INDEX

3.3.2: Number of Books and Chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during 2018-19.

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	Year of publication	Page No.
1	P M Warke	NA	Photocatalytic treatment of waste water by sing immobilized TIO2 nanoparticles	BVUNANOCON018	Nanotechnology	2018-19	1
2	Prashant Ghodekar and P M Warke	NA	Use of Iron Oxide Nanomaterials in Wastewater treatment	BVUNANOCON018	Nanotechnology	2018-19	2
3	U A Awari	Strength Of Materials	NA	NA	NA	2018-19	4
4	U A Awari	Engineering Mechanics	NA	NA	NA	2018-19	5
5	U A Awari	Structural Mechanics I	NA	NA	NA	2018-19	6

6	A V Mohod	Process Intensification and parametric optimization in biodiesel synthesis using hydrodynamic cavitation reactors	NA	NA	NA	2018-19	7
7	Sandip Chaudhari	Electrical Machines III Mumbai University	NA	NA	NA	2018-19	8
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9	Sandip Chaudhari	Electronics Measurements and Instrumentation	NA	NA	NA	2018-19	12
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11	Sandip Chaudhari	Measurement - I	NA	NA	NA	2018-19	16
12	Sandip Chaudhari	Utilization of Electrical Energy	NA	NA	NA	2018-19	18
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14	Sandip Chaudhari	Electrical Power Transmission And Distribution Diploma -2nd year	NA	NA	NA	2018-19	22
15	Sandip Chaudhari	Electric Motors and Transformers Diploma -2nd year	NA	NA	NA	2018-19	24
16	Sandip Chaudhari	Industrial Measurements Diploma -2nd year	NA	NA	NA	2018-19	26
17	Sandip Chaudhari	Power System -I	NA	NA	NA	2018-19	28
18	Sandip Chaudhari	Power System -II	NA	NA	NA	2018-19	30
19	Sandip Chaudhari	Electrical Machines I (BATU)	NA	NA	NA	2018-19	32

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23	Sandip Chaudhari	High Voltage Engineering (SPPU)	NA	NA	NA	2018-19	40
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29	D N Katkoria S V Chaitanya	NA	Introduction of EGR strategies for conversion of heavy duty natural gas engine from BS IV to BS VI norms	NA	MEHPGCON2019	2018-19	51
30	O A More, M P Wagh	NA	Vibration analysis and optimization of automotive front bumper	NA	MEHPGCON2019	2018-19	52

31	S. M. Kulkarni; D. S. Bormane; Chankya Kumar Jha	NA	Performance Assessment of Robust & Efficient Video Stabilization Algorithms based on L1- L2 Optimization and s-R-t Transform	2018 4th International Conference for Convergence in Technology (I2CT)	2019 4th International Conference for Convergence in Technology (I2CT)	2018-19	53
32	T. S. Khatavkar, D. S. Bormane	NA	Enhancing Capacity of Existing Fiber Optic Link Performance to 128 Terabit/s-Km using Multi-Pumped Raman Amplification Scheme	5th International Conference on " Co mputing for Sustainable Global Develop ment	5th International Conference on " Co mputing for Sustainable Global Develop ment	2018-19	54
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34	A S Jadhav	NA	Synthesis of EPDM rubber coconut leaves activated carbon composite for automibile application	ICMSMC 2019 UK	International Conference on Materials Science and Materials Chemistry	2018-2019	56

35	A S Jadhav	NA	Activated carbon from lignocellulosic waste of arecanut shell: Estimation of ferets diameter	ICMSE 2019 UAE	International Conference on Materials Science and Engineering 2019	2018-2019	58

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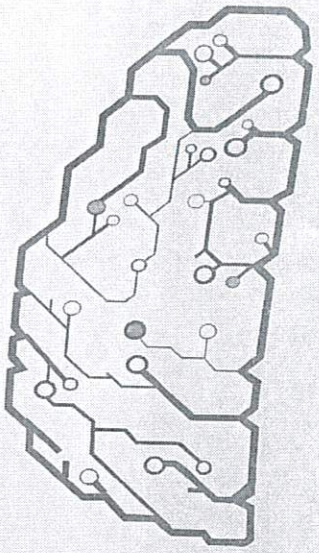

