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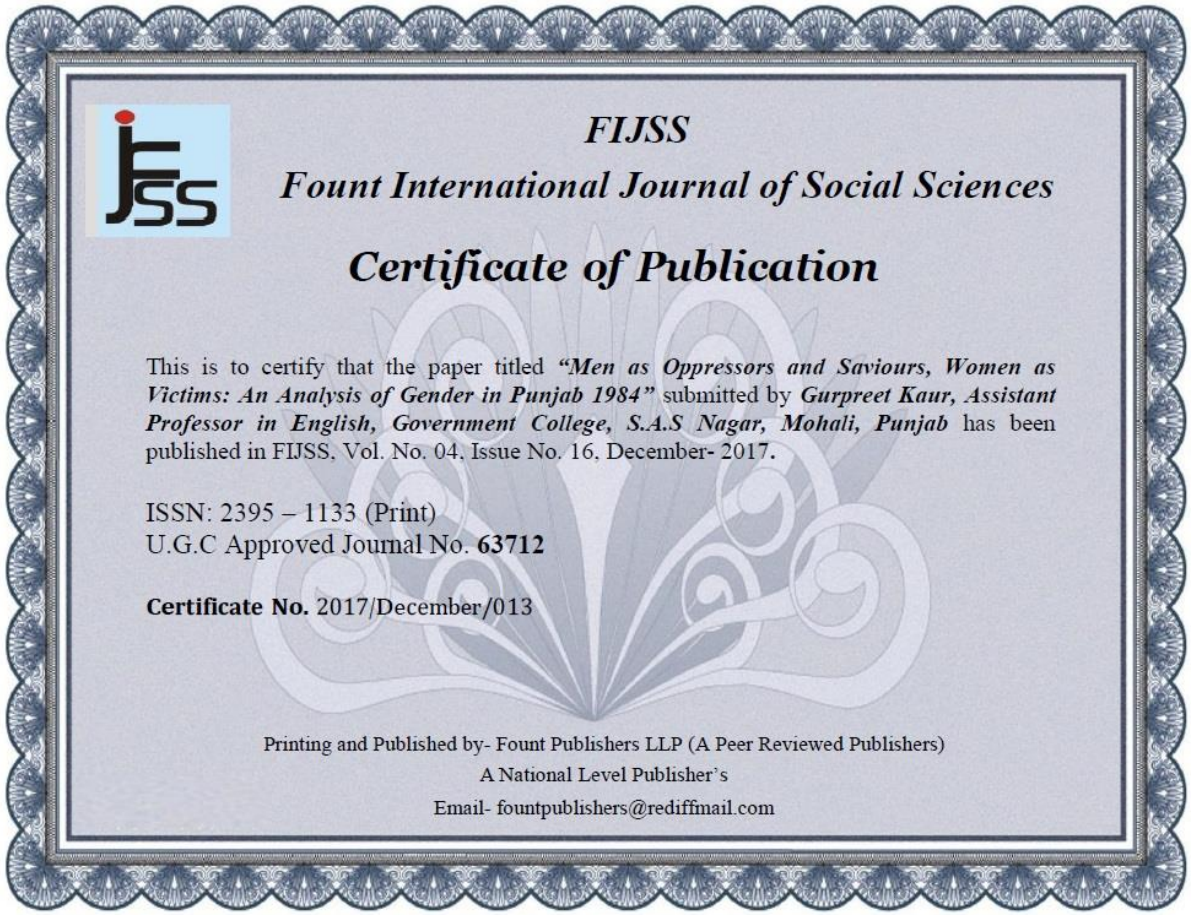

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Men as Oppressors and Saviours, Women as Victims: An Analysis of Gender in Punjab 1984

Author: Gurpreet Kaur, Assistant Professor in English
Government College, S.A.S Nagar, Mohali. Email: gurpreetgcmohali@gmail.com

The present research attempts to comprehend the portrayal of women in the film Punjab 1984. It investigates the women in the narrative for their opinion and voice. It underscores the stereotypical depiction of characters and the consequent victimhood of women. It questions the authority of men who possess the ability to oppress as well as rescue women.

