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Analyzation of Drinking Water in Selected Villages of Raigad District

Avinash Jadhav[1], Akash Gaikwad[2], Priyanka Shadani[3], Madhav Parodwad[4], Harshad Wakade[5], Prof. Aakanksha Darge[6], Dr. S. R. Bhagat[7]

[1, 2, 3, 4, 5, 6, 7]*Department of Civil Engineering, Dr. Babasaheb Ambedkar Technological University, Lonere, Maharashtra, India*

Abstract: ***Many can live without love but no one without water. The Analyzation of Drinking Water Quality implies checking of water Physical, Chemical, and Biological parameters and comparison with Indian drinking water standards. Selection of villages for the checking of water parameter was done based on different surveys collecting information about the water supply to various villages. Then collection of water sample from different location of Raigad district was carried out. Drinking water quality was investigated in eight villages of Raigad district. A number of parameters such as pH, Turbidity, Total Dissolved Solids (TDS), Dissolved Oxygen (DO), Total Hardness, Chloride Content, Fluoride Content, Total Alkalinity and Free/Residual Chlorine were analyzed for each water sample that were collected and compared with Indian permissible limits of drinking water.***

Keywords: Essential Thing, Data Collection Raigad District, Analysis of Drinking Water, Water Quality, Permissible Limit

I. INTRODUCTION

This project relates to the analyzation of drinking water in selected villages of Raigad District. Water supply to such rural communities can be sourced from rainwater, groundwater and surface water. In rural areas, effective and efficient management of water resources and proper maintenance of water supply infrastructure are the major issues. Different selective villages as shown in the maps below in the near vicinity of the University area and Mahad MIDC area of Raigad District were visited. Quality of water is dependent on the source of supply. An attempt to explore the determinants of water quality is made. Water quality has been examined on the basis of contamination by Fluoride, Salinity, Hardness, pH, Dissolved Oxygen, Free Chlorine, Chlorides, Turbidity, Total Alkalinity, TDS (Total Dissolved Solids).



Fig. 1 Area near by University

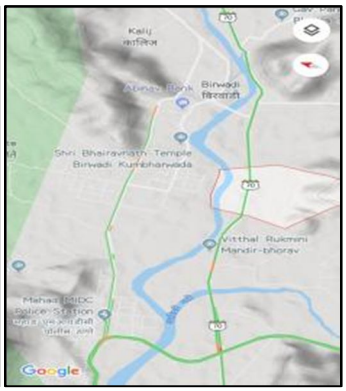


Fig. 2 Area near by Mahad MIDC

II. SAMPLE COLLECTION

The water sample was collected from different villages. Samples were taken from source and consumer head (House) for each village. Samples were collected from following villages:

A. Panhalghar-Zorewadi

Panhalghar located near Dr. Babasaheb Ambedkar Technological University Campus, Lonere, and Tal. Mangaon Dist. Raigad was visited on 11 Nov. 2019. Sufficient data from Mr. Pintu Karkare- Sarpanch of Panhalghar Group Gram Panchayat was collected. Population of Panhalghar Zorewadi was founded to be 795. The source of water is river and Zorewadi well. The village gets the supply of water directly from river or well which is lifted by pump in elevated tank. Mr. Sandip Manve (Water Supplier of the village) of this village guided us for the same. After that the villages were visited for collecting water sample for testing on 24 Dec. 2019. Three samples from Panhalghar were collected, one from River, one from well and another from residence of Mr. Sandip Manve and named as P1, S1, C1 respectively.

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B. Ambarle-Wadacha Kond

Ambarle located near DBATU Campus, Tal. Mangaon Dist. Raigad was visited on 12 Nov. 2019, and collection of sufficient data from Mrs. Rohini Ubhare- Sarpanch of Ambarle Group Grampanchyat was done. Population of Ambarle-Wadacha Kond is 1140. The source of water is well, which is connected with stream coming from Panhalghar dam. The village gets supply of water directly from well which is lifted by pump in elevated tank. After this, the village was visited for collecting water sample for testing on 24 Dec. 2019. Three samples were collected, one from River, another two from well and from residence of Mr. Shankar Renushe and named as P2, S2, and C2 respectively.



