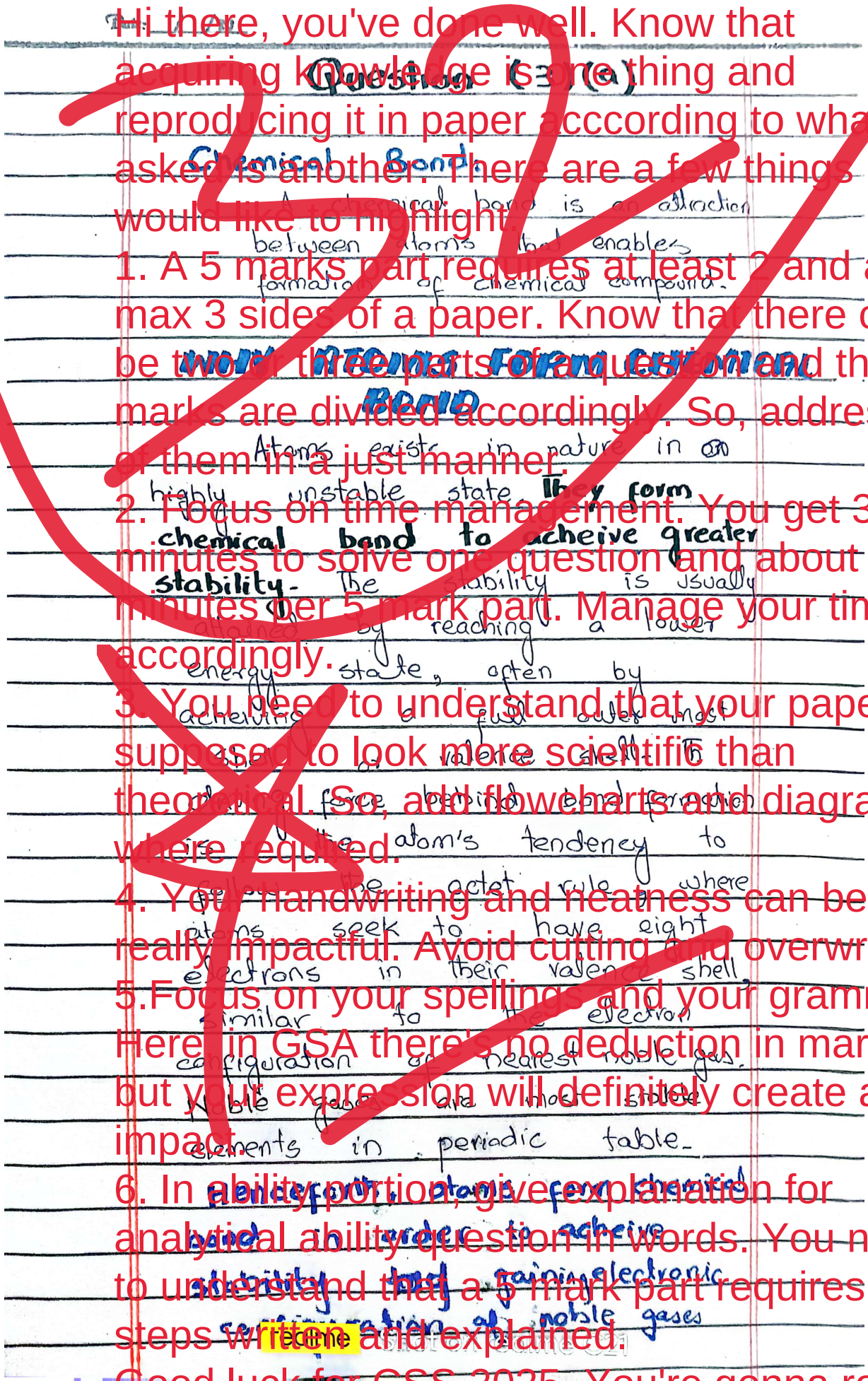


Dos and Don'ts for Generaral Science & Ability Paper

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

1. A 5 marks part requires at least 2 and at max 3 sides of a paper. Know that there can be two or three parts of a question and their marks are divided accordingly. So, address all of them in a just manner.
2. Focus on time management. You get 35 minutes to solve one question and about 8 minutes per 5 mark part. Manage your time accordingly.
3. You need to understand that your paper is supposed to look more scientific than theoretical. So, add flowcharts and diagrams where required.
4. Your handwriting and neatness can be really impactful. Avoid cutting and overwriting.
5. Focus on your spellings and your grammar. Here in GSA there's no deduction in marks but your expression will definitely create an impact.
6. In ability portion, give explanation for analytical ability question in words. You need to understand that a 5 mark part requires all steps written and explained.