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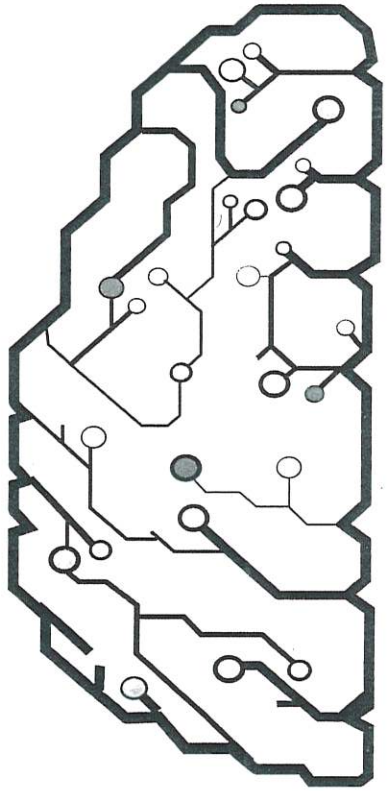

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Nowadays there is a continuously increasing worldwide concern for the developmentof wastewater treatment technologies. The utilizationof iron oxide nanomaterials has received much attention due to their unique properties,such as extremely small size, high surface-area-to-volume ratio,surface modifiability,excellent magnetic properties and great biocompatibility. A range of environmental clean-up technologieshave been proposed in wastewater treatment which applied iron oxide nanomaterials as nanosorbents and photocatalysts.Moreover iron oxide based immobilization technology for enhanced removal efficiency tends to be an innovative research point. This review outlined the latest application of iron oxide nanomaterials in wastewater treatment,and gaps which limited their large-scale field application. The outlook for potential application and further challenges, as well as the likely fate of nanomaterials discharged to the environment were discussed.

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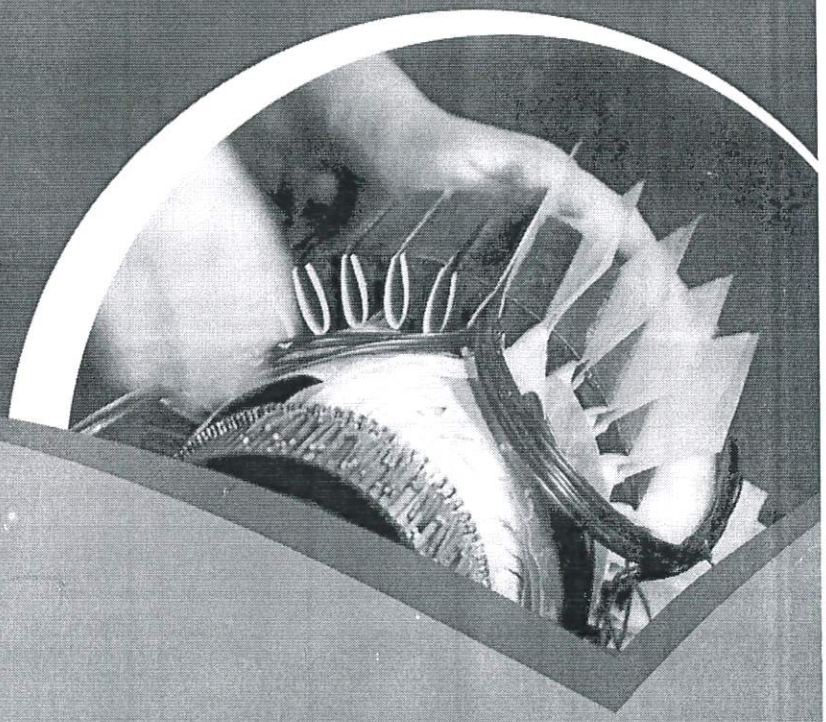