Fig.3 Collection of Samples

C. Mangrul

Mangrul located behind the DBATU Campus, Tal. Mangaon Dist. Raigad was visited on 12 Nov. 2019, collection of sufficient data from Mr. Sawantwas done. Population of Mangrul is 545. The source of water is weir on stream coming from hillsides. After this the village was visited for collecting water sample for testing on 24 Dec. 2019. Two samples were collected, one from weir, and another one from house of Mr. Sawant and named as S3, C3 respectively.

D. Repoli

Repoli, Tal. Mangaon Dist. Raigad was visited on 13 Nov. 2019, sufficient data was collected from Mr. Rajendra Manjare. Population of Repoli is 700. The source of water is borewell. The village get supply of water directly from borewell which is lifted by pump. The village was then visited for collecting water samples for testing on 24 Dec. 2019. Two samples were collected from this village. One from borewell, another one from home of Mr. Rajendra Manjare, named as S4, C4 respectively.

E. Birwadi

Birwadi located near to MIDC Mahad, Tal. Mahad Dist. Raigad was visited on 25 Dec. 2019, sufficient data was collected from Mr. Sadare. Population of Birwadi is 8829. Out of 6 wards, 4 wards get water from MIDC water treatment plant and another 2 wards directly from Bajire dam on Savitri River. The village gets supply of water directly from well which is lifted by pump in elevated tank. Two samples were collected, one from River, another one from Bajarpeth having population 1472, and named as S5, C5 respectively.

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F. Kharvali

Kharvali located near to MIDC Mahad, Tal. Mahad Dist. Raigad was visited on 25 Dec. 2019, sufficient data was collected from Mr. Ganpat Jadhav. Population of Kharvali is 2782. The village gets supply of water by directly from well in the Savitri River whichis lifted by pump in elevated tank. Two samples were collected, one from River, another from home of Mr. Ganpat Jadhav named S6, C6 respectively.

G. Akale

Akale, located at nearly MIDC Mahad, Tal. Mahad Dist. Raigad was visited on 25 Dec. 2019, sufficient data was collected from Mr. Datta Bhoir. Population of Akale is 600. The source of water is borewell. The population uses the same water for drinking and other purposes without any treatment. The water sample was collected from Hand pump and labelled as C7.

H. Goregaon

Goregaon, located in the west of Lonere, Tal. Mangaon Dist. Raigad, was visited on 25 Dec. 2019, sufficient data was collected from Ms. Pratiksha Khamkar. Population of Goregaon is 7135. The source of water is barrage. The same water is supplied for Dr. B.A.T. University too. Two different samples were collected, one from barrage and another from residence of Ms. Khamkar namely S8, C8 Respectively.

III.TESTS

A. Test Conducted on Water Samples

1) pH
2) TDS (Total Dissolved Solids)
3) Turbidity
4) Dissolved oxygen
5) Total Hardness
6) Chloride Content
7) Fluoride Content
8) Total Alkalinity
9) Free/Residual Chlorine

All water samples were collected from different location are tested in lab.



Fig. 4 Water testing of different parameter in lab

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B. Test conducted on Water Samples

Different samples collected from following villages by using plastic bottles named (P, C, S) respectively were tested by Physical and some chemical characteristics as given in result.

Name of villages: -

1) Panhalghar
a) River (P1)
b) Well (S1)
c) Home (C1)
2) Ambarle
a) River (P2)
b) Well (S2)
c) Home (C2)
3) Mangrul
a) Weir (S3)
b) Home (C3)
4) Repoli
a. Borewell (S4)
b. Home (C4)
5) Birwadi
a) River (S5)
b) Home (C5)
6) Kharwali
a) River (S6)
b) Home (C6)
7) Akale
a. Borewell (C7/S7)
8) Goregaon
a) Barrage (S8)
b) Home (C8)

