

Dos and Don'ts for General Science & Ability Paper

Hi there, you've done well. Know that acquiring knowledge is one thing and reproducing it in paper according to what's asked is another. There are a few things I would like to highlight.

SECTION 1

QNO:3

(a) Everything in the universe ranging from atoms to human beings requires stability. Same is the case with atoms. They form chemical bonds with each other to gain stability. Chemical bonds are forming by transfer of electrons or mutual sharing of pair of valence electrons between the atoms resulting in formation of ions, molecules or compounds etc.

According to rule of octet (8 electrons in valence shell) and rule of duplet (2 electrons in valence shell) this is the ideal state of our atoms. Every atom tries to gain outer shell state to be the most stable for that type of atom. Other gains or loses electrons or does mutual sharing of valence electrons to gain ideal state.

For example water (H_2O) is formed by mutual sharing of electrons between two hydrogen atoms and one oxygen atom forming covalent bond. Hydrogen atom has only one electron in its valence shell and oxygen atom has 8 electrons in its valence shell.

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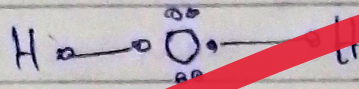
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Good luck for CSS 2025. You're gonna rock in sha Allah. :)

Address both parts of your question

so ~~the~~ the oxygen atom's two unpaired electrons do mutual sharing with 1 unpaired electron of two hydrogen atoms forming two covalent bonds between them as given below.



(b)

Doping: Semiconductors are the materials which partially conduct electricity more than insulators but less than conductors. To increase their power of conduction impurities are added to the semiconductors that process is called doping. There are two types of doping.

① N-type doping

② P-type doping

N-Type Doping = When pentavalent atoms like Antimony, Arsenic etc are added as an impurity to the semiconductor like selenium, silicon, germanium that is called N-type doping. Four atoms of the pentavalent atom form mutual bonds with atoms of the semiconductor one unpaired electron remains that will be responsible for conduct of electricity

① P-Type Doping = When a trivalent atom like boron, is added to the semi-conductor like arsenic, selenium, this is called P-type Doping. Three valence electrons of trivalent ~~atom~~ atom form bond with valence electrons of semi-conductors creating a blank space which will act as positive charge and when we apply potential difference that positive charge will move resulting in the movement of electric charge from one place to another.

Different types of ceramics

Ceramics are the materials that are solid, non-metallic and non-conductor of electricity. There are two major types of ceramics.

- ① Crystalline ceramics
- ② Non-crystalline ceramics

Crystalline ceramics : These are the materials which can't be undergone through various levels of processing

Non-crystalline ceramics = These are formed from melts for example glass.

(C) Merits and demerits of Global warming

With the passage of time humans have exploited the natural resources especially non-renewable energy sources like coal, oil, diesel, natural gas etc. There are many factors responsible for the global warming for example mass deforestation, burning of fossil fuels, Rapid urbanization, rapid industrialization and lots of more. If we enlighten the merits and demerits, the side of demerits is a lot heavier.

Demerits of global warming include rising temperature levels of the world for example according to global meteorological report temperature in China was recorded 52°C and that of London was 40°C in 2023 these were highest recorded temperatures of these areas. Raising temperature are giving heat strokes which are fatal, killing hundreds of people every year, adversely affecting agricultural production especially last year. ~~Raised temperature~~ cause melting of glaciers. ~~Total~~ fresh water in the world is only 3% in the form of ice and running water also. melting of glaciers will reduce levels of fresh water in the world. Filtering of mixed water will require heavy investment, which the world can't afford, especially developing countries.

Another demerit is rise of sea level. Sea level has raised 8-9 inches. It endangers the coastal population. Major population of the world around 2 billion are living on coastal areas like Karachi, Bombay, New Zealand, Malaysia etc. Their life is in danger due to high sea level. It will result in massive transfer of people from coastal areas which give rise to other problems like poverty, unemployment, hunger etc. Extremes of the weather have increased chances of natural disasters like floods every year. Frequently episodes of flood have been faced like 2003 in Karachi, etc India, 2017 in Lahore, 2020 in Karachi, 2022 in Sindh, Balochistan, Punjab etc. Also recently flood in Balochistan faced by people. These all factors not only increase hunger and poverty but also crime rates.

Add subheadings

On the other hand, if we see merits of global warming they are very few like higher temperature in colder areas increase their productivity rates, earlier springs increase the time of cultivation and more food production. However, we should take measures to reduce global warming like increasing use of renewable sources like solar, wind, water etc instead of non-renewable, lower the level of greenhouse gases, reducing burning of hydrocarbons used as fuel especially old engines should be banned, working on reforestation etc so that the world keeps breathing healthy.