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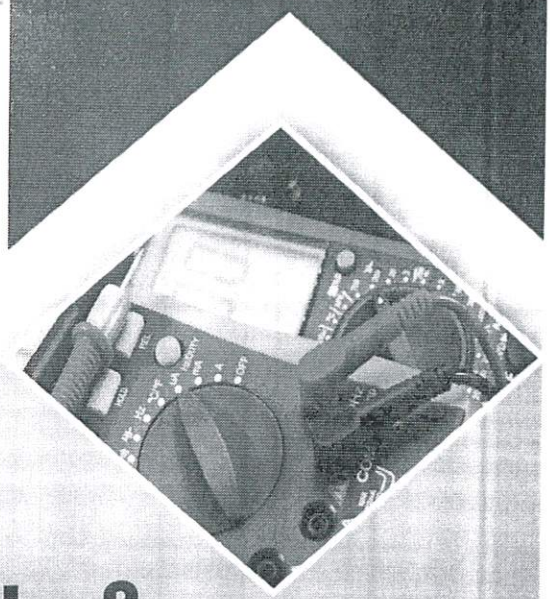

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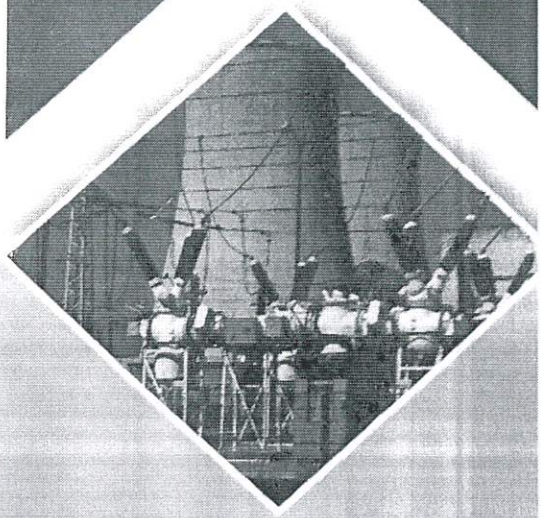

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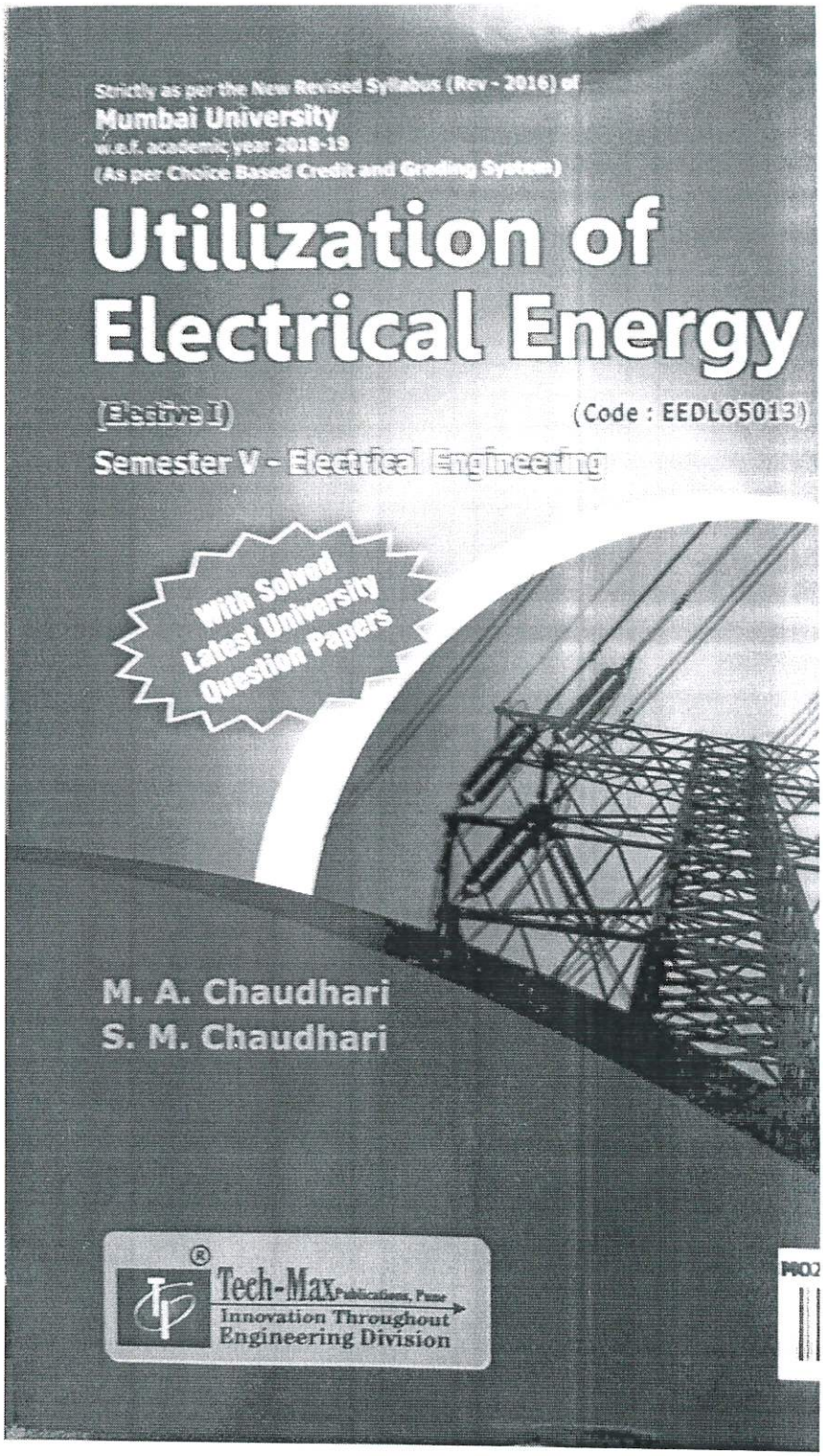

