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Chemical Quality Assessment of Drinking Water from Various Part of Junagadh

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Abstract: ***Water is our main requirement, but there are many problems in drinking water. This is the spread of bacteria in the water of more serious diseases such as parameter. So, we have taken water sample from different five place of the junagadh city for test parameter like chloride, hardness, chlorine, nitrate, fluoride, pH, turbidity etc. the proportion of the water parameter can be determine by "water parameter filed kit" and from our test duration of the three season of the year we will get the correct value of water parameter exist. In conclusions relative to the water adequacy of springs and drills, water tanks and supply network, as well as the possible reasons for water quality problems are presented in the study. Generally, the water quality depends on its chemical and microbiological condition. The water is easily infected during its transportation from the source to the internal water supply network and finally to the consumer. The condition of the water supply networks is a factor which contributes to the water quality.***

Keywords: Water Quality Assessment, Groundwater Quality, Chemical Parameters,

I. INTRODUCTION

Fresh water is necessary for the survival of all living organisms on Earth. Our bodies are made up of about 60% water and we cannot survive more than a few days without it. Water is a precious substance that meets our physical needs while at the same time being of great spiritual importance to many people. Water is also an integral part of many ecosystems that support us and a myriad of other species. The amount of moisture on Earth has not changed. The water the dinosaurs drank millions of years ago is the same water that falls as rain today. Water is especially valuable for human health, medicine, agriculture and industry. A well-hydrated body has good levels of oxygen. Water, after all, is two atoms of hydrogen and one atom of oxygen. The body can't properly burn its stores of fat for energy without oxygen. Water quality means the physical, chemical and biological characteristics of water. The first edition of standard methods was published in 1905. Since then it has been considered to be the best available guidance of water analysts, which covers all aspects of water and wastewater analysis techniques and categorizes the analytical methods based on the constituent and not on the type of water. Our dependence on fresh water resources has accelerated in last century due to rapid growth in world population and economic development.

II. DRINKING WATER QUALITY

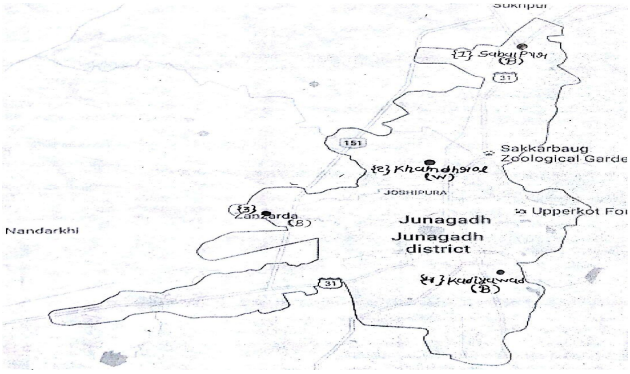
A Drinking water quality standards describes the quality parameters set for drinking water. Despite the truism that every human on this planet needs drinking water to survive and that water may contain many harmful constituents, there are no universally recognized and accepted international standards for drinking water. A parametric value in this context is most commonly the concentration of a substance, e.g. 30 mg/l of Iron. It may also be a count such as 500 E. coli per litre or a statistical value such as the average concentration of copper is 2 mg/l. Many countries not only specify parametric values that may have health impacts but also specify parametric values for a range of constituents that by themselves are unlikely to have any impact on health. These include colour, turbidity, pH, and the organoleptic (aesthetic) parameters (taste and odour).On one hand the pressures of development is changing the distribution of water in the country, access to adequate water has been cited as the primary factor responsible for limiting development. The average availability of water is reducing steadily with the growing population and it is estimated that by 2020 India will become a water stressed nation.

