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Impact of Climate Change on Human Health, Case Study of Thane

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Abstract: ***The influences of weather exchange are so large that it without delay and in a roundabout way placed human fitness at chance because of rising temperatures, growing sea levels, water and food deliver effects, and increased severe climate activities which include floods, droughts and earthquakes. It was something. The direct outcomes of environmental conditions can sell the unfold of sicknesses transmitted by means of vectors, sicknesses, cardiovascular sicknesses, cardiovascular sicknesses, hypersensitive reactions to breathing roses, malnutrition, and extra. youngsters, seniors and groups live in poverty, where they are maximum susceptible to the damaging results of climate alternate. Environmental influences weather trade together with extreme warmth waves, sea degree upward thrust, and modifications in precipitation results in cyclones, earthquakes, floods and droughts, intensive hurricanes, humiliating air excellent, bodily, social, and more. men's direct and indirect consequences on mental health. for instance, adjustments in precipitation lead to modifications in water availability and great, and extreme weather events along with extensive hurricanes and floods. Cumulative developments in the effect of weather alternate on human health, implementation of remedy measures together with integrated fitness systems, early surveillance, ailment trying out, vector and ailment control, and medical insurance provider mechanisms implementation, equations come to be authority Masu. Time is time: making an investment in research and development, studies into the calculation of fitness dangers, research into vulnerability, formation of simple line conditions, state of affairs modeling, and accepting clean extension mechanisms. The economic system will play a key position in fighting capacity threats. In nations with awesome GDP, the first-rate devices available may be added and fill the lacuna of the health gadget.***

Keywords: Climate change, human health, environment, natural resources, malnutrition, and diarrhea.

I. INTRODUCTION

Human health has continually been tormented by the climate and climate. climate and climate exchange, in particular in climate adjustments, impacts the environment that permits for easy air, meals, water, lodging and security. climate alternate (CC) puts human health and wells in a spread of ways, at the side of different nature and human beings produced by way of people. a number of these fitness results have already been skilled in India. Given the fact that the impact of nextgeneration weather alternate is growing, sure existing health threats can be bolstered and new fitness threats should rise up. Combining an expertise of the way climate alternate will have an effect on human health, and how those adjustments can have an effect on destiny weather exchange discounts (discounts) and prioritize safety. you may understand that scores can help you propose public health and pick out research needs. The impact of climate and weather on human fitness is crucial and distinctive. publicity to fitness risks associated with climate change is related to various tiers of different human beings and communities. although often assessed in my view, exposure to numerous threats to weather change can arise simultaneously. This results in advanced fitness impacts and modifications in cascade, climate, frequency, severity, length and location. weather phenomena such as multiplied climate, temperature, temperature, duration, climate place, and many others. Heavy rain, droughts and other varieties of storms trade. which means that climate and weather activities which can be threatened with the aid of fitness which include extreme warmth and hurricanes already have worsening effects along with higher temperatures, rain intensity, precipitation fees, and storm surfaces. This additionally manner that new climate fitness threats could be skilled in numerous places. Even in areas in which those fitness threats are presently happening, they could occur in the course of the seasons, the largest chance to human health. consequently, climate exchange can have an effect on human fitness in two main types.First, by converting the severity or frequency of fitness troubles laid low with weather or weather elements. 2nd, by way of creating extraordinary or surprising health troubles or fitness threats wherein that they had not came about previously. The ecosystem is warmer and observations aid the reality that high temperature and precipitation occasions turn out to be extra not unusual.The IPCC model(comparison) application also predicts destiny adjustments round the world. The ecosystem of caution influences several sectors of society.