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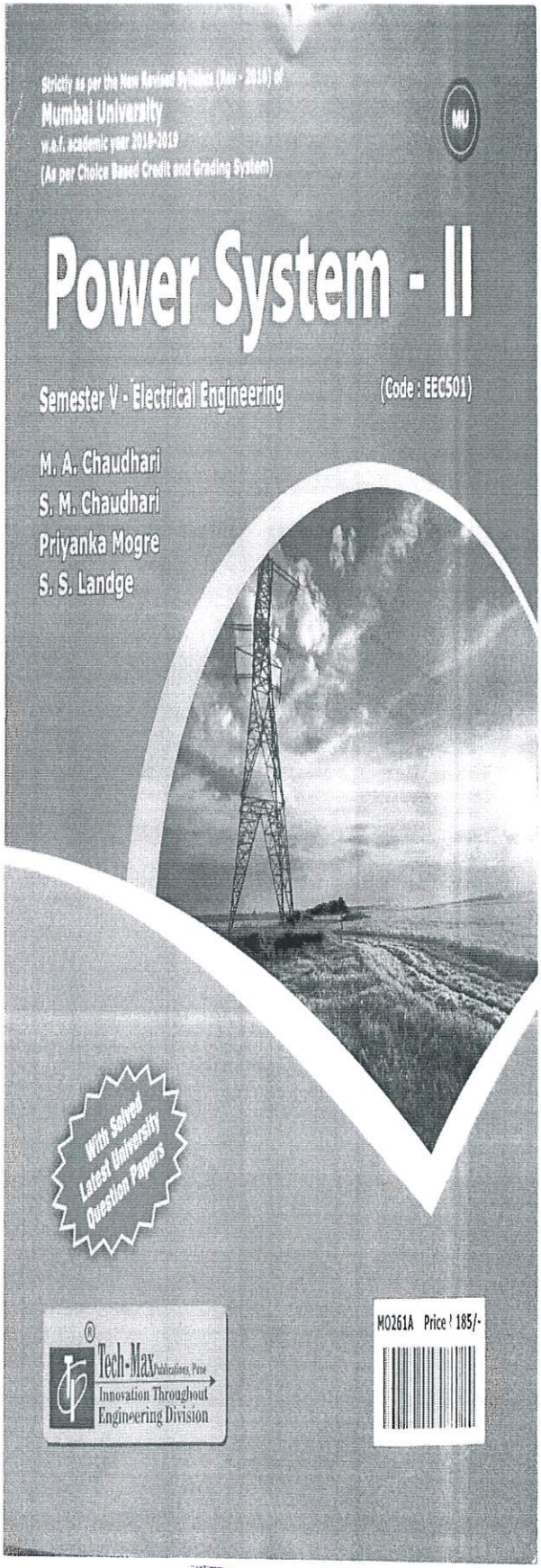

