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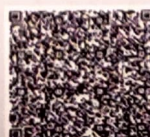
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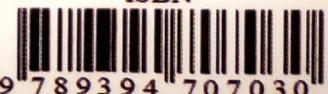
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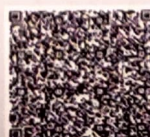
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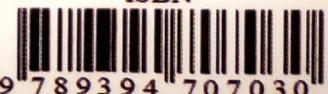
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Impact of Globalization on Higher Education

Professor S.N.Waghule

Abstract: Globalization trends and innovations in the instructional technologies are widely believed to be creating new markets and forcing a revolution in higher education. Much of the rhetoric of "globalists" has presented a simplistic analysis of a paradigm shift in higher education markets and the way nations and institutions deliver educational services. Globalization does offer substantial and potentially sweeping changes to national systems of higher education, but there is no uniform influence on nation-states or institutions. All globalization is in fact subject to local influences. A growing body of case studies point to the complexity of globalization in influencing the future of higher education. The objective of this analysis is to provide a framework for a more encouraging, and a more nuanced, understanding of this phenomenon and the true influence of globalization and the future path for higher education.

(Keywords: Globalization, Governing and managing higher education systems.)

Introduction:

Higher education has become a huge enterprise. World-wide tens of millions of students are enrolled in more than 15,000 public institutions, and a growing number of private institutions. Governing and managing higher education systems at all relevant levels especially system level, central institutional level, faculty and department level, program level) has become a profession on its own. However, the possibilities for higher education leaders and managers at all relevant levels inside and outside the higher education institutions to prepare and train themselves with respect to the governance and management side of their job are limited, especially concerning the threats and challenges of its global dimensions. Global initiatives promoting greater corporate social responsibility has made specific references to education as a sector or as an issue

भारत सरकारने ३४ वर्षानंतर नवीन शैक्षणिक धोरण-२०२० जाहीर केले आहे. इस्त्रोचे माजी प्रमुख के.कर्तुरीरंगन यांच्या अध्यक्षतेखालील समितीने या धोरणाचा मसुदा तयार केला असून या नवीन शैक्षणिक धोरणातील महत्वाच्या बाबी काय आहेत? पुढील कालात शिक्षण पद्धतीत कोणते आमूलाग्र बदल होणार आहेत? त्यातील उणिवा कोणत्या आहेत? या संदर्भाने डॉ.आरगडे अंबादास यांच्या 'नवीन शैक्षणिक धोरण' या प्रस्तुत संपादित पुस्तकात अनेक मान्यवरांनी मुद्देसूद आणि अभ्यासपूर्ण मांडणी केली असून या धोरणांच्या संदर्भातील जनजागृती होण्यास यामुळे मदत होईल. सदरील उपक्रम स्तुत्य असून नव्या शैक्षणिक धोरणाला सामोरे जाण्याच्या दृष्टीने मौलिक वाटतो. डॉ. आरगडे अंबादास या शैक्षणिक उपक्रमास मनःपूर्वक शुभेच्छा.....

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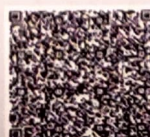
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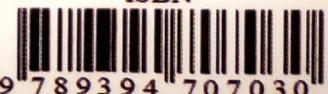
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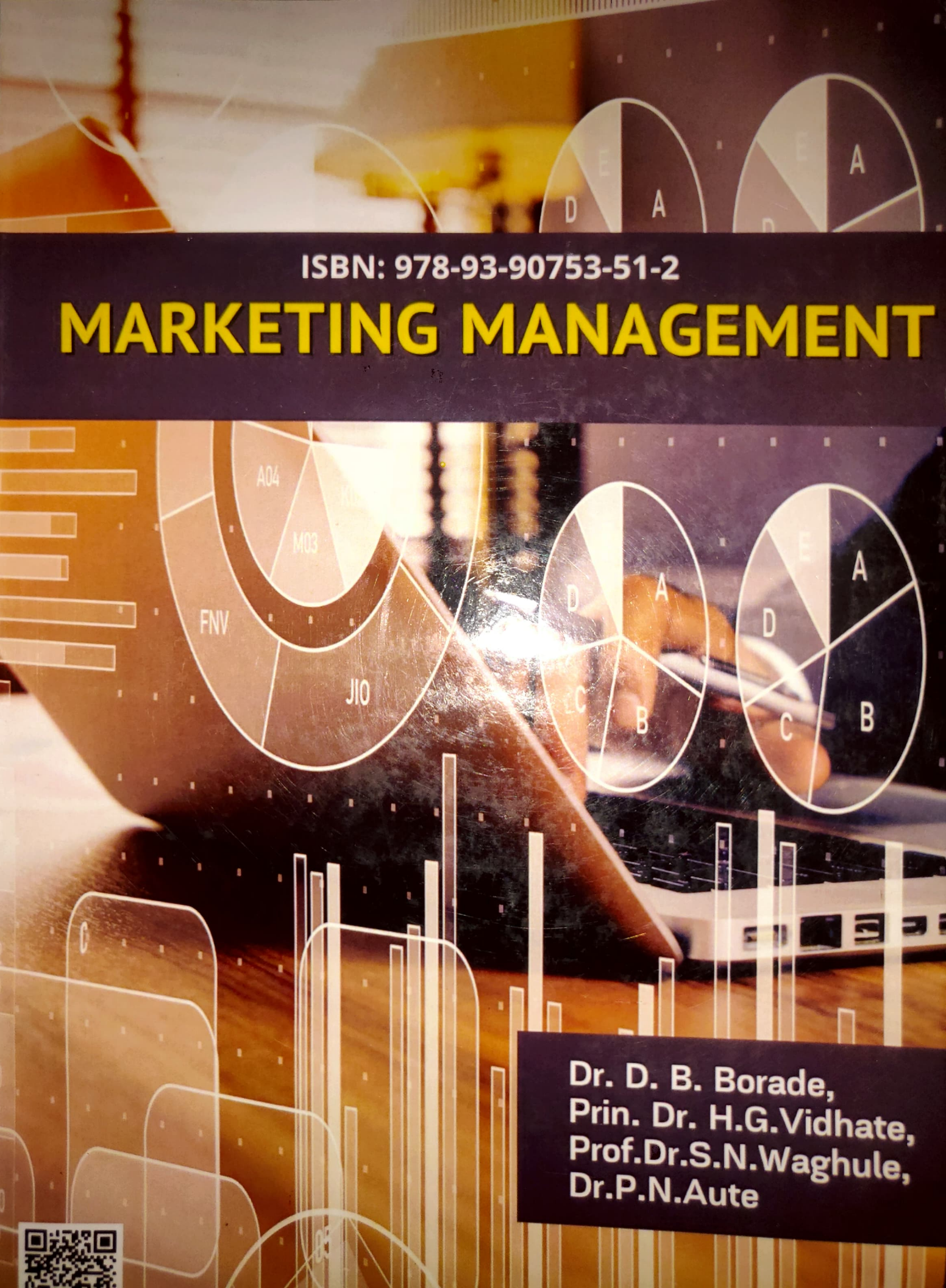


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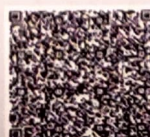
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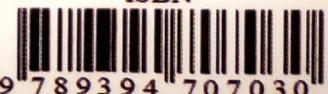
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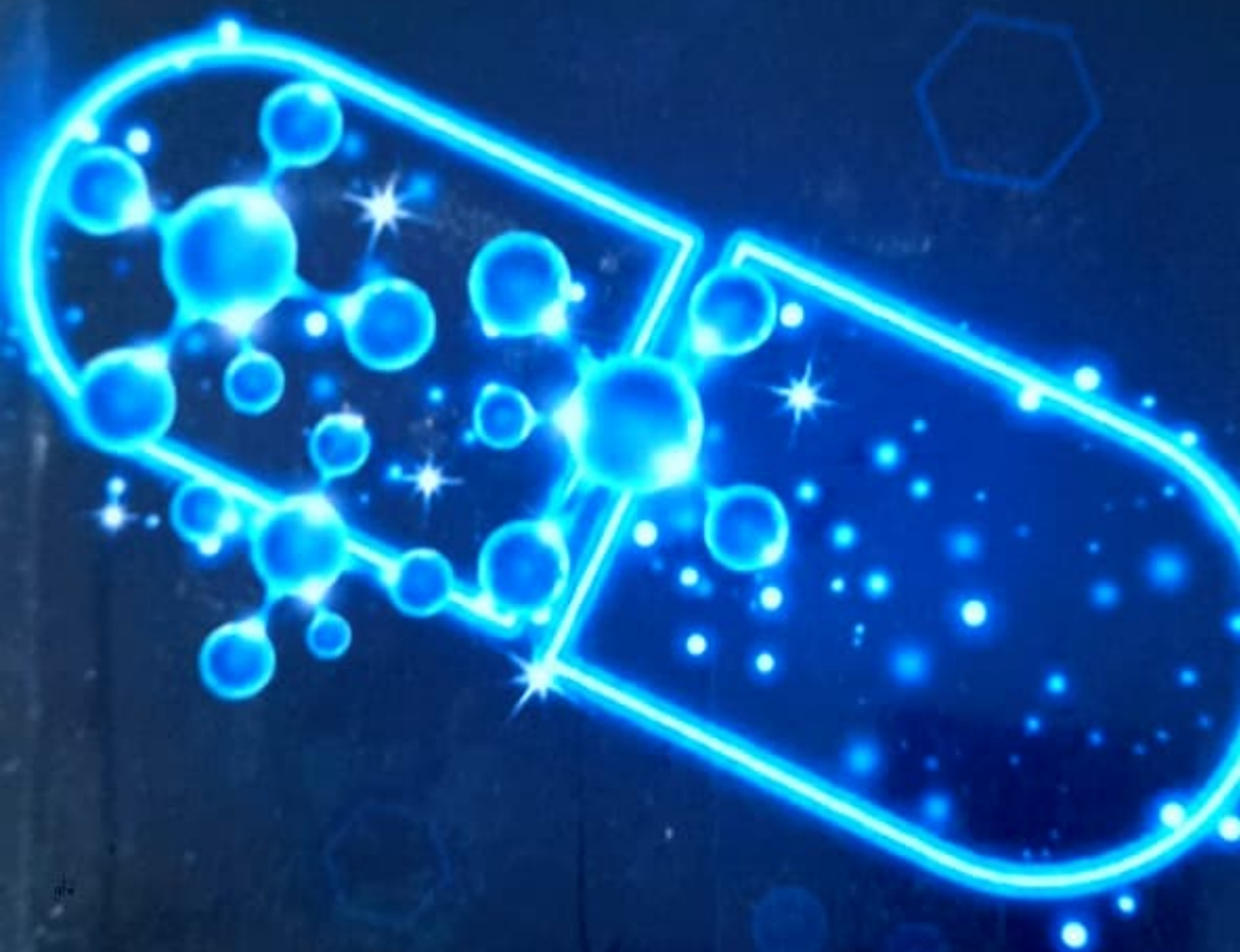
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CHAPTER I

INTRODUCTION

Drug maltreatment in India is pretty much as old as somewhere else, if not more established, all along, weed drugs have been being used. Antiquated books are loaded with references to intoxicants, for example, 'soma rasa', 'dev goods', 'madira' and so on Opium became well known during the Mughal time frame. As of not long ago, cocaine had numerous lovers, particularly in 'red-light' regions. The post-war period saw the ascent of engineered drugs-the two energizers and depressants. Hard drugs like heroin and lysergic corrosive diethylamide (LSD) are being used. As of late found drugs like phencyclidine hydrochloride (Angel Dust) may likewise be known to specific clients in metropolitan regions. In any case, it is hard to state that the predominance pace of psychoactive drugs in the nation is practically identical to that found in numerous western nations. In any case, the issue has regularly been related with the cycles of urbanization and modernization. As an agricultural nation, India is particularly in the pains of these cycles and subsequently the drug scene in the nation should be observed cautiously in light of the fact that this issue is more pervasive among adolescent gathering.

What are drugs and why do we need new ones?

Drugs are completely characterized as synthetic substances that are utilized to forestall or fix sicknesses in people, creatures and plants. The action of a drug is its pharmacological impact regarding the matter, for instance, its pain relieving or b-blocker activity. Drugs act by slowing down biological cycles, so no drug is totally protected. Everything drugs can go about as toxins



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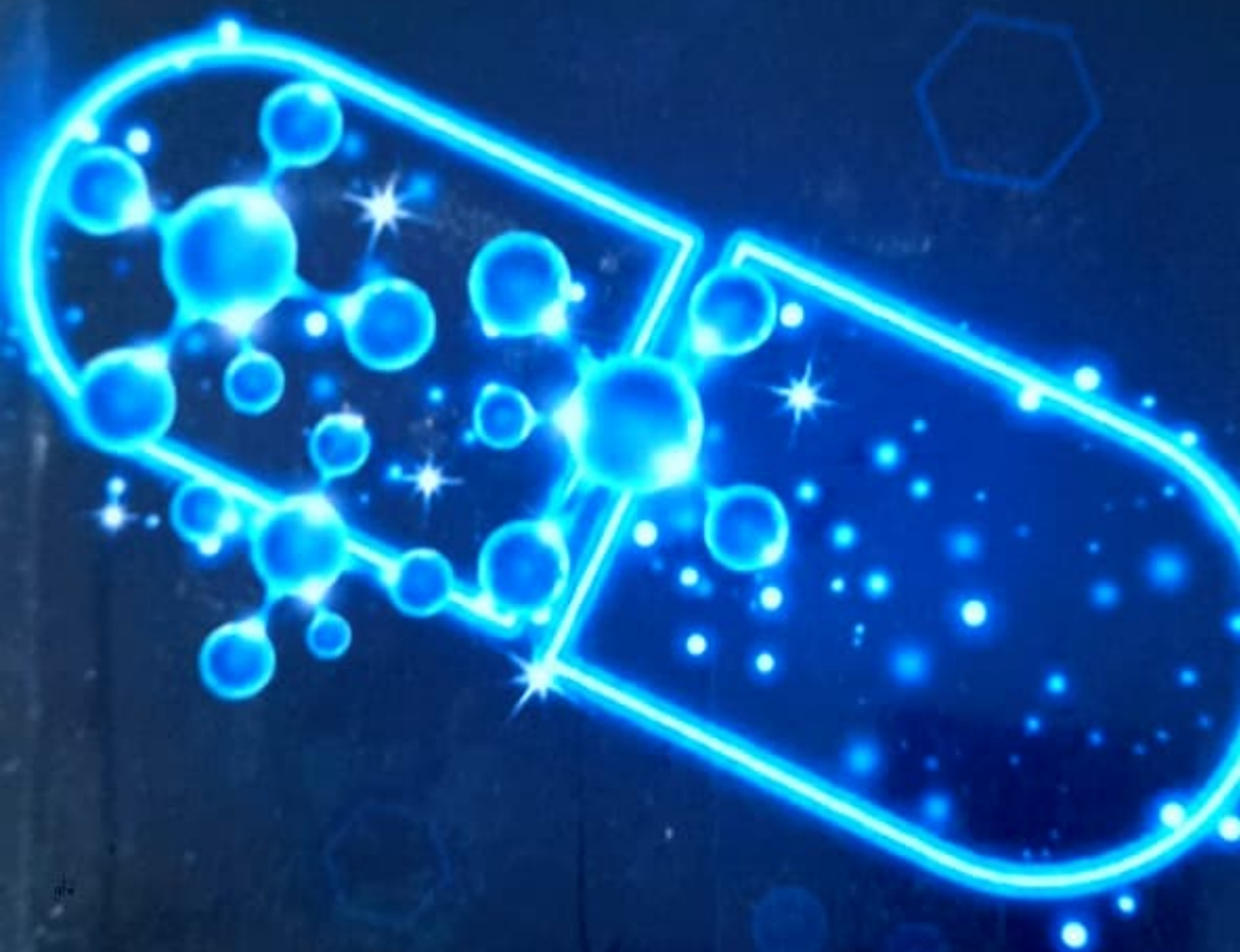
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CHAPTER I

INTRODUCTION

Drug maltreatment in India is pretty much as old as somewhere else, if not more established, all along, weed drugs have been being used. Antiquated books are loaded with references to intoxicants, for example, 'soma rasa', 'dev goods', 'madira' and so on Opium became well known during the Mughal time frame. As of not long ago, cocaine had numerous lovers, particularly in 'red-light' regions. The post-war period saw the ascent of engineered drugs-the two energizers and depressants. Hard drugs like heroin and lysergic corrosive diethylamide (LSD) are being used. As of late found drugs like phencyclidine hydrochloride (Angel Dust) may likewise be known to specific clients in metropolitan regions. In any case, it is hard to state that the predominance pace of psychoactive drugs in the nation is practically identical to that found in numerous western nations. In any case, the issue has regularly been related with the cycles of urbanization and modernization. As an agricultural nation, India is particularly in the pains of these cycles and subsequently the drug scene in the nation should be observed cautiously in light of the fact that this issue is more pervasive among adolescent gathering.

What are drugs and why do we need new ones?

Drugs are completely characterized as synthetic substances that are utilized to forestall or fix sicknesses in people, creatures and plants. The action of a drug is its pharmaco logical impact regarding the matter, for instance, its pain relieving or b-blocker activity. Drugs act by slowing down biological cycles, so no drug is totally protected. Everything drugs can go about as toxins



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Chemistry of Named Organic Reactions and Reagents



-Dr. Bhimraj Gawade
-Mr. I. G. Nannaware

Chemistry of Named Organic Reactions and Reagents

Dr. Bhimraj Gawade & Mr. I. G. Nannaware

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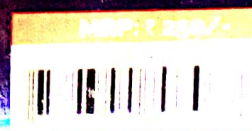


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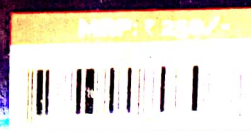


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An illustration of a woman with long dark hair, wearing a red shawl and dark pants, sitting on the ground in a forest. She is holding an open book and reading. The forest is filled with tall trees and many leaves are falling around her, creating a warm, golden atmosphere. The background is a bright, glowing light filtering through the trees.

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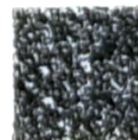
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PREFACE

This reference book aims to provide a comprehensive set of named reactions and reagents for organic chemistry, which will be suitable for scholars of chemistry. The reference book concentrates on core topics name reactions and reagents which are most likely to be common to those organic chemistry courses which follow on from a foundation or introductory general chemistry course. The knowledge of organic reactions and reagents are must for the study of fundamentals of organic chemistry as reactions are the heart of organic chemistry. Mechanism of reactions tells us how the molecules initiate reaction; permit us to find pathways of all reactants, which enable us to predict the nature of product expected. Many name reactions and reagents available in literature. We have selected some common reactions and reagents which are useful to understand the fundamentals of organic chemistry for any university undergraduate and postgraduate students. Out of them, some reactions for the synthesis of compounds have been described which have great synthetic utility in the field of pharmaceuticals. In deciding the depth of topic, we relied upon my experiences as a classroom teacher and interaction with organic chemistry scholars.