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

Date: __/__/20

COVALENT BOND IN WATER MOLECULE

Chemical Formula of water:

H_2O

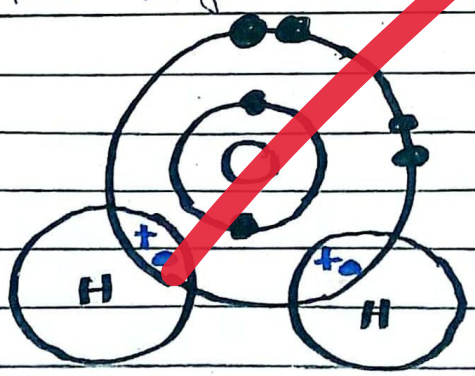
ATOMS INVOLVED IN FORMATION OF COVALENT BOND

Hydrogen, H = 1

Oxygen, O = 8

FORMATION OF BOND

Hydrogen has one electron in its valence shell and needs one more to acheive stability - similarly, oxygen has 6 electron in its valence shell and requires two electron to complete its valence shell - As water molecule has two hydrogen atom so each hydrogen atom will share one electron with oxygen atom in turn oxygen atom will share one electron with hydrogen - This sharing results in two single covalent bond.



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MOLECULAR GEOMETRY

The shape of water molecule is bent or V shaped with an angle of about 104.5°

Date __/__/20__

Question 3(b)

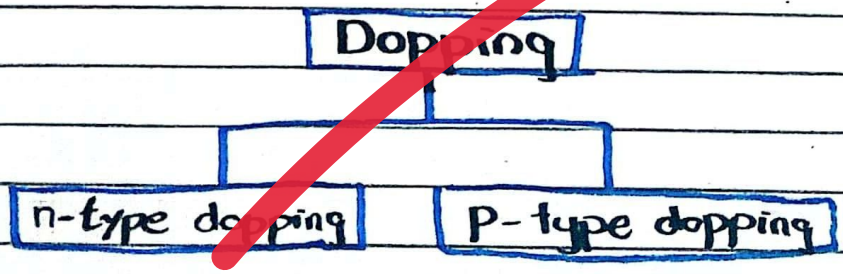
DOPPING

"Dopping refers to intentional introduction of impurities into pure semiconductor to modify its electrical properties"

The process is essential in creation and optimization of electronic devices such as transistors, diodes and integrated circuits - Doping increases number of charge carriers (electron or holes), thereby enhancing conductivity of material.

TYPES OF DOPPING

There are two main types of Dopping.



1- N-TYPE DOPPING

"It is acheived by adding donor impurities, which have more valence electrons that semiconductor"

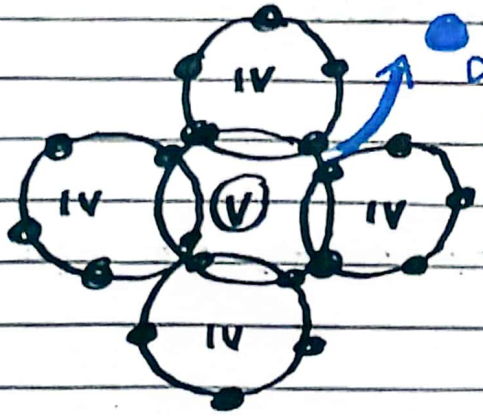
0.10
5-1(

2.82
55.
41.6

Date: / /

The member of 4th group in periodic table are used in type dopping. e.g Silicon, Germanium

In silicon (which has four valence electrons), common n-type dopant include phosphorous (five valencence electrons) and arsenic. These extra electrons increase the number of free electrons in semiconductor making it more conductive



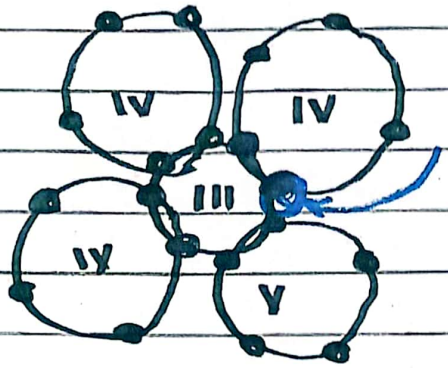
2. **P- TYPE DOPPING**

Acheived by adding acceptor impurities which have fewer valence electrons than semiconductor.