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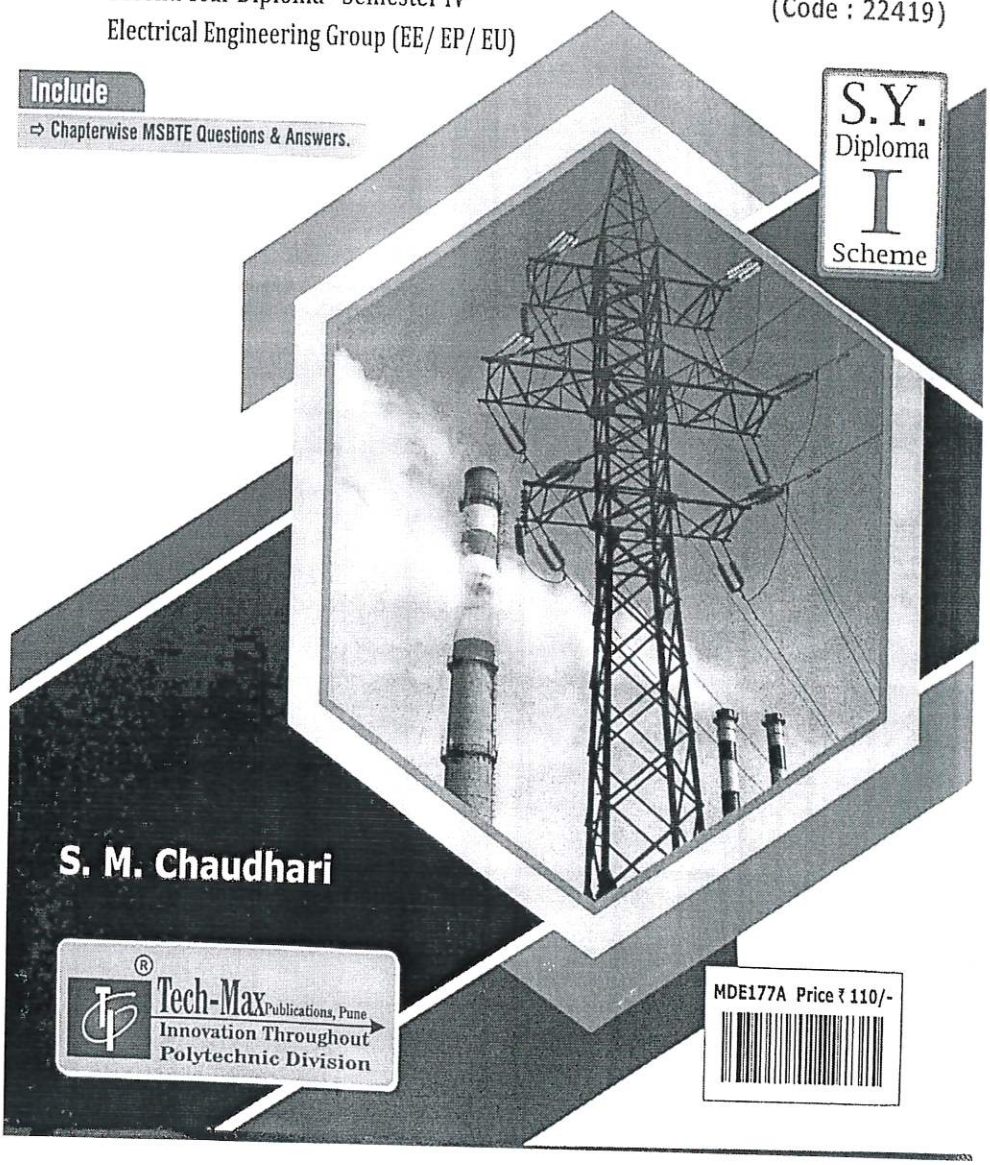