(d)

Poliomyelitis

Poliomyelitis is a viral disease caused by polio virus. Polio virus has three variants

- 1/ Poliovirus Type 1
- 2/ poliovirus type 2
- 3/ polio virus type 3

It is an acute crippling disease. It spreads through mouth. Virus enters into the mouth from where it travels to the tonsils and then into lymph nodes of the respiratory tract. Polio has various types depending upon how the virus affects parts of body.

Abortive poliomyelitis: when person is infected he gets symptoms of headache, sore throat, malaise, fever, nausea, vomiting etc

non-paralytic poliomyelitis = In this type, along with the symptoms of abortive poliomyelitis patient has neck stiffness. It presents like aseptic meningitis. There is no paralysis of any body part.

Paralytic poliomyelitis: In this type virus directly hits on nervous system causing muscular pain and paralysis of limbs

Bulbar poliomyelitis: In this type virus attacks on neurons of brain stems, may result in respiratory and heart failure.

The diagnosis of polio is done by throat cultures, stool sample or detection of antibodies in

the blood stream. There is no treatment of polio once it affects the body. Some measures can be taken like exercises can help.

If we talk about Pakistan, it is one of the two countries where polio still persists. Pakistan is facing socio-economic, political and cultural challenges. Due to poor governance, lack of whole area coverage, several myths like people say polio vaccine sterilizes the children so in future they will ~~not~~ no longer produce babies and some people claim that these are ^{micro}chips from western side installed in them. There is no safety of polio vaccine teams they are being attacked several times. These are some major challenges in Pakistan for eradication of polio - from ~~the~~ Pakistan.

Q No 4

(a) Bile

Bile is juice produced from liver, stored in gall bladder. It helps in digestion, absorption and emulsification of fats and excretion of waste from body. Bile has no enzymes but it contains bile salts, bile pigments, cholesterol, phosphorus. Bile pigments like bilirubin, biliverdin give it green colour and if they are stored in larger quantity they cause jaundice. Bile also alkalizes the acidic food that comes from stomach into the intestine and kills the micro-organisms if present.

(b) Role of kidney in excretion

Kidney is the major organ of excretion of nitrogenous waste from the body which are very harmful if accumulated. The basic functional unit of kidney is nephron. Kidney has millions of nephrons. Blood from body enters ~~enter~~ into kidney through renal artery. Then it enters glomerulus (Bunch of capillaries) here blood is filtered and passed to the proximal convoluted tubule (PCT) then loop of Henle and distal convoluted tubule (DCT). Here waste is excreted and water and ~~ions~~ are reabsorbed back into the body. This waste filtered from blood enters through ureter into bladder and then excreted out of body through urethra. Kidney also helps control of blood pressure in the body. It ~~helps~~ by balancing electrolytes and excretion of the waste.

Add diagrams and explain properly

(c) Different methods of solid waste management

Solid waste management is one of the major problem to tackle the problem of pollution. Solid waste management has three stage.

- ① Collective stage
- ② Recovery process
- ③ Waste Disposal

(1) Collective Stage: This is the major portion of collection of waste. It requires heavy investment but if we cooperate it can reduce the cost. Whole waste is collected at a point. Primary responsibility of collection of waste is of government but we can also give this responsibility to private sector. It requires staff. The work of garbage collection is not accepted in the society they should be encouraged by giving higher incentives, facilities of home, education so that people accept them. After collection, garbage is taken at a transfer station.

(2) Recovery Process: Here at transfer station, waste is segregated into recyclable and non-recyclable. The waste which can't be recycled is disposed off and that of recyclable is recycled.
remaining

(3) Waste disposal: Disposal of waste has **Add diagrams** main methods.

(i) Open waste disposal: Waste is disposed off openly at an area. This method is unhealthy, unhygienic. It should not be promoted.

(ii) Composting: It is the controlled decomposition of organic waste.

(iii) Incineration: It is the decomposition of inorganic waste through incinerators.

(iv) Land fill methods: It is a method in which waste is buried in land. It is some how acceptable method.