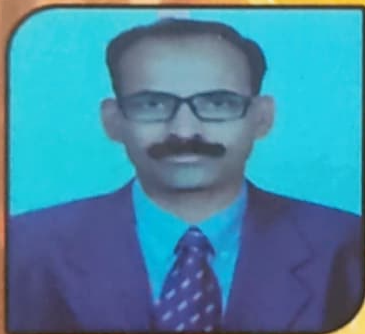
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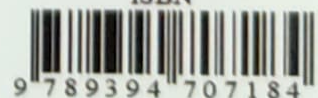
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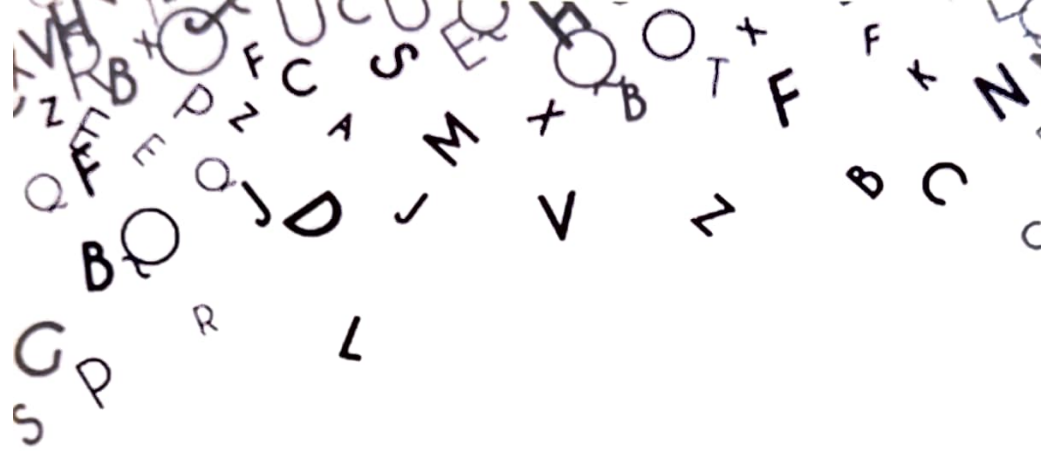


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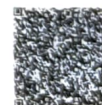
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PREFACE

The Word Grammar means different things to different people. To the ordinary citizen, it connotes to correctness or incorrectness of the language that he or she speaks. To a school student, it means an analytical and terminological study of sentences. Knowledge of grammar helps the student in the correction of mistakes and improvement of written work. A person can't learn a foreign language accurately only through a process of unconscious assimilation. Grammar is a sure ground of reference when linguistic habits fail us. So grammar is indispensable for the student. In this paper my aim is to bring the attention of the language teacher as well as the learner about the real utility of grammar in teaching English language. Hence, let's discuss some basic things about English grammar and composition.

Grammar is the study of words and the ways words work together; an invisible force that guides us as we put words together into sentences. Any person who communicates using a particular language, consciously or unconsciously becomes aware of the grammar of that language. But in this context I would like cite a wonderful example as described "A writer has given a beautiful analogy to illustrate the use of knowledge of Grammar. Imagine two car drivers. The first driver knows only driving and nothing about the working of the engine. He feels helpless whenever there is some trouble with the machinery. The second driver knows driving and also understands the working of the machinery. The person who knows grammar is like this second driver. In case he doubtful about the correctness of a particular thing, his knowledge of grammar comes to his rescue". Therefore, to speak in a clearer and more effective manner we have to study grammar. For the person who has unconscious knowledge of grammar, it may be sufficient for simple language use. But the persons who wish to communicate in the artistic manner with well-defined structures must go for the greater depth of understanding and proficiency what the study of grammar offers.

The next activity that helps significantly is reading and listening to English-speaking sources that contain mostly understandable words and/or phrases. The more learners process these input and make efforts to understand, the better and the sooner their mind will approximate the system of the English language. In other words, the principle is simple: the more one listens to and reads English input that he or she can understand, the more quickly their mind operates like the English grammar system.

Another activity that supports and expedites grammar learning is noticing English grammatical patterns. If the first strategy above draws on simple understanding of the input, this strategy draws attention to the patterns and silently commits them to the language system in the mind. This also involves parsing the sentences and analyzing the elements of sentences in order to produce output with the same patterns. In addition to the two activities above, an old adage "practice makes perfect" still works effectively. Mastery of grammar calls for a lot of intensive practice. This is where grammar books play out their roles. If done regularly, the exercises in the books will enable a learner to gain increasing mastery of the patterns.

Last but not least, the learning of grammar benefits from error corrections. Learners will come to a stage where they need to produce utterances or sentences, and it is at this stage that they should heed the corrections given by their teachers or more able friends.

In short, processing a lot of comprehensible input, noticing patterns, and attending to feedback are some strategies for mastering English grammar and composition.

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१)	नवीन शैक्षणिक धोरणाची ठळक वैशिष्ट्ये प्रोफेसर अशोक तेजनकर	१३-१८
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३)	नवे शैक्षणिक धोरण व अभिजात शिक्षण परंपरा प्रोफेसर अरुण राख	२३-२५
४)	राष्ट्रीय शैक्षणिक धोरण: स्थिती आणि गती डॉ.सुरेंद्र तांदळे	२६-३०
५)	राष्ट्रीय शैक्षणिक धोरण २०२०: ठळक बाबी डॉ.सुधाकर हांगे	३१-३४
✓६)	नवीन शैक्षणिक धोरण-एक परिक्षण डॉ.सज्जन गायकवाड	३५-४१
७)	नवीन शैक्षणिक धोरण २०२०: दृष्टीक्षेपातील तथ्ये डॉ.किशोरकुमार मनोहर इंगळे	४२-४६
८)	नवीन शैक्षणिक धोरणाची आवश्यकता डॉ.राजेंद्र साहेवराव धाये/गोधाजी सोपानराव कापसे	४७-५२
९)	नवीन शैक्षणिक धोरण: फायदे आणि तोटे डॉ.तुळशीदास विडवे	५३-५५
१०)	भारतातील नवीन शैक्षणिक धोरण २०२०: संधी आणि आव्हाने डॉ.बाळासाहेब निर्मळ	५६-६५
११)	उच्च शिक्षणाचे महत्त्व आणि गरज डॉ.अतुल पवार,डॉ.धर्मराज फड	६६-६९

नवीन शैक्षणिक धोरण - एक परिक्षण

श्री. राज्ञन गायकवाड

देशात शैक्षणिक काळासाठी शिक्षणाची कोणती नीती असावी, कोणता दृष्टीकोन असावा याबाबत सविस्तर माहिती प्रकाशित करण्याच्या क्रियेला शैक्षणिक धोरण म्हणतात. त्याला संसदेने मान्यता दिली की त्याचे कायद्यात रुपांतर होते. स्वतंत्र भारतात पहिल्यांदा १९६८ मध्ये कोळरी कमिशन (१०+२) या नावाने शैक्षणिक धोरण आले होते. यानंतर १९८६ मध्ये दुसरे शैक्षणिक धोरण अंमलात आले, तेव्हा भारताचे पंतप्रधान स्व. राजीव गांधी होते. १९९२ मध्ये याच धोरणात थोडा बदल करून दुसरी करण्यात आली. यानंतर २०२० पासून सध्या ज्याबाबत आपण बोलणार आहोत ते धोरण अंमलात येत आहे. या धोरणासाठी मा. सुब्रमन्यन यांची नियुक्ती करण्यात आली होती. सुब्रमन्यन यांनी जेव्हा अहवाल सादर केला तो सरकारला पटला नाही म्हणून पुन्हा मा. कस्तुरीरंगन यांची नेमणूक करून त्यांना अहवाल देण्यास सांगितले. २०१९ मध्ये कस्तुरीरंगन यांनी आपला अहवाल सरकारला सादर केला. २०२० मध्ये संसदेत याच्यावर कायदा संमत केला. या कायद्याने राज्यांचे अधिकार कमी केले जातील अशी भीती वाटत होती, परंतु ड्राफ्ट वाचल्या नंतर तरी तसे वाटत नाही. वरून धार्मिक रंगही यामध्ये दिसत नाही. या मध्ये अंतर्भूत असलेल्या काही महत्वाच्या स्तुत्य गोष्टी अशा आहेत.

- १) RTE- Right to Education- हा कायदा २००९ मध्ये बनला होता त्यामध्ये असे वर्णन होते कि Free and compulsory education from the age of 6 to 14, परंतु या नवीन कायद्याने याची व्याप्ती वाढवून free and compulsory education from the age of 3 to 18 असे करण्यात आले आहे, ही प्रशंसनीय बाब आहे.

- २) लहान मुलांना सध्याच जेवण व वगैरे breakfast द्याय ही प्रथा चांगली गोष्ट वात आहे.
 - ३) Droup out Rate कमी करण्याच आख्यान स्वीकारलेले दिसते. सद्याचा Droup out Rate अत्यंत भयावह आहे.
 - ४) लहान मुलांचा सार्वभौमिक विकास ८ वर्षांपर्यंतच होत असतो, म्हणून नवशे आणि प्री प्रायमरी stages मुलांच्या जीवनातील खूप महत्त्वाच्या वाटतात. या अनुषंगाने याकडे लक्ष या धोरणात दिलेले दिसते. नवशे नवीन शिक्षण धोरणात ५+३+३+८ असा फार्मूला दिसतो तो अगदी योग्यच आहे. यामध्ये मुलाला वयाच्या ३ वर्षांपर्यंतच शाळेत दाखल केले जाईल. त्यानंतर दोन वर्षे ते मूल पहिली व दुसरी इयत्ता करेल त्यालाच foundation course (५) म्हंटलेले आहे. त्यानंतरची तीन वर्षे पाचवीपर्यंत Preparatory (३), त्यानंतरची तीन वर्षे Middle Stage (३) सहावी सातवी आणि आठवी यामध्ये असले, त्यानंतरची ८ वर्षे secondary stage असले यामध्ये विद्यार्थी १२ वीत शिक्षण असले.
 - ५) शाळेत सर्व विद्यार्थ्यांना समान वागणूक.
 - ६) शाळांचे infrastructure व सुविधा वाढविण्यावर भर देण्यात येईल. त्याचबरोबर Group Facilities देण्यात येतील.
 - ७) Fair Recruitment ऑफ teachers, नो Guest teacher
 - ८) Medium ऑफ instruction Regional language असले.
 - ९) Multi diciplinary education, Liberal education या अतिशय चांगल्या गोष्टी इथे दिल्या आहेत. थोडक्यात, सध्याचे शिक्षण धोरण हे अति सुंदर आहे; परंतु व्यवहारात जेव्हा याचा वापर होईल तेव्हा याचे सत्य-असत्य निदर्शनास येईल हे मात्र तेवढेच खरे आहे.
- या नवीन धोरणाबाबत माझ्या मनात जी भीती आहे ती मी खालीलप्रमाणे मांडत आहे.

जगात प्रथम कोणी शिक्षण सुरु केले सांगता येणार नाही, परंतु युरोपमध्ये ग्रीस आणि रोमन साम्राज्यात स्त्री सत्ताक पद्धती होती. तेव्हाच आणि तिथेच शिक्षणाची सुरुवात झालेली आपणास पहावयास मिळते. शिक्षणातून सामाजिक सांस्कृतिक क्रांती होते. माणसाचे मानसिक बौद्धिक आणि भौतिक दारिद्र्य दूर करणारे ते खरे शिक्षण. शिक्षणाच्या संधीमुळे माणसाला ज्ञान, सत्ता आणि संपत्ती ही तीन बलस्थाने प्राप्त होतात. ही बलस्थाने सर्वसामान्यांना मिळू नये म्हणून पूर्वी काहीजण प्रयत्न करत होते. दुबळ्यातून आपणास स्पर्धक तयार होऊ नयेत अशी व्यवस्था प्रस्थापित करत असतात. शिक्षणामुळे माणूस शहाणा होतो, बदल स्वीकारतो, दुबळ्यांना शिक्षण मिळाले की ते अधिकार व हक्कांवर समानता सांगतील याची प्रस्थापितांना कायम भीती असते. प्रस्थापित दुबळ्या समाजाला शिक्षण देतात ते आपल्या सोयीसाठी. आगामी शिक्षण धोरण कुशल मजूर तयार करण्यावर भर देणारे तर नाही ना अशी मला भीती वाटते आहे.

अस्पष्टता, अंतर्गत विरोधाभासी स्थिती कल्पनांची वैचारिक अस्पष्टता आणि नक्कल हे आजच्या नवीन शैक्षणिक धोरणास चिन्हांकित करतात. हे शैक्षणिक धोरण मूलभूत कर्तव्याचा संदर्भ देते, परंतु मूलभूत अधिकारावर मात्र मौन बाळगते आहे. अनौपचारिक व औपचारिक शिक्षणातील फरक सुद्धा या नवीन शैक्षणिक धोरणात धुसर झालेला दिसतो. अलीकडच्या काळांत शैक्षणिक विषमता अधिकच गडद झालेली आपणास पहावयास मिळते. पहिल्यापासूनच भारतीय शिक्षणावर सामाजिक, कौटुंबिक आणि आर्थिक समस्यांचा परिणाम होत असल्याचे दिसते. भारतीय शिक्षणात ग्रामीण-शहरी, महिला-पुरुष आणि प्रादेशिक विषमता ठसठशीत दिसून येते. अगदी अलीकडच्या अहवालानुसार देशातील ७० % जनता गावात राहते, परंतु ६० % ग्रामीण महिला व ४२ % पुरुषांना लिहिता वाचता येत नाही. ही विषमता दिवसेंदिवस वाढताना दिसते आहे. या नवीन शैक्षणिक धोरणात १०० विदेशी विद्यापीठांना पायघड्या घालण्यात आल्या आहेत. या संस्थांना केवळ संस्था काढण्यास परवानगी दिली असे नाही, तर त्यांच्या हितसंबंधानुसार बदल करण्याची खुली परवानगी दिली जाईल. या संस्था स्वायत्त असतील यावरून हे शिक्षण सर्वसामान्यांच्या आवाक्याबाहेरच असेल यात

काही तिळमात्र शंका नाही. तसेच परावलंबी विद्यापीठांच्या शिक्षण संस्थांच्या आधारावर आत्मनिर्भर भारत कसा बनेल बरे?

नवीन धोरण बनवताना देशातील दारिद्र्य, साक्षरता, साधनसामुग्री यांचा विसर पडलेला दिसतो. प्रगतीपुस्तकाला स्मार्ट प्रगतीपुस्तक म्हटल्याने जास्तीचा काही फरक पडेल असे वाटत नाही. बाजारु शिक्षण संस्थांमध्ये गुणवत्ता ही मालकाच्या घरी पाणी भरते त्यामुळे मालक जे ठरवतील तेच शिक्षकांना शिकवावे लागते. या नवीन धोरणात नैतिक मूल्यांचे शिक्षण असा उल्लेख आहे. परंतु या नैतिक मूल्यांची दिशा कोणती आहे ते समजत नाही. 'सभी बच्चो में भारतीय मूल्य जैसा- सेवा, अहिंसा, स्वच्छता, सत्य, निष्काम कर्म, सहनशीलता, इमानदारी, कडी मेहनत, महिलाओं के प्रति आदर, बुजुर्गों के प्रति आदरभाव, सभी के लिये आदरभाव, पर्यावरण के लिए आदरभाव, आदी परंपरा पोषित विकसित किया जायेगा'. असे शब्द या धोरणात पहावयास मिळतात.

आगामी काळात भारतीय स्त्री चिकित्सक दृष्टी व वैज्ञानिक दृष्टीकोण गमावून बसते की काय अशी भीती वाटते आहे. अर्थात तिला गुलामगिरीच्या बंड्या टाकल्या जातील. ज्या देशातील स्त्री गुलाम त्या देशाचा समाज गुलाम, समाज गुलाम झाला की तो देश गुलाम बनतो हा इतिहास आहे. मनुस्मृतीने स्त्री, शूद्र, अतिशूद्र यांना शिक्षण नाकारून गुलामीला आमंत्रण दिले होते, हे विसरून चालणार नाही. नवीन शैक्षणिक धोरण हे खाजगीकरण, बाजारीकरण जातकेंद्री आणि धर्मकेंद्री वाटते. बहुजन समाजाकडे हे धोरण केवळ 'कुशल मजूर' म्हणून पाहते आहे असा समज धोरण वाचताना होतो. त्यापलीकडे डॉक्टर, वकील इंजिनियर, प्राध्यापक आणि संशोधक इत्यादी होण्यासाठी मोठी किंमत मोजावी लागेल. प्रशिक्षण घ्यावे लागेल हे तेवढेच खरे.

बहुजन समाजाला शिक्षणापासून वंचित ठेवून चालणार नाही हा विचार देशाला गुलामगिरीच्या खाईत लोटणारा आहे. शिक्षण नाकारून सर्वसमावेशक सर्वाना समान संधी देणारे सक्तीचे आणि मोफत शिक्षण देण्यासाठी शिक्षणाचे राष्ट्रीयकरण हाच एकमेव उपाय आहे. देशाची गरज वजा करून राष्ट्रीय शिक्षण

धोरण राबविले जाणार असेल तर देशाला आम्ही मध्ययुगीन अंधारात घेऊन जात आहोत. या नीतीमुळे शिक्षणाचे प्रचंड बाजारीकरण होऊन पैसे उभे करणारे कोर्सम महाविद्यालय व विद्यापीठ सुरू करतील; व्यवसायभिमुख च्या नावाखाली ही नवीन शिक्षण पद्धती भांडवली अर्धव्यवस्थेला सेवा देणारा 'मजूर' निर्माण करणार नाही कशावरून. शिक्षणाचा संबंध मूलभूत अधिकाररशी जोडला जायला हवा होता तो जोडलेला दिसत नाही. मग कोणत्या परंपरा आणि मूल्ये आपल्याला पुढे न्यायचे आहेत हे ही स्पष्ट जाणवत नाही. जग चौथ्या औद्योगिक क्रांतीच्या उंबरठ्यावर उभे आहे आणि आपला Gross enrolment rate सध्या २५ % आहे तो आपणास ५०% २०३५ पर्यंत करायचा आहे. लोकशाहीत शिक्षणाचे विकेंद्रीकरण महत्त्वाचे असते त्यामुळे समाजातील विविध घटकांपर्यंत व क्षेत्रांपर्यंत शिक्षण पोहोचत असते. २०४० पर्यंत उच्च शिक्षण संस्थांची संख्या खूप कमी होईल, परंतु कॉलेजमध्ये विद्यार्थी संख्या वाढेल हे या धोरणातून स्पष्ट दिसते आहे.

