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Formation and Preparation of Oatmeal Tahini Fudge

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Abstract: ***Fruit based products are major part of healthy diet ever since human life began on earth. In the present study, four treatments (T0 to T4) of date-based snack bar of approximately 36±2g with high nutritional value were prepared on the basis of oats supplementation. Electronic hygroma meter was used to determined water activity. After sensory evaluation, proximate composition, pH and free fatty acids, the mineral contents were measured by using atomic absorption spectrophotometry. The hardness increased and water activity decreased significantly ($p < 0.05$) among the treatments. Moisture content in all treatments was low as compared to that of date paste. Maximum fat content was found in T3 (6.9%) and the minimum in T0 (2.5%). The maximum protein content was found in T3 (~14%) than all other three treatments. Significant difference ($p < 0.05$) was found in mineral contents of all treatments. Total sugars ranged from 50.7% to 45.9% were recorded with significant variation among treatments. Reducing sugars were high than non-reducing sugars, while acidity and free fatty acid contents were varied non-significantly among treatments. The highest score (7.1 score) of sensory evaluation recorded for T2, followed by T1 and T3 and lowest for T0. It has been concluded that the addition of oats have positive effect on acceptability and nutritional value of bars. Because of high nutritive value these bars would be healthy for consumers and motivate the food manufacturers and farmers for cottage as well as international industry.***

Keywords: Oatmeal tahini fudge, oats, oats flour, tahini, sesame seeds

I. INTRODUCTION

The Oatmeal Tahini Fudge Bar represents a perfect intersection of flavor, nutrition, and culinary innovation. In today's fast-paced world, consumers increasingly seek snack options that offer both convenience and health benefits without compromising on taste. The Oatmeal Tahini Fudge Bar rises to meet this demand by combining three powerhouse ingredients—oats, tahini, and dates—into a delicious and nutrient-rich treat. This unique snack bar is more than just a quick energy source it embodies a thoughtful approach to nutrition and sustainability, aligning with modern trends toward mindful eating and the consumption of wholesome, minimally processed foods.

At its core, the Oatmeal Tahini Fudge Bar leverages the versatility and health benefits of oats, a staple ingredient in nutritious diets worldwide. Oats are renowned for their high fiber content, which supports digestive health and provides lasting energy, making them a perfect foundation for this snack. Beyond their nutritional appeal, oats contribute a chewy texture and subtle nutty flavor that pair seamlessly with the other ingredients. Tahini, a creamy paste derived from ground sesame seeds, is another standout component of this bar. Widely used in Middle Eastern and Mediterranean cuisines, tahini is valued not only for its rich, nutty flavor but also for its impressive nutrient profile. It is a source of calcium, magnesium, and vitamin E, as well as healthy monounsaturated and polyunsaturated fats that promote cardiovascular health. The inclusion of tahini adds a layer of complexity to the bar's flavor while enhancing its creamy, fudge-like texture. Dates, the third key ingredient, play a dual role as a natural sweetener and a nutrient booster. Unlike refined sugars, dates provide sweetness accompanied by dietary fiber, potassium, and antioxidants, making them a healthier alternative for those seeking to reduce their intake of processed sugars. Their soft, sticky texture also acts as a natural binding agent, contributing to the bar's moist and cohesive structure. Together, these three ingredients form a harmonious trifecta of flavor, texture, and nutrition, delivering a snack that is as indulgent as it is wholesome. The process of developing the Oatmeal Tahini Fudge Bar required a delicate balance of creativity and precision. The goal was to create a product that not only tasted great but also delivered on nutritional promises and met the expectations of health-conscious consumers. This involved meticulous experimentation with ingredient proportions and preparation methods to achieve the ideal consistency, flavor profile, and nutrient density.

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Special attention was given to avoiding artificial additives and refined sugars, ensuring that the bar maintained its all-natural appeal. The result is a dense yet tender snack with a satisfying chew and a rich, nutty sweetness that lingers pleasantly on the palate. In addition to its sensory appeal, the Oatmeal Tahini Fudge Bar serves as a response to growing consumer demands for sustainable and ethical food options. Each ingredient was selected with an emphasis on environmental and social responsibility, reflecting a commitment to creating products that are not only good for the body but also kind to the planet. In addition to its sensory appeal, the Oatmeal Tahini Fudge Bar serves as a response to growing consumer demands for sustainable and ethical food options. Each ingredient was selected with an emphasis on environmental and social responsibility, reflecting a commitment to creating products that are not only good for the body but also kind to the planet. By choosing ingredient s like oats, tahini, and dates, the bar aligns with dietary trends that prioritize plant-based, minimally processed foods, making it an ideal choice for vegans, vegetarians, and anyone looking

A. Health Benefits

1) Lowers Cholesterol: Oats contain a type of fiber called beta-glucan, which helps to lower cholesterol levels and reduce the risk of heart disease.