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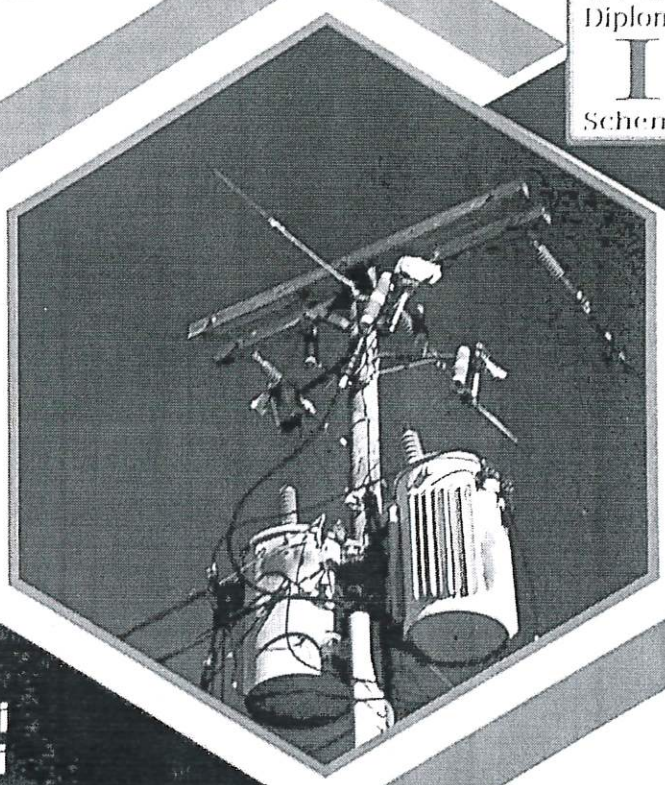

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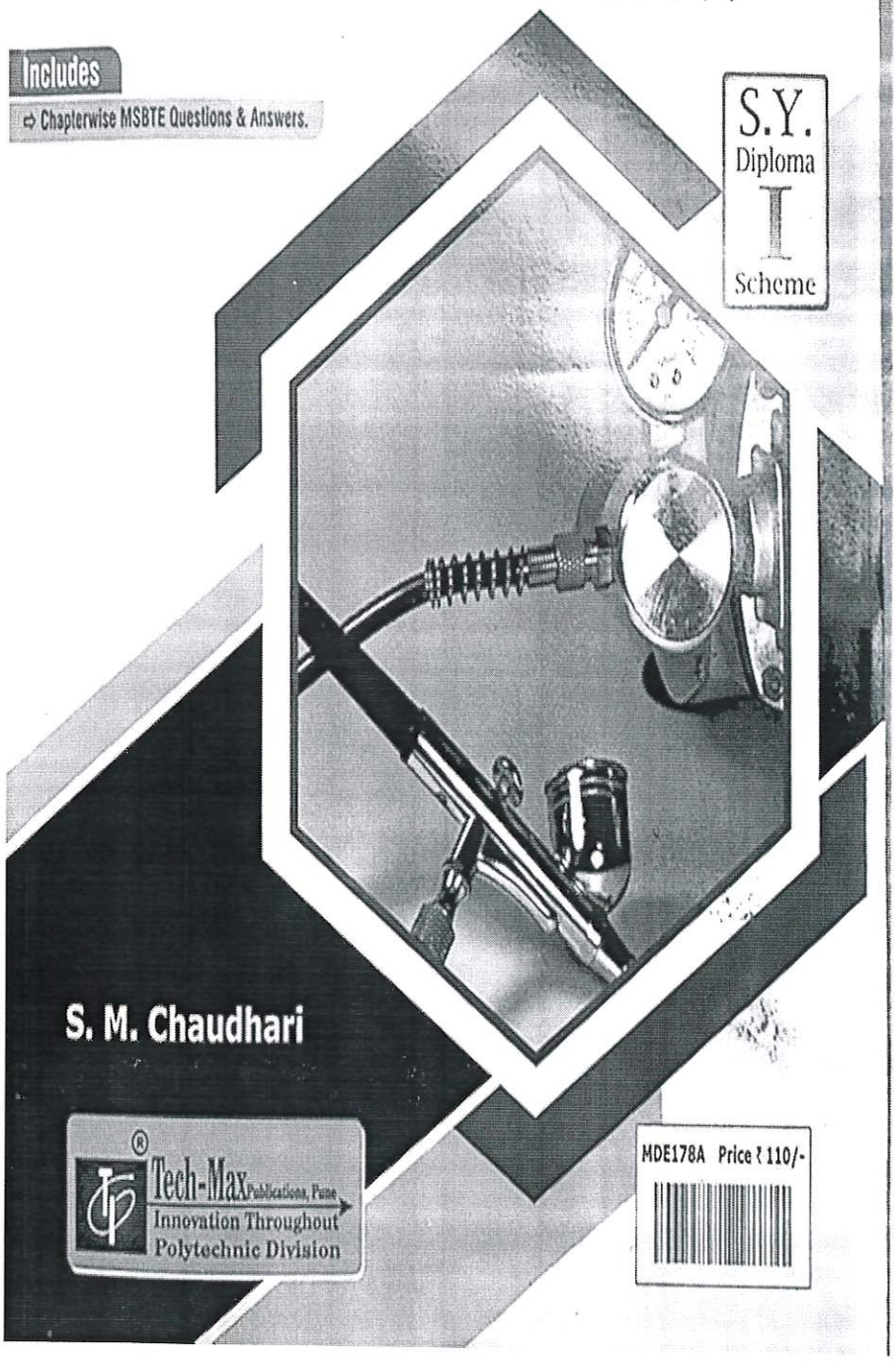