Gender refers to the social system of differentiating between people on the basis of their sex. It recognises a collection of qualities and behavioural traits that the society expects from females or males. The idea of gender was delineated in order to stress the social formulation of masculinity and femininity, and social arrangement of relations between women and men. The distinction between sex and gender is one of the main concerns of feminist theory. In sex/gender dichotomy, sex refers to the biological distinction between men and women, and is viewed as an innate quality which distinguishes each one of us into the categories of male and female. Thus, gender implies the socially constructed characters, traits, and conduct that the society associates with men and women separately. Further, it can also be inferred that gender is not the direct result of sex, and not even as fixed as sex. An individual is born with a particular sex, and adopts the constructed norms of gender in society.

Gender is a conception that exists in the practice and processes of day-to-day life and social institutions. It has become a truth which distinguishes male from female or masculinity from femininity on the basis of well-defined and strictly followed assumptions. It is paradoxical that on one hand, gender is continuously changing and re-formulating in society, and on the other hand, it forms the basis and structure of social life. An individual's upbringing as well as surroundings determines the process of functioning according to gender. The formulation and maintenance of gender are evident in personal selves as well as in social communications. The reproduction of gender in society gives birth to the gendered structure of society. Gender is observable in our personalities, our cultures, our institutions in a complicated manner. In fact, gender leads to the construction of patterns of expectations for individuals, and is built in the vital components of society i.e. economy, family, and politics.

Gender can also be understood as a routine and methodical performance that keeps repeating itself, and relies on everyone performing gender. The competence of men and women performing gender depends upon the performance that men and women indulge in. Although the individual performs gender, yet gender is regarded as a distinct feature of social circumstances. Gender is both a result, and a principle for maintaining social order. The process of belonging to a particular gender is understood and standardized by the society, its values, in addition to religion, legal as well as scientific structure. It is not only about cultural aspects and traits that produce personal identities. Performing gender is associated with a particular sex and thus, can be regarded as a natural process. The distinctions between women

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and men due to their sex transform them into fundamental and consistent characters. Since gender is instrumental in forming a structure of social life, gender statuses must be clearly distinguished. The resultant order of the society, thus, reflects fundamental and natural differences.

Incidentally, it can be contended that if we perform gender in a systematic manner

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SUBCLASSES OF ANALYTIC FUNCTIONS RELATED TO SIGMOID FUNCTION

Gagandeep Singh[1], Gurcharanjit Singh[2], Harjinder Singh[3]

[1]*Department of Mathematics, Majha College for Women, Tarn-Taran (Punjab), India*

[2]*Department of Mathematics, Guru Nanak Dev University College, Chungh, Tarn-Taran (Punjab), India*

[3]*Assistant Director, Directorate of Public Instructions Punjab, Chandigarh (Punjab), India*

ABSTRACT

In this paper, the authors investigate the initial coefficient bounds for some new subclasses of analytic functions related to Sigmoid function. Also the relevant connections to Fekete-Szegö inequality and Hankel determinant for these classes are briefly discussed. Our results serve as a new generalization in this direction.

Mathematics Subject Classification: *30C45, 33E99*

Keywords: Analytic functions, Convex function, Sigmoid function, Starlike function, Subordination.

I INTRODUCTION AND PRELIMINARIES

The theory of special functions is significantly important to scientists and engineers. Though not with any specific definition but its applications extend to physics, computer etc. Recently, the theory of special functions has been overshadowed by other fields like real analysis, functional analysis, algebra, topology and differential equations.

There are various special functions but we shall concern with one of the activation function known as sigmoid function or simple logistic function. Activation function is an information process that is inspired by the biological nervous system such as brain processes information. It comprises of large number of highly interconnected processing element (neurons) working together to solve a specific task. The function works in similar way the brain does, it learns by examples and cannot be programmed to solve a specific task.

The sigmoid function of the form

$$h(z)=\frac{1}{1+e^{-z}} \tag{1.1}$$

is differentiable and has the following properties:

- It outputs real numbers between 0 and 1.
- It maps a very large input domain to a small range of outputs.
- It never loses information because it is a one-to-one function.
- It increases monotonically.