1) *Sample Collection:* Total 12 sample were collected from various zone of Junagadh City in three seasonal conditions (winter, summer, monsoon). The area from where this sample was collected is Kadiyawad, Zanzarda, Khamdhrol, Sabalpur and found various chemical test data like Hardness, Chloride, Nitrate, Fluoride, Chloride, PH, and Turbidity. The chemical data is analysed with its permissible limits to check Drinking water quality for the area. All the samples were collected in sterilized bottles and were stored at 4°C till further investigation and analysis of water-quality parameters was carried out as per standard methods of APHA

2) *Sample Collection in Junagadh City:* Junagadh is the headquarters of Junagadh district in the Indian state of Gujarat The city is the 7th, largest in Gujarat. Total area of Junagadh is 160Km2 (60 sq. mi) It has an average elevation of 107 metres (351 ft.).Population in Junagadh is 2011.total population is 5, 17,350 and Density is 3,200 Km 2(8,400/sq. mi) Junagadh city has two rivers named Sonrakh and Kalwo. However Kalwo is facing major pollution problem because city sewers. Junagadh city has many lakes named Narsinh Mehta Sarovar, Damodarji, and Sudarshan Lake etc. There are manmade dams around Junagadh named Willington dam, Hasnapur Dam, Anandpur Weir. These are the main water sources for the city. Junagadh city has a population of 320,250 and at present the water demand is 30 million litres per day. Water is supplied through 25,000 tap connections by three major surface water sources namely Anandpur Weir, Hasanapur dam and Wellington dam and 32 wells Newly merge area has its individual ground water supply system through bore wells. Junagadh city has more than 1000 hand pumps and 200 stand posts as ground water sources situated all over the city area. Junagadh city area limit were extended in January 2004 increasing its area from 13.47 to 57 sq.km.

Different ward of Junagadh city

a) *Sabalpur:* collect water of the bore and depth of bore is 1500ft.
b) *Khamdhrol:* collect water of well and depth of well is 60ft.
c) *Zanzarda:* collect water of the bore and depth of bore is 1500ft.
d) *Kadiyawad:* collect water of the bore and depth of bore is 1500ft.



Zone indicate in Junagadh city map

III. EXPERIMENTAL PROGRAME

A. Hardness test for Water

Requirement of items in experiment:

Procedure of experiment

1) Fill the 5ml water in clean test tube
2) Add 5 drops of hardness reagent A with help of measuring cylinder in it.
3) Then, add few drops of hardness reagent B in it. The equivalent water shakes to merger in it
4) If water colour will be change in blue so, its indicate there is no hardness in water. But, if water colour will be change in red so, its indicate that there is hardness in water.
5) Then, add hardness reagent C drops with calculation and shake the water tube until the water colour is becomes change in blue, and then the water colour is change in blue the we stop dropping in tube and also calculate the number of drops.

B. Chloride test for Water

Requirement of items in experiment:- -Measuring cylinder, Test tube,

Procedure of experiment

1) Add few radicals of the chloride reagent A with help of measuring cylinder.
2) Then after the water colour is change in yellow.
3) Now, add a drops of chloride reagent B with calculation and stir until the solution is going to be until the colour of water is change in red. And also calculate the number of drops.
4) Now, the total volume of chloride in water = Drops of Chloride reagent B x 20.
5) In the water the chloride amount is in milligram / litre (PPM).

C. Nitrate test for Water

Requirement of items in experiment:--Measuring cylinder, Test tube,

Procedure of experiment:-

1) Fill the 5ml water in clean test tube with help of measuring cylinder.
2) Then, mix small table spoon of the powder of Nitrate reagent Areagent B and also shake it.
3) After 5 minutes, mix into 1 small table spoon of powder of nitrate
4) After 5 minutes the water colour will be change in bright or light red colour.
5) See the water colour, In the nitrate colour view chart which colour is maximum match with water colour.

D. Fluoride Test for Water

Procedure of experiment

1) Fill the 4ml water in clean test tube with help of measuring cylinder.
2) Add the (1ml) 20drops of fluoride reagent and shake it. Watercolour is change between red/ brown/ light blue.
3) See the water colour and it is more than match with fluoride colour viewer chart.
4) Note the following numbers written under colour which is match.
5) That number is represent the volume of fluoride in water = milligram/litter.
6) That water is suitable for drinking it is indicated in words of its safe/ carful/ unsecure in it.

E. Chlorine Test for Water

Requirement of items in experiment:-

Measuring cylinder -Test tube.