2) Helps with Weight Management: Oats are high in fiber, which helps to keep you feeling fuller for longer, making them a great addition to a weight loss diet.

3) Regulates Blood Sugar: Oats contain a type of fiber called soluble fiber, which helps to slow down the absorption of sugar into the bloodstream, regulating blood sugar levels.

4) Supports Healthy Gut Bacteria: Oats contain prebiotic fiber, which helps to feed the good bacteria in the gut, supporting a healthy gut microbiome.

5) Reduces Inflammation: Oats contain a type of antioxidant called avenanthramides, which have been shown to reduce inflammation and improve overall health

II. MATERIALS AND METHODOLOGY

Material Required	Collection Of Raw Material
Oat	Super Market
Oats Flour	Super Market
Sesame seeds	Home
Vanilla extract	Super Market
Coconut oil	Home
Salt	Home
Cinnamon powder	Super Market
Honey	Super Market
Tahini	Homemade
Dark chocolate	Super Market
Weighing Balance	Processing Lab
Pan	Home
Gas	Home

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1) Oats

Oats, a versatile grain packed with nutrients, have been a staple food for centuries. Their popularity continues to rise due to their numerous health benefits and delicious taste.

2) Oats Flour

This review discusses the potential of oat flour in the bakery industry, including its nutritional value and how it can be used in wheat flour mixtures.

3) Honey

According to modern scientific literature, honey may be useful and has protective effects for the treatment of various disease conditions such as diabetes mellitus, respiratory, gastrointestinal, cardiovascular, and nervous systems, even it is useful in cancer treatment because many types of antioxidant are present in Honey.

4) Sesame Seed

Sesame seeds (Sesamum indium) are a type of oil-rich seed that comes from the sesameplant, a flowering plant native to Africa and India. Sesame seeds have been a staple cropin many cultures for thousands of years, particularly in Asian and Middle Eastern cuisine.

5) Tahini

Tahini (also known as sesame paste or sesame butter) is a creamy, thick paste made from ground hulled sesame seeds. It's a staple ingredient in Middle Eastern cuisine, but its popularity is spreading worldwide due to its rich flavor and nutritional benefits.

6) Dark Chocolate

Dark chocolate, defined as chocolate containing at least 70% cocoa solids, has been associated with numerous health benefits due to its rich content of flavonoids, antioxidants, and other nutrients.

7) Vanilla Extractor

Vanilla is a flavoring derived from the seed pods of the vanilla orchid (Vanilla plan folia). It is a popular ingredient in baking, cooking, and flavoring due to its unique and distinctive flavor.

8) Coconut Oil

Coconut oil is extracted from the meat of mature coconuts (Cocos nucifera). Coconut palms are native to tropical regions of the world, particularly in Southeast Asia and the Pacific Islands. Coconut oil has been a staple in the diets of many cultures for centuries, particularly in traditional Ayurvedic and Polynesian medicine.

9) Salt

Salt, also known as sodium chloride, is an essential nutrient that plays a crucial role in various bodily functions. Despite its importance, excessive salt consumption has been linked to various health problems, including hypertension, cardiovascular disease, and stroke.