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A New Subclass of Univalent Functions

By Gagandeep Singh, Gurcharanjit Singh & Harjinder Singh
Majha College for Women

Abstract- In this paper, a new subclass $\chi_t(A,B)$ of close-to-convex functions, defined by means of subordination is investigated. Some results such as coefficient estimates, inclusion relations, distortion theorems, radius of convexity and Fekete- Szegö problem for this class are derived. The results obtained here is extension of earlier known work.

Keywords: *subordination, univalent functions, analytic functions, convex functions, close-to-convex, coefficient estimates, fekete- szegö problem.*

GJSFR-F Classification: *MSC 2010: 30C45*

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A Second Order Smoothing Penalty Function Algorithm for Constrained Optimization Problems

Darpan Sood [1], Dr. Amanpreet Singh [2], Dr.Rama [3], Dr. Amrit Pal Singh [4]

1Research Scholar, Department of Mathematics, Desh Bhagat University, Punjab, (India).147301

2Assistant Professor, Department of Mathematics, GSSDGS Khalsa College, Patiala. Punjab, 147001

3Professor, Department of Mathematics, Desh Bhagat University, Punjab, (India).147301

4Assistant Professor, Department of Mathematics, SMHS Government College , SAS Nagar ,Punjab, 160055

Abstract The current paper introduces a second order smoothing technique for classical l_1 exact penalty function in constrained optimization problems. Error calculations for optimum solution values for non-smoothed, smoothed penalty problem and for the original problem have been discussed in the paper. An algorithmic procedure for obtaining the solution is demonstrated and convergence is discussed.

Keywords Penalty Function, Smoothing, Error , Convergence, Constrained optimization problem

Introduction

The mathematical form of constraint optimization problem involves the introduction of certain terminology which should be known for better understanding of the topic. Let x be an n-dimensional vector given as $x=(x^1,x^2,...x^n)\in \mathrm{R}^n$, S be a subset of R^n. Let $f_0(x), f_1(x),..., f_m(x)$ are functions of x. The main problem in constrained optimization can be represented as

$$Min\ f_0(x) \tag{1}$$

$$\text{s.t} \quad f_j(x)\le 0 \quad j=1,2,3,...,m$$

The function f_0 and $f_j: R^n \to R$ are continuous differentiable functions of second order. The function $f_0(x)$ is called the objective function. The vector function $f(x)=f_1(x), f_2(x),..., f_m(x)$ defined above is generally referred to as the functional constraints. The set S is called the basic feasible set. The set $Q=\{x\in S, f_j(x)\le 0, j=1,2,3,...,m\}$ is called the feasible set of the problem (1). The set Q is assumed to be nonempty. The minimization problems can be classified as

1. Constrained Problems: $Q\subset R^n$

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Rapid green-synthesis of TiO_2 nanoparticles for therapeutic applications

Shilpy Bhullar,[a] Navdeep Goyal[a] and Shikha Gupta[*b]

Nanoparticles (NPs) with sizes ranging from 2 nm to 1 μm find various applications in the field of theranostics. Moreover, if eco-friendly methods are opted for the synthesis of biocompatible and less toxic NPs, then that's a huge success. Titanium dioxide nanoparticles (TiO_2 NPs) have been vigorously studied for their use in medical implants, photodynamic therapy, drug delivery, biosensing and as antimicrobial agents. The present study reports the green-synthesis of TiO_2 NPs for the first-time using extracts of black pepper (*Piper nigrum*), coriander (*Coriandrum sativum*) and clove (*Syzygium aromaticum*). All three samples of TiO_2 NPs were synthesized *via* a modified sol–gel method under similar environmental conditions. Similar treatments were given to the samples. The procedure adopted for the synthesis ensures the use of non-toxic materials, no production of toxic by-products and rapid synthesis of the TiO_2 NPs. The NPs were characterized by X-ray diffraction, high resolution-transmission electron microscopy, energy dispersive spectroscopy, field emission scanning electron microscopy and selected area electron diffraction which confirmed the formation, morphology, crystallinity and size of the TiO_2 NPs. These characterizations displayed the similarity index of all three samples. However, photoluminescence and vibrating sample magnetometer studies highlighted the differences among the three samples. All three samples of NPs obtained had a size range of 5–20 nm. Further, the findings showed that different plant extracts result in TiO_2 NPs with moderately different characteristics. Furthermore, the samples were analysed for their drug-encapsulation efficiency using UV-visible spectrophotometry. Among all three samples, the NPs synthesised using black pepper exhibited the maximum encapsulation efficiency. The study concludes that the plant's bio-profile is responsible for bringing about changes in the traits of the resulting nanoparticles. Thus, the extracts from different plants have the ability to manipulate the properties of the synthesized NPs. These findings can help to understand the role and importance of the plants in synthesizing NPs for biomedical applications. A further detailed study in this field can help researchers to understand the influence of the plant's biochemistry in shaping the NPs.