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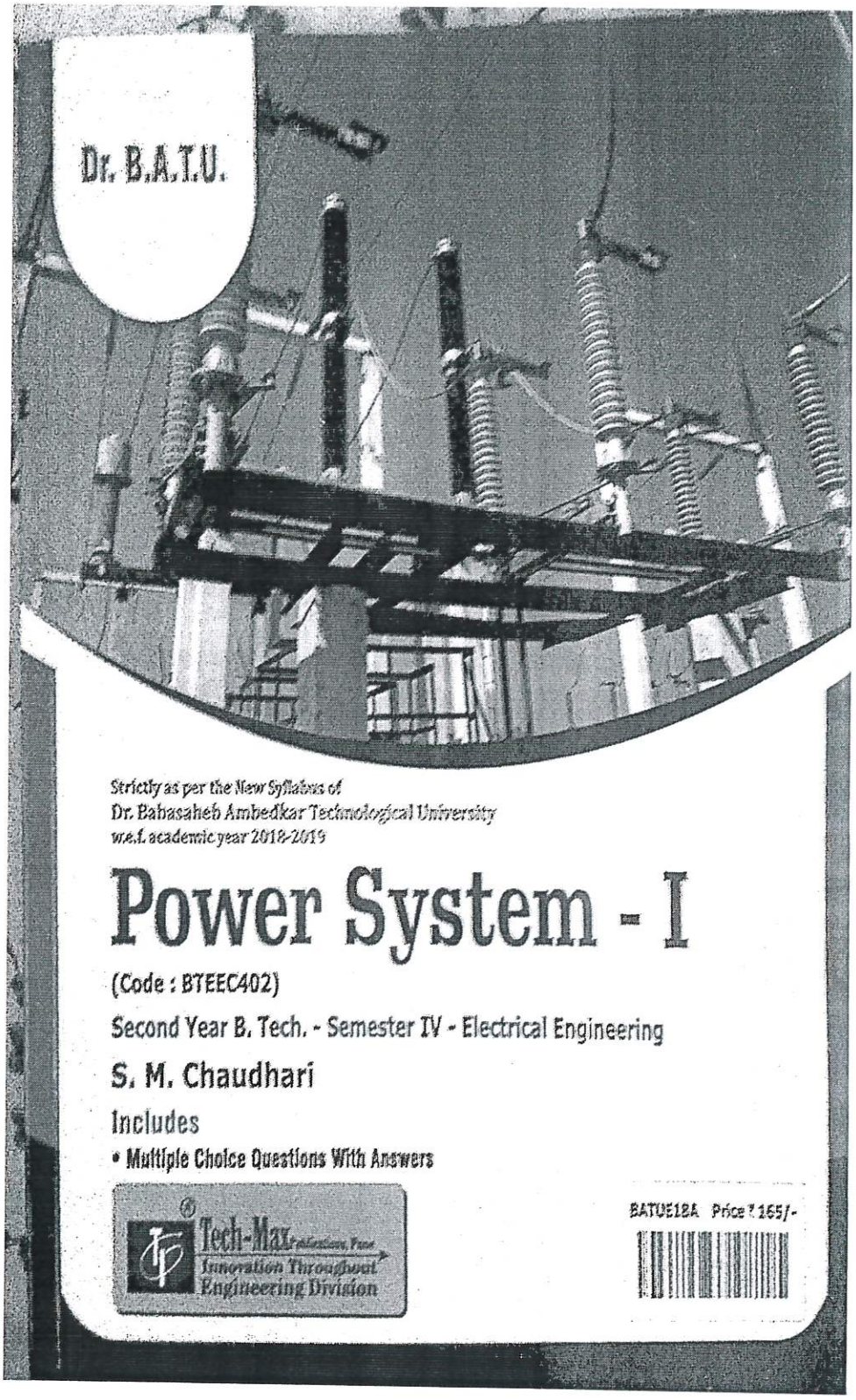