(d) Define the terms:

- (i) Anemia: Anemia is a condition of low haemoglobin level in the body.
- (ii) Appendicitis: Appendicitis is a condition of inflamed appendix. This inflammation is due to infection of the appendix.
- (iii) Spleen: Spleen is a human organ present in left side of the upper abdomen, close to stomach and pancreas. The function of spleen is to store, and filter the blood and produce white blood cells that provide immunity to the human body.
- (iv) Myopia: Myopia is also called near-sightedness. It is a condition of eye in which a person can't see distant objects clearly.
- (v) Isotopes: Isotopes are those atoms that have similar number of neutrons in their nucleus. For example Cl-37 and Argon-38 are isotopes having similar neutron number.

Add diagrams

SECTION-II

Q NO: 6

(a) Ratio of blocks

$$A : B : C : D = 4 : 7 : 3 : 1$$

If number of A = 50 + C

number of B = ?

Solution

let, $A = 4x \rightarrow (i)$

$$B = 7x \rightarrow (ii)$$

$$C = 3x \rightarrow (iii)$$

$$D = x \rightarrow (iv)$$

As given above,

$$A = 50 + C$$

From eq (i) & (iii)

$$4x = 50 + 3x$$

$$\boxed{x = 50}$$

From eq (ii)

$$B = 7x \quad \text{putting the value of } x$$

$$B = 7(50)$$

$$\boxed{B = 350 \text{ blocks}} \quad \text{Ans.}$$

(b)

original cost = 80 \$

discount = 15%

sales tax = 10%

Final price = \$

Solution:

1st we will find discounted^{on} price:

$$x = \frac{80}{100} \times 15$$

$x = 12.5 \$$ is the discount on 80 \$

For sales tax

$$\frac{80 \times 10}{100} = 8 \$$$

→ we will subtract the discount and add tax from original price

$$x = 80 \$ - 12.5 + 8$$

$$x = 75.5 \$ \rightarrow \text{Final price}$$

(c) distance b/w 2 stops = 42 km

Speed = 36 km/hr

departure time = 4pm.

arrival time = ?

If a train travels 36 km in 60 min then, 42 km is covered in x min:

$$x = \frac{60}{36} \times 42 = 70 \text{ min}$$

So the train will arrive at 5:10 pm

(d)

Jumbled words

(i) feminine

?

superintendent

(ii) hunched

white

Q7

(a)

$$r = 30 \text{ cm}$$

$$h = 1 \text{ m} = 100 \text{ cm}$$

Volume of cylinder = ?

Sol

$$V = \pi r^2 h$$

$$V = 3.14 (30)^2 \times 100$$

$$V = 3.14 \times 900 \times 100$$

$$V = 282600 \text{ cm}^3$$

$$V = 282.6 \text{ m}^3$$

(b)

average = 15 years

a : b : c = 3 : 5 : 7

let a = 3x → (i)

b = 5x → (ii)

c = 7x → (iii)

$$\text{average} = \frac{a+b+c}{3}$$

$$15 = \frac{3x+5x+7x}{3}$$

$$15 = \frac{15x}{3}$$

$$x = 3$$

To find age of youngest boy
put value of x in eq (i)

$$a = 3x$$

$$a = 3(3)$$

$$a = 9 \text{ years (Ans)}$$

(c)

(i) 8, 19, 59, 151, 447, _____
 \ / \ / \ / \ / 862,
 || 33 99 296.

wrong number in above series is 447
 It should be 262

(ii) 11, 13, 17, 19, 23, 25

(d) sides of triangle 5cm, 4cm, 6cm
 each angle = ?

Apply to law of cosine

~~cos C =~~

To find A

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

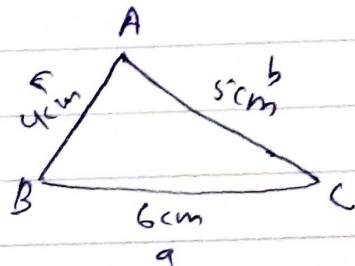
$$\cos A = \frac{(5)^2 + (4)^2 - (6)^2}{2(5)(4)}$$

$$\cos A = \frac{25 + 16 - 36}{40} = \frac{41 - 36}{40} = \frac{5}{40}$$

$$\cos A = \frac{5}{40}$$

$$A = \cos^{-1}\left(\frac{5}{40}\right)$$

$$\boxed{A = 73^\circ}$$



To find B,

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac}$$

$$\cos B = \frac{(6)^2 + (4)^2 - (5)^2}{2(6)(4)}$$

$$\cos B = \frac{36 + 16 - 25}{48} = \frac{27}{48}$$

$$B = \cos^{-1}\left(\frac{27}{48}\right)$$

$$\boxed{B = 46^\circ}$$

As total angle of triangle is

180°

$$C = 180 - 73 - 46$$

$$\boxed{C = 63.4^\circ}$$