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1 Introduction

Today the world is moving towards adopting eco-friendly measures for sustainable development. Nanoparticles (NPs) are now slowly capturing the global market because of their versatility. But as everything comes with a flaw, these NPs also result in biohazards. During their synthesis, chemicals are used which often lead to many toxic by-products. As a remedy to this bizarre scenario, the green synthesis approach is fascinating to researchers these days. The green synthesis technique involves the maximum use of biomass to retrieve the NPs. However, the term 'green' is not restricted to plants alone. Various fungi-mediated and bacteria-mediated synthesis also come under the green synthesis procedure. Thus, biomass, in general, is being extensively utilised for environment-friendly synthesis techniques. When using plants, the extracts of their roots, leaves, stems, seeds, flowers or fruits, can be used. Organic polymers are the building blocks of the plants and these include starch, chitin, cellulose, hemicellulose, lignin and various resins. Whenever plant extracts are used, the organic polymers and the biomolecules present in them, are responsible for their characteristic behaviour. Cellulose is the most abundant organic polymer and is a polysaccharide present in the primary cell wall of plants and many forms of algae. Lignocellulose biopolymers nourish the cell wall of the plants and they consist of cellulose, hemicellulose and lignin. Lignin constitutes around 30 percent of the lignocellulose biomass and contains a large number of phenylpropanoids. It has the potential to replace petroleum and its depolymerization offers remarkable possibilities for producing high-quality chemicals.[1,2,3] This is a step towards modern day eco-friendly synthesis procedures.

[a]Department of Physics, Centre of Advanced Study in Physics, Panjab University, Chandigarh-160014, India
[b]Department of Physics, Goswami Ganesh Dutta Sanatan Dharma College, Sector-32C, Chandigarh-160032, India. E-mail: shikha.gupta@ggdsd.ac.in

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FEKETE-SZEGÖ INEQUALITY FOR CERTAIN CLASSES OF CLOSE-TO-CONVEX FUNCTIONS

GAGANDEEP SINGH, GURCHARANJIT SINGH, HARJINDER SINGH

Abstract. Close-to-convex functions and quasi-convex functions are of great importance in geometric function theory. In the present investigation, the authors study the subclass C_1 of close-to-convex functions and the subclasses C' and C'_1 of quasi convex functions in the open unit disc $E = \{z : |z| < 1\}$. The sharp upper bounds of the functional $|a_3 - \mu a_2^2|$, μ real, for the functions of the form $f(z) = z + \sum_{n=2}^{\infty} a_n z^n$ belonging to these classes are provided. This work will pave the way to investigate the upper bound of the Fekete-Szegö functional for some other subclasses of close-to-convex and quasi-convex functions.

1. Introduction

Let A denote the class of functions of the form

$$f(z) = z + \sum_{n=2}^{\infty} a_n z^n \tag{1}$$

which are analytic in the unit disc $E = \{z : |z| < 1\}$. Let S be the class of functions of the form (1) which are analytic univalent in E.