Human health is perhaps the most important area wherein climate change is maximum prominent. There are several examples of the bad effects of human spouse and children and people with intense climate events. India is no exception to worldwide warming in terms of human health dangers along with vectorborne sicknesses, epidemic floods, air pollutants illnesses and heat pressure. India's fitness and Welfare government (2018), climate trade is associated with longterm lingering, typically weather trade can be because of herbal internal techniques and outside energy, consisting of: B. Modulation of solar cycles, volcanic improvement, and sustained anthropogenic adjustments in atmospheric composition or land use. The Framework conference on climate alternate, Article 1 (UNFCCC), defines climate change as follows: weather trade is assigned directly or not directly to human hobby. 3). therefore, the UNFCCC distinguishes between climate trade. that is due to human sports that trade the composition of the ecosystem and weather variability due to natural causes. climate change is one of the largest fitness dangers of the twenty first century four.five. It influences social and ecological determinants of health, along with clean air, secure drinking water, good enough food, and secure safety. weather alternate, in conjunction with other herbal and humanmade matters, influences the fitness and diseases of many species of human species (figure 1). weather alternate may have a spread of effects, but the maximum frequent observed destructive effects on human health is taken into consideration an boom in disorder and loss of life. climate variables that without delay price lifespans had been identified as extended frequency and intensity of warmth waves, elevated rainfall, flooding, and drought. excessive temperatures are acknowledged to modify the basic tiers of ozone and other climate pollutants as carbon dioxide that exacerbate cardiac resistance and allergic sicknesses and positive cancers.The arena fitness agency estimates that weather change from 2030 to 2050 is predicted to cause about 2,50,000 extra deaths in step with year, which is malnutrition, malaria, diarrhea and fever. it is because of pressure. those deaths will hold to have a financial effect envisioned at between $24 billion from sixteenth January 303,14.203. sicknesses which include malaria, yellow fever, dengue and cholera are touchy to climate exchange due to their impact on the survival and geographical distribution of mosquitoes and microorganisms that select a moist and heat international. India is a tremendously populous united states of america, with industrialization and ruralurban migration, chaotic, unplanned urbanization, forest cowl fatigue and excessive electricity requirements being liable to negative outcomes of climate trade. As can be visible from numerous literature around the world, fitness outcomes can arise both from direct or indirect reasons of weather exchange or from severe weather reasons.

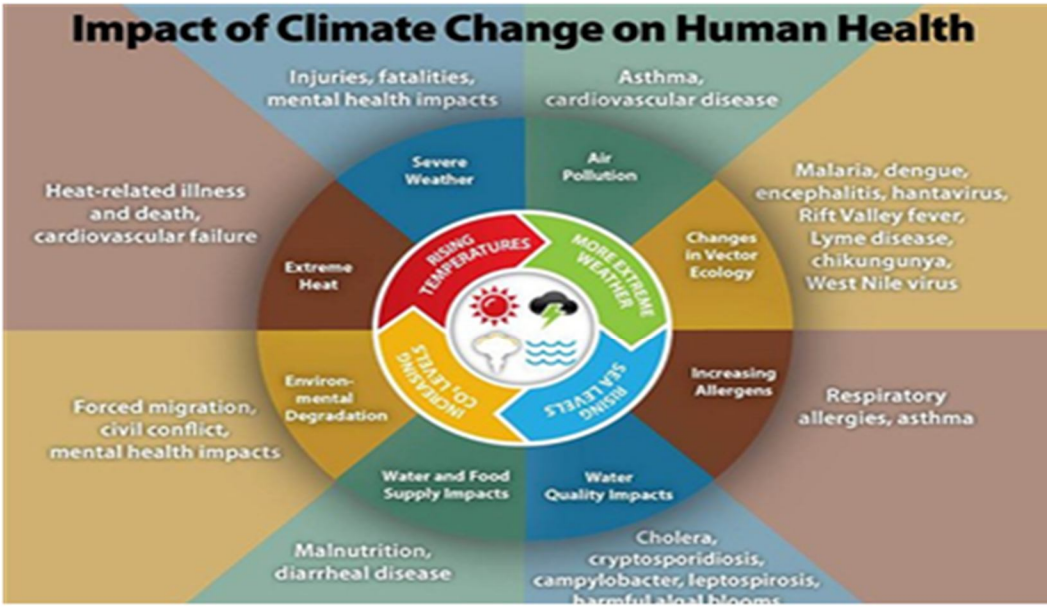


Fig:1. Likely Impacts of Climate Change on Human Health Source

II. CASE STUDY

Thane District is the most important District in Maharashtra country. Thane is the 0.33 most industrialized district inside the kingdom. The city ranks No. 16 in the united states of america. The town is unfold around 147 sq. km (50 sq. miles). Thane is adjoining to Mumbai and 2 national highways NH3 - Mumbai - Agra & NH4 - Mumbai -Bangalore bypass through it.

