

GSA

Question No. 4

(a) Answer:

Earthquakes are generated due to the movement of plates in earth's crust. There is a theory called "Plate Tectonics Theory". According to this theory there are 7 major plates in earth's crust. These plates move sometimes rubbing each other, sometimes one is above the other and sometimes by getting away from each other. Earthquake is generated when one plate's some portion is beneath ~~is~~ the other plate. The other half of that plate is still vibrating to move. As a result there is building energy and when that plate is released, the energy built is released too. As a result the surface of earth experiences a shake called earthquake.

Tsunami:

Tsunami is the same phenomenon as earthquake except that it happens under the sea bed. The plates or earth under the sea go through the same process and Tsunami happens. However, for a tsunami to occur the earthquake must be strong and vertical not horizontal.

b. Coriolis Force:

Coriolis force is produced due to earth's rotation and is one of the significant force in weather patterns. Coriolis force deflects air to the left in southern hemisphere and to the right in northern hemisphere. Coriolis effect has a major role in the production of hurricanes, tornadoes and other major phenomena.

Hurricanes:

Hurricanes are generated over the water body. When the water body gets warm, there builds a low pressure area and the water evaporates. When the warm air goes up, there is a vacuum created. So, cold air from the

surroundings come and they go up too. This keeps on happening and the water makes a cloud above in ~~cloud~~ cold atmosphere due to condensation. The next step is done by Coriolis force which deflects the air in those directions. As a result the winds and water make a hurricane. Hurricane is moving over the water body until it reaches the shore and causes huge rainfall and sometimes flooding.

c. Solar Eclipse :-

Solar eclipse is a space phenomenon which occurs once or twice in a year. Solar eclipse occurs when the earth and moon rotating around the sun come at a similar point. The moon is between the sun and earth casting an angular shadow on earth. Solar eclipse cannot be seen with the naked eye. Because there are strong UV rays which have the potential to cause blindness. Protective goggles must be used to see a solar eclipse.

Lunar Eclipse :-

Lunar Eclipse happens more often than solar eclipse. Lunar Eclipse occurs when earth comes between the sun and moon. Casting its shadow on moon. It can be seen with the naked eye and doesn't cause any damage. Lunar eclipse can be:

- ① Total: When the whole moon comes under the shadow
- ② Partial: When a part of moon comes under the shadow.

d. Doping in Semi-Conductors :-

Doping in semi-conductors refers to adding impurity to the semi-conductors in order to make them better conductors.

Ceramics:

Ceramics are durable materials made from inorganic, non-metallic substances that are fired at high temperatures.

Types:-

- ① Glass Ceramics: controlled crystallization that has properties close to glass.

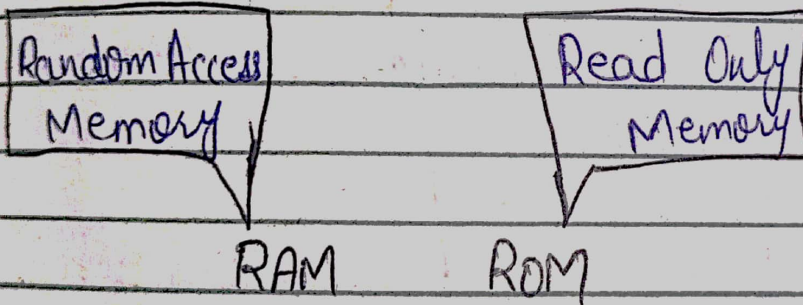
② with strength and durability of glass.
Earthenware - made from clay heated at higher temperatures.

③ Porcelain - a fine white clay, fired at highest temperature.

Question No 5:

a. RAM and ROM:

RAM stands for Random Access Memory, it is volatile and stores information only temporarily. However, ROM stands for Read Only Memory - which is non-volatile and stores information permanently.



Nibble and USB:

↓
Nibble is a four bit aggregation of bits.

