

GENERAL KNOWLEDGE - I GENERAL SCIENCE AND ABILITY

PART - II

SECTION - I

QNO.02.

(a) Cyclones are storms that have a low-pressure center and are rotating. They are caused due to a convection process of rising hot air over the ocean surface. This vacant space is then occupied by the cool air around, which further heat up and rises. The most dangerous and destructive part of a tropical cyclone is the eyewall. Here, winds are strongest, rainfall is heaviest, and deep convective clouds rise from close to earth's surface to a height of 15,000 metres (49,000 feet).

(b) Black Hole:

A black hole is a cosmic body of extremely intense gravity from which even light cannot escape. Black holes usually cannot be observed directly, but they can be "observed" by the effects of their enormous gravitational fields on nearby matter.

FORMATION:-

Black hole can be formed by the death of a massive star. At the end of a massive star's life, the core becomes unstable and collapses in upon itself, and the star's outer layers are blown away. The remaining weight of constituent matter falling in from all sides compresses the dying star to a point of zero volume and infinite density called the singularity.

(c) A rotation is a circular movement of an object around a center of rotation.

Revolution occurs when one body moves around another, while rotation means moving around the axis. For example, the moon revolves around the earth, and the earth revolves around the sun.

Structure of a earth:-

The structure of the earth is divided into four major components: the crust, the mantle, the outer core, and the inner core. Each layer has a unique chemical composition, physical state,

and can impact life on Earth's surface. Movement in the mantle causes surface variations in heat from the core, but the plates to shift, which can cause earthquakes and volcanic eruptions. These natural hazards then change our landscape, and in some cases, threaten lives and property. ~~because~~

d)

	Ionic Bonds	Covalent Bonds
Description	Bond between metal and non-metal. The non-metal attracts the electrons, so it's like the metal lends its electrons to it.	Bond between two non-metals with similar electronegativity. Atoms share electrons in their outer orbitals.
Melting Point	High	Low
Shape	No definite shape	Definite shape
Polarity	High	Low
Boiling Point	High	Low
At Room Temp	Solid	Liquid/Gas
Examples	NaCl , MgO	CH_4 , H_2O

Q no 05.

(a) Remote Sensing:-

It is the technique of acquiring information about objects, on the earth's surface without physically coming into contact with them.
It records the electromagnetic energy reflected or emitted by the earth's surface.

Naturally, remote sensing data provides vital information used to monitor and predict weather and climate change, land use changes at a macro scale, and monitor and protect our borders.

(b) Optical Fiber:-

Fiber optic is the technology used by internet services such as video on demand, voice internet to transmit information as pulses of light through strands of fiber made of glass or plastic over long distances.

Fiber-optic cables transmit data via fast-transmitting pulses of light. Another layer of glass, called 'cladding', is wrapped around the central fibre and causes light to repeatedly bounce off the walls of the cable, rather than leak out at the edges, enabling the signals to go further without attenuation.

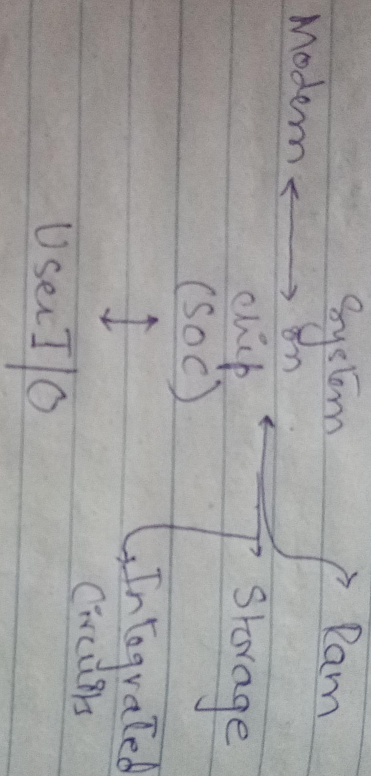
(c) Cell Phone :

A cell phone is a ~~text~~ telecommunication device that uses radio waves over a networked area (cells) and is served through a cell site or base station at a fixed location, enabling calls to ~~transmit~~ transmit wirelessly over a wide range, to a fixed landline or via the internet.