Fig.2:THANE MUNICIPAL CORPORATION REGION

TMC Population (2024)	Approx. 24 lakh
Vehicular Population (2020)	2217699
TMC Area	12823 H
Forest Area	H
Green Area	3211.77 H
Developable Area	50%
Weather	Hot & Humid
Humidity	14% to 95%
Wind speed	0.5 Km/hr. To 2 km/hr.
Rainfall	3793.07 mm (Year 2020)
See level	7.0 m.s.l.

A. Location

Thane, the second northern-maximum districts of Konkan, lies adjacent the Arabian Sea inside the north-west part of Maharashtra nation. It extends among 18’420 and 20’200 north range and seventy two’450 and 73’480 east longitude. Its northern limits adjoin the Palghar District carved out of Thane in 2014 at the same time as the district of Nasik and Ahmednagar to its East, Pune to the South–East, Raigad to the south and Mumbai Metropolitan to the South – West.

B. Topography

Topographically, district may be divided into 2 parts:-

within the north and japanese part of the district, Sahyadri stages are unfold and its north aspect the thick woodland region is situated. The critical vicinity of the district is in most cases flat vicinity and Rice farming is completed in this region. It's heavily urbanized region.

C. Weather

climate at Thane city has been noted as hot and humid. The maximum temperatures variety between 35 - 40oC and minimum between 25 -35oC. The maximum humidity is registered as ninety five% and minimum humidity at 14%. The rainfall average is also top. The metropolis has around 2,500 to three,000 mm of common annual rainfall. The winds at the metropolis blow from North to South and South west at an average of round zero.5 to five km consistent with hour.

Thane basic features

S. No.	Parameter	Value
1.	Average Temp	33^0C
2.	Humidity	14% - 95%
3.	Wind speed	0.5 - 2 km/hr
4.	Rainfall	2,500 to 3,000 mm
5.	Sea level	7.0 M.S.L

(Table no -01)

D. Demographics

Populace of Thane its boom and density

The resident populace at Thane in line with the 2011 census was18,18,872, with 9,66,293 males and eight,52,579 females. The populace of Thane metropolis is growing atthe annual growth rate of 6.five% in view that 1951. thinking about the 2001 Census the populace become just12,60,000. After this the development of the metropolis was very fast under Municipal administration. The populace has seen boom of round 44.35% nowadays. by using 2020, the populace of Thane town reached around 23 Lakhs. With proximity to Mumbai the Thane town has attained a massive importance. In terms of improvement Thane metropolis has additionally earned a name as an industrial metropolis. The wide variety of IT Parks and department stores is increasing. With this severa employment possibilities are to be had. With addition and availability of less expensive housing as well as centers and services, the populace of the city is growing in a timely fashion. The growth has been at the fee of eight to ten% according to 12 months. The average density of the city populace has been registered as 14,177 in step with sq. km.