IV. RESULTS

Comparative Parameters

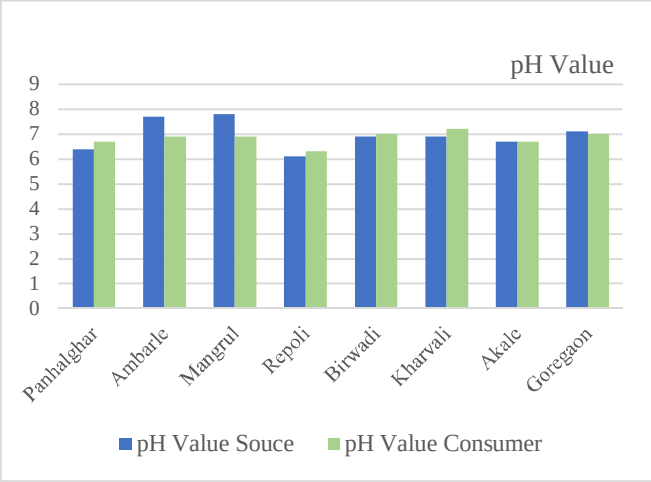


Fig. 5 Comparative pH

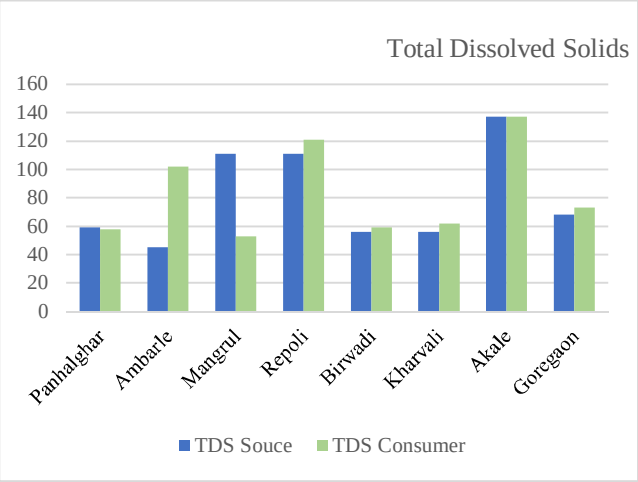


Fig. 6 Comparative TDS

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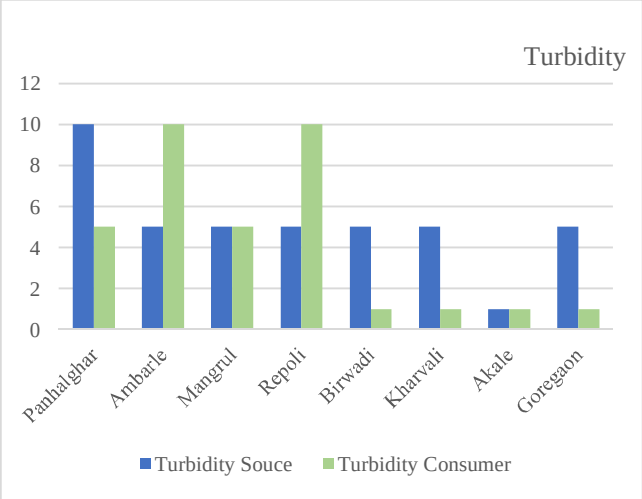