१८८२ मध्ये हंटर कमिशन समोर महात्मा ज्योतिबा फुले यांनी शिक्षणाचे माध्यम मातृभाषा असले पाहिजे असे ठगकावून सांगितले होते. मागच्या इतिहासात आपण पाहिले आहे शिक्षणाच्या बाजारीकरणाला व खासगीकरणाला प्रोत्साहन देण्यासाठी इंग्रजी माध्यमाच्या शाळांना महत्त्व जाणीवपूर्वक दिले गेले. त्यामुळे मातृभाषेला थोरवी देऊन शिक्षणक्षेत्र इंग्रजीमय केले व शेवटी ते हिनत्त्वला गेले. आजतरी या इंग्रजी माध्यमांच्या शाळांना कोणी लगाम घालेल असे वाटत नाही. मातृभाषेचा मुद्दाही भारतासारख्या जाती समाजात क्लिष्ट आहे त्रिभाषा सूत्राचा उल्लेख या नवीन धोरणात ठेवलेला दिसतो. भाषा म्हणजे केवळ शब्द आणि व्याकरण नव्हे किंवा भावना व विचारांचे आदान-प्रदानाचे साधन नव्हे तर ती एक जिवंत दृष्टी असते; ती एक संस्कृती आणि सुखदुःखाचे प्रकटीकरण आहे. या धोरणात प्राचीन शिक्षण पद्धती व बहुविद्याशाखीय (Liberal Education) आणि (Multi disciplinary education) एकमेकांशी जोडण्याचा प्रयत्न केला आहे. हे केवळ अशक्य आहे, देशातील उपलब्ध सर्व साधने व त्रुटी लक्षात घेतल्याशिवाय हे करता येणार

नाही. या धोरणात २०३० पर्यंत प्रत्येक जिल्ह्यांत एक मॉडेल बहुविद्याशाखीय उच्च शिक्षण संस्था असेल असे नमूद केले आहे. मग अगोदरच्या मॉडेल शिक्षण संस्थांचे काय? शिक्षण संस्था म्हणून टिकून राहयचे असेल तर प्रत्येक शिक्षण संस्थेला खालीलपैकी काहीतरी दर्जा प्राप्त करावा लागेल .

१.संशोधन करणे २.संशोधन व शिकविणे ३.शिकविणे आणि डिग्री देणारे उच्च शिक्षण संस्था या तीनपैकी एका स्तरात आपला दर्जा प्रत्येक महाविद्यालयास निश्चित करावा लागेल. नाहीतर महाविद्यालय बंद होतील. योग्य गणित, सांख्यिकीय आणि संगीत इत्यादी विषयांचे शिक्षण अनिवार्य असेल.भारतातील नालंदा तक्षशिला, वल्लभी विक्रमशिला ही आदर्श विद्यापीठे त्यांची निर्मिती कशी झाली त्याचा उहापोह न करता या विद्यापीठांचा सरळ संबंध बहुविद्याशाखीय शिक्षणाशी जोडला आहे. माझ्या मते (गुह्यत्प्रथु कद्रघच्छु इदुह कच्छ) या सुबक नावाखाली विद्यार्थ्यांची हद्दपारी कायदेशीर केली जाणार आहे. त्यामुळे कागदावर गळती कमी होऊन ५० % पर्यंत Gross Enrolment ratio पूर्ण होणार आहे. एक-दोन वर्षांचे कोर्सेस केलेले विद्यार्थी अर्धकुशल राहून वडिलांच्या व्यवसायात ढकलले जाण्याची दाट शक्यता आहे. स्वायत्त महाविद्यालयातून 'बाजार केंद्रीय' अभ्यासक्रम सुरू करण्याचे स्वातंत्र्य महाविद्यालयांना मिळणार आहे. लोकल टीचर्स, लोकल experts, लोकल volunteers इत्यादींची भरती कंत्राटी पद्धतीने केली जाण्याची दाट शक्यता आहे. यासाठी एक अमेरिकन शब्द tenure हा वापरण्यात आला आहे. यूजीसी चे अस्तित्व नष्ट होऊन त्या ठिकाणी हायर एज्युकेशन कौन्सिल ऑफ इंडिया येईल. यामध्ये १२ सदस्य असतील. त्यातील फक्त दोन सदस्य academician असतील असा उल्लेख आहे. विद्यापीठमध्ये बोर्ड ऑफ गव्हर्नेस असेल, त्यांची नियुक्ती सरकार करेल. यामध्ये विद्यार्थी, प्राध्यापक, रोटेशन नुसार येणारे इत्यादींचा समावेश आढळत नाही. लोकशाही प्रक्रियेला आव्हान निर्माण होणार आहे. नवीन धोरणानुसार Vice Chancellor जाऊन त्या ठिकाणी चीफ एक्झिक्युटिव्ह येणार असेल तर ते लोकशाहीला मारक ठरेल. शिक्षणाच्या

ख्वाजगीकरणामुळे व बाजारीकरणामुळे भांडवली कंपनीना कमी मोददल्यात श्रम विकण्या व सेवा देणारा मजूर लाभणार आहे.

अशाप्रकारे नवीन शिक्षणविषयक धोरणात अनेक गोष्टी चांगल्या आहेत त्याचबरोबर वाईटही दिसत आहेत. विशाल महासागरासारखे जरी धोरण असले तरी ते पाण्यावर लिहिण्यासारखे कुचकामाचेही आहे. याचे सारे यश-अपयश हे अंमलबजावणीवर अवलंबून राहिल.

Sajjangaikwad68@gmail.com

आनंदराव घोडे उर्फ बाबाजी महाविद्यालय,

कडा,ता.आष्टी,जि.बीड.

multiple entry and exit

An illustration of a woman with long dark hair, wearing a red shawl and dark pants, sitting on the ground in a forest. She is holding an open book and reading. The forest is filled with tall trees and many leaves are falling around her, creating a warm, golden atmosphere. The background is a bright, glowing light filtering through the trees.

CONTEMPORARY INDIAN ENGLISH NOVELISTS:

Style & Technique

-Dr. Shailaja B. Kuchekar
-Dr. Sajjan D. Gaikwad

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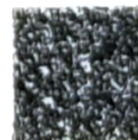
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PREFACE

This reference book aims to provide a comprehensive set of named reactions and reagents for organic chemistry, which will be suitable for scholars of chemistry. The reference book concentrates on core topics name reactions and reagents which are most likely to be common to those organic chemistry courses which follow on from a foundation or introductory general chemistry course. The knowledge of organic reactions and reagents are must for the study of fundamentals of organic chemistry as reactions are the heart of organic chemistry. Mechanism of reactions tells us how the molecules initiate reaction; permit us to find pathways of all reactants, which enable us to predict the nature of product expected. Many name reactions and reagents available in literature. We have selected some common reactions and reagents which are useful to understand the fundamentals of organic chemistry for any university undergraduate and postgraduate students. Out of them, some reactions for the synthesis of compounds have been described which have great synthetic utility in the field of pharmaceuticals. In deciding the depth of topic, we relied upon my experiences as a classroom teacher and interaction with organic chemistry scholars.

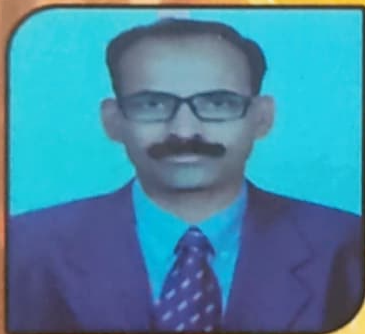
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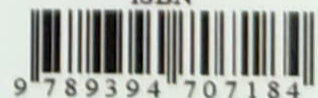
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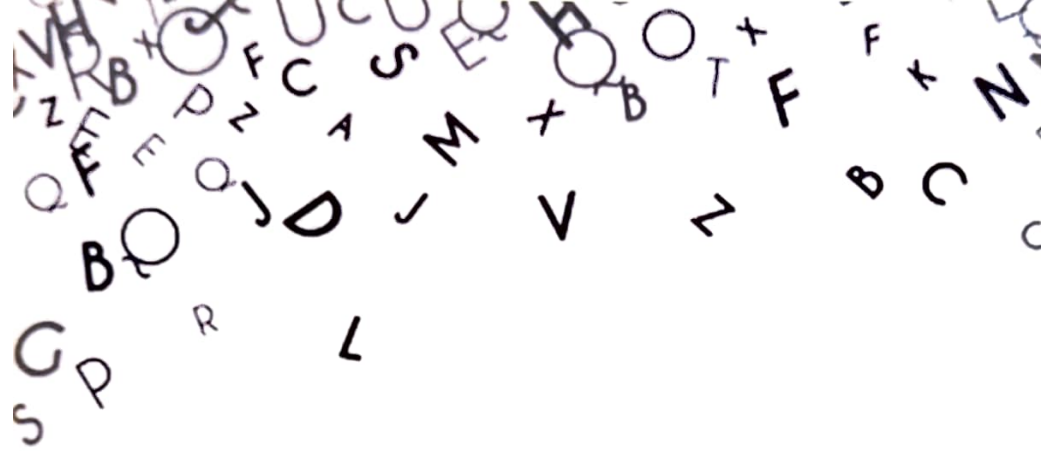


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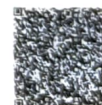
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PREFACE

The Word Grammar means different things to different people. To the ordinary citizen, it connotes to correctness or incorrectness of the language that he or she speaks. To a school student, it means an analytical and terminological study of sentences. Knowledge of grammar helps the student in the correction of mistakes and improvement of written work. A person can't learn a foreign language accurately only through a process of unconscious assimilation. Grammar is a sure ground of reference when linguistic habits fail us. So grammar is indispensable for the student. In this paper my aim is to bring the attention of the language teacher as well as the learner about the real utility of grammar in teaching English language. Hence, let's discuss some basic things about English grammar and composition.

Grammar is the study of words and the ways words work together; an invisible force that guides us as we put words together into sentences. Any person who communicates using a particular language, consciously or unconsciously becomes aware of the grammar of that language. But in this context I would like cite a wonderful example as described "A writer has given a beautiful analogy to illustrate the use of knowledge of Grammar. Imagine two car drivers. The first driver knows only driving and nothing about the working of the engine. He feels helpless whenever there is some trouble with the machinery. The second driver knows driving and also understands the working of the machinery. The person who knows grammar is like this second driver. In case he doubtful about the correctness of a particular thing, his knowledge of grammar comes to his rescue". Therefore, to speak in a clearer and more effective manner we have to study grammar. For the person who has unconscious knowledge of grammar, it may be sufficient for simple language use. But the persons who wish to communicate in the artistic manner with well-defined structures must go for the greater depth of understanding and proficiency what the study of grammar offers.

The next activity that helps significantly is reading and listening to English-speaking sources that contain mostly understandable words and/or phrases. The more learners process these input and make efforts to understand, the better and the sooner their mind will approximate the system of the English language. In other words, the principle is simple: the more one listens to and reads English input that he or she can understand, the more quickly their mind operates like the English grammar system.

Another activity that supports and expedites grammar learning is noticing English grammatical patterns. If the first strategy above draws on simple understanding of the input, this strategy draws attention to the patterns and silently commits them to the language system in the mind. This also involves parsing the sentences and analyzing the elements of sentences in order to produce output with the same patterns. In addition to the two activities above, an old adage "practice makes perfect" still works effectively. Mastery of grammar calls for a lot of intensive practice. This is where grammar books play out their roles. If done regularly, the exercises in the books will enable a learner to gain increasing mastery of the patterns.

Last but not least, the learning of grammar benefits from error corrections. Learners will come to a stage where they need to produce utterances or sentences, and it is at this stage that they should heed the corrections given by their teachers or more able friends.

In short, processing a lot of comprehensible input, noticing patterns, and attending to feedback are some strategies for mastering English grammar and composition.

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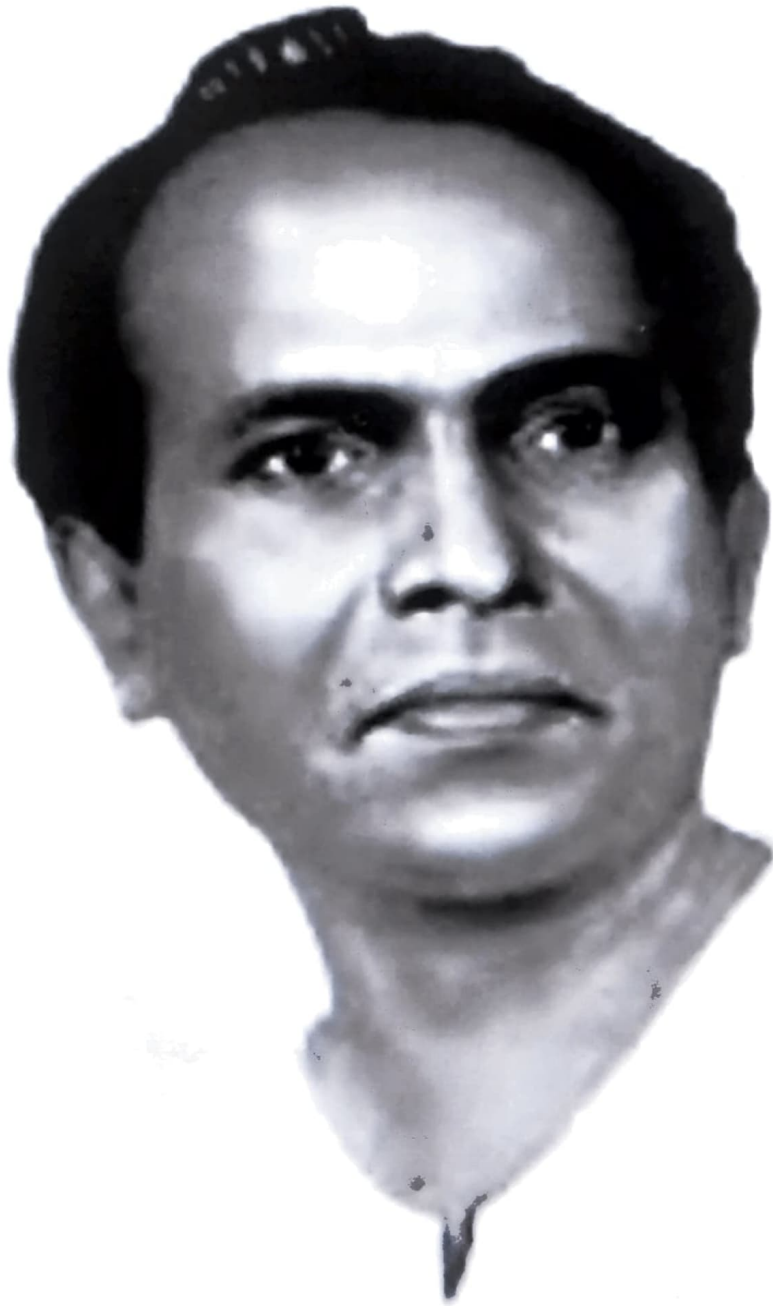
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ANNA BHAU SATHE

A Voice of Marginalized Society



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Anna Bhau Sathe: A Voice of Marginalized Society

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Chapter-4

Anna Bhau Sathe: Maker of Indian Literature

-Ms. Shailaja B. Kuchekar

Abstract

Indian literature is read all over the world. Various regional languages and regional writers have contributed to Indian literature. These writers presented their regional and social problems. Among them, Anna Bhau Sathe is one of the Indian writers who has created his own place in the world of literature. The contribution he has made to Indian society as a social reformer is greater than the contribution as a writer. He has used his skill of writing to awaken the weaker part of Indian society. He tried to lessen the lower class exploitation and sufferings through his literature. He used popular forms of literature like *Powada* and *Lawani* to make the society aware of the reality about the lower caste. He became popular as a writer and poet as well as a reformer. His way of writing for the sake of enlightenment made him different from other writers. This gave way to shape the Indian literature. He created a group of followers who read and created the similar type of literature. He was inspired by Dr. Babsaheb

Ambedkar's writing. But Dr. Babasaheb Ambedkar himself was inspired by Anna Bahu Sathe's literary works and with his struggle as a reformer. The coming generations inspired by Sathe's works as he gave a new direction to the Indian literature and created a different place in the world literature.

Key Words: Dalit, Literature and Indian Literature

Intoduction

India is the land of culture. Its culture is followed and appreciated all over the world. 'Indian Culture' has been the area of intrest of the research scholars and students. Not only culture but the Indian literature is also the thing that has been the topic for discussion. Literature in India has started around late 19th century. There are many Indian writers who have contributed great pieces of literature to the world of literature. But Bankimchandra Chatterjee's *Rajmohan's Wife* is said to be the first Indian English novel. It is evident that history of Indian literature does owe a lot to Bengali literature. As K. R. Srinivasa Iyengar states in his book *Indian Writing in English*, "It was in Bengal that the literary renaissance first manifested itself; but almost immediately afterwards, the signs of 'new life' were to be seen in Madras, Bombay and other parts of India as well."¹ Bengali writer started writing in English; others translated their Bengali works into English. Thus, the literary renaissance was begun in Bengal. But the writers throughout India were trying their hands in English. Their new ideas in writing were coming out with the literary works they created. In those days the writers from Madras, Bombay and some other parts of India were creating new and innovative literary pieces in English.

Anna Bhau Sathe: Maker of Indian Literature

Indian writers not only wrote in English but also in their mother tongue. Literature in various regional languages was created by the Indian writers. Anna Bhau Sathe is also among them. He was a social reformer, poet and novelist. He has

written novels, poems and other literary genres in Marathi. He depicted rural Indian society and the lower caste people with their problems. Being a lower caste, rustic and a downtrodden he could experience and feel the situations and present it with truth and reality. Unfortunately, he couldn't take education. He could attend only a one and half day school. Indian caste system, the mentality of not allowing lower caste people to learn and live a good life and economically low condition of his family forced him to do odd jobs. He could somehow manage to have bread for his family by working as a labour. But he had a strong feeling for education. So he learned to write and started writing novels and poems to uplift the caste and the society in which he lives. His works are the best pictures of the lower social class. He himself had witnessed the men and women bullied by the upper class people. The rustic men and women depicted in his works were brave; they were ready to fight for the undertrodden. The characters in his novels are appreciated and adored by the readers. Specially, bravery and the ability to fight for the downtrodden are shown in his works.

Anna Bhau Sathe wrote in the age when upper middle class writers like Phadake and V.S. Khandekar were writing entertaining pieces of literature. There was no place for *Dalit* literature. But Anna Bhau Sathe began to write on the workers, exploited lower class people, rustic and economically poor people. This kind of writing gave birth to the *Dalit* movement. Being a worker, he has experienced a great deal of suffering. So his works were the real picture of the pathetic condition of lower class people. Dr. B. R. Ambedkar's participation in social movements and his works have been great impact on Anna Bhau Sathe's writings and his social activities. Dr. B. R. Ambedkar also believed that Anna Bhau Sathe's one ballad is more powerful than Ambedkar's one speech. Thus, his literature was getting shaped and it was giving shape to the literature created in India.

Like Dr. B.R. Ambedkar, Anna Bhau Sathe also has the impact of Jyotirao Phule's writings and his social work. He

was using his skill of writing for the development of weaker class of the society. For that he presented the exploitation of lower social class by the upper class. This proved helpful for the enlightenment and the awakening of the exploited people. His characters and themes revolve around the reality in the society. He belonged to a lower caste. This untouchable caste was not allowed to get along freely in society. They have no right to get education and participate in the religious programmes. So the people belonging to this caste have to do the lower type of jobs like cleaning, sweeping, etc. Many times they have no works so no food to eat. In such situations they have to steal something for the urge of stomach. Sathé has presented the characters belonging to this lower caste that they are not merciless but full of self-respect. His characters are rebellious against the unnecessary social customs. They actually fight for the protection of human rights. Through his literature, Anna Bhau Sathé shows the hard-working labor class. The literature also shows the strong feeling that the hard-working and suppressed should be respected. His characters are full of self-respect and bravery. Presentation of the lower class, their exploitation by the upper class and the bravery and the self respect of the lower class men and women in Sathé's literature helped to get the new dimension to the Indian literature. Ballads and poems, being a popular literary form also contributed to give shape to the Indian literature.