We shall concentrate on the coefficient problem for the class S and certain of its subclasses. In 1916, Bieberbach [3] proved that $|a_2| \leq 2$ for $f(z) \in S$ as a corollary to an elementary area theorem. He conjectured that, for each function $f(z) \in S$, $|a_n| \leq n$; equality holds for the Koebe function $k(z) = z/(1-z)^2$, which maps the unit disc E onto the entire complex plane minus the slit along the negative real axis from $-\frac{1}{4}$ to $-\infty$. De Branges [5] solved the Bieberbach conjecture in 1984. The contribution of Löwner [10] in proving that $|a_3| \leq 3$ for the class S was huge.

With the known estimates $|a_2| \leq 2$ and $|a_3| \leq 3$, it was natural to seek some relation between a_3 and a_2^2 for the class S. This thought prompted Fekete and Szegö [6] and they used Löwner's method to prove the following well-known result for the class S:

1991 *Mathematics Subject Classification.* 30C45, 30C50.
Key words and phrases. Univalent functions, starlike functions, convex functions, close to convex functions, bounded functions.
Submitted April 30, 2020. Revised May 24, 2020.

Australian Government

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CERTIFICATE OF GRANT

INNOVATION PATENT

Patent number: 2021107060

The Commissioner of Patents has granted the above patent on 17 November 2021, and certifies that the below particulars have been registered in the Register of Patents.

Name and address of patentee(s):

Amanpreet Singh of GSDS Khalsa College Patiala Punjab India

Darpan Sood of SGTB Khalsa College Anandpur Sahib Punjab India

Amrit Pal Singh of SMHS Government College SAS Nagar Punjab India

Title of invention:

A SMOOTHING TECHNIQUE FOR SQUARE ROOT EXACT PENALTY FUNCTION IN CONSTRAINED OPTIMIZATION

Name of inventor(s):

Singh, Amanpreet; Sood, Darpan and Singh, Amrit Pal

Term of Patent:

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NOTE: This Innovation Patent cannot be enforced unless and until it has been examined by the Commissioner of Patents and a Certificate of Examination has been issued. See sections 120(1A) and 129A of the Patents Act 1990, set out on the reverse of this document.

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COEFFICIENT INEQUALITY FOR A COMBINED SUBCLASS OF VARIOUS CLASSES OF REGULAR FUNCTIONS

Gurmeet Singh
Department of Mathematics, Khalsa College, Patiala
E-mail: meetgur111@gmail.com
Harjinder Singh (Corresponding Author) SMHS Govt. College, Mohali
E-mail: harjindpreet@gmail.com
Misha Rani
Research Fellow, Punjabi University, Patiala
E-mail: mishagargsamana@gmail.com

Abstract. Here, we take functions of the type $f(z) = z + \sum_{k=2}^{\infty} a_k z^k$ and solve the Fekete – Szegö inequality for a new class of analytic functions.

2010 ***Mathematics Subject Classification***: **30C45, 30C50**.

Keywords: Fekete – Szegö Inequality, Starlike functions, Bounded analytic functions and concept of subordination.

1. Introduction

In this paper we define an inequality called Fekete – Szegö Inequality for a new class of analytic functions. This is an inequality which relates to those coefficients which are related to univalent analytic functions [8],[16]. M. Fekete and G. Szego proved this inequality in 1933[5]. It originates from bieberbach conjecture([6], [13], [14], [15]), which was given by Bieberbach [2] in 1916 but finally proved by him [3] in 1985.

Firstly, let us discuss some classes and some basic results :

Let A be the family of functions f of the form $f(z) = z + \sum_{k=2}^{\infty} a_k z^k$, having conditions of normalisation $f(0) = 0, f'(0) = 1$; analytic in open unit disc $E = \{ z \in C : |z| < 1 \}$.

Let S be the family of functions f univalent in the open disk $\{ z \in C : |z| < 1 \}$ with conditions

$f(0) = 0, f'(0) = 1; f(z) = z + \sum_{k=2}^{\infty} a_k z^k$.

Any function f belonging to the class A is said to be a Starlike function if $f(E)$ is starlike domain with respect to the origin and this class is denoted by S^* [1]. The essential condition for this class as given by Duren [4], is $Re\left(\frac{zf'(z)}{f(z)}\right) > 0; z \in E$, and $S^*(\phi)$ be the class of functions in $f \in S$, for which $\frac{z f'(z)}{f(z)} \prec \phi(z)$, given by Ma and Minda [10].