III. METHEDOLOGY

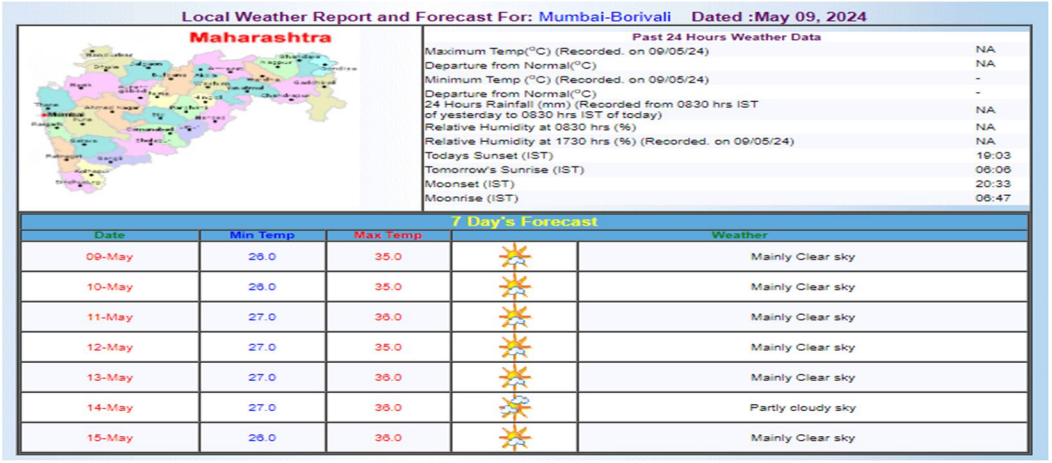
A. Climate Data of Thane District

We've accumulated records of weather and weather from MPCB (Maharashtra pollutants control Board), Thane Municipal company, local Meteorological center Borivali and Thane, imperative pollution control Board (CPCB). This statistics particularly worried climate facts of Thane district and nearby localities, Temperature, Humidity, Rain Forecast, Air first-rate populace Density.

SUB DIVISION	25-04-24 (Thus)	26-04-24 (Fri)	27-04-24 (Sat)	28-04-24 (Sun)	29-04-24 (Mon)	30-04-24 (Tue)	01-05-24 (Wed)
North Konkan	N	N	N	N	AN	AN	AN
South Konkan –Goa	N	N	N	N	N	AN	N
North Madhya Maharashtra	N	N	N	N	N	N	N
South Madhya Maharashtra	N		N		N		N
Marathawada	N		N		N		N
Vidarbha	N	BN	N	N	BN	N	N
North Konkan	N	N	N	N	AN	AN	AN

(Table no:02)

Local Meteorological Centre, Mumbai – 400005
Weekly climate file for Maharashtra
Weekly weather document throughout The Week ending On 01.05.2024 (25.04.2024 To 01.05.2024)
Spatial Distribution Of most Temperature (for the duration of beyond 24 Hours stated At 0830 Hours Of The Day)
Legend: N – Normal, AN –Above Normal, AAN – Appreciably Above Normal, MAN– Markedly Above Normal, BN –Below



Local Weather Report and Forecast For: Mumbai-Borivali Dated :May 09, 2024

Maharashtra

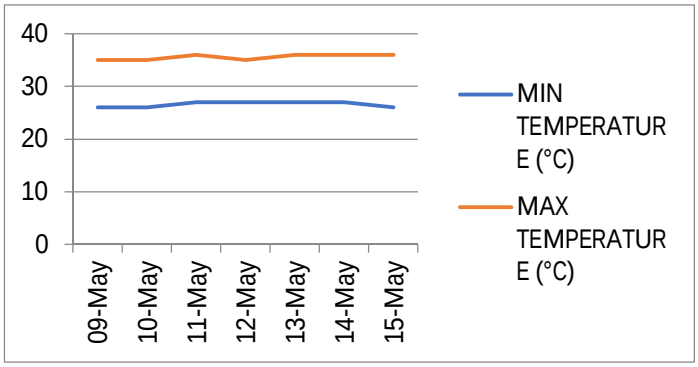
Past 24 Hours Weather Data

Maximum Temp(°C) (Recorded. on 09/05/24)	NA
Departure from Normal(°C)	NA
Minimum Temp (°C) (Recorded. on 09/05/24)	-
Departure from Normal(°C)	-
24 Hours Rainfall (mm) (Recorded from 0830 hrs IST of yesterday to 0830 hrs IST of today)	NA
Relative Humidity at 0830 hrs (%)	NA
Relative Humidity at 1730 hrs (%) (Recorded. on 09/05/24)	NA
Todays Sunset (IST)	19:03
Tomorrow's Sunrise (IST)	06:06
Moonset (IST)	20:33
Moonrise (IST)	06:47

7 Day's Forecast

Date	Min Temp	Max Temp	Weather
09-May	26.0	35.0	Mainly Clear sky
10-May	26.0	35.0	Mainly Clear sky
11-May	27.0	36.0	Mainly Clear sky
12-May	27.0	35.0	Mainly Clear sky
13-May	27.0	36.0	Mainly Clear sky
14-May	27.0	36.0	Partly cloudy sky
15-May	26.0	36.0	Mainly Clear sky

