outcomes}}$$

$$= \frac{9}{20}$$