His writings depict rural India, true picture of lower class society, changing image of rustic women, communal conflict, social class conflict, etc. He chooses his themes and characters as to represent the true picture of Indian society. This gave birth to social reforms. Sathé became icon to *Dalits*. He chose the folkloric narrative styles like *Powada* and *Lawani*. This kind of narrative poems easily made him popular. He became popular not for his literature but also for his way of social reform. The community was awakening. There was impact of foreign literature on Indian literature, specially, on Marathi literature. But Sathé inserted new ways and styles in writings which helped the Indian literature to take a new shape and

new style. New generations inspired and imitated his styles. Gangadhar Pantawane, Namdev Dhasal carried on this heritage of *Dalit* literature. They wrote books like *Dalitanche Prabodhan* and *Aambedkari Chalval Aani Socialist, Communist* respectively. Sathe's impact can be seen easily in the writings of these writers. The heritage is now followed by many new writers who are the followers of Sathe's literature. Laxman Mane's *Upara*, Narendra Jadhav's *Ambedkar: Awakening India's Social Conscience*, Laxman Gaikwad's *Uchalya* are the books which are related to lower class conflict and social awakening. Thus, Anna Bhau Sathe's writings have proved to be a turning point in Indian literature. It gave new shape and style to the Indian literature. Not only to the period which Sathe belongs to but also to the coming generations Sathe's writings is the inspiration in the area of literature.

Conclusion

Being an icon to *Dalits* Anna Bhau Sathe has contributed great literary pieces to the Indian literature. His writings have proved inspiration to the generations. Not only in India but his literature has been read all over the world. The translation of his works in different languages is in itself a great honour to Anna Bhau Sathe and his contribution. He was not the icon of *Dalits* for his writings only. He was a social reformer. He presented the pathetic and real situation of undertrodden. He used his writings as a tool in his social fight. He was unaware of the fact that his literary works are going to be the turning point in shaping the Indian literature. His literature stands as a literature of entertainment as well as the literature of reform.

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Innovative ideas in the learner's minds are given shape with this new education policy. They will be given quality education through using proper language. Their mental health as well as social interaction will be improved. Interaction happens with the help of language. The native language or mother tongue will make them

this new system will be ready to face the world, not only India. From preschool to secondary school. The children learned through language. It is actually a process of universalisation of education three regional languages. There is no force of a particular or foreign language as a medium of instruction. Children are free to take two or their native language. The New policy does not insist a particular process. Children understand in a proper manner if they are taught in learning process. Medium of instruction plays a vital role in the The way in which the instructions are given affects the teaching-personality development is expected through New Education Policy. Language are focused on in the new policy. Children's overall educational system is remodeled. Particularly, ancient tradition and With the reformation of New Education Policy india's overall unnecessary points in the policy design.

have included some necessary methods and removed some education policy to become 'global knowledge superpower'. They culture alive. The government of India has designed the new implemented has some points which help to keep the tradition and generation. New Education Policy formed in 2020 but yet to be necessary to hand over the ancient and rare things to the next coming generations. Young generation is the future of nation. It is being adored and should be taken care of as to keep it safe for the and customs. Its heritage has become the attraction for the world. It is India has been appreciated for its ancient culture, tradition

Dr. Kuchekar Shailaja Baburao

Role of Language in New Education Policy

Indian culture and ancient languages are the attraction for the whole world. New education policy has included ancient Indian languages in the system. Learners are free to choose ancient ent

This will again show the importance of mother tongue. Indian culture and ancient languages are the attraction for the whole world. New education policy has included ancient Indian languages in the system. Learners are free to choose ancient ent

The language plays vital role in the understanding of the innovative ideas and concepts. Some of the concepts are not easy to understand in other languages. So translation is the best way to provide the concepts in the native language. As the focus is on the language content in other languages will be translated into mother tongue or regional language. It will make the learner's understand easily. The will not be wasted on knowing the language. The proper way to teach is through mother tongue. Translation will make it easy.

Such teachers will be created for the new education system. The language plays vital role in the understanding of the innovative ideas and concepts. Some of the concepts are not easy to understand in other languages. So translation is the best way to provide the concepts in the native language. As the focus is on the language content in other languages will be translated into mother tongue or regional language. It will make the learner's understand easily. The will not be wasted on knowing the language. The proper way to teach is through mother tongue. Translation will make it easy.

languages like Sanskrit or any other language. It will fulfil the aim of saving ancient Indian traditions and languages. The learner's will choose the languages themselves and so will learn without any burden.

Today's modern world can not avoid technology. The modern technology must be included in the education system. So the artificial intelligence is included in the education. The new policy is based on access, equity, quality and accountability. Thus the mathematical thinking, scientific temper coding and vocational education is included in the system. At a particular stage these concepts will be introduced to the students. Step by step learning will enhance the quality of education and understanding of new concepts. Knowledge of technology, e-learning will make the learners technically strong and the study of ancient, regional traditions, ethical reasoning, and socio-emotional learning will make them aesthetically strong. The education will inculcate the feeling of social responsibility through the social interaction. It will develop the learner thoroughly. Quantitative and logical reasoning, digital literacy, computational thinking and scientific temper are necessary in the building of human personality. All these features are included in the new policy. But knowledge of languages and communication skills are equally important. Communication skills are developed with the knowledge of language. So languages are very important. The policy fulfils all the needs of a perfect personality as it includes the languages in the education system.

Understanding is very important so the medium of instruction is mother tongue upto particular age group. Mother tongue is a proper medium to learn new things. Basic knowledge will be perfect if learned through mother tongue. Not only the medium of instruction but also the text books are in mother tongue. With the help of mother tongue learners will understand spoken as well as written language properly. They will hardly need any help to understand the concepts. Teachers will play the role of mentor only. The students are given the option of two to three regional languages. If they have some difficulty in their mother tongue they can choose some other regional language.

So that the learner can not find any difficulty in the process of learning as the learners cross the initial stage they are able to opt for the foreign language. There is no compulsion of language. It can be learner's own choice. Thus at an initial stage help of mother tongue and at the secondary stage knowledge of foreign language by his own choice will make the process of learning easier and interesting.

The role of language has been the important part of teaching-learning process. The compulsion of language, particularly a foreign language increases unnecessary burden on the learner's mind. Three language formulas have compulsion about languages. But the revised education policy has no compulsion about language. So the learner's can learn the concepts without bueder. They also have the option of selecting the language of their own choice. They can choose two to three regional languages. Mother tongue as a medium of instruction makes the learning comfortable. Translation is ok ne of the ways to provide various concepts in native languages. Thus the government has taken care of the learner's mental, intelectual as well as social abilities. Learners can have the better experience while learning at different age groups. The new education policy will create the better generations ahead.

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Plant Breeding and Seed Technology

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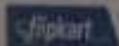
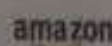
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Investigation of Physical and Dielectric Properties of Indium Substituted Yttrium Iron Garnet

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ABSTRACT

The Yttrium Iron Garnet (YIG) series having the general formula $Y_3In_xFe_{5-x}O_{12}$ ($x=0.0$, and 0.2) were synthesized by using double sintering solid state reaction method. The samples were characterized by X-ray diffraction technique (XRD). The X-ray diffraction studies of compositions revealed the formation of single phase cubic structure with lattice constant ranging from 12.37 to 12.40 Å to $x = 0.0$ and 0.2 . The dielectric properties were investigated using LCR-Q meter (hp HEWLETT) in the frequency range 100 Hz to 1MHz. The dielectric constant (ϵ'), dielectric loss (ϵ'') and dielectric loss tangent ($\tan \delta$) were measured as a function of frequency by using LCR-Q meter. The frequency dependence of dielectric measurements was carried out for both the samples.

Keywords: Garnet, YIG, X-ray diffraction, Dielectric.

1. INTRODUCTION

Ferrite is a class of magnetic material used in various applications. In this current decade, ferrite has most demand in the developments of nanotechnology and its applications. Ferrites represent an important category of materials, which are in great demands due to their numerous applications in many fields. Ferrite materials exhibits many properties. The electrical and magnetic properties of ferrites are strongly dependent on their chemical composition and their method of preparation [1, 2]. It is important to optimize the electrical and magnetic properties of ferrites, for desired applications. Due to their interesting properties scientists, researchers and engineers are still interested in designing the various types of ferrites material substituted with different cations with different valences and prepared by different techniques.

Among the various types of ferrites rare earth garnet especially yttrium iron garnet (YIG) is of great importance for scientist and technologist because of their applications in microwave communication devices such as circulators, gyrators and phase shifters because of its small ferromagnetic resonance line-width, high electrical resistivity and low dielectric loss in microwave regions in many fields [3]. Yttrium iron garnet (YIG) is microwave ferrite, which in polycrystalline form has specific characteristics. The magnetic and crystallographic properties of the magnetic iron garnet have been studied by many workers [4-7]. Substituted iron garnets have found extensive use in wide band non reciprocal microwave devices [8].

2. EXPERIMENTAL

Sample preparation is very important in the preparation of sample. Here, the samples of In^{3+} substituted $Y_3In_xFe_{5-x}O_{12}$ garnets with $x = 0.0$ and 0.2 were prepared by well-known double sintering ceramic method in which a molar ratio of analytical Y_2O_3 , Fe_2O_3 and In_2O_3 (all 99.99% pure AR grade chemicals, Mumbai) were mixed thoroughly in stoichiometric proportions and then ground to very fine powder by using agate mortar for about 3 hr. These mixtures in powder form were pre-sintered in an Indfur Programmable muffle furnace at $1200^\circ C$ for 24 h and cooled to room temperature slowly at the rate of $2^\circ C/min$. The samples were reground and re-fired at $1350^\circ C$ for 30 h and slowly cooled to room temperature at the rate of $2^\circ C/min$, and then reground for 1 h. The fine powdered sample was pelletized under the pressure 5 ton/inch².

3. RESULTS AND DISCUSSION

3.1. Structure analysis

Mixed garnet ferrites system under investigation has been structurally investigated by X-ray diffraction technique. Typical XRD pattern for $x = 0.2$ sample is shown in Fig. 1.

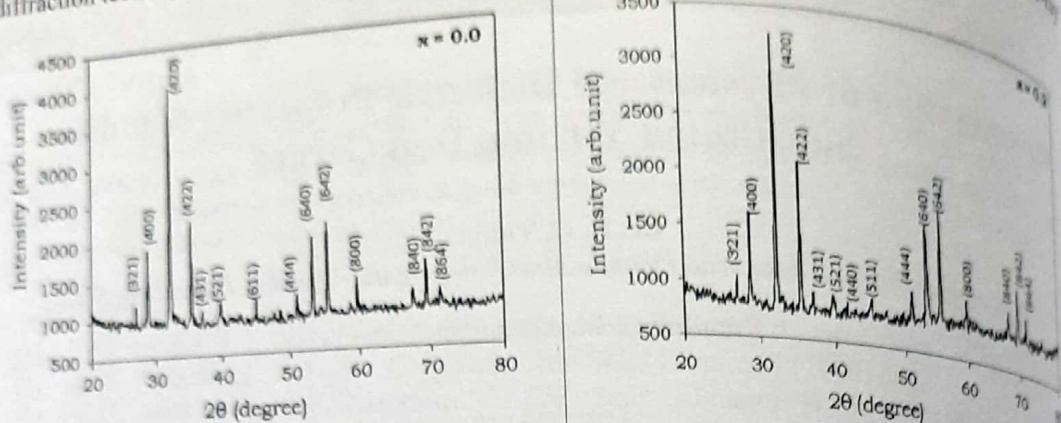


Fig. 1: XRD pattern of $Y_3In_xFe_{5-x}O_{12}$ for $x = 0.0, 0.2$ samples.

The XRD pattern shows the reflections namely (321), (400), (420), (422), (431), (521), (611), (444), (640), (642), (800) and (842). No extra peaks other than cubic structure have been observed in the XRD pattern. The Bragg peaks are sharp and intense. The lattice parameters are calculated using XRD data and are given in table-1. It is observed from table-1 that lattice constant increases with increase in indium content 'x'. The ionic radii of yttrium (0.89Å) Fe^{3+} is (0.67Å) and indium (0.81Å) hence we observe variation in the lattice parameter with indium substitution. The bulk density of all samples was measured using Archimedes principle and values are tabulated in table-1. Bulk density increases with increase in indium content 'x'. Using the values of molecular weight and volume of the sample X-ray density was calculated. The values of X-ray density are also listed in Table 1.

X-ray density increase with composition 'x'. The observed variation in X-ray density is attributed to increase in volume of the samples. The crystallographic parameters (lattice constant, X-ray density) are in good agreement with reported values [9]. The most intense peak (4 2 0) of XRD pattern was used to evaluate particle size of the samples. The particle size was calculated by using Scherer's formula, the values of particle size for all the composition is listed in Table 1.

Table 1: Lattice constant (a), X-ray density (dx), bulk density (dB), porosity (P) and particle size (t) of $Y_3In_xFe_{5-x}O_{12}$.

x	a (Å)	dx (gm/cm ³)	dB (gm/cm ³)	P (%)	t (µm)
0.0	12.370	5.179	4.13	20.25	3.42
0.2	12.401	5.224	4.19	19.97	3.25

3.2. Dielectric constant measurements

The dielectric constant measurements were carried out on disc shaped pellets as a function of frequency by using two probe method. The real ϵ' and imaginary ϵ'' parts of the dielectric constant and loss tangent $\tan\delta$ of $Y_3In_xFe_{5-x}O_{12}$ were computed according to Smith and Wijn [10, 11]. The variation of the dielectric constant ϵ' and dielectric loss ϵ'' with respect to frequency at room temperature is shown in Fig.2 (a) and (b). It can be observed from Fig. 2 (a) and (b) that dielectric constant (ϵ') and dielectric loss (ϵ'') both decreases with increase in frequency. It can also be observed that dielectric loss (ϵ'') decreases with increasing frequency much more rapidly than (ϵ'). This behaviour of dielectric constant is attributed by assuming that mechanism of polarization in ferrites is similar to that of conduction mechanism. Iwauchi [12] reported strong co-relation between the conduction mechanism and dielectric behaviour of the ferrites. Fig.2 (c) shows the variation of dielectric loss tangent with frequency at 300 K for all the values of 'x'. It is observed from Fig. 2 (c) that, the parameter $\tan \delta$ decreases exponentially with the increase of frequency. Room temperature

dielectric constant (ϵ'), dielectric loss (ϵ'') and dielectric loss tangent ($\tan\delta$) at 100Hz, 10 KHz and 1 MHz of $Y_3In_xFe_{5-x}O_{12}$ as shown in the following Table 2.

Table 2: Room temperature dielectric constant (ϵ'), dielectric loss (ϵ'') and dielectric loss tangent ($\tan\delta$) at 100 Hz, 10 KHz and 1 MHz of $Y_3In_xFe_{5-x}O_{12}$.

x	Frequency								
	100 (Hz)			10 (KHz)			1 (MHz)		
	ϵ'	ϵ''	$\tan\delta$	ϵ'	ϵ''	$\tan\delta$	ϵ'	ϵ''	$\tan\delta$
0.0	864	268	0.31	714	120	0.28	487	112	0.23
0.2	877	324	0.37	814	284	0.35	502	140	0.28

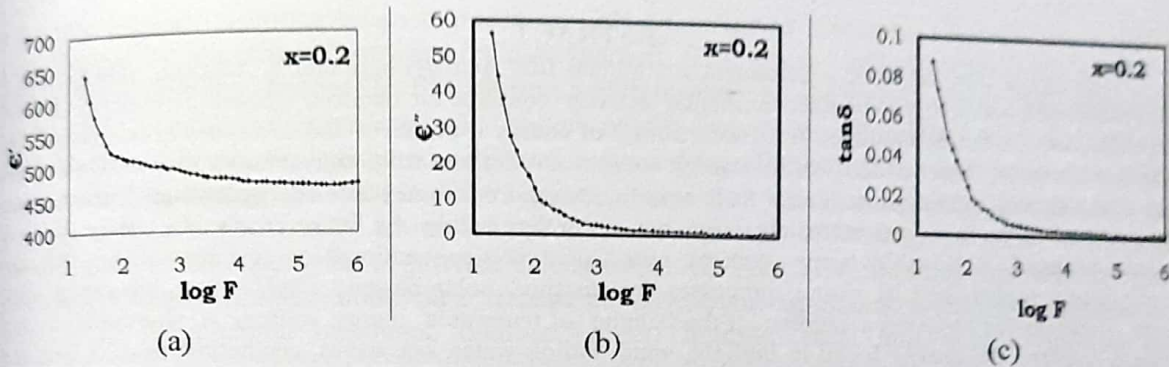


Fig. 2: Variation of (a) dielectric constant (ϵ'), (b) dielectric loss (ϵ'') and (c) dielectric loss tangent ($\tan\delta$) with logarithm of frequency ($\log f$) of $Y_3In_xFe_{5-x}O_{12}$ ($x = 0.2$).

4. CONCLUSIONS

The indium substituted yttrium iron garnet system $Y_3In_xFe_{5-x}O_{12}$ ($x = 0.0$, and 0.2) have been successfully prepared by standard ceramic technique. The lattice parameter increases slightly with In^{3+} substitution. The dielectric constant (ϵ') and dielectric loss (ϵ'') both decreases with increase in frequency. It can also be observed that dielectric loss (ϵ'') decreases with increasing frequency much more rapidly than (ϵ'). This behaviour of dielectric constant is attributed by assuming that mechanism of polarization in ferrite is similar to that of conduction mechanism. The dielectric loss tangent ($\tan \delta$) also decreases exponentially with the increase in frequency.

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Mixed garnet ferrites system under investigation has been structurally investigated by X-ray diffraction technique. Typical XRD pattern for $x = 0.2$ sample is shown in Fig. 1.