(Table no :03)
Rainfall Data Recorded for this month



(Graph No .01)
Graph of Temperature variation in May

RAINFALL FOR THE WEEK ENDING 01.05.2024					01/03/2024 TO 01/05/2024		
DISTRICTS							
STATES							
	Actual	Normal	Excess or Deficit	% Dep	Actual	Normal	Excess or Defic	% Dep
STATES								
MUMBAI CITY	0	0.1	-0.1	-100	3.2	1.8	1.4	78
MUMBAI SUBURBAN	0	0	0	-100	0	1.2	-1.2	-100
THANE	0	0.1	-0.1	-100	0	1	-1	-100

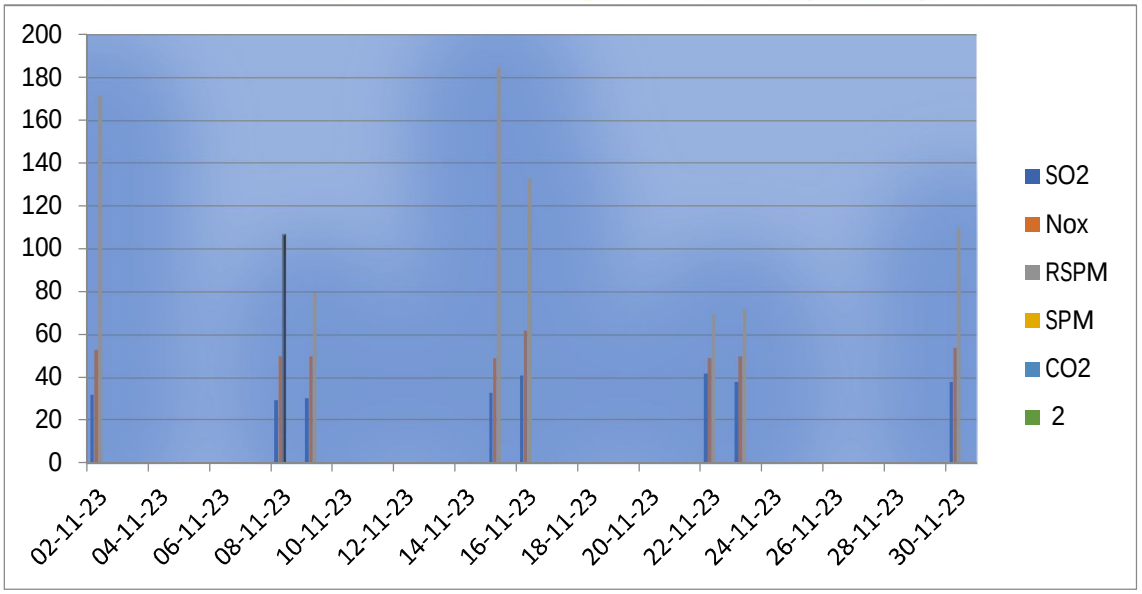
(Table No -04)

Air Quality Parameters for Thane District as per MPCB

Ambient Air Quality at Kolshet centre (Thane)							
Location - Kolshet Thane		Type- Industry					
Sr no.	Date	SO2	Nox	RSPM	SPM	Co2	AQI
		µg/m3	µg/m3	µg/m3	µg/m3	kt	
Standards		80	80	100	50mg/m3	130 kg/m	
1	02.11.2023	32	53	172	o	0.197 ton/Capita	148
2	08.11.2023	29	50	107	o	0.197	105
3	09.11.2023	30	50	80	o	0.197	80
4	15.11.2023	33	49	185	o	0.197	157
5	16.11.2023	41	62	133	o	0.197	122
6	22.11.2023	42	49	70	o	0.197	70
7	23.11.2023	38	50	72	o	0.197	72
8	30.11.2023	38	54	110	o	0.197	107

(Table no : 05)

AQI limit- 0-50 Good, 51-100 Moderate, 101-200 Unhealthy, 201-300 Poor very unhealthy, 301-500 Hazardous



(Graph No-02 , AQI)