Structure of the cell phone:-

The common components found on all the phones are a number of metal-oxide-semiconductor (MOS) integrated circuit (IC) chips. A battery typically a lithium-ion battery, providing the power source

of the phone functions. An input mechanism to allow the user to interact with the phone.



How does it work?

A microchip in the phone modulates (or varies) a radio wave using the electrical signal. The radio wave travels through the air to a nearby cell tower, the tower sends your voice to the person you are calling and the process is reversed so that the person on the other end can hear your voice.

(A) Artificial Intelligence :-

Artificial intelligence is where systems emulate the human mind to learn, solve problems and make decisions on the fly without needing the intricate specifications programmed.

Robotics :-

Robotics is where robots are built and programmed to perform very specific duties.

SECTION - II

Q no 06.

(a) Identify the series :-

4, 18, 100, —, 294

$$\frac{184}{16} \\ \frac{16}{48}$$

$$2^3 - 2^2 = 8 - 4 = 4$$

$$3^3 - 3^2 = 27 - 9 = 18$$

$$4^3 - 4^2 = 64 - 16 = 48$$

$$5^3 - 5^2 = 125 - 25 = 100$$

$$6^3 - 6^2 = 216 - 36 = 180$$

$$7^3 - 7^2 = 343 - 49 = 294$$

(b) Solution

Total investment of Taher = $15,000 \times 12 = 180,000 / =$
in year

Total investment of Umar = $30,000 \times 7 = 210,000 / =$
in year

Total investment of Usman = $45,000 \times 4 = 180,000 / =$
in year

Therefore, the profit share ratio is,

Ta	Um	Us
180,000	: 210,000	: 180,000
18	: 21	: 18
6	: 7	: 6

$\rightarrow 6+7+6 = 19$

Total profit earned = $406,000 / =$

Share of Taher = $\frac{406,000}{19} \times 6 = 128,210 / =$

= $\frac{406,000}{19} \times 7 = 149,579 / =$

= $\frac{406,000}{19} \times 6 = 128,210 / =$

(e) BROTHER
 | | | | |
 O D G S N Q A

BROTHER: O D G S N Q A

- R-1 = Q
- B-1 = A
- R-1 = Q
- O-1 = N
- T-1 = S
- H-1 = G
- E-1 = D
- R-1 = Q

What if we do the same for sister

- S-1 = R
 - I-1 = H
 - S-1 = R
 - T-1 = S
 - E-1 = D
 - R-1 = Q
- Sister = Q D S R H R

(d) Total height is of 2000 meters
 Aspiration course $25^\circ 10' \times 2000 = 2960 \times \frac{1}{4}$
 = 500 meters.

Leftover height to be covered = $2000 - 500$
 = 1500 meters.

QNOO7.

(a) Daughter's age = x
 Father age = $4x$

" $4x + 5 = 3(x + 5)$.

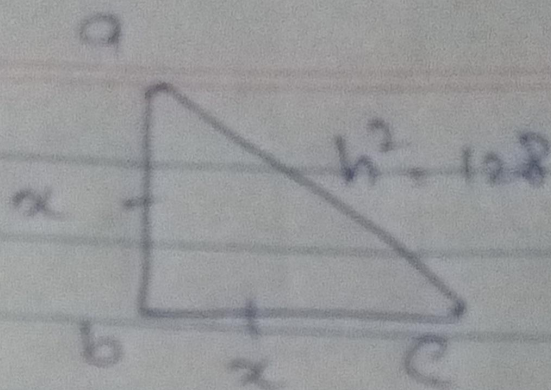
$4x + 5 = 3x + 15$

$x = 10$

Father's age = $4 \times 10 = 40$

After $5 + 5 = 10$ years, daughter's age would be 20 years and father's will be 50 years.
 Hence $50 / 20 = 2.5$ times of his daughter's age.

(a) Permittivity sensing:
 " It is the technique of information about unknown objects on surface with them.
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(b)

$$h^2 = 128$$

so,

$$ac^2 = ab^2 + bc^2$$

$$h^2 = x^2 + x^2$$

$$h^2 = 2x^2$$

$$128 = 2 \times x^2$$

$$\frac{128}{2} = x^2$$

$$x^2 = 64$$

$$x = \sqrt{64}$$

$$x = 8$$

\therefore length of each side is 8 cm.