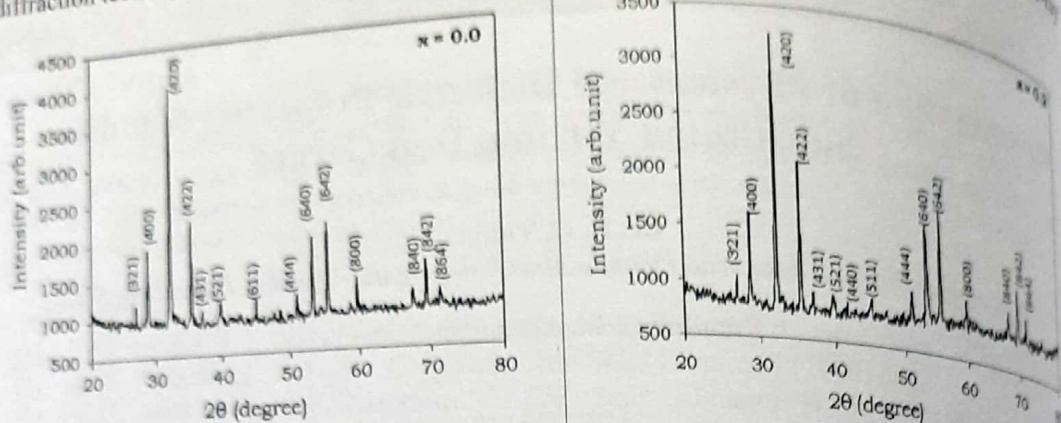


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x	a (Å)	dx (gm/cm ³)	dB (gm/cm ³)	P (%)	t (µm)
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The dielectric constant measurements were carried out on disc shaped pellets as a function of frequency by using two probe method. The real ϵ' and imaginary ϵ'' parts of the dielectric constant and loss tangent $\tan\delta$ of $Y_3In_xFe_{5-x}O_{12}$ were computed according to Smith and Wijn [10, 11]. The variation of the dielectric constant ϵ' and dielectric loss ϵ'' with respect to frequency at room temperature is shown in Fig.2 (a) and (b). It can be observed from Fig. 2 (a) and (b) that dielectric constant (ϵ') and dielectric loss (ϵ'') both decreases with increase in frequency. It can also be observed that dielectric loss (ϵ'') decreases with increasing frequency much more rapidly than (ϵ'). This behaviour of dielectric constant is attributed by assuming that mechanism of polarization in ferrites is similar to that of conduction mechanism. Iwauchi [12] reported strong co-relation between the conduction mechanism and dielectric behaviour of the ferrites. Fig.2 (c) shows the variation of dielectric loss tangent with frequency at 300 K for all the values of 'x'. It is observed from Fig. 2 (c) that, the parameter $\tan \delta$ decreases exponentially with the increase of frequency. Room temperature

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Table 2: Room temperature dielectric constant (ϵ'), dielectric loss (ϵ'') and dielectric loss tangent ($\tan\delta$) at 100 Hz, 10 KHz and 1 MHz of $Y_3In_xFe_{5-x}O_{12}$.

x	Frequency								
	100 (Hz)			10 (KHz)			1 (MHz)		
	ϵ'	ϵ''	$\tan\delta$	ϵ'	ϵ''	$\tan\delta$	ϵ'	ϵ''	$\tan\delta$
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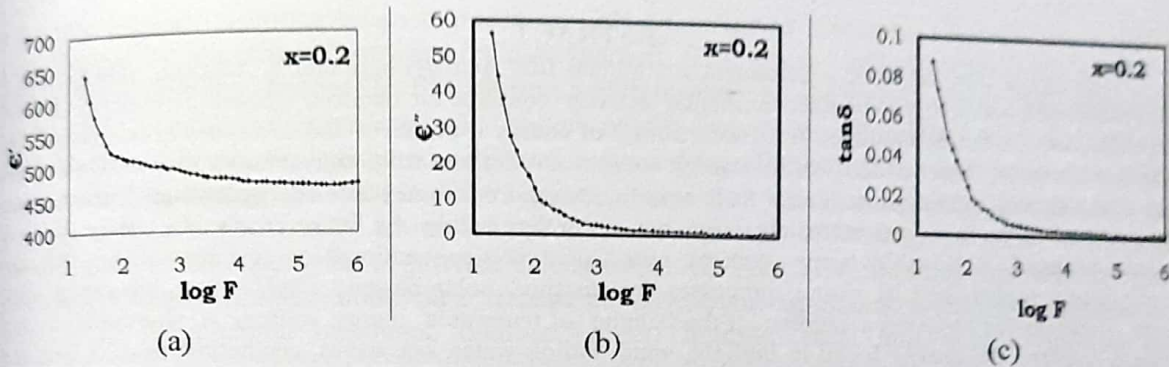


Fig. 2: Variation of (a) dielectric constant (ϵ'), (b) dielectric loss (ϵ'') and (c) dielectric loss tangent ($\tan\delta$) with logarithm of frequency ($\log f$) of $Y_3In_xFe_{5-x}O_{12}$ ($x = 0.2$).

4. CONCLUSIONS

The indium substituted yttrium iron garnet system $Y_3In_xFe_{5-x}O_{12}$ ($x = 0.0$, and 0.2) have been successfully prepared by standard ceramic technique. The lattice parameter increases slightly with In^{3+} substitution. The dielectric constant (ϵ') and dielectric loss (ϵ'') both decreases with increase in frequency. It can also be observed that dielectric loss (ϵ'') decreases with increasing frequency much more rapidly than (ϵ'). This behaviour of dielectric constant is attributed by assuming that mechanism of polarization in ferrite is similar to that of conduction mechanism. The dielectric loss tangent ($\tan \delta$) also decreases exponentially with the increase in frequency.

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ENVIRONMENTAL BIOLOGY

(ECOLOGY)

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Dr. Ravindra S. Ganjure

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A MANUAL OF - FISH PATHOLOGY



Dr. Sambhaji Ovhal,
Dr. Sandeep Anarse

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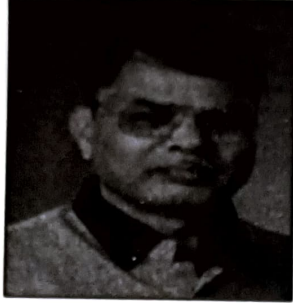
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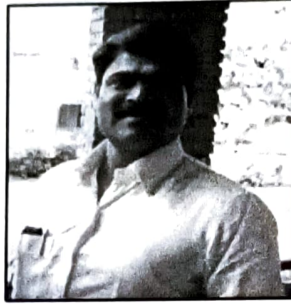
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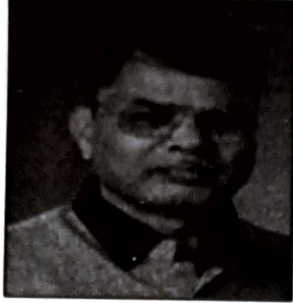
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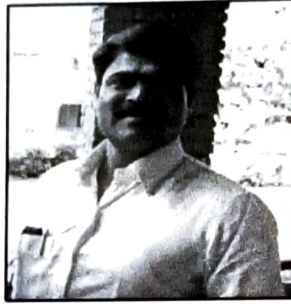
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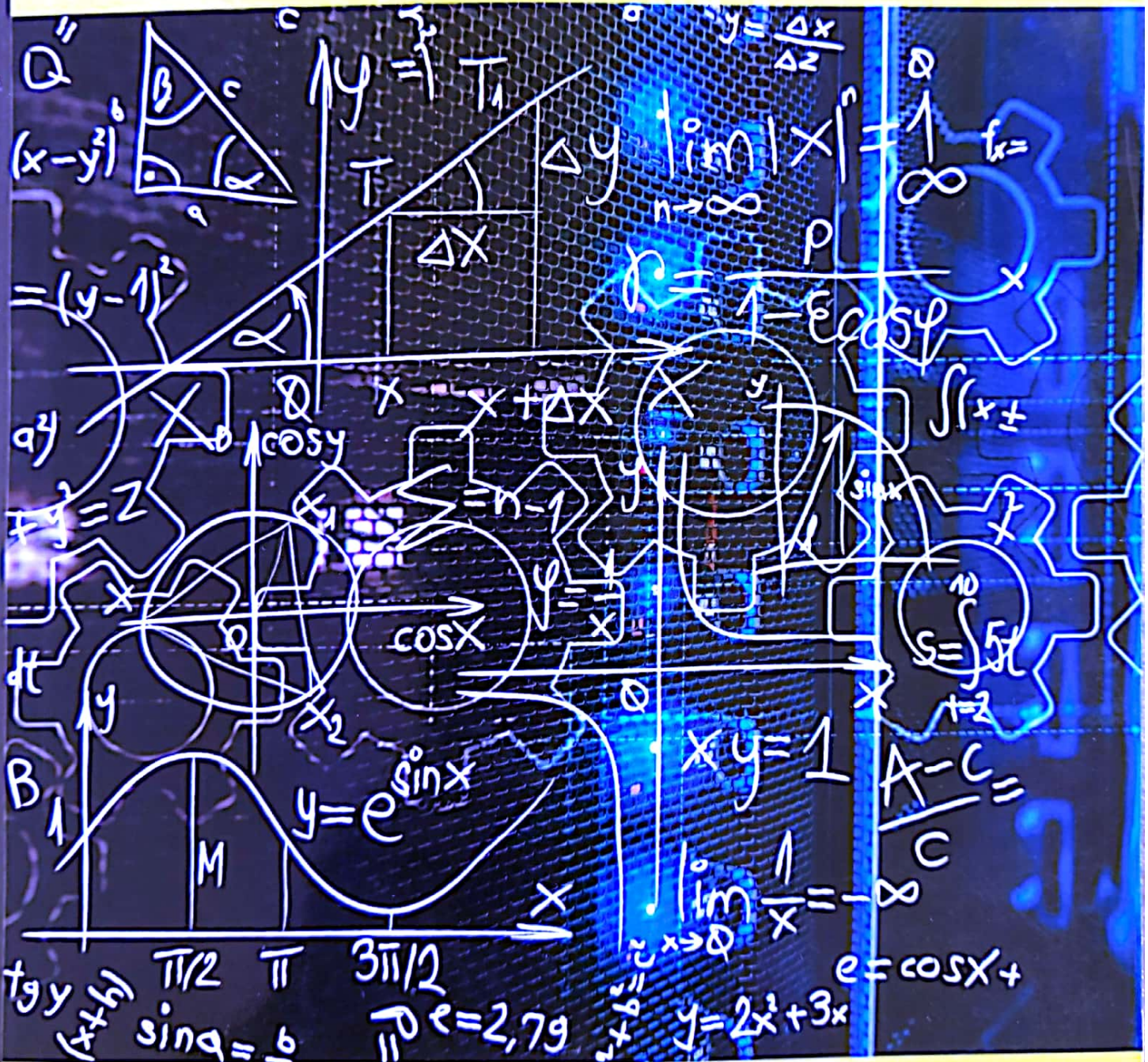


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INTEGRAL TRANSFORM AND ITS APPLICATIONS



Dr. D. S. Bodkhe,
Dr. G. S. Jagtap

Integral Transform and Its Applications

- Dr. D. S. Bodkhe

- Dr. G. S. Jagtap

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Preface....

We present a novel complicated integral transform, the complex SEE transform, in this book. The features of this transform are studied. This complex integral transform is also used to simplify the core issue to a simple algebraic equation. The solution to this basic issue may then be determined by solving this algebraic equation and applying the inverse of this complex integral transform. Finally, the complex integral transform is employed to solve higher order ordinary differential equations. Also, we present several key engineering and physics applications. This chapter of the course teaches two incredibly effective ways to solve differential equations: the Fourier and the Laplace transforms. Beside its practical application, the Fourier transform is also of vital significance in quantum physics, establishing the relationship between the position and momentum representations of the Heisenberg commutation relations. An integral transform is valuable if it helps one to convert a difficult issue into a simpler one. The transforms we will be learning in this portion of the course are largely used to solve differential and, to a lesser degree, integral equations. The theory of Fourier series and integrals has always had considerable challenges and requires a huge mathematical apparatus in dealing with concerns of convergence. It encouraged the creation of techniques of summation, albeit they did not lead to a wholly adequate solution of the issue. ... For the Fourier transform, the inclusion of distributions (thus, the space S) is inevitable either in an explicit or hidden form. ... As a consequence one may acquire everything that is wanted from the point of view of the continuity and inversion of the Fourier transform.

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Integral Transform and Its Applications

- Dr. D. S. Bodkhe

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Globalization and Higher Education: Changing Trends in Cross Border Education

Dr.B.M.Dhonde, Dr.B.G.Kale

Abstract: Globalization is a market-driven process and it stems from a belief that markets play more important role than the State in development. Knowledge-based production has become the distinguishing characteristic of globalized economies. The intellectual capital produced by universities and research institutions has become a crucial factor of production in a globalized knowledge economy. Theological developments, especially in information technology transformed the way the world economy is organized and the way higher education is provided. This paper analyzes the effects of globalization on higher education on the one hand and trends in globalization of higher education on the other. It categorizes the globalization of higher education into three distinct, but related, phases. The first phase experienced a surge in cross-border student flow, the second phase saw the development of education hubs and branch campuses, and the third and the most recent phase witnessed program mobility and is revolutionized by the mystification of online courses such as Massive Open Online Courses.

(Keywords: branch campuses, cross-border mobility, education hubs, globalization, internationalization, knowledge economy, Massive Open Online Courses, MOOC)

Introduction:

Globalization implies free flow of goods and services across borders resulting in an integrated world economy. It is a market-driven process and stems from a belief in markets, as opposed to the state, to promote economic growth and social welfare. Events such as the disintegration of the centralized system of the Soviet Union, spread of democracy among increasingly more countries, liberalization policies following the structural adjustment regime in developing countries, and foundation of the World Trade Organization (WTO) and General Agreement in Trade in Services (GATS) have all contributed to the shaping of a globalized economy. In the early 1990s, globalization was perceived to bring “unprecedented prosperity to all” The end of the same

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डॉ. आरगडे अंबादास

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FOREWORD

It gives me an immense pleasure to introduce this book consisting of multiple choice questions based on undergraduate (B.Sc.) Physics curriculum by the Editor Dr. C. M. Kale of Indraraj Arts, Commerce and Science College, Sillod. Dr. C. M. Kale and his co-authors have been teaching this subject for over twenty years and achieved thorough depth in the subject.

This book covers the current syllabus prescribed for the B.Sc. Ist, IInd and IIIrd year students and deals with the multiple choice questions generated on various topics of Physics with optimum level. M.C.Qs are also set on application of laws, principles and concepts of Physics.

I am sure, the book will prove a boon to students of B.Sc. as well as those students who are appearing for SET, NET, PET and other competitive examinations and help them to acquire sound knowledge of the Physics

In today's pandemic situation all universities are going for online MCQ type examinations as well. For them this book will be very useful to teachers.

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46.

SOLAR PHOTOVOLTAIC SYSTEM

MULTIPLE CHOICE QUESTIONS

- 1]. The electrons in the outermost shell of the atom are called as, ---
(a) **Valance Electron** (b) Conduction Electron
(c) Free electron (d) None of the above
- 2]. At absolute zero temperature, a semiconductor is a perfect, ---
(a) Conductor (b) **Insulator**
(c) Semiconductor (d) Dielectric
- 3]. Such a P-N junction forms a very useful device and is called
(a) Transistor (b) Transformer
(c) Resistor (d) **semiconductor diode**
- 4]. Whenever a semiconductor material is illuminated by a photon may be absorbed and propagated through the material depending upon the photon energy --- of the semiconductor.
(a) **Bandgap energy** (b) Binding Energy
(c) Kinetic energy (d) Potential Energy
- 5]. When $E = hv > E_g$, the incident photons get --- in the semiconductor.
(a) Transmitted (b) Reflected
(c) **Absorbed** (d) Scattered
- 6]. In the solar cell the typical value of fill factor is in the range of, ---
(a) **0.5-0.083** (b) 0.5-0.085
(c) 0.5-0.081 (d) 0.5-0.082

- 7]. We know that holes and electrons are mobile charges, and therefore are known as, - - -
 (a) Free charge carriers (b) bound charge carriers
 (c) **Mobile charge carriers** (d) opposite charge carriers
- 8]. The potential barrier formed in a P-N junction exerts a - - - force on mobile charge carriers.
 (a) **Repelling force** (b) Attractive force
 (c) Both forces (d) None of these
- 9]. The emf of lead acid cell depends on concentration of, - - -
 (a) Acetic acid (b) **Sulphuric acid**
 (c) Both acid (d) None of these
- 10]. During discharging the lead-acid cell the lead at the negative electrode is converted to - - - and takes place of lead paste in the plate.
 (a) Lead phosphate (b) Lead solution
 (c) **Leadsulphate** (d) None of the above
- 11]. In Bell laboratories produced the first solar cell in, - - -
 (a) **1954** (b) 1854
 (c) 1945 (d) 1845
- 12]. How many junctions does a diode consist of?
 (a) 0 (b) **1**
 (c) 2 (d) 3
- 13]. If the positive terminal of the battery is connected to the anode of the diode, then it is known as, - - -
 (a) **Forward-bias** (b) Reverse-biased
 (c) Equilibrium (d) Schottky barrier
- 14]. During reverse bias a small current develops known as, - - -
 (a) Forward current (b) Reverse current
 (c) Active current (d) **Reverse saturation current**
- 15]. If the voltage of the potential barrier is V_0 . A voltage V is applied to the input, at what moments will the barrier disappears?
 (a) $V < V_0$ (b) $V = V_0$
 (c) $V > V_0$ (d) $V \ll V_0$

- 16]. In a PN junction with no external voltage, the electric field between acceptor and donor ions is called a, - - -
 (a) Peak (b) **Barrier**
 (c) Threshold (d) Path
- 17]. In a PN junction the potential barrier is due to the charges on either side of the junction, these charges are, - - -
 (a) Majority carriers (b) Minority carriers
 (c) Both 'a' and 'b'
 (d) **Fixed donor and acceptor ions**
- 18]. The efficiency of the solar cell is about, - - -
 (a) 25 % (b) **15 %**
 (c) 40 % (d) 60 %
- 19]. The output power from solar cell is the product of, - - -
 (a) Current and charge
 (b) Current and resistance
 (c) **Current and Voltage**
 (d) Voltage and charge
- 20]. The output of the solar cell is of the order, - - -
 (a) 0.5 W (b) **1.0 W**
 (c) 5.0 W (d) 10.25 W
- 21]. In a fuel cell cathode is of, - - -
 (a) Oxygen (b) Ammonia
 (c) **Hydrogen** (d) Carbon monoxide
- 22]. What is the maximum possible output of a solar array?
 (a) 300 W/m^2 (b) 100 W/m^2
 (c) **250 W/m^2** (d) 500 W/m^2
- 23]. The current density of a photo voltaic cell ranges from, - - -
 (a) 10 - 20 mA/cm^2 (b) **40 - 50 mA/cm^2**
 (c) 20 - 40 mA/cm^2 (d) 60 - 100 mA/cm^2
- 24]. The term photo voltaic comes from, - - -
 (a) Spanish (b) **Greek**
 (c) German (d) English

25]. The volt is the units of emf that was named after its inventor, ---

- (a) **Alessandro Volta**
- (b) Alxender Volta
- (c) Alexa Volta
- (d) Alexandro Volta

26]. The capacitance of a reverse biased PN junction, ---

- (a) Increases as reverse bias is increased
- (b) Decreases as reverse bias is increased
- (c) **Increases as reverse bias is decreased**
- (d) Is insignificantly low

27]. For a PN junction diode, the current in reverse bias may be, ---

- (a) Few miliamperes
- (b) Between 0.2 A and 15 A
- (c) Few amperes
- (d) **Few micro or nano amperes**

28]. A module in a solar panel refers to, ---

- (a) Series arrangement of solar cells.
- (b) Parallel arrangement of solar cells.
- (c) **Series and parallel arrangement of solar cells.**
- (d) None of the above.