Fig. 7 Comparative Turbidity

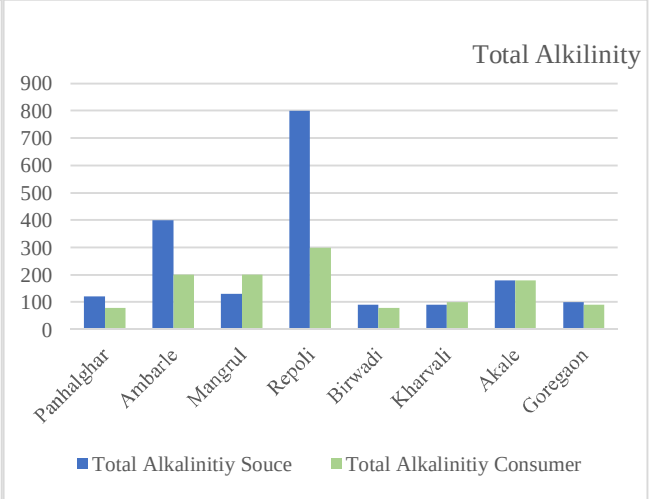


Fig. 8 Comparative Total Alkalinity

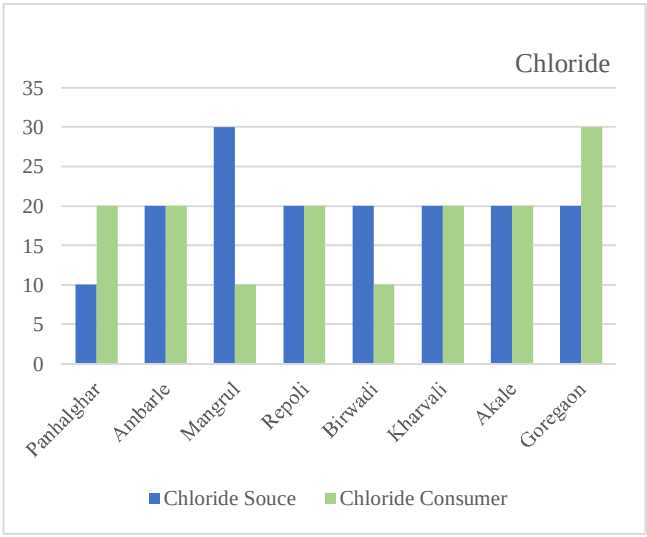


Fig. 9 Comparative Chloride

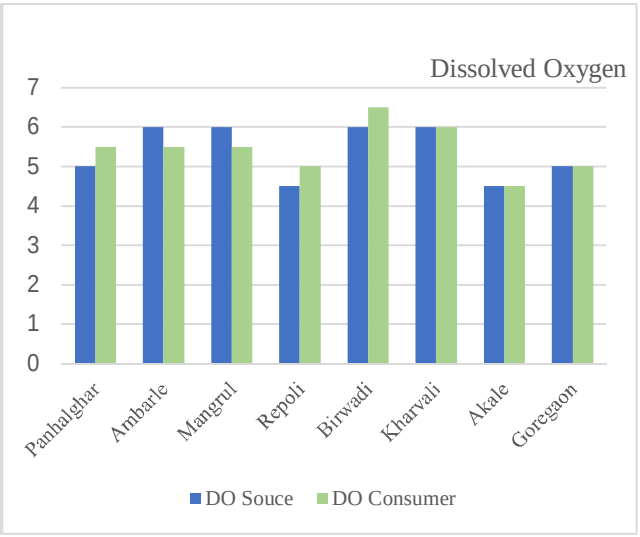


Fig. 10 Comparative DO

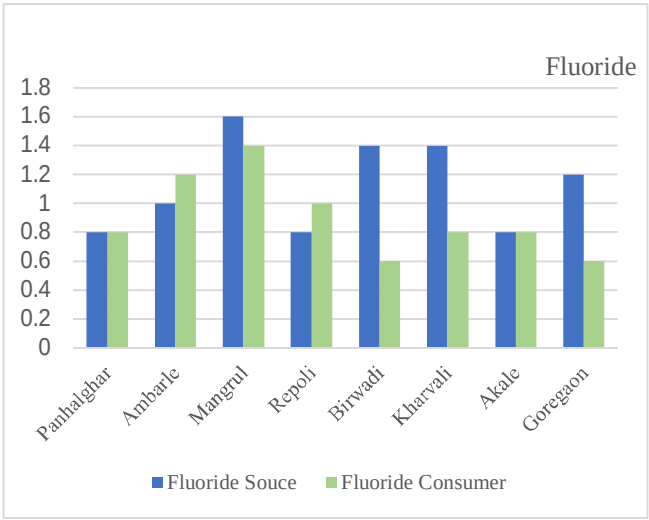


Fig. 11 Comparative Fluoride

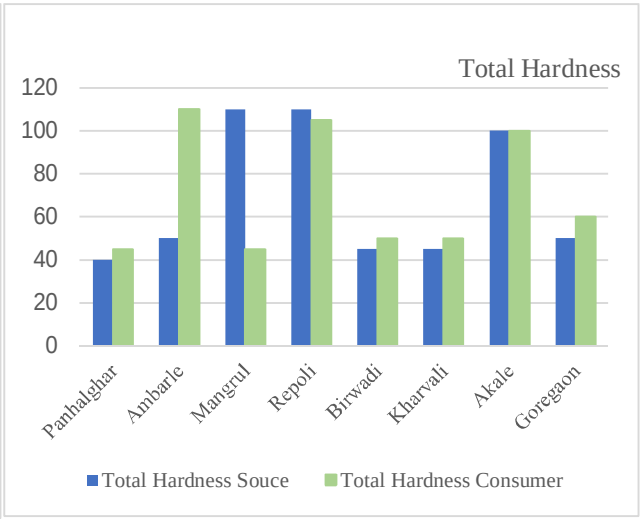


Fig. 12 Comparative Hardness

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TABLE 1. Test Results

Tests	ph	TDS (Total Dissolved Solid)	Turbidity	Hardness	Chloride	DO (Dissolved Oxygen)
Panhalghar- Zorewadi (S1)	7.2	59	10	40	10	5
Panhalghar- Zorewadi (P1)	7.4	82	1	80	20	5
Panhalghar- Zorewadi (C1)	6.7	58	1	45	20	5.5
Ambarle- Wadacha Kond (P2)	6.9	46	5	30	10	5.5
Ambarle- Wadacha Kond (S2)	7.7	45	5	50	20	6
Ambarle- Wadacha Kond (C2)	7.4	102	10	110	20	5.5
Mangrul (S3)	7.8	111	5	110	30	6
Mangrul (C3)	7.1	53	5	45	10	5.5
Repoli (S4)	7.9	111	5	110	20	4.5
Repoli (C4)	7.3	121	5	105	20	5
Birwadi (S5)	7.6	56	5	45	20	6
Birwadi (C5)	7	59	1	50	10	6.5
Kharwali (S6)	7.7	56	5	45	20	6
Kharwali (C6)	7.2	62	1	50	20	6
Akale (S7 & C7)	7.6	137	1	100	20	4.5
Goregaon (S8)	7.1	68	5	50	20	5
Goregaon (C8)	7	73	1	60	30	5
Range (Acceptable limit)	6.5-8.5	<500 PPM	1 NTU	<200 PPM	<250 PPM	>4 PPM

TABLE 2. Test Results

Tests	Fluoride	Total Alkalinity	Residual Chlorine	Odour	Temperature	Colour
Panhalghar- Zorewadi (S1)	0.8	120	0	Odourless	27	Muddy
Panhalghar- Zorewadi (P1)	1	300	0	Odourless	22	Colourless
Panhalghar- Zorewadi (C1)	0.8	80	0	Odourless	24	Colourless
Ambarle- Wadacha Kond (P2)	1.2	300	0	Odourless	28	Colourless
Ambarle- Wadacha Kond (S2)	1	400	0	Odourless	28	Colourless
Ambarle- Wadacha Kond (C2)	1.2	200	0	Odourless	25	Colourless
Mangrul (S3)	1.6	130	0	Odourless	28	Muddy
Mangrul (C3)	1.4	200	0	Odourless	25	Colourless
Repoli (S4)	0.8	800	0	Odourless	25	Colourless