B. Data for Study Design and Participants

We carried out key data through interviews and head to head conversation with scientific professionals (both in practice and re-seek) and officers from the department of science, technology and surroundings (DSTE) involved within the Thane district. individuals have been to begin with selected the use of purposive sampling based on professional relevance to the topic and prior connections. To that give up, the pattern included on this take a look at consisted of interviewees with both a clinical or an environmental expert's profile. We specifically chose this method to make sure that we were able to elucidate the views of professionals running closest to this field. we've got taken the interviews of 20 medical experts From the clinical professionals, we focused particularly on educated cardiologists, surgeons, popular medical doctor, ENT expert, medical officer, Pediatric professional, emergency medicine and fashionable medication doctors with varying levels of revel in. the majority of doctors interviewed had been male, with simplest one female informant. The entire sample most effective consists of 3 lady participants.The members profiles as follow,

Data of Doctors,Researchers,Professors

Sr.no	Name	Specialization	Experience
1	Dr. Makrand Salunkhe	General Physician	18 Years
2	Dr. Sundar Krishnan	General Physician	25 Years
3	Dr. Alok Modi	General Physician	35 Years
4	Dr. Aman Jain	General Physician	25 Years
5	Dr.B.G. Chikhlekar	General Physician	40 Years
6	Dr. Madhukar Gaikwad	General Physician	30 Years
7	Dr. Nikhil Kamble	General Physician	25 Years
8	Dr. Krishna Tadewad	Paediatric	20 Years
9	Dr. Adyushi Saboo	ENT	32 Years
10	Dr. Sneha Sawarkar	ENT	25 Years
11	Dr. Mahesh Kamble	General Surgery	15 Years
12	Dr. Zeba Patel	General Medicine	18 Years
13	Dr. Amol Ahire	General Medicine	25 Years
14	Dr. Amit Patle	General Medicine	15 Years
15	Dr. Avinash Jadhav	Paediatric	12 Years
16	Dr. Kunal Chawdhary	Ortho-specialist	20 Years
17	Dr. S.R. Bhagwat	General Surgery	25 Years
18	Dr. V.P.Kale	Psychiatrist	25 Years
19	Dr. Avinash K.	Medical Officer	15 Years
20	Dr. Meera P.	General Medicine	11 Years

(Table No -05)

IV. CONCLUSION

The RSPM component has been temporarily increased due to various constructions such as construction of Thane Municipal Corporation bridges, foot over bridge, metro work, laying of sewerage in various chowks.

1) Air pollution is increasing due to increasing urbanization and the number of vehicles. Measures such as road widening, construction of flyovers and tree planting are being implemented by the municipality to reduce air pollution, as well as regular vehicle PUC checks, use of clean fuel in vehicles, awareness to prevent the engine of the vehicle does not run on the signal. Thane Municipal Corporation has developed app with the help of DRP Global Technology to check air quality. The Municipal Corporation monitors the air quality in various residential, commercial, industrial zones and various junctions in the city.

2) TMC has also observed the air quality in Thane at different places and in different climatic conditions. The results of the current air quality have also been compared with the results of the previous air pollution index. Air quality is also checked during the festival to understand the sudden temporary effect of such activities on air quality. E.g. Diwali. Also air quality is checked near the source of pollution. E.g. Dumping ground site.

3) The rapid development of Thane city is one of the reasons why the level of air quality in Thane is leaning towards pollution. Air quality has come under strain in Thane city due to ongoing development works like Metro work, development of infrastructure, increasing load of vehicle pollution. However, efforts like tree planting, green canopy development, awareness and development of many infrastructure projects in a timely manner have resulted in some control over air pollution in Thane city. But there is still an opportunity to improve the air quality of Thane city. For this, Thane Municipal Corporation has developed a grievance redressed mechanism.

4) There are restricted records on how climate change and its health risks are perceived by key stakeholders. Our take a look at sheds new light in this topic amongst clinical specialists and environmentalists in the Thane location as well as some perceived gaps and recommendations. even as there was awareness at the affects of weather change, inclusive of on fitness, we located a disconnect when it got here to diseases no longer conventionally related to weather.