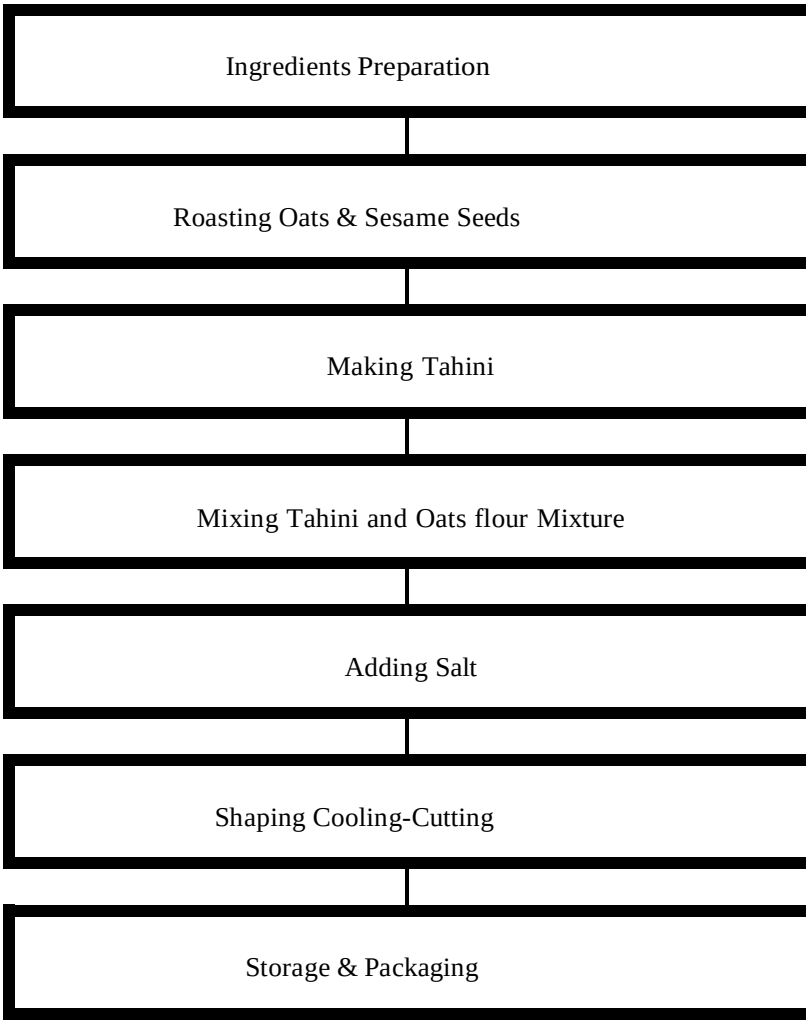
10) Cinnamon

Cinnamon is a spice derived from the bark of the cinnamon tree (Cinnamomum verum). It has been used for centuries in traditional medicine and cooking due to its unique flavor, aroma, and potential health benefits.

11) Cardamon

Cardamom, also known as Elettaria card amomum, is a spice commonly used in Indian and Middle Eastern cuisine. It is known for its unique flavor, aroma, and numerous health benefits. Here is a breakdown of the nutritional value of cardamom:

FLOW SHEET FOR MAKING OATMEAL TAHINI FUDGE BAR



A. Methodology

1) Prepare the base: Mix oats, tahini, and sweetener in a bowl until well combined.
2) Add flavorings: Incorporate any optional ingredients, such as nuts or spices.
3) Press the mixture: Press the mixture into a lined or greased baking dish.
4) Chill and set: Refrigerate the mixture until set.
5) Cut into bars: Cut the set mixture into bars.
6) Chocolate coating: Melt chocolate and coat the bars for an extra layer of flavor

III. RESULT AND DISCUSSION

A. Moisture Content

5gmof the product sample was taken in a Petri plate and the weight was measured, the Petri plates with samples were placed in a hot-air oven for drying at a temperature of 105 '°C, after 3 hours the sample was taken out and cooled in a desiccator, weight was taken and again placed in the hot-air oven to re-dry the sample and re weighed after half an hour until the constant weight was obtained for last three readings.

$$\textbf{Moisture \%} = \frac{W1\text{-}W2}{W1} \times 100$$

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B. Estimation Of Fat

5 gm sample was weighed and packed in a thimble the prepared thimble was weighed to cross- check the weight of the sample. The thimble was then enclosed in a big cellulose thimble and then it was placed in a Soxhlet extraction tube, 250 ml, of petroleum ether, was added to the Soxhlet extraction tube containing the sample. The heating mantle was turned on and the temperature was set at 60°C. Petroleum ether gets evaporated and condensed and falls over the sample drop by drop and the speed of dropping should be 150 drops per minute. When clear color petroleum ether was seen in Soxhlet after 6-12 hours, the assembly was turned off. The round bottom flask containing the solvent was separated from the assembly to recover the solvent. The solvent was recollected by using the downward distillation unit for the next use and the round bottom flask.

$$\textbf{Crude Fat \%} = \frac{\textbf{Weight of Fat} \times \textbf{100}}{\textbf{\textit{Weight of sample}}}$$