Repoli (C4)	1	300	0	Odourless	26	Colourless
Birwadi (S5)	1.4	90	0	Odourless	29	Colourless
Birwadi (C5)	0.6	80	0	Odourless	26	Colourless
Kharwali (S6)	1.4	90	0	Odourless	26	Greenish
Kharwali (C6)	0.8	100	0	Odourless	25	Colourless
Akale (S7 & C7)	0.8	180	0	Odourless	24	Colourless
Goregaon (S8)	1.2	100	0	Odourless	29	Colourless
Goregaon (C8)	0.6	90	0	Odourless	25	Colourless
Range (Acceptable limit)	<1.0 PPM	<200 PPM	<1 PPM	Agreeable	10-25^{O}C	--

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V. CONCLUSIONS

The existing water supply system was studied for different villages near the University and Mahad MIDC areas. The existing water supply system, water resources and water treatment systems installed were known and observed that it was operated by the people in the village. As observed, some villages (Nhave) had proper water treatment systems installed that are properly operated. Maintenance and operation of the treatment system there, are provided by Swadesh Foundation. In some villages (Akale-Mahad), people directly use the water from the Bore well (Hand pump) without any treatment for drinking purpose. CETP Mahad, discharges effluent treated water at Birwadi (Ovale) directly in to the natural stream of Kal River, which affects water quality near the discharge point. Free chlorine was observed only at Gagangiri Boys Hostel during spread of Jaundice in Lonere area. In most of the villages, only fluoride and alkalinity were observed in excess. An attempt to make society aware about the scarcity of water and current water crisis and about water treatment methods in selected villages of Raigad district is made. Different primary treatment processes and alternative low cost treatment procedures that can be applied in order to obtain portable and safe drinking water were suggested to the local people as per our research studies and surveys.