Procedure of experiment:-

1) Fill the 5ml water in clean test tube with help of measuring cylinder.
2) Take 1 tablet of chlorine reagent and mix ii and shake after that the colour of water will be change pink.
3) Then, See the water colour and it is more than match with chlorine colour viewer chart.
4) Note the following numbers written under colour which is match.
5) That number is represent the volume of chlorine in water = milligram/litter.
6) That water is suitable for drinking it is indicated in words of its safe/ carful/ unsecure in it.

F. PH test for Water

Requirement of items in experiment

Procedure of experiment

1) Take a empty plastic cup and filled it with water.
2) Then after take a small piece PH paper (long about 1 cm).
3) That ph. paper extract drowned in the water.
4) Now, its piece of paper colour is matched with pH meter and see which colour is match with it.
5) Then note a number make with coloured point. That, number is showing your PH.

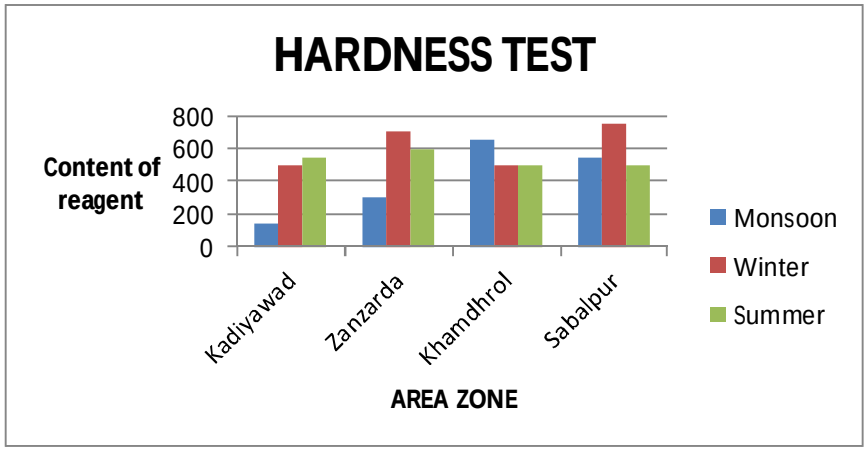
G. Turbidity Test

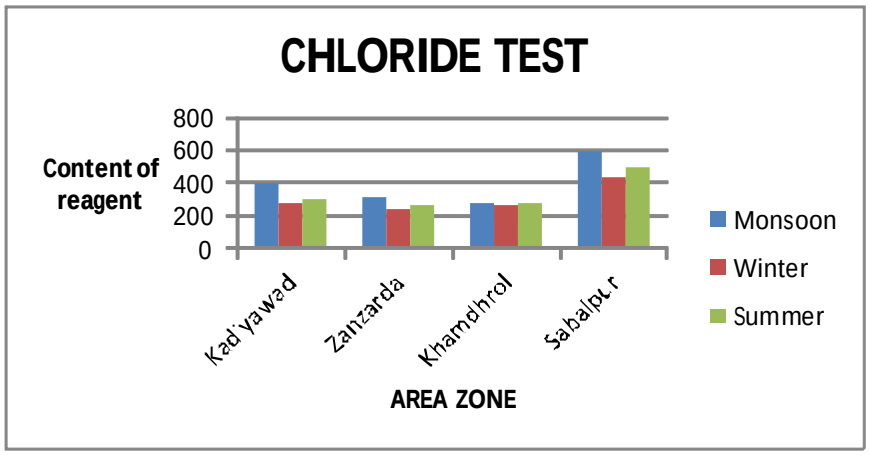
Procedure of experiment

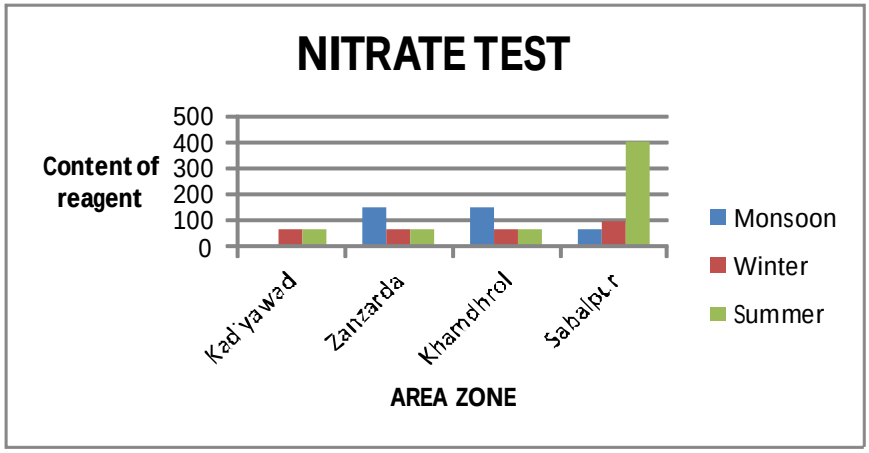
1) First, fill the empty glass cup with water.
2) Take a turbidity chart place it on lighten and clear place and also put it on flat surface.
3) Then take glass cup which filled with water and place on circle which makes in turbidity chart.
4) Now, look around picture to upper of glass cup. Now that picture colour compare with other four circle picture.
5) Which picture is maximum match its NTU number is represent a turbidity of water.
6) If the water is less than format from 10 NTU it is suitable for drinking water.
7) But, if the water is greater than format from 10 NTU so that water is not suitable for drinking.