C. Estimation Of Protein

The protein content of the samples was determined utilizing the Kjeldahl method. Initially, 2 grams of the sample underwent digestion with 5 grams. of a digestion mixture, comprising 10 parts potassium sulfate and 1 part copper sulfate, along with 20 ml of concentrated sulfuric acid. This digestion process continued in a Kjeldahl flask until the contents achieved a state of being carbon-free. The resulting digested sample was then adjusted to a final volume of 100 ml. A 10 ml aliquot of the digested sample was subjected to distillation with 20 ml of 30 percent sodium hydroxide. The liberated ammonia from this process was collected in a solution containing 20 ml of 2 percent boric acid, enriched with 2-3 drops of a mixed indicator.

$$\% \textbf{\textit{Nitrogen}} = \frac{\textbf{14} \times \textbf{N of HCL} \times \textbf{Titre value (ml)} \times \textbf{Dilution factor} \times \textbf{100}}{\textbf{\textit{Weight of sample}}(\textbf{\textit{g}}) \times \textbf{1000}}$$

D. Estimation Of Total Ash

To determine the ash content, a 2-gram sample was placed in a silica crucible and ignited on a heater. Subsequently, the crucible was transferred to a muffle furnace and maintained at a temperature of 550° C +15° C until a clean ash was obtained. The weight of the resulting residue was then recorded, and the percentage of ash was calculated using the following formula:

$$\% \textbf{\textit{Ash}} = \frac{\textbf{Weight of residue} \times \textbf{100}}{\textbf{\textit{Weight of sample}}3}$$

Factor/Parameter (%)	Results
Moisture Content	31.02%
Ash content value	19.32%
Oatmeal Fat	10gm
Oatmeal Fiber	7.74%
Protein	7.02%
Energy	370kcl

IV. MICROBIAL ANALYSIS

A. Isolation Of Microorganisms From Sample

For microbial analysis, black rice laddu sample were serially diluted serial dilution were carried out by using standard protocol. Sample were diluted by using distilled water by using six test tube. Last three dilutions were used for microbial analysis. Basal media and different selective media were used for microbial analysis.

B. Culture of Microbes

The sample were screened for presence of different types of microorganisms. Basal media like Nutrients agar were used to isolate non-fastidious microorganisms present in the sample for fastidious microorganisms, different media were used for culture. Micro-organism were allowed to multiply and grow by incubating at 37 degree for 24-48 hrs. Following types of media were used for culture of microbes.

1) Nutrients agar basal or general-purpose media used for culture of non-fastidious microorganisms. Microbes which don't have any special nutritional requirements were grown using this media. The media contain common nutrients required for growth of microorganisms. This media were used to screen common types of bacteria present in given sample.
2) Malt extract -Malt Extract Agar is a nutrient-rich medium for the use of cultivation, isolation and enumeration of a broad-spectrum environmental and pathogenic yeasts and molds. It is used to isolate and culture different types of yeast and mold in food sample. The media used for screening of different yeast and mold in given sample of food.
3) MacConkey Agar-MacConkey agar is a selective and differential culture medium for bacteria. It is designed to selectively isolate Gram-negative and enteric (normally found in the intestinal tract) bacteria and differentiate them based on lactose fermentation. This media used for screening of Gram Negative and enteric bacteria in given food sample.
4) Tryptone Broth-Tryptone Broth (Tryptone Water) is recommended for detection of indole producing microorganisms. The test demonstrates the ability of certain bacteria to decompose the amino acid tryptophan to indole which accumulates in the medium. This media were used to screened for different indole producing bacteria in given sample of food.
5) EMB Agar-Eosin-methylene blue (EMB) agar is selective for gram-negative bacteria against gram-positive bacteria. In addition, EMB agar is useful in isolation and differentiation of the various gram-negative bacilli and enteric bacilli, generally known as coliforms and fecal coliforms respectively. This media were used for screening of different gram negative bacteria like Coliforms and feacal Coliforms in given food sample.

Microbial analysis of given food sample were performed using these above mentioned media. Microbes were allowed to grow and multiply in incubator in controlled conditions. The microbial growth were observed after 24 hrs. of Incubation.

Microbial Growth analysis - After 24 Hrs. Of Incubation, culture plates were screened for microbial growth. The following results were obtained.

V. SHELF-LIFE STUDY

According to our research by doing sensory analysis we observe that the Oatmeal tahini fudge before 1 months where good in taste and texture but same mix after 1 months the texture, taste and aroma get changed. So, we observe that it is better to use before 1 month.

