

General Knowledge-I

General Science AND Ability

Part-II

SECTION - A

Q No. 2

a. Part

Igneous Rocks

- Igneous Rocks also known as Magmatic Rocks
- Igneous rocks are formed from magma
- They can be classified on basis of geological as well as chemical composition basis

⇒ Classification on Basis of Chemical Basis

- **Felsic**: High silicate content
- **Intermediate**: Between felsic and mafic (50-63% felsic content)
- **Mafic**: low silicate and higher iron content
- **ultra mafic**: silicate content less than 45%

Metamorphic Rocks

- Meta means change morphic means in form so metamorphic means change in form.
- when already existing sedimentary and igneous rocks are subjected to great heat and pressure they change their form, characteristic and feature are called metamorphic rocks.
- There are two types of metamorphic rocks
- **Contact Metamorphism** when change in form occurs due to high temperatures for example limestone changed to marble
- chert into Quartz
- sandstone into Quartzite.

classification on Basis of Geological Setting

• Extrusive

also known as volcanic rocks. when lava/magma comes out through partial melts of the rocks in planets mantle and crust.

→ they are smooth crystalline and fine grained.

• Intrusive

cooling and solidification of magma inside crust of earth.

• also known as Plutonic rocks

• medium grained

Pressure Metamorphism

• when the change in form occur due to high pressure from overlying rocks for example Jade.

b. Part

Smog:

Smog is derived from two words 'Smoke' and 'fog'.

Smog is a type of air pollution that

Occurs when pollutants in air react with sunlight and forms a dense layer of pollution, appearing between smoke and fog.

Types of Smog:

- Sulphurous Smog
- Photochemical Smog

Sulphurous Smog: also known as the 'London Smog' results from a high concentration of sulfur oxide in the air and is caused by use of sulphur-bearing fossil fuels such as coal.

- This type of smog is formed by dampness and a high concentration of suspended particles in air.

photochemical smog: also known as 'Los Angeles Smog' occurs most prominently in urban areas that have large numbers of automobiles.

- This type of smog has its origin in the nitrogen oxides and hydrocarbon vapours emitted by automobile and other sources, which then undergo photochemical reaction in lower atmosphere

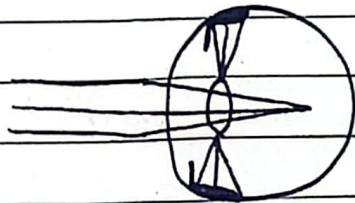
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d. part

Short and Far Sightedness

Short Sightedness:

- Also known as Myopia or Refractive errors.
- It leads to blurred vision of the distant objects, while close vision is usually normal.

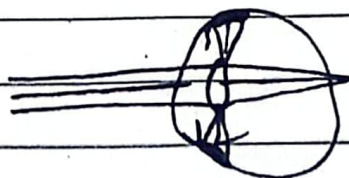


light focused in front of Retina

- In Myopia the light coming from distant objects is focused in front of Retina
- It can be corrected by use of concave lens.

Far Sightedness :

- Also known as hyperopia
- It leads to blurred vision of close objects but distant objects seems clear.
- In hyperopia, the light coming from the close object is focused behind the retina
- It can be corrected by use of convex lens.



light focused behind Retina.

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Q.No. 3

a. Part

'Protein & Carbohydrates'

What are protein & Carbohydrates?

Proteins:

'proteins are the polymers of Amino acids'

- They build up the structures of the cell.
- all enzymes are proteins in nature, so they control metabolism of cells.
- There are two categories of Amino acids that forms different types of proteins

* **Essential Amino acids:** required by body throughout the life such as Valine, Argentine etc.

* **Non-Essential Amino Acids:** not required by body throughout life such as Glutamine, Cysteine etc.

Digestion of Protein: ^{Starts} occurs in stomach.

Stomach releases an enzyme called Pepsinogen which after its conversion into pepsin changes the protein into peptones and then into polypeptides. this process until small intestine.