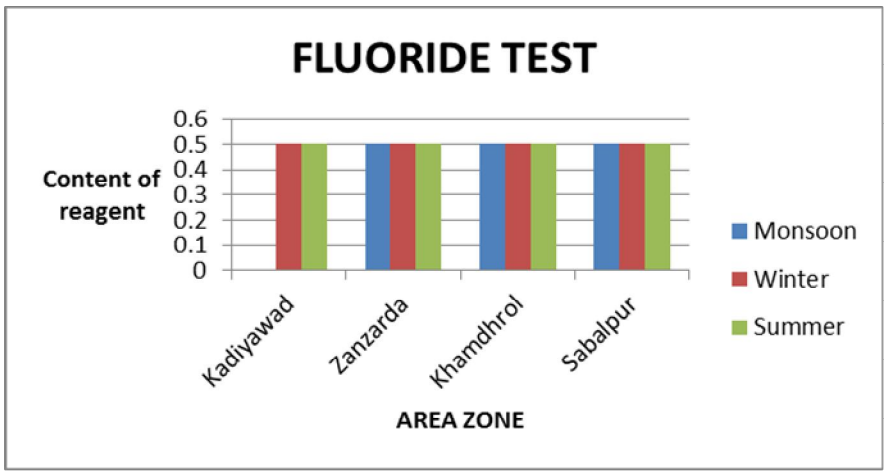
IV. TEST RESULT ANALYSIS

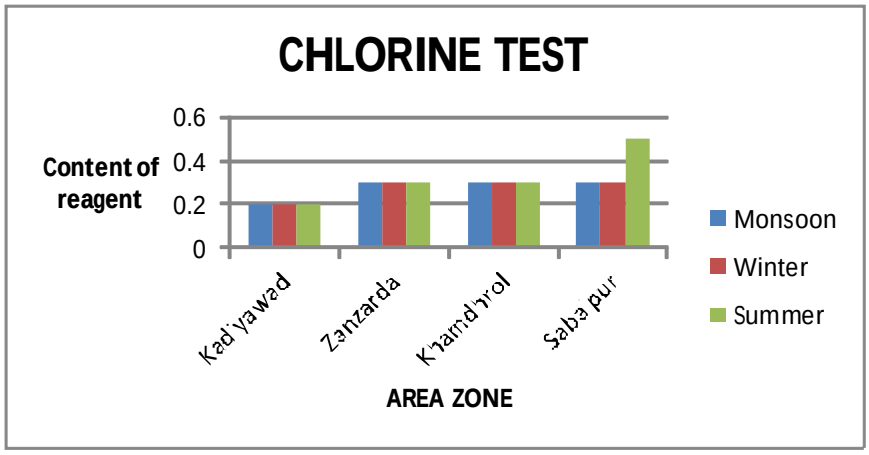
Reagent	ward name	Contain of reagent in (mg/lit)		
		Monsoon	Winter	Summer
Hardness	Kadiyawad	150	500	550
	Zanzarda	300	700	600
	Khamdhrol	650	500	500
	Sabalpur	550	750	500
Chloride	Kadiyawad	400	280	300
	Zanzarda	320	240	260
	Khamdhrol	280	260	280
	Sabalpur	600	440	400
Nitrate	Kadiyawad	00	65	65
	Zanzarda	150	65	65
	Khamdhrol	150	65	65
	Sabalpur	65	100	100
Fluoride	Kadiyawad	00	0.5	0.5
	Zanzarda	0.5	0.5	0.5
	Khamdhrol	0.5	0.5	0.5
	Sabalpur	0.5	0.5	0.5
Chlorine	Kadiyawad	0.2	0.2	0.2
	Zanzarda	0.3	0.3	0.3
	Khamdhrol	0.3	0.3	0.3
	Sabalpur	0.3	0.3	0.3
PH	Kadiyawad	7.5	7.5	8.0
	Zanzarda	8.5	8.0	8.5
	Khamdhrol	8.5	7.0	7.5
	Sabalpur	8	8.0	8.0
Turbidity	Kadiyawad	10(NTU)	10(NTU)	10(NTU)
	Zanzarda	10(NTU)	10(NTU)	10(NTU)
	Khamdhrol	10(NTU)	10(NTU)	10(NTU)
	Sabalpur	10(NTU)	10(NTU)	10(NTU)

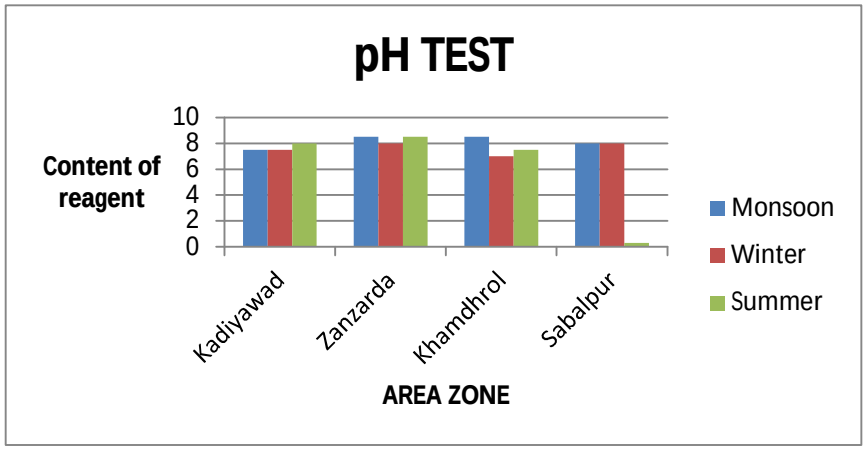












Diseases arising from water: Waterborne diseases are caused by pathogenic microorganisms that most commonly are transmitted in contaminated fresh water. Infection commonly results during bathing, washing, drinking, in the preparation of food, or the consumption of food thus infected. Various forms of waterborne diarrheal disease probably are the most prominent examples, and affect mainly children in developing countries; according to the World Health Organization, such diseases account for an estimated 3.6% of the total DALY global burden of disease, and cause about 1.5 million human deaths annually. The World Health Organization estimates that 58% of that burden, or 842,000 deaths per year, are attributable to unsafe water supply, sanitation and hygiene.

1) *Cholera:* Bacteria called 'vireo chloral' cause a small intestinal disease known as cholera. Symptoms of cholera include diarrheal and vomiting, as well as abdominal cramps and headache.
2) *Diarrhea:* Infectious diarrheal is one of the most common diseases caused by water pollution. It causes frequent passage of loose, water stools that can cause dehydration and death to young children and infants.
3) *Fluorosis:* This is a condition that leads to serious bone disease and is caused by high levels of fluoride naturally found in groundwater.

Typhoid Fever This common bacterial infection affects around 12 million people annually. It is caused by the ingestion of contaminated food and water.