A. Observation

The trial 5th is acceptable by sensory evaluation carried out by a panel of 7 judges (the academic staff of department of food technology) using 9-point hedonic scale.

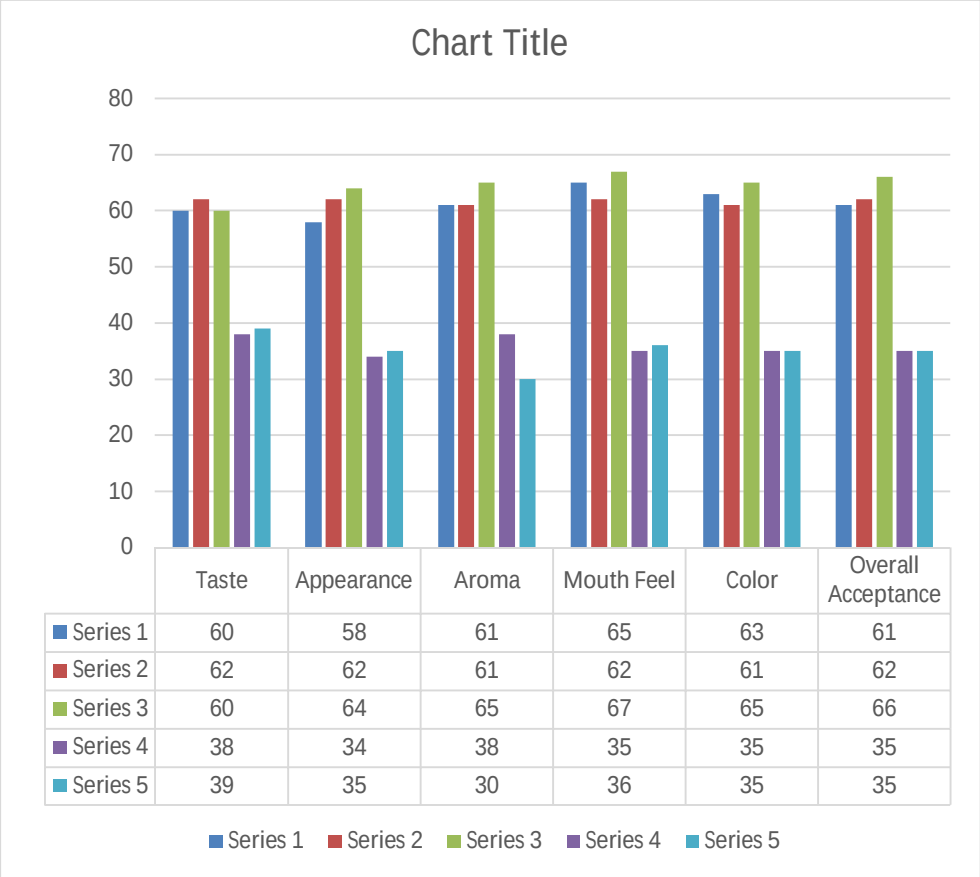
The Oatmeal Tahini Fudge Prepared out of 150gm Oats, 30gm Oats flours, 10gm Sesame seeds, 10ml Vanilla extract, 10ml Coconut oil, 1.50gmcinnamon powder, 1.30gm Cardamom powder, 70ml Honey, 150gm Tahini, 200ml Dark Chocolate.

The Oatmeal Tahini Fudge a delicious and satisfying treat that combines the heartiness of oatmeal with the indulgence of fudge.

VI. SENSORY ANALYSIS OF OATMEAL TAHINI FUDGE

A. Sensory Evaluation of Oatmeal Tahini Fudge

In the campus of Ballarpur Institute of Technology for Sensory Evaluation of product, sensory panel is made in which 10 untrained pane list is present. The sensory panel is there for evaluation in which panelist observed color, appearance, flavor, texture, taste and acceptability overall of product.



	Taste	Appearance	Aroma	Mouth Feel	Color	Overall Acceptance
Series 1	60	58	61	65	63	61
Series 2	62	62	61	62	61	62
Series 3	60	64	65	67	65	66
Series 4	38	34	38	35	35	35
Series 5	39	35	30	36	35	35

VII. FINAL PRODUCT

Fig- Oatmeal Tahini Fudge

VIII. CONCLUSION

In summary, oatmeal tahini fudge bars represent a game-changing snack option that seamlessly blends nutrition and indulgence. By combining the distinct, nutty flavor of tahini with the wholesome texture of oats, these bars create a truly satisfying experience that caters to diverse tastes and dietary preferences. Whether you're seeking a healthy pick-me-up, a convenient breakfast solution, or a sweet treat, oatmeal tahini fudge bars deliver unparalleled taste and nutrition in every bite. Their ease of preparation, coupled with the incorporation of beneficial ingredients, renders them an incredibly versatile and appealing addition to any snacking routine. Oatmeal tahini fudge offers a delightful and unexpected culinary adventure. It subverts expectations by combining the comforting familiarity of oats with the rich nuttiness of tahini, resulting in a treat that's both satisfying and delicious.