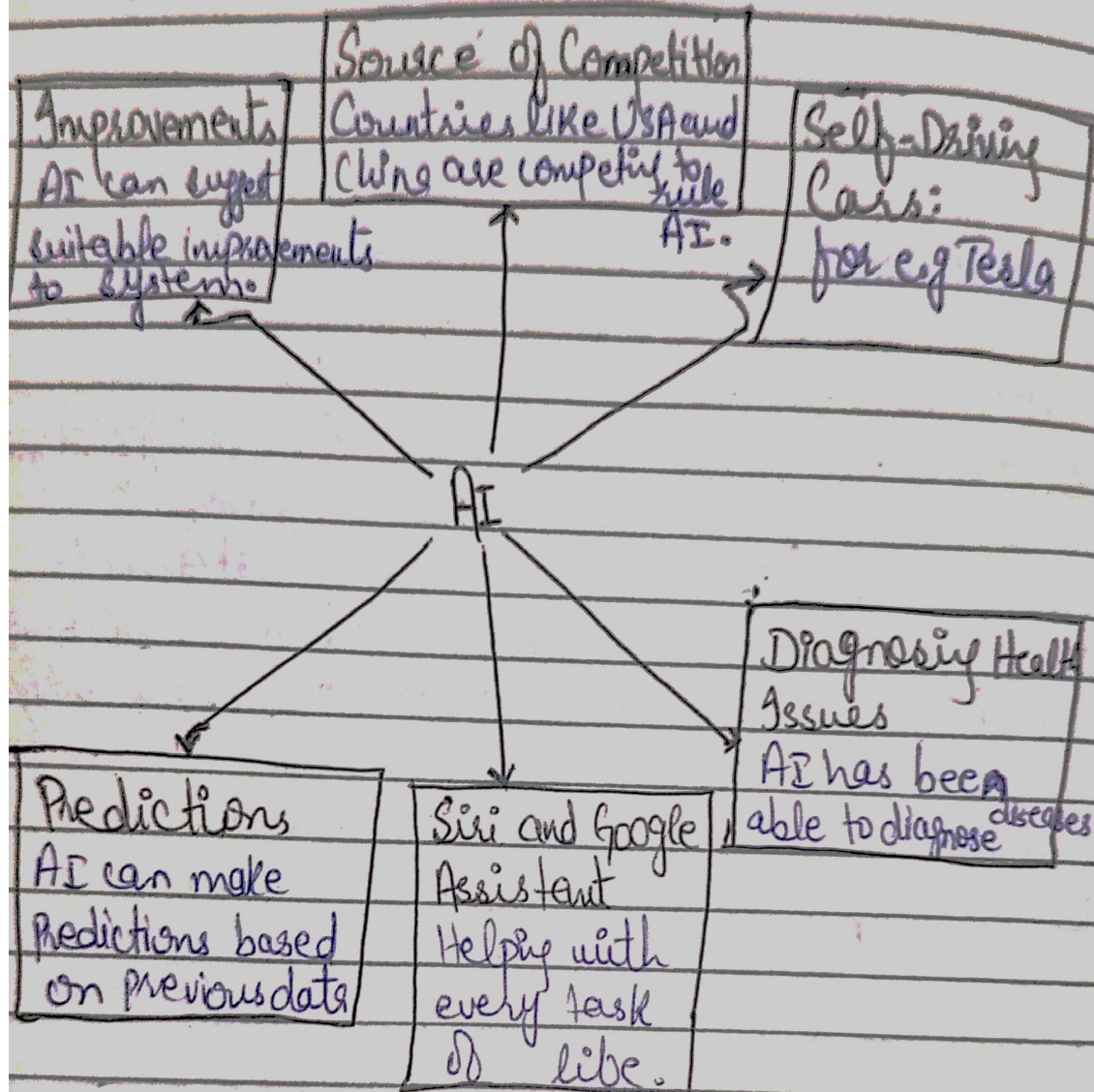
↓
Half-byte

↓
Universal Serial Bus

↓
allows devices to communicate with each other and exchange data.

