

Section-II

Qnos: Given data:

(a) Let Total Number of Students = y
 No of Students of below 8 years
 age = A

No of Students of 8 years
 of age = 48

No of Students above
 8 years of age = B

Given Condition:

$$= \frac{20}{100} \times y = A$$

$$= \frac{2}{3} \times 48 = B$$

To Find: $y = ?$

Soln:

$$= \frac{20}{100} \times y = A, \quad \frac{2}{3} \times 48 = B$$

$$= \frac{2}{3} \times 48 = B \rightarrow B = 32$$

$$B = 32$$

As 20% of Students are
 below 8 years of age
 Then remaining 80%
 are those at age of 8

years and above 8 years.
and suppose these are C.

$$C = 80\% \times y$$

$$48 + 32 = \frac{80}{100} \times y$$

$$80 = \frac{80y}{100}$$

$$y = 100$$

$$y = 100$$

Total No of students = 100

Qnos (b)

Given condition:

Let: age of Father = A

Rashid's age = B

At present father's age = A

Rashid's age = B

So, $3B = A$ — (1)

After 8 years :

$$2.5(B+8) = A+8$$
 — (2)

After further 8 years:

$$x(B+16) = A+16$$
 — (3)

To Find: $x = ?$

Soln: Eq 1) $3B = A$
 $B = \frac{A}{3}$ put in

eq ② $2.5(B+8) = A+8$

$$2.5B + 20 = A + 8$$

$$2.5\left(\frac{A}{3}\right) + 20 = A + 8$$

$$\frac{2.5A}{3} + 20 = A + 8$$

$$\frac{2.5A}{3} + 12 = A$$

$$12 = \frac{A - 2.5A}{3}$$

$$12 = \frac{3A - 2.5A}{3}$$

$$12 = \frac{0.5A}{3}$$

$$36 = 0.5A$$

$$A = 72$$

Father's age = 72

As per eq ① $A = 3B$

$$72 = 3B$$

$$B = 24$$

Rashid's age = 24

After 8 years $A = 80$, $B = 32$

After further 8 years, means
after 16 years

$$x(B+16) = A+16 \quad \text{--- (3)}$$

$$x(24+16) = 72+16$$

$$24x + 16x = 88$$

$$40x = 88$$

$$x = 2.2$$

Rashid's age will be
40 years and 2.2 times
of his age age is his
father's age.

Q 5 (c)

Given condition:

As 2 dice tossed

Total Numbers = 12

Total Score can be prime no
= 13 times

Probability of total score of
prime no = $\frac{12}{13} = 0.923$

Q5(d)

Given:

age of captain = 26 years

age of wicket keeper who is 3 years older = 29 years

Total no of players = 11

Sum of their total = x

Average of team = y

$$\frac{x - (26 + 29)}{9} = y - 1 \quad \text{--- (2)}$$

$$\frac{x + 55}{11} = y \quad \text{--- (1)}$$

$$x + 55 = 11y \quad \text{--- (1)}$$

$$x - 55 = 9y - 9 \quad \text{--- (2)}$$

Subtract eq (2) from (1).

$$110 = 2y + 9$$

$$2y = 110 - 9$$

$$2y = 101$$

$$y = 50.5$$

$$y = 50.5 \text{ years}$$

Average age of whole team = 50.5 years

Q no 7 (a)

$$5\% \cdot A + 4\% \cdot B = \frac{2}{3} (6\% \cdot A + 8\% \cdot B)$$

A : B = ?

$$= \frac{5}{100} \times A + \frac{4}{100} \times B = \frac{2}{3} \left[\frac{6A}{100} + \frac{8B}{100} \right]$$

$$= \frac{5A}{100} + \frac{4B}{100} = \frac{2}{3} \left[\frac{6A}{100} + \frac{8B}{100} \right]$$

$$= \frac{5A}{100} + \frac{4B}{100} = \frac{12A}{300} + \frac{16B}{300}$$

$$= \frac{5A}{100} - \frac{12A}{300} = \frac{16B}{300} - \frac{4B}{100}$$

$$= \frac{15A - 12A}{300} = \frac{16B - 12B}{300}$$

$$= \frac{3A}{300} = \frac{4B}{300}$$

$$3A = 4B$$

$$\frac{A}{B} = \frac{4}{3}$$

$$A : B = 4 : 3$$

Q no 7 (b)

Let Two digit number = xy
if $x = 2$
then $y = 4$ as exceeds
by 2

$$\text{so } xy \times (x+y) = 144$$

$$24 \times (2+4) = 144$$

$$24 \times 6 = 144$$

The number is 24

Q no 7 (c)

$$A : B : C : D = 5 : 2 : 4 : 3$$

$$\text{Sum of ratios} = 5 + 2 + 4 + 3 = 14$$

$$C's \text{ Share} = 1000 + D's \text{ Share}$$

$$B's \text{ share} = ?$$

$$\rightarrow \frac{4}{14} \times x = 1000 + \frac{3}{14} \times x$$

Let x is total Money

$$\frac{4x}{14} = 1000 + \frac{3x}{14}$$

$$\frac{4x - 3x}{14} = 1000$$

$$x = 14000 \text{ Rs}$$

$$B's \text{ share} = \frac{\text{Ratio of B}}{\text{Sum of Ratios}} \times \text{total Money}$$

$$= \frac{2}{14} \times 14000$$

$$B's \text{ share} = 2000 \quad B's \text{ share} = 2000 \text{ Rs}$$

Q7 (d)

present Father age = $x = 38$ years

present Son's age = y

Five years ago:

Son's age = $y - 5$

At time of Son's birth:

father's age = Son's present age

~~38~~ = y

Father's present age - Son's age
= Son's age

$$38 - y = y$$

$$38 = 2y$$

$$y = 19$$

Son's age = 19 years

Father's age = 38 years

5 years back

Son's age = $19 - 5$

= 14 years

Five years back Son's
age was 14 years.

Section-I

Q2 (a)

1. Benefits of Implementing Artificial Intelligence (AI) in healthcare:

In patient's care and medical diagnosis, A.I. plays a crucial role as discussed below:

1.1) Early and Accurate Diagnosis:

AI can detect diseases like Cancer and strokes and some others too, faster and with more accuracy. For example Google's Deep mind detects eye diseases with 94% accuracy.

1.2) Personalized Treatment Plan:

AI analyses individual health to tailor treatments and it enhances outcome with reduced side effects.

1.3) Effectiveness in Administrative tasks:

AI can

quickly and automate all kind of administrative work like paper scheduling and

1.4) Remote Monitoring and Telemedicine:

AI helps in monitoring illness from home for rural and underserved areas.

1.5) Drug Development Research:

AI speeds up drug trials and processes so it can lower the cost of pharmaceuticals.

2- Challenges of Artificial Intelligence in healthcare:

2.1) Privacy and Security:

AI uses large amounts of patient data of people because of its high accuracy.

quickly and automatically do all kind of administrative work like paper work, scheduling and billing etcetera.

1.4) Remote Monitoring and Telemedicine:

AI monitor chronic illness from home and useful for rural and underdeveloped areas.

1.5) Drug Development and Research:

AI speeds up clinical trials and predicts results. So it can lower down cost of pharmaceutical research.

2- Challenges of Implementing Artificial Intelligence (AI) in healthcare:

2.1) Data Privacy and Security Risks:

Sensitive data of patients is not secure because of AI and there is high risk and concerns

over consent and confidentiality
2-2) High Initial Cost and Infrastructure Gaps:

AI tools are expensive and require high technical infrastructure. Developing countries struggle to acquire these tools.

3) Lack of Human touch in Care:

AI can not replace human's care, ethics and empathy, also there is also risk of depersonalized treatment.

2-4) Bias in Algorithms:

If AI is trained on biased data then it can be harmful. For example underrepresentation of minorities in datasets.

Q no 2 (b)

1- Big Bang theory.

The most popular theory "Big bang theory" describes that this universe came into existence after a huge explosion of a huge ball of matter that contained everything as matter in it. After explosion everything inside it came out and spread at wide distances in universe.

2- Significance in understanding the origin and evolution of the universe:

It is the most popular theory that give evidence of origin of universe and its evolution with passage of time.

3- Key Evidences supporting the theory:

3.1- Red shift

of Galaxies: This was observed by Edwin Hubble in

1929 showing that light from distant galaxies is moving away and proving that universe is expanding from its initial point.
Emission of Light:

The nucleosynthesis of Big Bang suggested that there is 75% hydrogen and 25% Helium by mass and which is matching to a great extent.

Cosmic Microwave Background Radiation: (CMB):
discovered in 1965 by Arno Penzian and Robert Wilson explaining that faint thermal radiation are expanding in the universe.

Q No 2 (c)

1- Primary Causes of Global warming:

Primary causes of Global warming are all related to human activities that started after industrial revolution. These are discussed below:

1.1) Burning of Fossil Fuels:

Burning of fossil fuels like coal, oil and natural gas is responsible for almost 75% of global warming and it spread after industrial revolution.

1.2) Deforestation:

Trees or forests are carbon sinks and absorb the harmful CO₂ gas but deforestation has spread and increased after industrial revolution which has contributed to the global warming.

1.3) Urbanization:

Urbanization resulted after huge increase in population and after increased effects of human activities interfering the natural phenomenon. It resulted in increased use of transport, deforestation, industrialization all leading to global warming.

2. Strategies for Mitigation of Global warming:

2.1) Reduce

Green house gas emissions:

Green house gases i.e CO_2 , CH_4 , CFCs etc are main reasons of global warming and are spread in atmosphere because mainly of burning of fossil fuels, there is an immediate need of reduced emission of

these gases and follow the Kyoto protocol and Paris agreement.

2.2) Protection of ozone layer:

Protection of ozone layer can be done by implementing Montreal protocol and it can lead to reduced G.W.

2.3) Shift to Renewable Sources of Energy:

There is a strong need of shifting from non-renewable energy sources to renewable energy sources. It includes use of hydro power, wind power, tidal power and Bio-fuels, Biomass etc.