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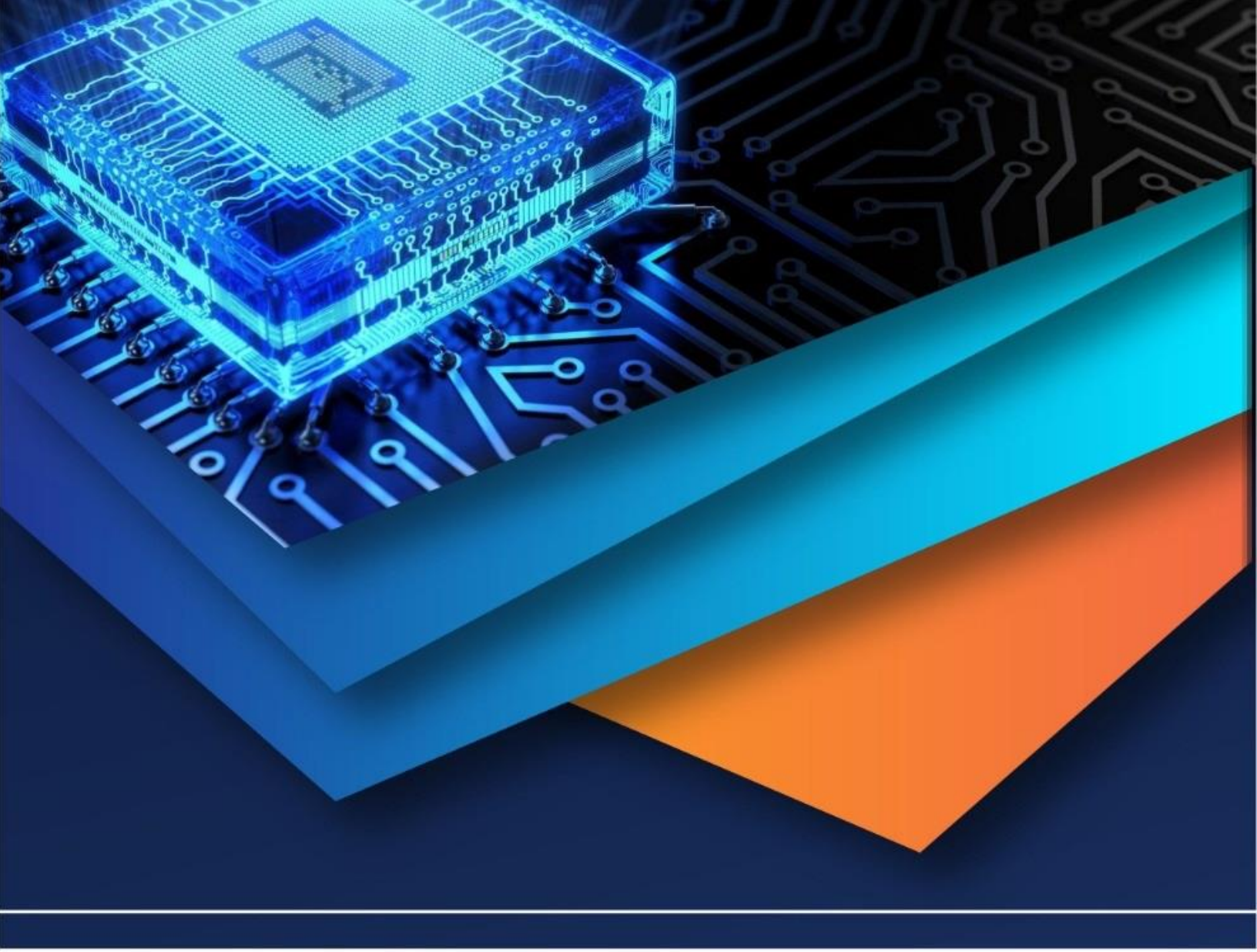

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