In silicon, common p-type dopant include Boron (three valence electron) and gallium

These dopant create holes (positive charge carriers) by accepting electron from silicon atom

Date: __/__/20



DIFFERENT TYPES OF CERAMICS

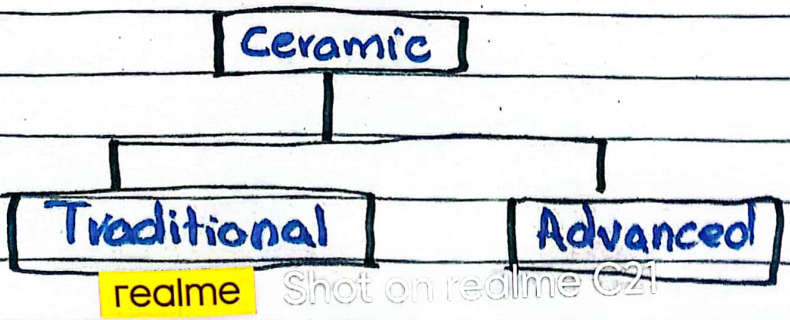
CERAMICS

Ceramics are inorganic, non-metallic meterials made through specialized manufacturing processes.

PROPERTIES OF CERAMICS

1- Harder and more brittle than metal
2- Refractory
3- nanmagnetic
4- oxidation resistance
5- chemically stable.

TYPES OF CERAMIC



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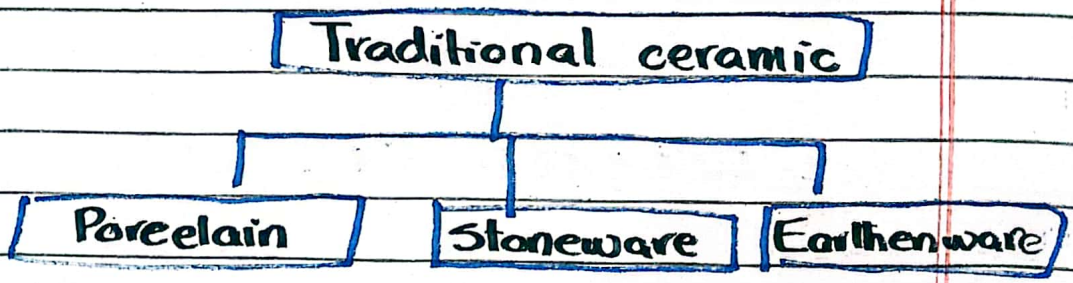
1- TRADITIONAL CERAMICS

These are made from natural materials like quartz, clay. Their structure depends on the composition of clay which makes them more imperfect compared to uniform microstructure of advanced ceramics. They are manufactured by wet moulding.



2- ADVANCED CERAMICS

These use synthetic powders such as aluminium oxide, silicon carbide, and silicon nitride - they are designed and engineered to have specific properties for high-performance application. Each of these ceramics is known for its ability to use in magnetism, insulation and conductivity.

Date __/__/20

MERITS OF GLOBAL WARMING

Some benefits of global warming are:

1- LONGER GROWING SEASONS

In certain regions, warmer tempratures can lead to longer growing season potentially increasing agricultural yields and enabling multiple harvest per years.

2- REDUCED HEAT COSTS

Warmer winters can lead to lower heating costs for homes and buisnesses in colder regions reducing energy consumption and expenses.

3- NAVIGATING ARCTIC ROUTES

Melting polar ice opens new shipping routes in arctic reducing travel distance and time between major global ports.

Date __/__/20

DEMERITS OF GLOBAL WARMING

1- SEA LEVEL RISE

Melting ice caps and glaciers contribute to rising sea levels, leading to coastal erosion increased flooding and displacement of communities.

2- EXTREME WEATHER EVENT

Increased frequency and intensity of extreme weather events such as hurricanes, drought, heatwaves and heavy rainfall causing widespread damage and loss of life.

3- LOSS OF BIODIVERSITY

Changes in temprature and habitat loss threaten many species leading to reduced biodiversity and extinction of vulnerable species.