29]. The term photo voltaic is in use since, ---

- (a) 1840
- (b) 1844
- (c) **1849**
- (d) 1850

30]. When the source of light is not sun light then the photo voltaic cell is used as, ---

- (a) Photo diode
- (b) Photovoltaic cell
- (c) **Photo detector**
- (d) Photo transmitter

31]. The region where the electrons and holes diffused across the junction is called, ---

- (a) Depletion Junction
- (b) **Depletion region**
- (c) Depletion space
- (d) Depletion boundary

32]. The current produce by the solar cell can be given by, ---

- (a) $I_L - I_D + I_{Sh}$
- (b) $I_L + I_D - I_{Sh}$
- (c) $I_L + I_D + I_{Sh}$
- (d) **$I_L - I_D - I_{Sh}$**

33]. The amount of photo generated current increases slightly with an increase in, ---

- (a) **Temperature**
- (b) Photons
- (c) Diode current
- (d) Shunt current

34]. A typical output of a solar cell is, ---

- (a) 0.1 V
- (b) **0.26 V**
- (c) 1.1 V
- (d) 2 V

35]. Which of the following material is used in solar cells?

- (a) Barium
- (b) **Silicon**
- (c) Silver
- (d) Selenium

36]. The efficiency of a solar cell may be in the range, ---

- (a) 2 to 5%
- (b) **10 to 15%**
- (c) 30 to 40%
- (d) 70 to 80%

37]. Satellite power requirement is provided through, ---

- (a) **Solar cells**
- (b) Dry cells
- (c) Nickel Cadmium cells
- (d) Lead acid batteries

38]. Batteries are charged by, ---

- (a) Rectifiers
- (b) Engine generator sets
- (c) Motor generator sets
- (d) **Any of the above**

39]. Battery container is acid resistance therefore it is made up of, ---

- (a) Glass
- (b) Plastic
- (c) Wood
- (d) **All of the above**

40]. The following will happen if the battery charging rate is too high.

- (a) Excessive gassing
- (b) Temperature rise will occur
- (c) Bulging and buckling of plates we occur
- (d) **All of the above**

41]. The following indicate that battery on charge has attained full charge, ---

- (a) Colour of electrode
- (b) Gassing
- (c) Specific gravity
- (d) **All of the above**

42]. To prevent local action in battery only --- is used in electrolytes.

- (a) Pump water
- (b) **D stilled water**
- (c) Tap water
- (d) Both 'a' and 'c'

- 43]. Ampere hour capacity of an industrial battery is based on - - - hours discharge rate.
 (a) **8** (b) 12
 (c) 16 (d) 24
- 44]. When two batteries are connected in parallel, it should be ensured that - - -
 (a) **They have same emf** (b) They have same make
 (c) They have the same ampere-hour capacity
 (d) They have identical internal resistance
- 45]. In a lead acid battery, separators are provided to, - - -
 (a) Reduce internal resistance
 (b) Facilitate flow of current
 (c) Reduce tendency for polarization
 (d) **Avoid internal short circuits**
- 46]. The electrode for a battery must be, - - -
 (a) A semi-conductor (b) An insulator
 (c) **A good conductor of electricity**
 (d) A bad conductor of electricity
- 47]. Cells are connected in series in order to, - - -
 (a) **Increase the voltage rating**
 (b) Increase the current rating
 (c) Increase the life of the cells
 (d) None of the above
- 48]. Five 2V cells are connected in parallel. The output voltage is, - - -
 (a) 1 V (b) 1.5 V
 (c) 1.75 V (d) **2 V**
- 49]. The open-circuit voltage of any storage cell depends wholly upon, -
 (a) Its chemical constituents
 (b) On the strength of its electrolyte
 (c) Its temperature (d) **All of the above**
- 50]. The current in a chemical cell is a movement of, - - -
 (a) Positive ions only (b) **Positive and negative ions**
 (c) Negative ions only (d) Positive hole charges

- 51]. Each pentavalent atom donates one free electron and therefore are known as - - -
 (a) **Donor** (b) Acceptor
 (c) Combination (d) P-type semiconductor
- 52]. Internal resistance of a cell is due to, - - -
 (a) Resistance of electrolyte
 (b) Electrode resistance
 (c) Surface contact resistance between electrode and electrolyte
 (d) **All of the above**
- 53]. The output voltage of a charger is, - - -
 (a) Less than the battery voltage
 (b) **Higher than the battery voltage**
 (c) The same as the battery voltage
 (d) None of the above
- 54]. It is noticed that during charging, - - -
 (a) There is a rise in voltage
 (b) Energy is absorbed by the cell
 (c) Specific gravity of H_2SO_4 is increased
 (d) **All of the above**
- 55]. A typical output of a solar cell is, - - -
 (a) 0.1 V (b) **0.26 V**
 (c) 1.1 V (d) 2 V
- 56]. Which of the following material is used in solar cells?
 (a) Barium (b) **Silicon**
 (c) Silver (d) Selenium
- 57]. In a lead acid cell, hydrogen is liberated at, - - -
 (a) Positive plate
 (b) **Negative plate**
 (c) Both positive and negative plates
 (d) None of the above
- 58]. Satellite power requirement is provided through, - - -
 (a) **Solar cells** (b) Dry cells
 (c) Nickel Cadmium cells (d) Lead acid batteries

- 59]. During the charging of a lead acid cell, ---
 (a) **Its voltage increases** (b) It gives out energy
 (c) Its cathode becomes dark chocolate brown in Colour
 (d) Specific gravity of H_2SO_4 decreases
- 60]. Active materials of a lead acid cell are, ---
 (a) Spongy lead (b) Lead peroxide
 (c) Dilute H_2SO_4 (d) **All of the above**
- 61]. During charging the specific gravity of the electrolyte of a lead acid battery, ---
 (a) **Increases** (b) Decreases
 (c) Remains the same (d) Becomes zero
- 62]. The capacity of a lead acid cell does not depend on its, ---
 (a) Temperature (b) **Rate of charge**
 (c) Rate of discharge (d) Quantity of active material
- 63]. In a lead-acid cell dilute sulphuric acid approximately comprises the following, ---
 (a) One part H_2O , three parts H_2SO_4
 (b) Two-part H_2O , two parts H_2SO_4
 (c) **Three parts H_2O , One part of H_2SO_4**
 (d) All H_2SO_4
- 64]. The watt-hour efficiency of a lead acid cell varies between, ---
 (a) 25 to 35% (b) 40 to 60%
 (c) **70 to 80%** (d) 90 to 95%
- 65]. The capacity of a lead acid cell depends on, ---
 (a) Amperes (b) **Ampere-hours**
 (c) Watts (d) Watt-hours
- 66]. The capacity of a lead acid cell depends on, ---
 (a) Rate of discharge (b) Temperature
 (c) Density of electrolyte (d) **All of the above**
- 67]. Level of electrolyte in a cell should be --- the level of plates
 (a) Below (b) Equal to
 (c) **Above** (d) None of the above

- 68]. In a lead acid cell, lead is called as, ---
 (a) Positive active material
 (b) **Negative active material**
 (c) Passive material
 (d) None of the above
- 69]. Electrolyte used in a lead acid cell is, ---
 (a) NaOH (b) **H_2SO_4**
 (c) HCL (d) HNO_3
- 70]. The lead acid cell never be discharged beyond, ---
 (a) **1.8 V** (b) 1.9 V
 (c) 2 V (d) 2.1 V
- 71]. If a lead-acid cell is discharge below 1.8 V, the following will happen, ---
 (a) Capacity of cell will reduce
 (b) Sulphation of plates will occur
 (c) Internal resistance will increase
 (d) **All of the above**
- 72]. In a lead acid battery the energy is stored in the form of, ---
 (a) Charged ions (b) **Chemical energy**
 (c) Electrostatic energy (d) Electromagnetic energy
- 73]. The forbidden band exists in, ---
 (a) Semiconductor (b) Insulator
 (c) Conductor (d) **Both a and b**
- 74]. No forbidden band exists between the valence band and the conduction band in a, ---
 (a) **Conductor** (b) Insulator
 (c) Semiconductor (d) None of these
- 75]. The current flow through electrolyte is due to the movement of, ---
 (a) **Ions** (b) Holes
 (c) Electrons (d) None of the above



OBJECTIVE PHYSICS

For B.Sc. Students

Editor : Dr. C. M. Kale

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Dr. C. M. Kale

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I am sure, the book will prove a boon to students of B.Sc. as well as those students who are appearing for SET, NET, PET and other competitive examinations and help them to acquire sound knowledge of the Physics.

In today's pandemic situation all universities are going for online MCQ type examinations as well. For them this book will be very useful to teachers.

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46.

SOLAR PHOTOVOLTAIC SYSTEM

MULTIPLE CHOICE QUESTIONS

- 1]. The electrons in the outermost shell of the atom are called as, - - -
(a) **Valance Electron** (b) Conduction Electron
(c) Free electron (d) None of the above
- 2]. At absolute zero temperature, a semiconductor is a perfect, - - -
(a) Conductor (b) **Insulator**
(c) Semiconductor (d) Dielectric
- 3]. Such a P-N junction forms a very useful device and is called
(a) Transistor (b) Transformer
(c) Resistor (d) **semiconductor diode**
- 4]. Whenever a semiconductor material is illuminated by a photon may be absorbed and propagated through the material depending upon the photon energy - - - of the semiconductor.
(a) **Bandgap energy** (b) Binding Energy
(c) Kinetic energy (d) Potential Energy
- 5]. When $E = h\nu > E_g$, the incident photons get - - - in the semiconductor.
(a) Transmitted (b) Reflected
(c) **Absorbed** (d) Scattered
- 6]. In the solar cell the typical value of fill factor is in the range of, - - -
(a) **0.5-0.083** (b) 0.5-0.085
(c) 0.5-0.081 (d) 0.5-0.082

- 7]. We know that holes and electrons are mobile charges, and therefore are known as, - - -
 (a) Free charge carriers (b) bound charge carriers
 (c) **Mobile charge carriers** (d) opposite charge carriers
- 8]. The potential barrier formed in a P-N junction exerts a - - - force on mobile charge carriers.
 (a) **Repelling force** (b) Attractive force
 (c) Both forces (d) None of these
- 9]. The emf of lead acid cell depends on concentration of, - - -
 (a) Acetic acid (b) **Sulphuric acid**
 (c) Both acid (d) None of these
- 10]. During discharging the lead-acid cell the lead at the negative electrode is converted to - - - and takes place of lead paste in the plate.
 (a) Lead phosphate (b) Lead solution
 (c) **Leadsulphate** (d) None of the above
- 11]. In Bell laboratories produced the first solar cell in, - - -
 (a) **1954** (b) 1854
 (c) 1945 (d) 1845
- 12]. How many junctions does a diode consist of?
 (a) 0 (b) **1**
 (c) 2 (d) 3
- 13]. If the positive terminal of the battery is connected to the anode of the diode, then it is known as, - - -
 (a) **Forward-bias** (b) Reverse-biased
 (c) Equilibrium (d) Schottky barrier
- 14]. During reverse bias a small current develops known as, - - -
 (a) Forward current (b) Reverse current
 (c) Active current (d) **Reverse saturation current**
- 15]. If the voltage of the potential barrier is V_0 . A voltage V is applied to the input, at what moments will the barrier disappears?
 (a) $V < V_0$ (b) $V = V_0$
 (c) $V > V_0$ (d) $V \ll V_0$

- 16]. In a PN junction with no external voltage, the electric field between acceptor and donor ions is called a, - - -
 (a) Peak (b) **Barrier**
 (c) Threshold (d) Path
- 17]. In a PN junction the potential barrier is due to the charges on either side of the junction, these charges are, - - -
 (a) Majority carriers (b) Minority carriers
 (c) Both 'a' and 'b'
 (d) **Fixed donor and acceptor ions**
- 18]. The efficiency of the solar cell is about, - - -
 (a) 25 % (b) **15 %**
 (c) 40 % (d) 60 %
- 19]. The output power from solar cell is the product of, - - -
 (a) Current and charge
 (b) Current and resistance
 (c) **Current and Voltage**
 (d) Voltage and charge
- 20]. The output of the solar cell is of the order, - - -
 (a) 0.5 W (b) **1.0 W**
 (c) 5.0 W (d) 10.25 W
- 21]. In a fuel cell cathode is of, - - -
 (a) Oxygen (b) Ammonia
 (c) **Hydrogen** (d) Carbon monoxide
- 22]. What is the maximum possible output of a solar array?
 (a) 300 W/m^2 (b) 100 W/m^2
 (c) **250 W/m^2** (d) 500 W/m^2
- 23]. The current density of a photo voltaic cell ranges from, - - -
 (a) 10 - 20 mA/cm^2 (b) **40 - 50 mA/cm^2**
 (c) 20 - 40 mA/cm^2 (d) 60 - 100 mA/cm^2
- 24]. The term photo voltaic comes from, - - -
 (a) Spanish (b) **Greek**
 (c) German (d) English

25]. The volt is the units of emf that was named after its inventor, ---

- (a) **Alessandro Volta**
- (b) Alxender Volta
- (c) Alexa Volta
- (d) Alexandro Volta

26]. The capacitance of a reverse biased PN junction, ---

- (a) Increases as reverse bias is increased
- (b) Decreases as reverse bias is increased
- (c) **Increases as reverse bias is decreased**
- (d) Is insignificantly low

27]. For a PN junction diode, the current in reverse bias may be, ---

- (a) Few miliamperes
- (b) Between 0.2 A and 15 A
- (c) Few amperes
- (d) **Few micro or nano amperes**

28]. A module in a solar panel refers to, ---

- (a) Series arrangement of solar cells.
- (b) Parallel arrangement of solar cells.
- (c) **Series and parallel arrangement of solar cells.**
- (d) None of the above.

29]. The term photo voltaic is in use since, ---

- (a) 1840
- (b) 1844
- (c) **1849**
- (d) 1850

30]. When the source of light is not sun light then the photo voltaic cell is used as, ---

- (a) Photo diode
- (b) Photovoltaic cell
- (c) **Photo detector**
- (d) Photo transmitter

31]. The region where the electrons and holes diffused across the junction is called, ---

- (a) Depletion Junction
- (b) **Depletion region**
- (c) Depletion space
- (d) Depletion boundary

32]. The current produce by the solar cell can be given by, ---

- (a) $I_L - I_D + I_{Sh}$
- (b) $I_L + I_D - I_{Sh}$
- (c) $I_L + I_D + I_{Sh}$
- (d) **$I_L - I_D - I_{Sh}$**

33]. The amount of photo generated current increases slightly with an increase in, ---

- (a) **Temperature**
- (b) Photons
- (c) Diode current
- (d) Shunt current

34]. A typical output of a solar cell is, ---

- (a) 0.1 V
- (b) **0.26 V**
- (c) 1.1 V
- (d) 2 V

35]. Which of the following material is used in solar cells?

- (a) Barium
- (b) **Silicon**
- (c) Silver
- (d) Selenium

36]. The efficiency of a solar cell may be in the range, ---

- (a) 2 to 5%
- (b) **10 to 15%**
- (c) 30 to 40%
- (d) 70 to 80%

37]. Satellite power requirement is provided through, ---

- (a) **Solar cells**
- (b) Dry cells
- (c) Nickel Cadmium cells
- (d) Lead acid batteries

38]. Batteries are charged by, ---

- (a) Rectifiers
- (b) Engine generator sets
- (c) Motor generator sets
- (d) **Any of the above**

39]. Battery container is acid resistance therefore it is made up of, ---

- (a) Glass
- (b) Plastic
- (c) Wood
- (d) **All of the above**

40]. The following will happen if the battery charging rate is too high.

- (a) Excessive gassing
- (b) Temperature rise will occur
- (c) Bulging and buckling of plates we occur
- (d) **All of the above**

41]. The following indicate that battery on charge has attained full charge, ---

- (a) Colour of electrode
- (b) Gassing
- (c) Specific gravity
- (d) **All of the above**

42]. To prevent local action in battery only --- is used in electrolytes.

- (a) Pump water
- (b) **D stilled water**
- (c) Tap water
- (d) Both 'a' and 'c'

- 43]. Ampere hour capacity of an industrial battery is based on - - - hours discharge rate.
 (a) **8** (b) 12
 (c) 16 (d) 24
- 44]. When two batteries are connected in parallel, it should be ensured that - - -
 (a) **They have same emf** (b) They have same make
 (c) They have the same ampere-hour capacity
 (d) They have identical internal resistance
- 45]. In a lead acid battery, separators are provided to, - - -
 (a) Reduce internal resistance
 (b) Facilitate flow of current
 (c) Reduce tendency for polarization
 (d) **Avoid internal short circuits**
- 46]. The electrode for a battery must be, - - -
 (a) A semi-conductor (b) An insulator
 (c) **A good conductor of electricity**
 (d) A bad conductor of electricity
- 47]. Cells are connected in series in order to, - - -
 (a) **Increase the voltage rating**
 (b) Increase the current rating
 (c) Increase the life of the cells
 (d) None of the above
- 48]. Five 2V cells are connected in parallel. The output voltage is, - - -
 (a) 1 V (b) 1.5 V
 (c) 1.75 V (d) **2 V**
- 49]. The open-circuit voltage of any storage cell depends wholly upon, -
 (a) Its chemical constituents
 (b) On the strength of its electrolyte
 (c) Its temperature (d) **All of the above**
- 50]. The current in a chemical cell is a movement of, - - -
 (a) Positive ions only (b) **Positive and negative ions**
 (c) Negative ions only (d) Positive hole charges

- 51]. Each pentavalent atom donates one free electron and therefore are known as - - -
 (a) **Donor** (b) Acceptor
 (c) Combination (d) P-type semiconductor
- 52]. Internal resistance of a cell is due to, - - -
 (a) Resistance of electrolyte
 (b) Electrode resistance
 (c) Surface contact resistance between electrode and electrolyte
 (d) **All of the above**
- 53]. The output voltage of a charger is, - - -
 (a) Less than the battery voltage
 (b) **Higher than the battery voltage**
 (c) The same as the battery voltage
 (d) None of the above
- 54]. It is noticed that during charging, - - -
 (a) There is a rise in voltage
 (b) Energy is absorbed by the cell
 (c) Specific gravity of H_2SO_4 is increased
 (d) **All of the above**
- 55]. A typical output of a solar cell is, - - -
 (a) 0.1 V (b) **0.26 V**
 (c) 1.1 V (d) 2 V
- 56]. Which of the following material is used in solar cells?
 (a) Barium (b) **Silicon**
 (c) Silver (d) Selenium
- 57]. In a lead acid cell, hydrogen is liberated at, - - -
 (a) Positive plate
 (b) **Negative plate**
 (c) Both positive and negative plates
 (d) None of the above
- 58]. Satellite power requirement is provided through, - - -
 (a) **Solar cells** (b) Dry cells
 (c) Nickel Cadmium cells (d) Lead acid batteries