Carbohydrates:

- Literally means 'hydrated carbons'.
- composed of carbon, hydrogen and oxygen
- General formula is $C_x(H_2O)_y$.
- There are three main types of carbohydrates
 - Monosaccharides
 - Oligosaccharides
 - Polysaccharides

Digestion of Carbohydrates starts in oral cavity. Salivary glands secrete enzyme called as Amylase which breaks down carbohydrates into maltose before entering stomach. and this process occurs until small intestine.

b. Part

Atmospheric Pressure / temperature / Humidity

Atmospheric Pressure:

- the force exerted by the weight of air in the atmosphere
- also known as Barometric pressure

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- decreases with altitude
- measured in pascals.

Temperature:

- It is the average kinetic energy of air molecule in atmosphere.
- controlled by balance of energy Earth receives from sun rays and radiates back into space.
- measure in degrees.

Humidity:

- It is the measure of water content of air.
- water vapours molecules are lighter than air molecules, so they occupy more space and increased humidity pressure is caused in high humidity environment.

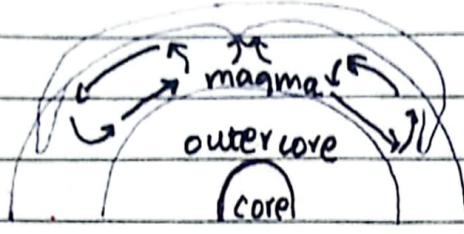
C Part

Earthquakes:

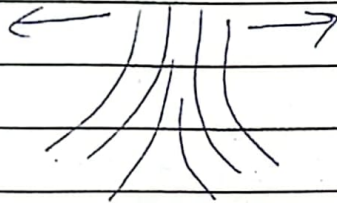
is the sudden violent shaking of the ground due to under ground seismic activity within earth crust. The movement is caused by the release of energy by magnetic convection current around a fault (or crack)

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Line on the earth crust, along which movement can occur causing earthquake



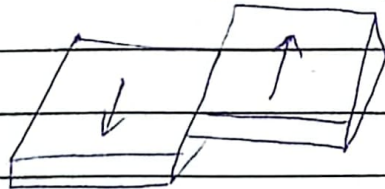
- There are three types of movement that occurs along the tectonic plates.
- **Divergent Tectonic plate** :- when plates moves away from each other.



- **Convergent TP** :- when the two plates slides over one another.



- **Transitional fault line** :- when two fault lines slide past one another.



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d. Part

RADAR

→ The word stands for Radio detection and ranging. It was invented during WW-II.

Working of RADAR:

1. The transmitter generates very high frequency electromagnetic waves.
2. The waves are sent out in desired direction in a narrow cone-shaped beam from a concave antenna.
3. The waves travel outward ^{with} the velocity of light and are reflected back, when strike a distant object which comes their way.
4. These waves then return and strike back with radar antenna and are amplified in radar receiver.
5. Receiver sends signal to indicating device which measure the time taken by radar waves. ~~and~~
6. By knowing the waves velocity, the distance of the object from radar can be found.
Radar waves can penetrate through haze, fog and clouds.

Question No. 6

a. Part

Rate of dep. every year: 10%

Present value: 8748

price of machine 3 years ago: ?

Solution

using formula;

$$\text{final price} = \text{initial price} \left(\frac{100 - \text{rate}}{100} \right)^{\text{time}}$$

$$8748 = x \left(\frac{100 - 10}{100} \right)^3$$

$$" = x \left(\frac{90}{100} \right)^3$$

$$8748 = x \times \frac{90}{100} \times \frac{90}{100} \times \frac{90}{100}$$

$$x = 8748 \times \frac{10}{9} \times \frac{10}{9} \times \frac{10}{9}$$

$$x = 12000$$

b. Part

- Age of father = 4 × age of daughter
- after 5 years, Age of father = 3 × "
- after another 5 years, " = ?

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Solution:

Let present age of daughter be x .

So father's age is $4x$

After 5 years,

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

$$4x + 5 = 3x + 15$$

$$4x - 3x = 15 - 5$$

$$x = 10 \quad \text{daughter}$$

Present age of father is = 10 years

" " " father is = $4 \times 10 = 40$

Age after 10 years will be : 50 : 20
5 : 2

So age of father will be 2.5 times
that of daughter age after 10
years.

$$\text{Age of father} = 2.5 (\text{age of daughter})$$

c. Part

Diameter of football : 12cm

Volume of football : ?