5) There is scope for schooling and education, mainly amongst healthcare vendors, on climate sensitive sicknesses. We additionally document a excessive perceived want for more training and cognizance on weather alternate and health, now not most effective among the scientific community however also amongst the general population, along side guidelines for edition measures. It also highlights the want for studies in other areas of India and some other place. those findings may be used to bolster the region's climate action plan through concentrated on key areas recognized on this observe together with education and consciousness constructing on fitness affects of weather exchange, now not most effective a few of the local population but also among key stakeholders.

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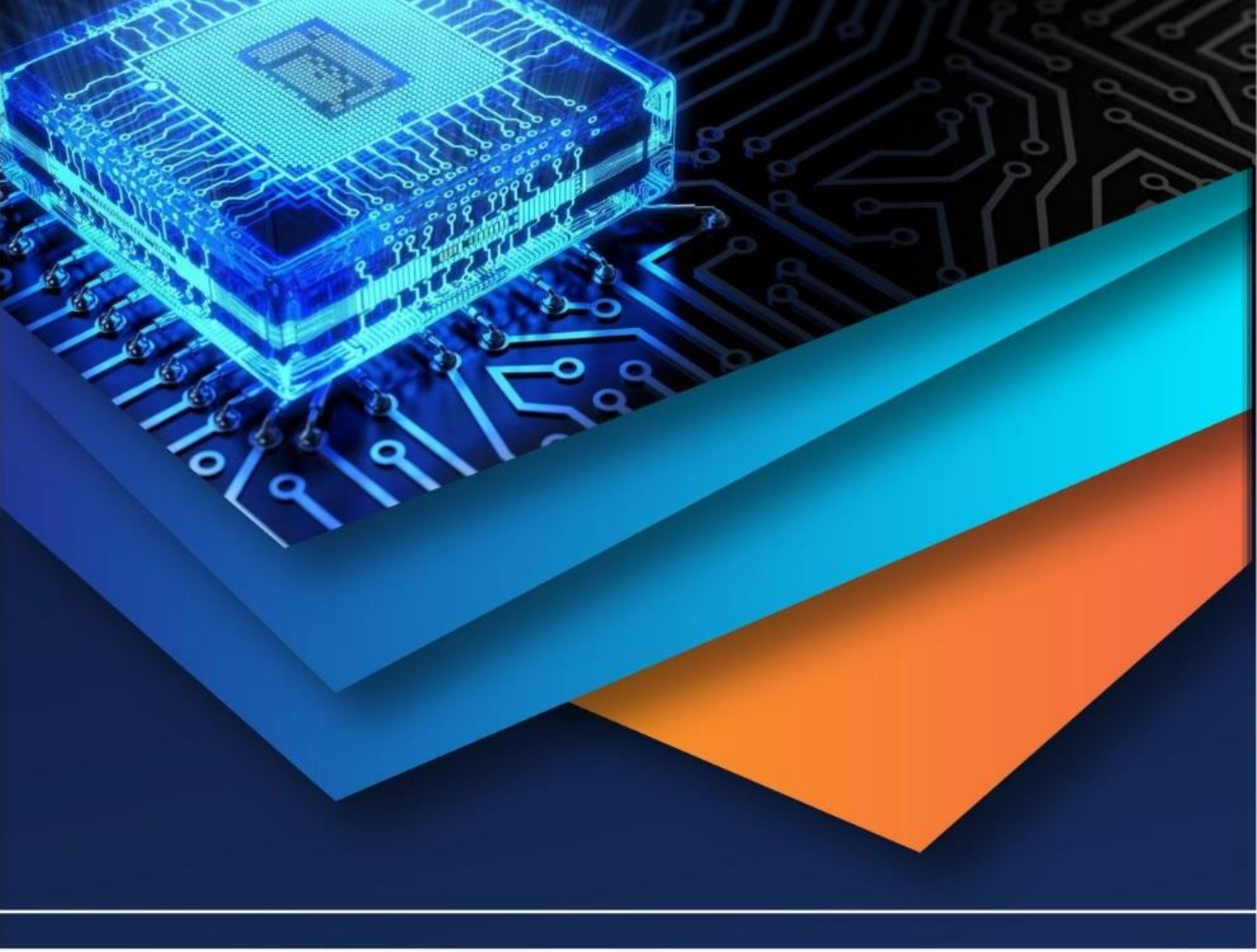

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