- 59]. During the charging of a lead acid cell, ---
 (a) **Its voltage increases** (b) It gives out energy
 (c) Its cathode becomes dark chocolate brown in Colour
 (d) Specific gravity of H_2SO_4 decreases
- 60]. Active materials of a lead acid cell are, ---
 (a) Spongy lead (b) Lead peroxide
 (c) Dilute H_2SO_4 (d) **All of the above**
- 61]. During charging the specific gravity of the electrolyte of a lead acid battery, ---
 (a) **Increases** (b) Decreases
 (c) Remains the same (d) Becomes zero
- 62]. The capacity of a lead acid cell does not depend on its, ---
 (a) Temperature (b) **Rate of charge**
 (c) Rate of discharge (d) Quantity of active material
- 63]. In a lead-acid cell dilute sulphuric acid approximately comprises the following, ---
 (a) One part H_2O , three parts H_2SO_4
 (b) Two-part H_2O , two parts H_2SO_4
 (c) **Three parts H_2O , One part of H_2SO_4**
 (d) All H_2SO_4
- 64]. The watt-hour efficiency of a lead acid cell varies between, ---
 (a) 25 to 35% (b) 40 to 60%
 (c) **70 to 80%** (d) 90 to 95%
- 65]. The capacity of a lead acid cell depends on, ---
 (a) Amperes (b) **Ampere-hours**
 (c) Watts (d) Watt-hours
- 66]. The capacity of a lead acid cell depends on, ---
 (a) Rate of discharge (b) Temperature
 (c) Density of electrolyte (d) **All of the above**
- 67]. Level of electrolyte in a cell should be --- the level of plates
 (a) Below (b) Equal to
 (c) **Above** (d) None of the above

- 68]. In a lead acid cell, lead is called as, ---
 (a) Positive active material
 (b) **Negative active material**
 (c) Passive material
 (d) None of the above
- 69]. Electrolyte used in a lead acid cell is, ---
 (a) NaOH (b) **H_2SO_4**
 (c) HCL (d) HNO_3
- 70]. The lead acid cell never be discharged beyond, ---
 (a) **1.8 V** (b) 1.9 V
 (c) 2 V (d) 2.1 V
- 71]. If a lead-acid cell is discharge below 1.8 V, the following will happen, ---
 (a) Capacity of cell will reduce
 (b) Sulphation of plates will occur
 (c) Internal resistance will increase
 (d) **All of the above**
- 72]. In a lead acid battery the energy is stored in the form of, ---
 (a) Charged ions (b) **Chemical energy**
 (c) Electrostatic energy (d) Electromagnetic energy
- 73]. The forbidden band exists in, ---
 (a) Semiconductor (b) Insulator
 (c) Conductor (d) **Both a and b**
- 74]. No forbidden band exists between the valence band and the conduction band in a, ---
 (a) **Conductor** (b) Insulator
 (c) Semiconductor (d) None of these
- 75]. The current flow through electrolyte is due to the movement of, ---
 (a) **Ions** (b) Holes
 (c) Electrons (d) None of the above

१

‘अहमदनगर जिल्ह्यातील परित्यक्ता
स्त्रियांच्या आर्थिक, सामाजिक समस्या
— एक समाजशास्त्रीय अभ्यास’



प्रा. डॉ. आव्हाड भगवान भानुदास



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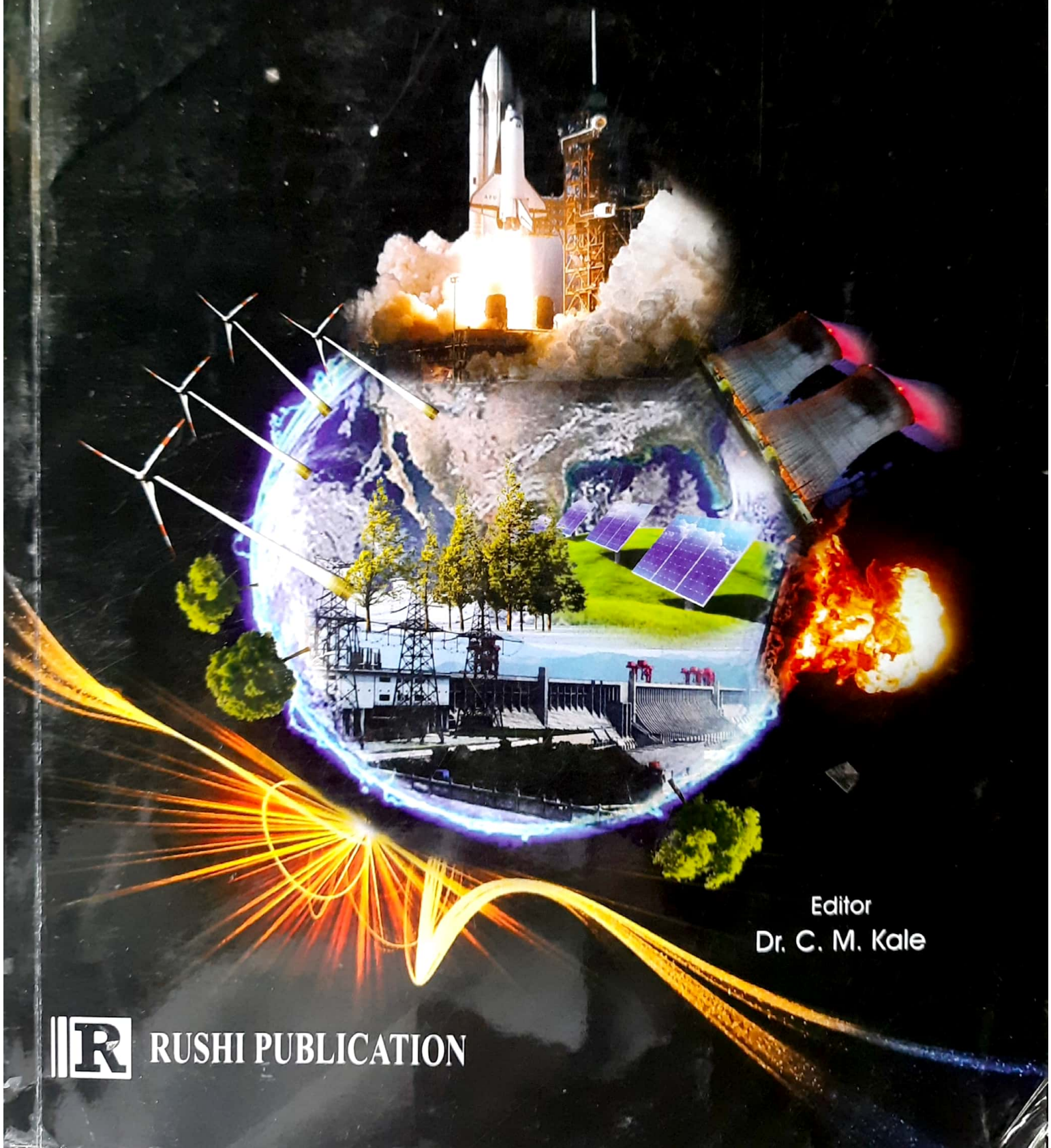
अहमदनगर जिल्ह्यातील परित्यक्ता स्त्रियांच्या आर्थिक, सामाजिक
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अहमदनगर जिल्ह्यातील परित्यक्ता स्त्रियांच्या आर्थिक, सामाजिक समस्या— एक समाजशास्त्रीय अभ्यास

THE SCIENCE OF ENERGY



Editor
Dr. C. M. Kale

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CHAPTER.3

WIND ENERGY

3.1. INTRODUCTION

The wind is a natural phenomenon on the earth which is been created by the difference of air density. It's in simple words 'an atmospheric air in motion'. Wind energy is a form of solar energy. Wind energy is generated by the movement of air relative to the earth's surface. Wind energy (or wind power) defines the process by which wind is utilized to generate electricity. Wind turbines convert the kinetic energy in the wind into mechanical power. A generator can convert mechanical power into electricity. In prehistoric times, the wind was used to move the sails of the ships. In this chapter, we will see how wind energy is used to generate electricity.



Wind energy captures the natural wind in our environment and translates the air's motion into mechanical energy. The wind is produced by differences in atmospheric pressure. Wind speeds differ founded on geography, landscape, and season. As an effect, there are some locations well-matched for wind energy production than others. In all-purpose, wind speeds are higher near the shoreline and offshore since there are rarer objects like vegetation, mountains, and buildings to slow them down.

The mechanism used to convert air motion into electricity is referred to as a turbine. A turbine is a large structure with several spinning blades. These blades are connected to an electromagnetic generator that generates electricity when the wind rotates the blades.

A turbine translates the kinetic energy of the wind to beneficial mechanical energy. This energy could be used in mechanical form or turn generator turbines and deliver electricity. Fair like in the hydropower systems, wind energy is harnessed through the conversion of the wind kinetic energy into mechanical energy. Wind power generation means getting the electrical energy by converting wind energy into the rotating energy of the blades and converting that rotating energy into electrical energy by the generator. Wind energy increases with the cube of the wind speed; therefore, wind turbine generators (WTGs) should be installed in the higher wind speed area.

The inventors keep developing electronic devices including controlling systems with knowledge and technologies cultivated from the thermal and hydraulic power plant. The wind turbines are largely classified into two types- horizontal axis wind turbines and vertical axis wind turbines. Large areas installed with wind turbines, that is, wind farms are increasingly emerging today. The first known wind turbine used to produce electricity is built in Scotland in 1887. The wind turbine is formed by Prof James Blyth of Anderson's College, Glasgow (now recognized as Strathclyde University). Wind energy offers numerous advantages, which clarifies why it's one of the fastest-growing energy sources in the world.

3.2. WIND POWER PRODUCTION

The terms "wind energy" and "wind power" both describe the procedure by which the wind is used to produce mechanical power or electricity. This mechanical power can be used for specific tasks such as crushing grains or pumping water or a generator can convert this mechanical power into electricity. Wind turbines based on a simple principle that, instead of using electricity to make wind-like a fan, conversely wind turbines use the wind to produce electricity. The wind turns the propeller-like blades of a turbine around a rotor, which spins a generator, which creates electricity. The wind is a form of solar energy caused by a combination of three concurrent events:

- (a) The sun disproportionately heating the atmosphere
- (b) Anomalies of the earth's surface
- (c) The revolution of the earth.

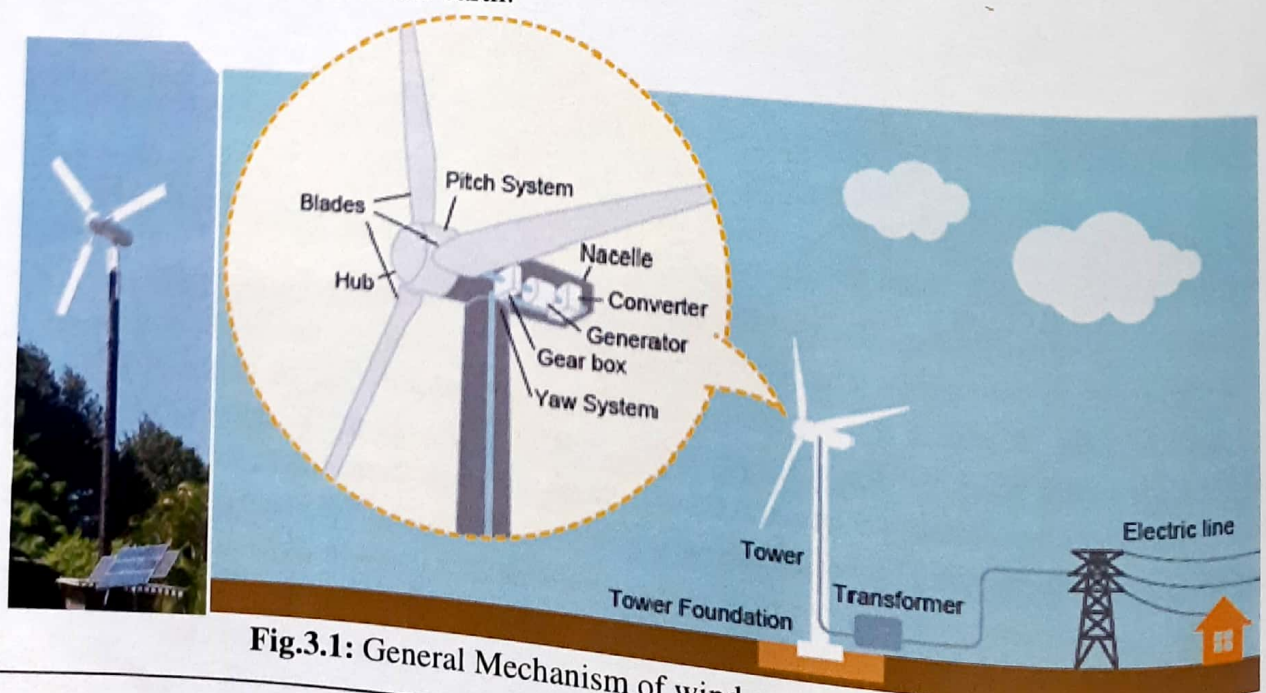


Fig.3.1: General Mechanism of wind energy generation

Wind flow designs and speeds differ significantly across the Windy regions (like the United States) and are modified by bodies of water, vegetation, and changes in topography. Humans use this wind flow, or motion energy, for many purposes: flying a kite, sailing, also even for producing electricity.

Fig.3.1 shows the general working mechanism of the production of wind energy. A wind turbine turns wind energy into electricity using the aerodynamic force from the rotor blades, which work like an airplane wing or helicopter rotor blade. When wind flowing across the blade, the air pressure on one side of the blade decreases. The difference in air pressure across the two sides of the blade creates both lift and drag. The force of the lift is stronger than the drag and this reasons the rotor to spin. The rotor attaches to the generator, either directly (if it's a direct drive turbine) or through a shaft and a series of gears (a gearbox) that speed up the rotation and permit for a physically smaller generator. This translation of aerodynamic force to rotation of a generator creates electricity that can be used for numerous purposes.

3.3. WIND CHARACTERISTICS

There are general characteristics of wind while others are more precise to the place. Some of the site-specific characteristics include:

1. **Mean wind speed:** This evaluates the annual wind yield though it does not give the distributions.
2. **Wind speed distribution:** There are three aspects namely annual, diurnal, and seasonal characteristics. Understanding the wind speed variations and the spread is necessary when choosing a site.
3. **Turbulence:** This is the chaotic movement of wind in unpredictable patterns. Turbulence results from continuously changing properties of wind motion that impact on energy production and fatigue on blades.
4. **Long term fluctuation:** Irregular wind causes unpredictable energy supply. Before a wind turbine is set, the area should be studied for a constant wind flux.
5. **Distribution of wind direction:** This is more significant in the positioning of the blades especially for horizontal axis types.
6. **Wind shear:** Shear is changed in wind direction, speed, or the height at which the maximum velocity occurs.

3.4. WIND SPEED PATTERNS

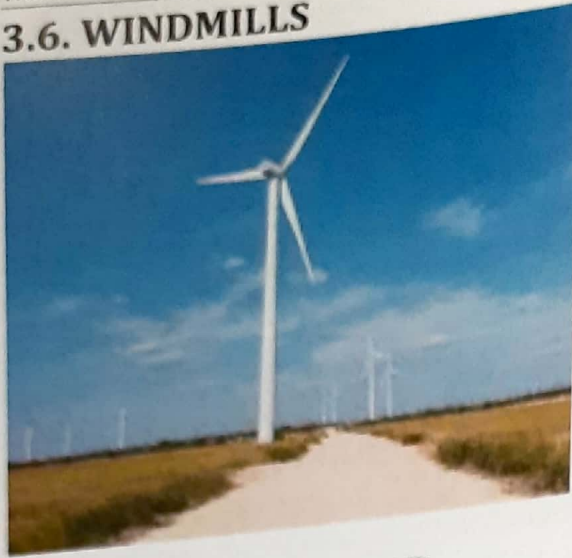
Wind patterns are important and are often analyzed using a wind spectrum. A high value of the wind spectrum represents a large change in the wind speed at the given time interval. If represented on a graph, the peaks depict turbulences that occur with time.

3.5. WIND SPEED DISTRIBUTION

There are three types of distributions:

1. **Diurnal:** Caused by the difference between temperatures during the day and at night.
2. **Depressions:** Occur with four-day intervals along the coastal region.
3. **Annual:** Distribution is latitude dependent.

3.6. WINDMILLS



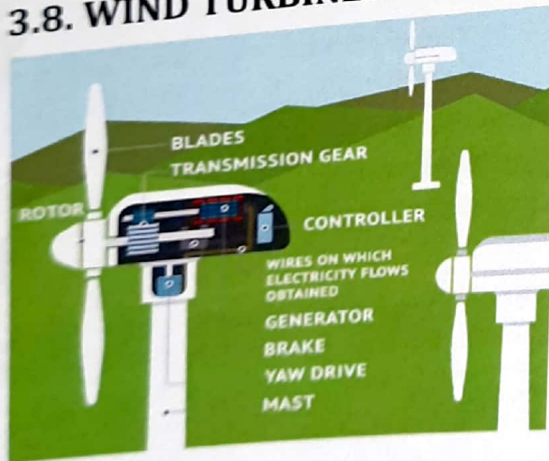
If the mechanical energy is used directly by machineries, such as a pump or grinding stones, the machine is usually called a windmill. The wind flows over windmill blades that are mounted on a rotor, which causes them to lift or turn like an airplane propeller. The blades are connected to a drive shaft that turns a generator to make electricity. This process converts the kinetic energy of the wind into electrical power. For utility-scale wind energy, large numbers of wind turbines are close together to form a wind farm.

3.7. WIND GENERATOR



If the mechanical energy is then converted to electricity, the machine is called a wind generator. There are many different types of generators used today in wind turbines, but the most common types are asynchronous generators. The two types mostly used are the squirrel cage induction generator & the wound rotor induction generator- also known as a doubly-fed induction generator.

3.8. WIND TURBINES



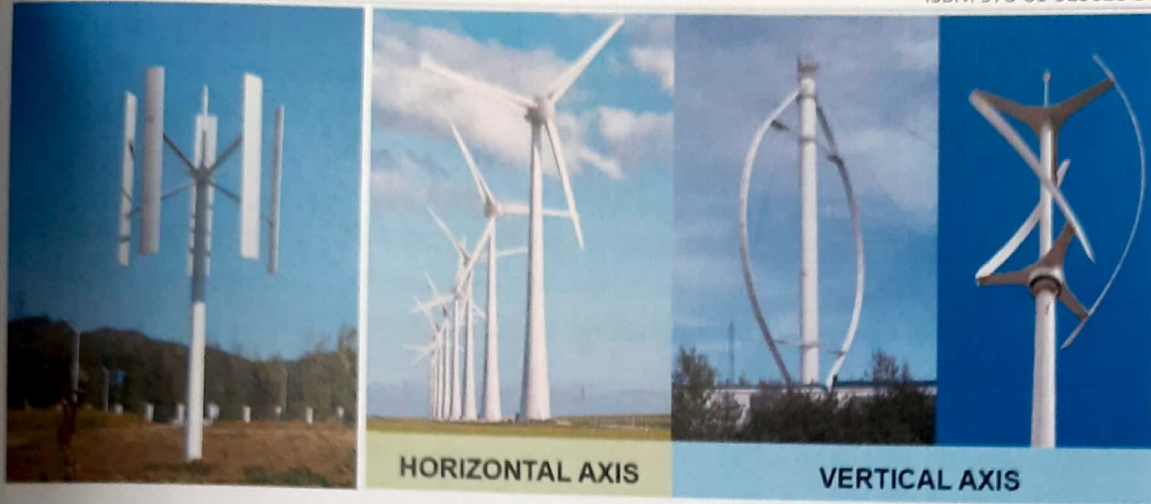
Windmills and wind turbines are different. They both use wind as a resource, but wind turbines are used to generate electricity. A wind turbine is a machine for converting the kinetic energy in wind into mechanical energy. Turbines and generators are equally used in the production of electric power; nevertheless, the turbine converts available energy forms into the rotation while the generator converts rotation into electricity. Two types of modern wind turbines generate electricity

3.8.1. Types of wind turbines

Wind turbines are classified into two general types:

1. Horizontal axis wind turbines (HAWTs) and
2. Vertical axis wind turbines (VAWTs).

A horizontal axis machine has its blades rotating on an axis parallel to the ground. A vertical axis machine has its blades rotating on an axis perpendicular to the ground. There are several available designs for both and each type has certain advantages and disadvantages. However, compared with the horizontal axis type, very few vertical axis machines are accessible commercially.



