M. Saad Afzal - Batch 343 (Sec - Mock-8)

Day / Date

General Science and ability

(Part - II)

(Section - II)

(Question-6)

a. Father's age 5 years ago is thrice the son's age.

Let Father's age = $x$

Son's age 5 years ago = $30 - 5 = 25$ years.

Father's age was thrice of 25, 5 years ago, so Father's age 5 years ago = $3 \times 25 = 75$ years.

Father's age after five years = Current age = $75 + 5 = \boxed{80 \text{ years}}$

b. Means = $\frac{\text{Sum of all terms}}{\text{No. of terms}}$.

Mean = 50, Terms = 30, 10, Y, 50

No. of terms = 4

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

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

$$200 = 90 + Y$$

$$Y = 200 - 90$$

$$\boxed{Y = 110}$$

c. i. 2, 6, 18, 54, 162

Each successive term is multiplied by 3.

$2 \times 3 = 6$. $6 \times 3 = 18$ & $18 \times 3 = 54$ Maxim.....

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Hence the next term would be
$54 \times 3 = \boxed{162}$ → Missing term.

ii. 3125, 256, 27, 4, 1

Powers seem to be successively decreasing for consecutively decreasing integers, i.e.

$(5)^5 = 3125$, $(4)^4 = 256$,
$(3)^3 = 27$, $(2)^2 = 4$
$(1)^1 = 1$

Hence, the missing term is

$(3)^3 = \boxed{27}$

d. let the two numbers be x & y

Product of two numbers $\Rightarrow xy = 320 \rightarrow (i)$
Ratio of two numbers $\Rightarrow \frac{x}{y} = \frac{1}{5} \rightarrow (ii)$
Difference between the squares of these two numbers $\Rightarrow ?$

From (ii), $x = \frac{y}{5}$.

Put $x = y/5$ in (i),

$\left(\frac{y}{5}\right) y = 320$

$y^2 = 320 \times 5$

Maxim.....

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Maxim.....

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$$\sqrt{y^2} = \sqrt{1600}$$

$$y = \pm 40$$

putting $y = 40$ in (ii)

$$\frac{x}{40} = \frac{1}{5} \Rightarrow x = \frac{40}{5} \times 1$$

$$x = 8.$$

Difference b/w square of these two numbers $\Rightarrow x^2 - y^2 = 64 \pm 1600$

$$= \pm 1536$$

The difference between the squares is $\boxed{1536}$

Day / Date

(Q no. 7) a. Total profit % on 1st scooty = 20 %.
Total loss % on 2nd scooty = 20 %.

Total percentage = ?

Total cost price = 192,000 Rs.
115,200
76,800 . = 192,000

However, loss is incurred in this case due to buying at same rate, so,

Total loss % = $\frac{x^2}{100}$

$= \frac{x2}{10^2} = \left(\frac{20}{10}\right)^2 = 2^2$

= 4 % loss

b.

| Men | Hours | Days. |
|---|---|---|
| ↑ 195 | ↓ 10 | ↓ 20 |
| x | ↓ 13 | ↓ 15 |

$\frac{x}{195} \frac{195}{x} = \frac{10}{13} \times \frac{20}{15}$

As men increase, days decrease so proportion is inverse.
As days decrease, hours also decrease Maxim..... and hours decrease if men increase.

So,

$$x = \frac{195 \times 10 \times 20}{13 \times 15 \times 3}$$

$$x = \frac{195 \times 40}{13 \times 3} = \frac{65 \times 40}{13}$$

$$= \frac{2600}{13} = \boxed{200 \text{ men}}$$

c. $A = \{a, e, i, o, u\}$

$U = \{a, b, c, \ldots . z\}$

$A' = U - A$

Which means alphabets except vowels, so,

$A' = U - A = \{b, c, d, f, g, h, j, k, l, m, n, p, q, r, s, t, v, w, x, y, z\}$

d. Volume of pyramid $= \frac{a^2 h}{3}$

Here, $h$ = height, $a$ = Base edge.

Putting $h = 3\text{km}$ & $V = 372\text{cm}^3$,

$$372\text{cm}^3 = a^2 \times \frac{3 \times 1000 \times 100\text{cm}}{3}$$

$$\frac{372\text{cm}^3}{100{,}000\text{ cm}} = a^2$$

$$0.00372\text{ cm}^2 = a^2$$

? can be solved for $h = 3\text{cm}$, Maxim.....

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$$\text{Volume} = \frac{h}{3} \times a^2$$

$$372\,cm^3 = \frac{31\,cm}{3} \times a^2$$

$$\frac{372 \times 3\,cm^3}{31\,cm} = a^2$$

$$36\,cm^2 = a^2 \Rightarrow a^2 = 36\,cm^2$$

$$a = 6\,cm$$

$$\text{Perimeter} = 4a = 4 \times 6 = \boxed{24\,cm}$$

(Part-II)
(Section-I)

a. The loss and damage fund was formed on the opening plenary of the first day of the COP-28 summit in Dubai. This is a hard won victory by the developing nations as it signals a sense of commitment from the developed nations.

Key features are:-

1. Fund comes as grants not loans.
2. So far, 700 m$ pledged - 0.2% of what's needed
3. The formation and need shows nations have not beer

Maxim

stepping up.

**b. Solid Waster Management:-**

Solid Waster Management involves the collection of, disposal and treatment of solid waste to minimize its environmental impact. Effective SWM is crucial for maintaining environmental sustainibility, public health and overall well being. Various methods are applied which can be characterized as follows:-

1. Landfills:- Solid waste is compacted and buried under the soil, layer by layer. Care has to be taken for methane and other toxic gases to not be released in the atmosphere.
2. Incineration:- High temperature incinerators burn the collected solid waste and produce energy as a result. Incineration is efficient in reducing volume of the waste as well.
3. Composting:- Solid organic waste is naturally decomposed into compost containing nutrients which is then used to condition soil. It produces a valuable soil ammendment and reduces the need for chemical and toxic fertilizers.