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In-vitro pH-responsive release of imatinib from iron-supplement coated anatase TiO_2 nanoparticles

Shilpy Bhullar[1], Navdeep Goyal[1] & Shikha Gupta[2]✉

Targeted drug delivery is one such precision method of delivering medication inside the human body which can vanquish all the limitations of the conventional chemotherapeutic techniques. In the present study, two types of nanoparticles (NPs) were chosen for the in-vitro pH-responsive release study of the drug, Imatinib, namely anatase Titanium Dioxide nanoparticles (TiO_2 NPs) and iron-capped TiO_2 NPs, designated as Fe@TiO_2 NPs. The novelty of this work lies behind the use of commercially available iron supplement 'Autrin' meant for human consumption, as the material to coat the TiO_2 NPs to synthesize Fe@TiO_2 NPs. The synthesized NPs were analyzed by XRD, HR-TEM, SAED, EDX and VSM. UV–Vis spectroscopy was performed for absorption studies. Fe@TiO_2 NPs showed superparamagnetic behavior and thus they are able to ensure the facile transfer of Imatinib via external magnetic fields. The results obtained from in-vitro drug release studies depicted that both TiO_2 NPs and Fe@TiO_2 NPs showed a controlled pH-sensitive delivery of the loaded Imatinib molecules. Moreover, both types of NPs do not result in the formation of ROS under human physiological conditions. These results can lay the foundation to the development of efficacious targeted drug delivery systems in the healthcare sector.

Today, we are witnessing a global pandemic whose impact has been devastatingly pervading. Not to mention, many new diseases caused by fungi and other microbes are discovered each year. What worsens the situation is our inability to treat life-threatening diseases like cancer which have been known to mankind for quite a long time. Genetic mutations cause many carcinogenic cells to acquire resistance against many drugs thereby convoluting the treatment provided[1]. There is no denying the fact that today we need smarter tools and smarter medicines to provide advanced medical treatments and to combat the deadly diseases. Nanotechnology is the future of mankind. This technology of manipulating the matter at nano scales to obtain remarkably novel materials with unique properties has huge potential in the field of healthcare.

Radiotherapy, surgery and chemotherapy are the major anti-cancer therapies undertaken. But, the non-specific targeting of cancer cells have made these approaches ineffective in a number of patients as they affect the healthy tissues as well. Chemo drugs used in cancer treatment often lack the target-specificity and many times, a combination of chemo drugs is used to ascertain complete treatment. However, not all medicines work in a similar manner and they possess their own side-effects as well. The non-directionality of these drugs result in their action at undesirable sites too. To cope with this, higher doses of drugs are administered which generates major health concerns. Here, nanotechnology can come to the rescue. Nanoparticles (NPs) are the new era tools which can be used to load drugs onto them and ensure targeted drug delivery. This is a method of delivering medications inside the human body by achieving maximum concentration at the target locations and the least concentration around the normal tissues. This confirms the least drug wastage in the other regions of the body and maximum dosage released at the site of action[2].

The state of the art in medical research involves using the NPs as drug carriers and following different approaches to achieve targeted drug delivery. One of the approaches involves conjugating the drug to a cell-specific ligand or tissue to have active targeted drug delivery, whereas, the other involves encapsulation of NPs or macromolecules with a therapeutic agent which passively reaches the target through Enhanced Permeability and Retention (EPR) effect. Liposomes and other biologically modified NPs are often used for the efficient delivery of lipophilic drugs which dissolve through the outer lipid membrane of the NPs right into the target cells via lipid-lipid exchange[3]. Infact, NPs have been reported to cross the Blood–Brain Barrier (BBB) and thus, they are favorable in treating difficult-to-treat tumors. Most of the tumor cells are recognized by the over-expression of

[1]Department of Physics, Centre of Advanced Study in Physics, Panjab University, Chandigarh 160014, India. [2]Department of Physics, Goswami Ganesh Dutta Sanatan Dharma College, Sector-32C, Chandigarh 160032, India. ✉email: shikha.gupta@ggdsd.ac.in