→ 16 possible values.

b. AI has revolutionized the world in various aspects. Better explained with a tree diagram.



c. Optical Fiber :-

Optical fibers work on the principle of total internal reflection. When light enters the core of optical fiber at a certain angle (critical angle).

It reflects off the boundary between the core and the cladding, allowing it to travel down the fiber without significant loss of signal.

Advantages :-

① High Bandwidth - can carry large amounts of data

② Low Signal Loss.

③ Lightweight and durable.

④ Immune to electromagnetic influence.

⑤ Provides security of data, difficult to tap into.

d. Critical Speed of Satellite:

The minimum speed required for a ~~stable~~ satellite to maintain a stable orbit around a planet.

Critical speed depends on weight and distance of satellite.

Geo-Stationary Satellites:

Satellites that orbit the earth at speed equal to earth's rotation and appear stationary.

Polar Satellites are that which orbit the earth at higher inclination to the equator. They pass over both North & South poles.

Question No 6:

a. Let's suppose the age of father as 'x', and son as 'y'.

Five years ago.

$$x - 5 = 3(y - 5) \rightarrow \text{①}$$

Presently - putting the value of y in equation 1.

$$x-5 = 3(30-5)$$

$$x-5 = 90-5$$

$$x-5 = 85$$

$$x = 85 + 5$$

$$x = 90$$

So, Presently / currently the age of father is 90.

b. Mean = $\frac{\text{Sum of all observations}}{\text{No of observations}}$

$$50 = \frac{10+30+Y+50}{4}$$

$$50 \times 4 = 90 + Y$$

$$200 = 90 + Y$$

$$Y = 200 - 90$$

$$Y = 110$$

c. Missing terms

(i) 2, 6, 18, 54, 162

Since the pattern of multiplication with 3 is being followed. So, the missing term is 162.

(ii) 3125, 256, 27, 4, 1

The pattern being followed here is the position of number raised to the number itself.

For example $5^5 = 3125$

$$4^4 = 256$$

$$3^3 = 27$$

$$2^2 = 4$$

$$1^1 = 1$$

Hence, the missing number is 27.

d. Let's consider the two numbers as x and $5x$, since their ratio is 1:5. Now their product equals to 320.

$$x(5x) = 320$$

$$5x^2 = 320$$

$$x^2 = \frac{320}{5}$$

$$x^2 = 64$$

Taking square root on both sides.

$$\sqrt{x^2} = \sqrt{64}$$

$$x = 8$$

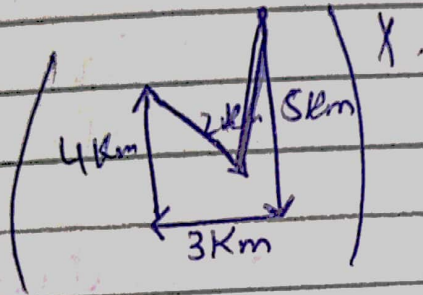
So, the two numbers are 8 and $5(8) = 40$.

Now the difference b/w squares of these two numbers.

$$\begin{aligned} &= (40^2 - 8^2) \\ &= 1600 - 64 \\ &= 1536. \end{aligned}$$

Question No 8:

a.



b.

$\frac{1}{3}$ is the probability of shiza picking a slice with raisin in it.

c. No of triangles in the figure is 12.

d Factors which can affect IQ:-

The factors which can affect an IQ include

- ① Unhealthy Diet: Brain needs proper nutrition present in a balanced diet. When the nutrition is unhealthy, and all the requirements are ^{not} fulfilled, the IQ is affected.

② Psychological Strain: If a person takes too much stress and is under a psychological strain, his IQ can be affected.

③ Smoking/Vaping: Smoking contains nicotine which numbs the brain activity. It can affect IQ.

④ Trauma: Any human going through a trauma can have IQ issues.

⑤ Genetic Issues: Genetic mutations can also affect IQ.