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## C. A balanced diet:

A balanced diet is crucial for maintaining good health and well being It refers to a proportionate intake of foods and necessary nutrients. It aids in the growth, development and functioning of the body as well. This may include carbohydrates, fats, vitamins, minerals and proteins.

Carbohydrates:- Help provide energy
Proteins:- Useful for growth
Fats:- Important for energy storage.
Vitamins:- Prevention of deficiencies and diseases.

Different sources of these important components in the above order are:- Cereals, grains, meat, fish, yoghurt, nuts, seeds, olive oil, fruits, vegetables, whole grains etc.

Proper consumption of these edibles in proportionate amount as per body need would lead to a balanced diet which would in return lead to a healthier and more sustainable lifestyle.

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d. Renewable energy resources under CPEC

CPEC includes many key renewable energy resources that would contribute to greener energy consuption in Pakistan. Three of them are discussed below:-

1. Hydropower Project in Dasu:-

Located on the Indus River with ample water flow, this project aims to generate a significant amount of clean and sustainable electricity. Harnessing the energy of the flowing water in river indus to produce electricity is the goal here.

2. The Quaid-e-Azam Solar Park:-

This initiative in Punjab is a key solar energy project under CPEC. It is one of the largest solar power projects in the country contributing to the generation of clean and sustainable energy.

3- The Jhimpir Wind Power Plant:-

The plant in Sindh is an example of wind energy project in Sindh. The plant aims to utilize strong winds in the region to generate electricity and to contribute to Pakistan's renewable energy goals.

Maxim.....

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Qn. 3) a. The human eye:-

The human eye is a complex organ with various parts that work together to facilitate vision. Here are the main components of the eye:-

1. Cornea:- The transparent front part coving Iris and pupil. Focuses light on retina.
2. Iris:- Colored part surrounding the pupil. Adjusts pupil size to control light entering the eye.
3. Pupil:- Black circular opening in the center of Iris. Regulates light entering the eye.
4. Lens:- Transparent flexible structure located behind the ~~eye~~ iris. Further focuses light on the retina.
5. Retina:- Innermost layer of the eye containing light sensitive cells. Converts light into electrical signals and sends it to optic nerve,
6. Optic nerve Bundle of nerve fibres that carries visual information from the retina to the brain.

**Correction of far-sightedness:-**

Convex lenses can be used to correct farsightedness as they focus and converge the light. ~~behind~~ The retina is hence correctly focused.

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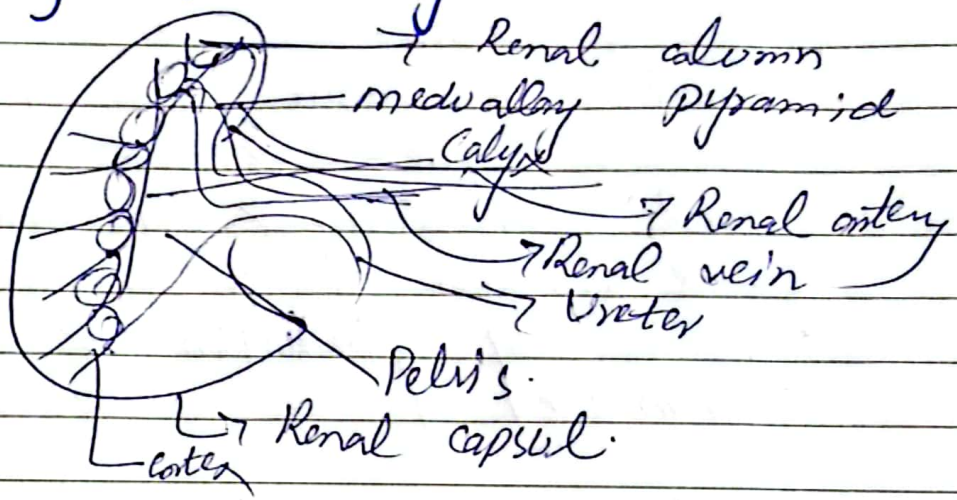
2. Correction of short-sightedness:
Using concave lenses, light is diverged before it enters the eye helping to focus directly on the retina. Refractive surgery may also be used for correcting vision.

b. Functioning of kidney:




Blood containing waste products and excess substances enters the glomerulus under pressure and filtration occurs allowing water electrolytes and small molecules to pass into Bowman's capsule. The filtrate moves through the renal tubule, when blood absorption occurs selectively. Remaining filtrate becomes concentrated, passing through Henle loop. The final product, Urine is modified in the collective ducts..

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c. **Blackhole formation:-**

Blackholes are formed though a process known as gravitational collapse, which occurs when massive stars reach the end of their life cycle. The formation of the blackhole is closely tied to the dynamics of stellar evolution. Here's a general overview of the process:-

Formation of massive stars → Depletion of nuclear fuel → Core collapses after fuel exhaustion → Supernova explosion occurs. → Formation of a compact object → Singularity formation → Event horizon → Formation of a blackhole.

d. **Isotopes:-**

(i) Atoms of same element having equal protons and unequal neutrons.

(ii) Similar chemical but different physical properties

**Isotopes of Hydrogen:-**

(Protium $^{1}H$) (Deuterium $^{2}H$ or D) (Tritium $^{3}H$ or T)

**Isotones**

(i) Same no. of neutrons but different no. of protons in atomic numbers.

(ii) ~~Ato~~ Same n, but different elements.

**Isobars.**

(i) Same mass numbers but different atomic numbers.

(ii) Different elements.

Maxim