3.8.2. Components of a wind turbine

1. The nacelle contains the key components of the wind turbine, including the gearbox, and the electrical generator.
2. The tower of the wind turbine carries the nacelle and the rotor. Usually, it is an advantage to have a high tower, since wind speeds increase farther away from the ground.
3. The rotor blades capture wind energy and transfer its power to the rotor hub.
4. The generator converts the mechanical energy of the rotating shaft to electrical energy
5. The gearbox increases the rotational speed of the shaft for the generator.

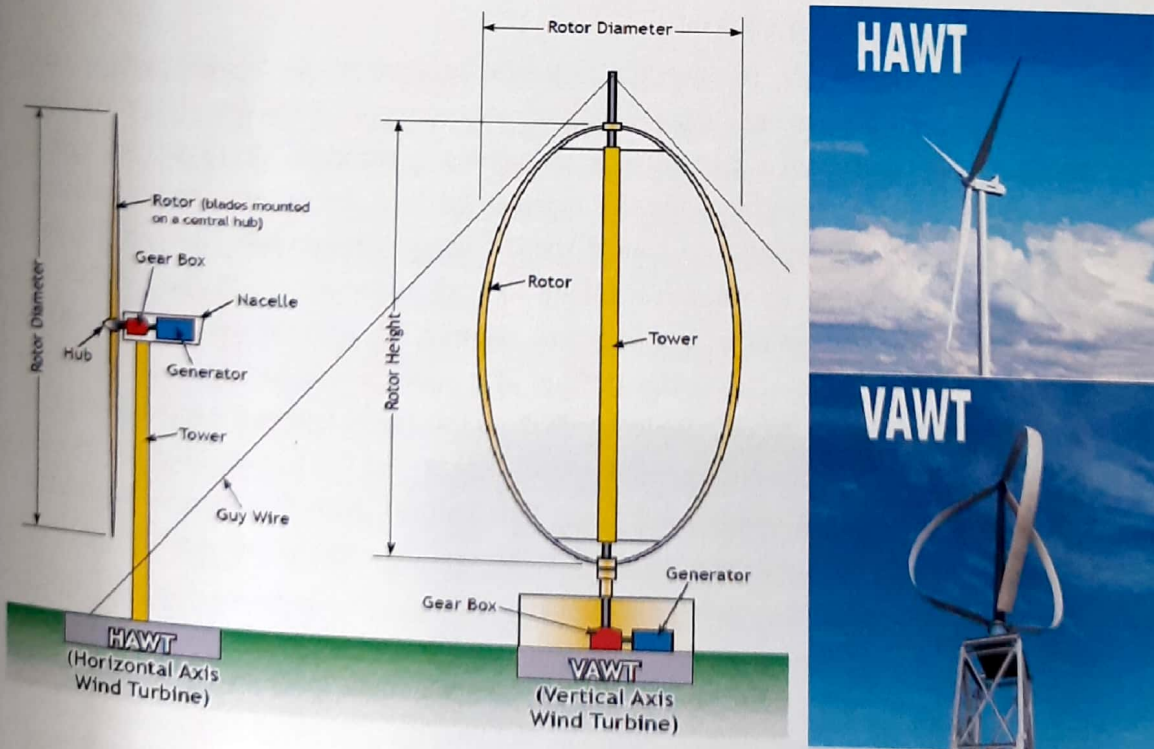


Fig.3.2: Schematics of HAWT and VAWT

Though vertical axis wind turbines have existed for centuries, they are not as common as their horizontal axis counterparts. The main cause for this is that they do not take benefit of the higher wind speeds at higher elevations above the ground as well as horizontal axis turbines.

HAWTs are the most commonly used type, and each turbine possesses two or three blades or a disk containing many blades (multibladed type) attached to each turbine. VAWTs can harness wind blowing from any direction and are usually made with blades that rotate around a vertical pole (Fig.3.2).

HAWTs are characterized as either high or low solidity devices, in which solidity refers to the percentage of the swept area comprising solid material. High-solidity HAWTs comprise the multibladed types that cover the total area swept by the blades with solid material to maximize the total amount of wind coming into contact with the blades. An example of the high-solidity HAWT is the multibladed turbine used for pumping water on farms, often seen in the landscapes of. Low-solidity HAWTs most often use two or three long blades and resemble aircraft in appearance. Low-solidity HAWTs have a low proportion of material within the swept area, which is compensated by a faster rotation speed used to fill up the swept area. Low-solidity HAWTs are the most commonly used commercial wind turbines as well as the type most often represented through media sources. Those HAWTs offer the greatest in electricity generation and, therefore, are among the most cost-efficient designs used. The Darrieus VAWT, which uses curved blades in a curved arch design, became the most common VAWT in the early 21st century. H-type VAWTs use two straight blades attached to either side of a tower in an H-shape, and V-type VAWTs use straight blades attached at an angle to a shaft, forming a V-shape. Most VAWTs are not economically competitive with HAWTs, but there is continuing interest in of VAWTs, particularly for building wind energy systems.

3.9. ESTIMATING GENERATION

Rendering to Betz's law, the maximum amount of power that a wind turbine can generate cannot exceed 59 percent of the wind's kinetic energy. Given that limitation, the expected power generated from a particular wind turbine is estimated from a wind speed power curve derived for each turbine, usually represented as a graph showing the relation between power generated (kilowatts) and wind speed (meters per second). The wind speed power curve varies according to variables unique to each turbine such as the number of blades, blade shape, rotor swept area, and speed of rotation. To determine how much wind energy will be generated from a particular turbine at a specific site location, the turbine's wind speed power curve needs to be coupled with the wind speed frequency distribution for its site. The wind speed is representing wind speed classes and the frequency of hours per year that are expected for each wind speed class. The data for those histograms are usually provided by wind speed measurements collected at the site and used to calculate the number of hours observed for each wind speed class.

A rough estimate of annual electric production in kilowatt-hours per year at a site can be calculated from a formula multiplying average annual wind speed, swept area of the turbine, the number of turbines, and a factor estimating turbine performance at the site. However, additional factors may decrease annual energy production estimates to varying degrees, including loss of energy because of the distance of transmission, as well as availability (that is, how reliably the turbine will produce power when the wind is blowing). By the early 21st century most commercial wind turbines functioned at over 90 percent availability, with some even functioning at 98 percent availability.

3.10. ADVANTAGES OF WIND ENERGY

1. It's a fresh fuel source. Wind energy doesn't pollute the air like power plants that depend on the combustion of fossil fuels, such as coal or natural gas. It is far more eco-friendly than the burning of fossil fuels for electricity. Wind turbines don't produce atmospheric emissions that cause acid rain or greenhouse effect.
2. Wind turbines can be constructed on existing farms. This significantly benefits the economy in rural areas, where most of the best wind sites are found. Farmers and planters can continue to work the land since the wind turbines use only a fraction of the land. Wind power plant owners make rent payments to the farmers for the use of the land providing landowners with extra income.
3. Wind power is cost-effective. Because the electricity from wind farms is sold at a fixed price over a long period (20+ years) and its fuel is free, wind energy mitigates the price uncertainty that fuel costs add to traditional sources of energy.
4. Wind creates jobs. The wind sector employs several workers and wind turbine technicians for manufacturing, installation, maintenance, and supporting services are one of the fastest-growing jobs across the globe.
5. The wind is a domestic source of energy. Over the past ten years, the wind power capacity of the world has grown 15%/year, & wind is now the largest source of renewable power.
6. It's sustainable. The wind is a form of solar energy. Winds are caused by the heating of the atmosphere by the sun, the rotation of the earth, and the earth's surface irregularities.

3.11. DISADVANTAGES OF WIND ENERGY

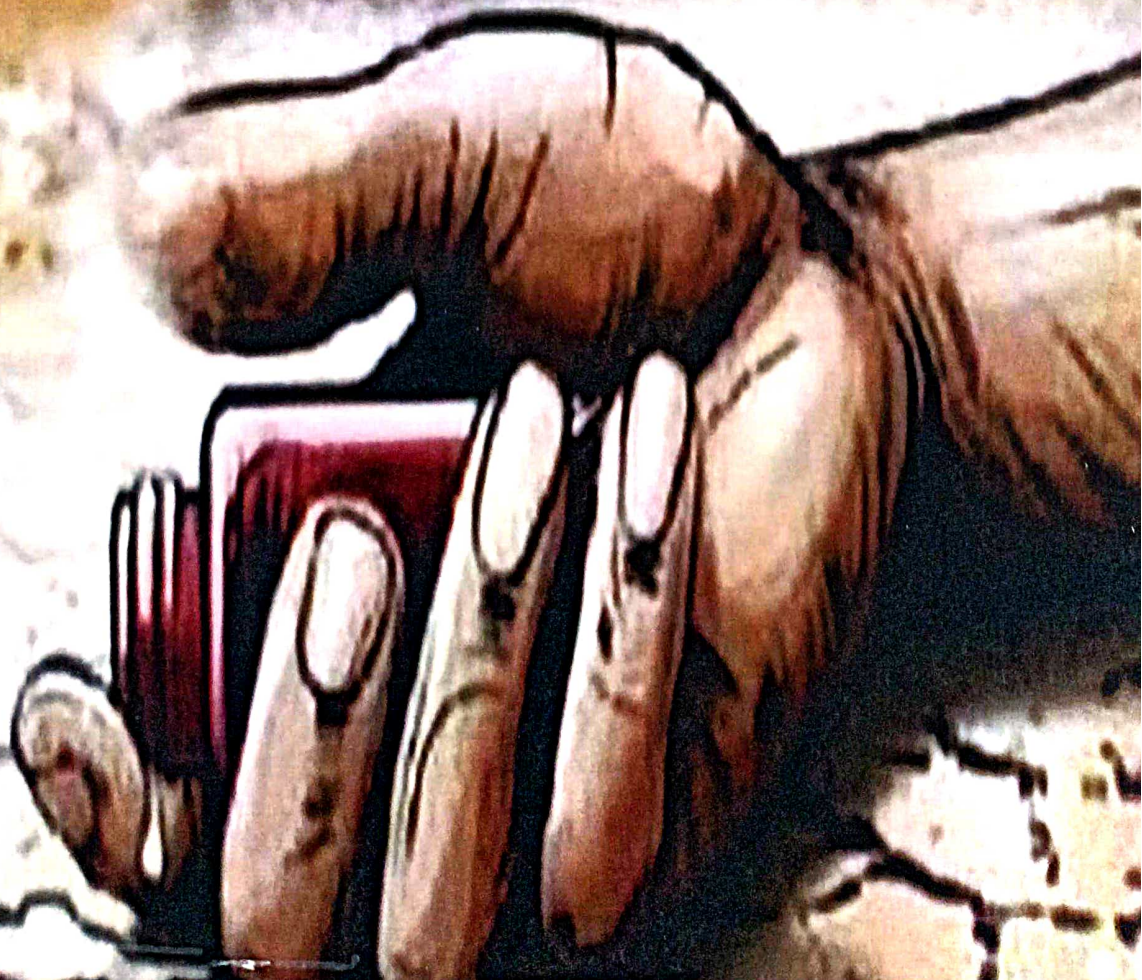
1. Constructing turbines and wind facilities is extremely expensive.
2. Some wind turbines cause to generate a lot of noise which can be unpleasant. Two kinds of noise associated with turbines are mechanical noise, which is produced by its equipment such as its gearbox, and aerodynamic noise, which is produced from the movement of air over the blades.
3. Though, this may be an advantage that placing wind turbines in desolate areas, far away from people, but it may also be a disadvantage. The cost of travel and maintenance on the turbines increases and is time-consuming. Offshore wind turbines require boats and can be dangerous to accomplish.
4. The turbine blades may damage local wildlife. Sometimes birds have been killed by flying into the rotors. Most of these problems have been resolved or greatly reduced through technological development or by properly setting wind plants.

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प्रा. डॉ. अशोक माळशिखरे

आनंदराव धोंडे ऊर्फ बाबाजी महाविद्यालय, कडा ता. आष्टी
जि. बीड, महाराष्ट्र.

प्रस्तावना :

भारत कृषीप्रधान देश म्हणून ओळखला जातो. कृषीप्रधान अर्थव्यवस्थेतील शेतकरी पुर्वीपासून शेतीसाठी योग्य अशा प्रदेशातच वस्ती करून रहात आहे. भारतातील एकूण लोकसंख्येपैकी 70 टक्के लोकसंख्या प्रत्यक्ष व अप्रत्यक्ष शेती क्षेत्रातच गुंतलेली आहे. एकूण राष्ट्रीय उत्पन्नात शेतीक्षेत्राचा वाटा 22 टक्के एवढा आहे, एकूण निर्यातीत 10 टक्के एवढा आहे. असे असतांना देखील शेतकरी कर्जात जन्मतो, कर्जात जगतो व कर्जातच मरतो. 1991 नंतर 49 टक्के शेतकरी कर्जात बुडालेले आहेत व त्यामुळेच शेतकऱ्यांच्या आत्महत्या होत आहेत. उत्तम शेती, मध्यम व्यापार, कनिष्ठ नौकरी या म्हणी ऐवजी उत्तम नौकरी, मध्यम व्यापार व कनिष्ठ शेती असे सुत्र तयार झाले आहे.

ब्रिटीश काळात शेतकऱ्यांचे मोठ्या प्रमाणात शोषण झाले व आता नैसर्गिक आपत्ती दुष्काळ, अतिवृष्टी, वीजपुरवठ्यातील अनियमित पाणी पुरवठ्याचा अभाव, कर्जपुरवठ्याचा अभाव यामुळे शेतकऱ्यांच्या आत्महत्या ही एक मोठी समस्या बनली आहे.

महाराष्ट्रातील शेतकऱ्यांच्या आत्महत्या :

1991 नंतर जागतीकीकरणाला सुरुवात झाली. जागतीकीकरणानंतर शेती क्षेत्रात मोठ्या प्रमाणावर बदल घडून आले.

10. शेतकरी बाजार योजना :

शेतकऱ्यांनी उत्पादित केलेला माल थेट ग्राहकांना मिळावा व त्यातून शेतकऱ्यांच्या मालाला वाजवी भाव मिळून ग्राहकांनाही रास्त दराने अन्नधान्य उपलब्ध व्हावे याकरिता महाराष्ट्रराज्य कृषीपणन मंडळाने शेतकरी व ग्राहक यांच्यातील मध्यस्थांचे उच्चाटन करण्यासाठी 2 जुलै 1992 रोजी शेतकरी बाजार योजना सुरु केलेली आहे. शेतकऱ्यांच्या मालाला योग्य भाव मिळून देणे, कसल्याही प्रकारची वजावट न करता शेतमालाची रक्कम तत्काळ उपलब्ध करणे व ग्राहकांना दर्जेदार मालाबरोबर ताजी फळे व भाजीपाला उपलब्ध करून देणे हा योजनेचा हेतु आहे.

11. इतर उपाय :

वरील उपायांबरोबर कृषी क्षेत्राचे नियोजन, विशेष कृषी क्षेत्र, सर्वकष राष्ट्रीय कृषीधोरणाचा स्वीकार, सहकारी पतपुरवठा, अवर्षणप्रवण क्षेत्र विकास कार्यक्रम, सधन शेती कार्यक्रम, दारिद्र्य निर्मुलन, रोजगार हमी योजना, नद्याजोड प्रकल्प, शेतीसाठी मोफत अखंडित वीज, शेतीविषयक शिक्षण आवश्यक, गोडावुन व्यवस्था, भ्रष्ट अधिकाऱ्यावर कडक कारवाई, बिनव्याजी कर्ज, उत्पादन खर्च वजा जाता 50 टक्के नफा या तत्वावर शेतमालाला हमी भाव दिला जावा. आत्महत्याग्रस्त शेतकरी कुंटुबातील व भुमीहीन, अत्यल्प व अल्पभुधारकांच्या कुंटुबातील एकाला नौकरी, जलयुक्त शिवाराची व्याप्ती वाढवावी, स्मार्ट शेतीची संकल्पना राबवावी, गावपातळीवर माती परीक्षण योजना राबवावी, फळपिके, फुलशेती, नवीन तंत्रज्ञानाविषयी कार्यशाळा घेणे, महिला सबलीकरण अशा विविध प्रकारच्या उपाययोजना करून शेतकऱ्यांच्या आत्महत्या कमी करता येतील.

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6.

Globalization And Its Impact On Indian Agriculture

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As a central concept in the present day international scenario, globalization is difficult to define. Still, scholars have made attempts to provide a basic understanding of the concept. The concept has become inextricably linked with the process of transformation touching upon every aspect of social, political and economic development in the globe. It can be seen as a process by which the population of the world is increasingly bonded into a single society. In the social front, globalization signifies closer interaction of people and homogenization of culture and value and the world being transformed into a 'global village'.

This concept has assumed much significance in both developing and developed nations-more so in the former as the people talk about dilution of state authority and interference of supra national institutions. The present paper is a theoretical study which discusses the impact of globalization on agriculture in India since two decades, the problems faced by the farmers, measures to be taken to overcome these problems and negative influence of globalization so as to improve the productivity, because 56% of the population still depend on agriculture in India, and the process of globalization cannot be reversed now. Hence, an attempt is made to highlight the positive and negative impacts of globalization on this important sector.

(i) India and Globalization

India has pre-dominantly an agrarian economy. Over 56% of the population depends on agriculture and related occupations for their livelihood. Nearly three-fourth of the population belongs to the weaker sections, some of whom are marginal and small farmers



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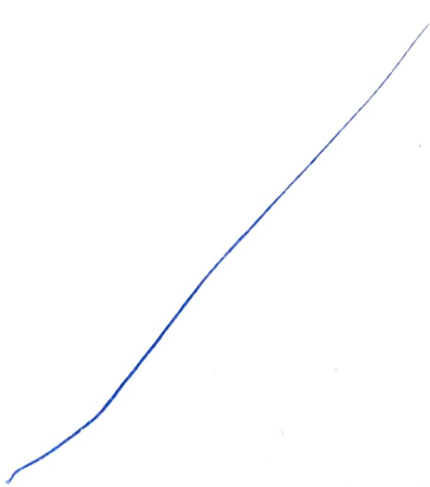
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