Date: / /

Question 3(d)

POLIO (POLIOMYELITIS)

It is highly infectious viral disease caused by polio viruses It primarily affects young children and can lead to paralysis primarily of legs

CAUSES OF POLIO -

Polio is caused by poliovirus - It mainly targets nerve cells in spinal cord and brain stem that control muscle movement - Nervecells controling sensation are not affected

COMMON SYMPTOMS

- Meningitis
- Flaccid paralysis
- Loss of reflexes
- paresthesia (tingling feeling in legs)
- Severe muscle aches
- paralysis

Date: / /20

CHALLENGES IN ERADICATION OF POLIO IN PAKISTAN

Pakistan, along with Afghanistan and Nigeria, are at last country struggling to eradicate poliovirus transmission. Several challenges persist in eradicating polio in Pakistan.

1- SECURITY CONCERNS
2- MISCONCEPTION AND MYTHS
3- Health Infrastructure challenges
4- Population Mobility and Migration
5- Resistance from Local leaders
6- Vaccine access and cold chain Management

Date: / /20

Section II

QUESTION 6(a)

The ration of Blocks : A : B : C : D

4 : 7 : 3 : 1

Let, denote toyblocks with alphabet A, B, C, D as $4x$, $7x$, $3x$ and x respectively.

A block is 50 more than C block

$A = C + 50$

$4x = 3x + 50$

$4x - 3x = 50$

$x = 50$

No. of B block = $7x$

$B = 7 \times 50$

$B = 350$

B = 350

Date: __/__/20

Question 6(B)

Data:

Original Cost = 80 $
Discount = 15%
Sale tax = 10%

To Find:

Final Price = ?

Solution:

Discount price of 80 $ = 80 $ × 15/100

Discount price = 12 $

Sale tax = 80 × 10/100

Sale tax = 8 $

Total ... = 12 + 8
= 20 $

Final Price = Total price - Discount
= 80 - 20
= 60 $

Final Price = 60 $

Date: __/__/20

Question 6(c)

Data:

Distance, $s = 42\ km$

$= 42000\ m$

Speed, $v = 36\ km/hr$

$= \frac{36000\ m}{3600\ sec}$

$= 10\ m/sec$

Departure time = 4pm

Arrival time = ?

Solution:

$$\text{Speed, } v = \frac{\text{Distance } (s)}{\text{Time } (t)}$$

$$\text{Time } (t) = \frac{s}{v}$$

$$= \frac{4200\ \phi}{1\ \phi}$$

Time = 4200 sec

= 70 min

= 1hr 10m

Arrival time = 4pm + 1 hr 10m

Arrival time = 5pm 10m

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Question 6(d)

1- tenin superted

Superintendent

2- hweti

White

A

Date: / /20

Question 7 (a)

Data:

Radius, r = 30 cm

Height, h = 1 m

To Find:

Volume of Cylinder, V = ?

Formula:

$V = \pi r^2 h$

Solution:

$V = \pi r^2 h$

$= 3.14 (30)^2 (1m)$

$= 3.14 (900)$

$V = 2826\ m^3$

✓

✓

Date __/__/20__

Question 7(b)

Average age of three boys = 15 yrs

Ratio of ages = 3 : 5 : 7

Let, ages are denoted in a way 3x, 5x and 7x

$$\text{Average age} = \frac{\text{Sum of Ages}}{\text{total number}}$$

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

$$15 \times 3 = 15x$$

$$45 = 15x$$

$$x = 45/15$$

$$x = 3$$

Age of youngest boy:

Age of youngest = 3x

$$= 3(3)$$

$$= 9 \text{ yr}$$

Age of youngest boy = 9 yrs

Date: __/__/20

Question 7(c)

i- 8, 19, 52, 151, 447, ___

11 33 99 297

Hence the number '447' is wrong in series, it must be '448'.

The resultant series is as follow;

8, 19, 52, 151, 448.

ii- 11, 13, 17, 19, 23, ___

11, 13, 17, 19, 23, 29

As it is series of prime number

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Question 7 (d)

Given sides.

$a = 5\,cm$

$b = 4cm$

$c = 6cm$

For angle Law of Cosines is used

$c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$

C = angle opposite to c

1- Angle C opposite side $c = 6cm$

$$\cos(C) = \frac{a^2 + b^2 - c^2}{2ab}$$

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

$$\cos(C) = 0.125$$

$$C = \cos^{-1} 0.125$$

2- Angle A opposite side $a = 5cm$

$$\text{Angle}(A) = \frac{b^2 + c^2 - a^2}{2bc}$$

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

$$\cos(A) = 0.56$$

$$A = \cos^{-1}(0.56)$$

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3. Angle B opposite side b = 4cm

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

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

$$\cos B = 0.75$$

$$B = \cos^{-1}(0.75)$$

Hence, C = 82.82°

A = 55.77°

B = 41.41°