Solution:

Since volume of a football is

$$\text{given by } V = \frac{4}{3} \pi r^3$$

$$\text{where } r = \frac{d}{2} = 6 \text{ cm}$$

$$\text{and } \pi = 3.14$$

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$$V = \frac{4}{3} (3.14) (6)^3$$
$$= \frac{864}{3} (3.14)$$
$$= 288 (3.14)$$

$$V = 894.32 \text{ cm}^3$$

R W

$$\begin{array}{r} 3.14 \\ \times 288 \\ \hline 2512 \\ 2512 \\ \hline 894.32 \end{array}$$

d. Part



- two trains moving oppositely cross a man in 27s and 17s respectively
- they cross each other in 23 seconds
- Ratio of their Speed

Solution:

Let train one be $t_1 = 27s$

& train two be $t_2 = 17s$

cross each other = 23 secs

Total time = total distance / Total speed

Let their speeds be 'a' and 'b' respectively

so distance $t_1 = 27a$

& distance $t_2 = 17b$

$$\Rightarrow 23 = \frac{27a + 17b}{a + b}$$

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$$23a + 23b = 27a + 17b$$

$$6b = 4a$$

$$a/b = 6/4 = 3/2$$

$$a:b = 3:2$$

Ratio of speed is 3:2.

Question no. 7

a. part

average of 7 consecutive number is : 20

find the largest number : ?

Solution:

let the first consecutive number be x

the seven consecutive number can be.

$$x, x+1, x+2, x+3, x+4, x+5, x+6$$

$$\text{Sum of consecutive no.s} = 7 \times 20 = 140$$

$$x + x+1 + x+2 + x+3 + x+4 + x+5 + x+6 = 140$$

$$7x + 21 = 140$$

$$x = 17$$

So the largest number is $17+6 = 23$

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b. Part

Solution

let \square \rightarrow female

\square \rightarrow male

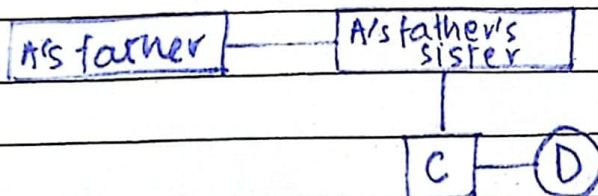
$=$ \rightarrow married

$—$ \rightarrow Siblings

and | \rightarrow different Generation

C is A's father's Nephew means C is
the cousin of A

D is A's cousin but not brother of C
means D is sister of C



• D is sister of C.

c. Part

Missing Number in Sequence

(i) 4, 18, 48, 100, 180, 294, 448

(ii) 12, 10, 37, 101, 226

(iii) 11, 17, 39, 85, 163

(iv) 13, 24, 46, 90, 178, 354

(v) 4, 36, 144, 400, 900, 1764

d. Part

ratio of A and B = 1:2

ratio of B and C = 3:2

ratio of C and D = 3:4

difference in shares of A and D = 2240

Solution:

A : B : C : D Ratio of A & B = 1:2 = $\frac{1}{2}$

$$\text{let } \frac{1}{2} \times \frac{9}{9} = \frac{9}{18}$$

Ratio of B and C = 3:2 = $\frac{3}{2} = \frac{3}{2} \times \frac{6}{6} = \frac{18}{12}$ Ratio of C and D = 3:4 = $\frac{3}{4} = \frac{3}{4} \times \frac{4}{4} = \frac{12}{16}$

So the final ratio could be

$$9 : 18 : 12 : 16$$

$$A : B : C : D$$

let's assume A's share is $9x$, B's $18x$ and C's $12x$ and D's share is $16x$.

$$16x - 9x = 2240$$

$$7x = 2240$$

$$x = 2240/7 = 320$$

$$\rightarrow \text{B's share} = 18x = 320 \times 18 = 5760$$