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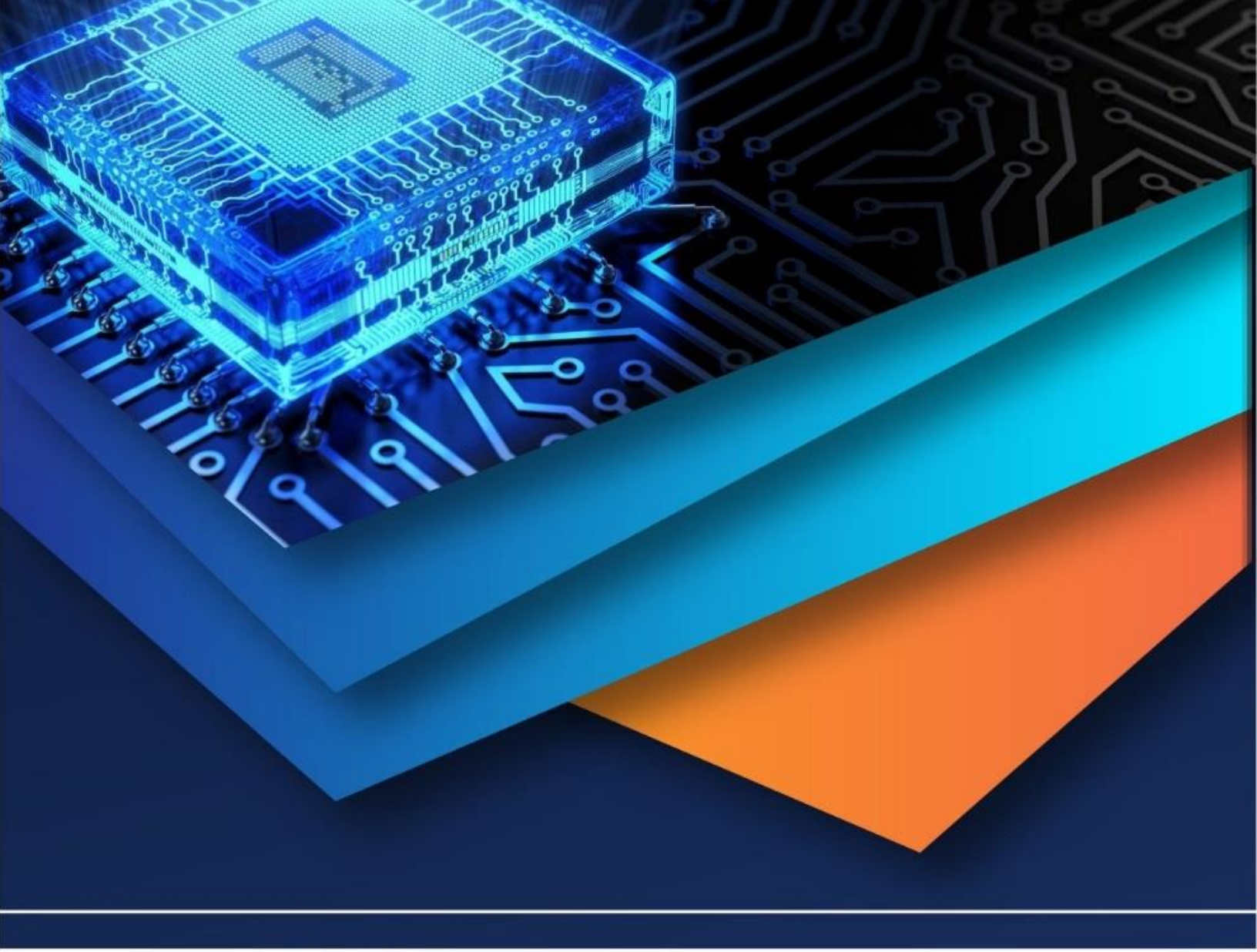
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