V. CONCLUSION

The observation of study strongly suggest that water of Junagadh region is of very high TDS and needs to be lowered down within prescribed limits before using it for drinking purposes. Also, the water samples were showing microbial content beyond the portability range, which needs to be disinfected before consumption to avoid water-borne diseases. Although, the present investigation is essentially a primary work and needs to be further investigated to arrive at specified conclusion with respect to clinical implications.

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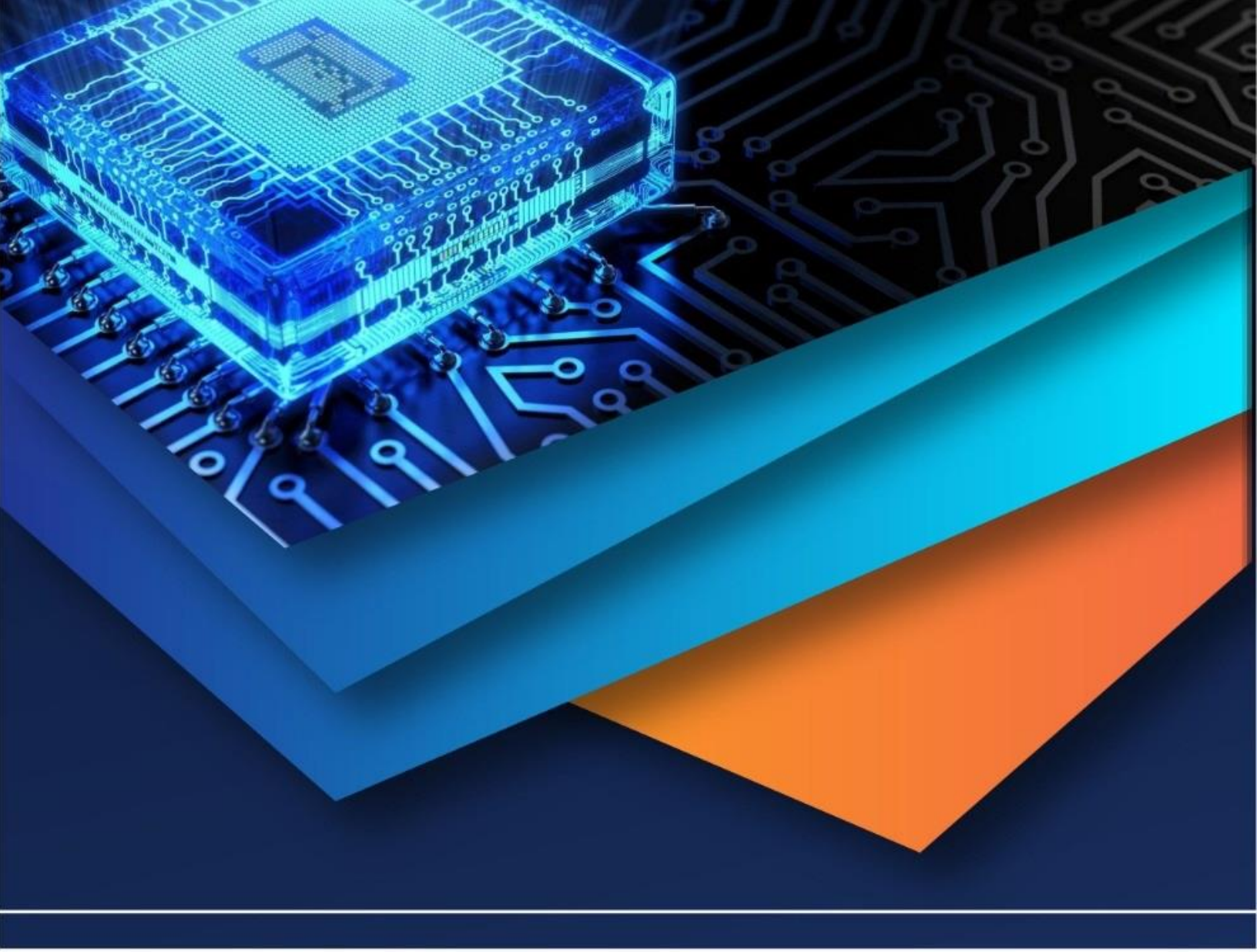

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