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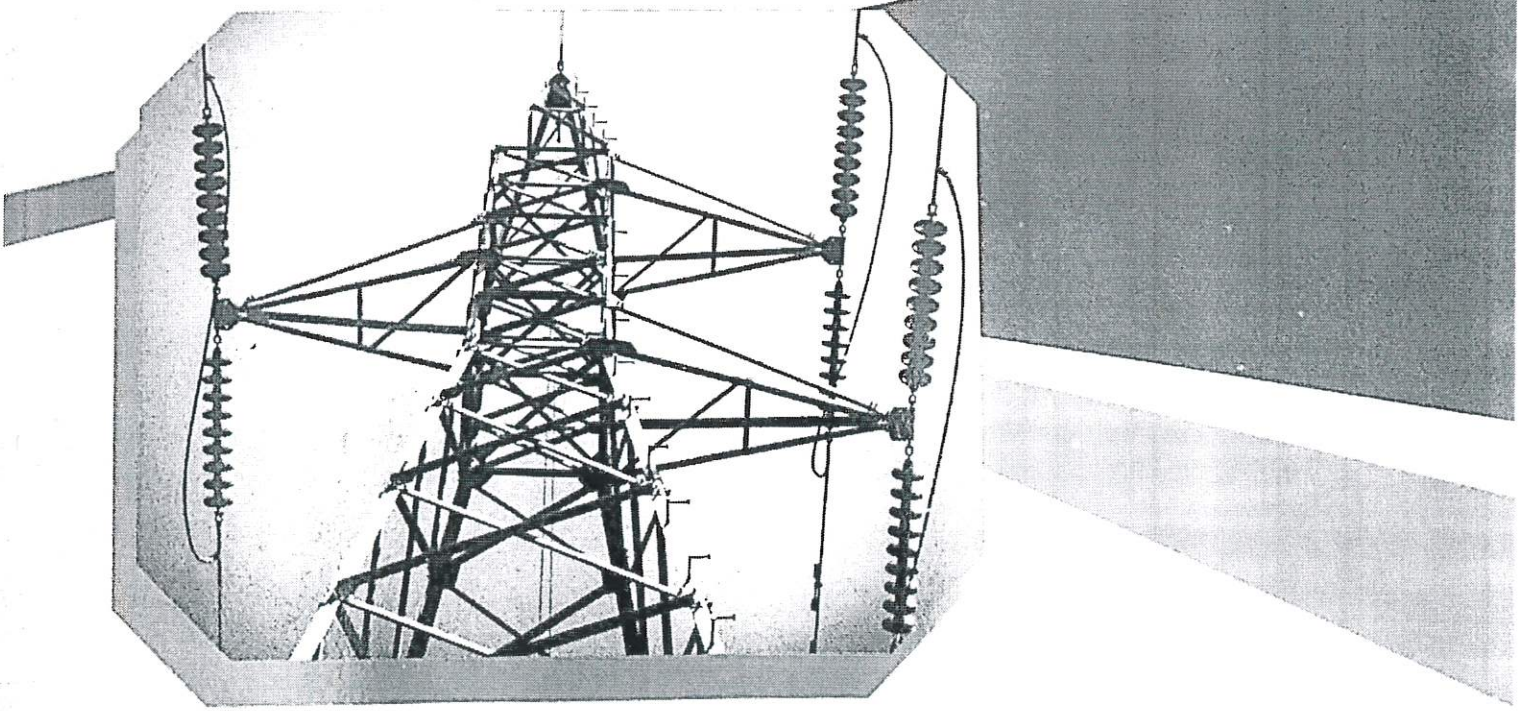

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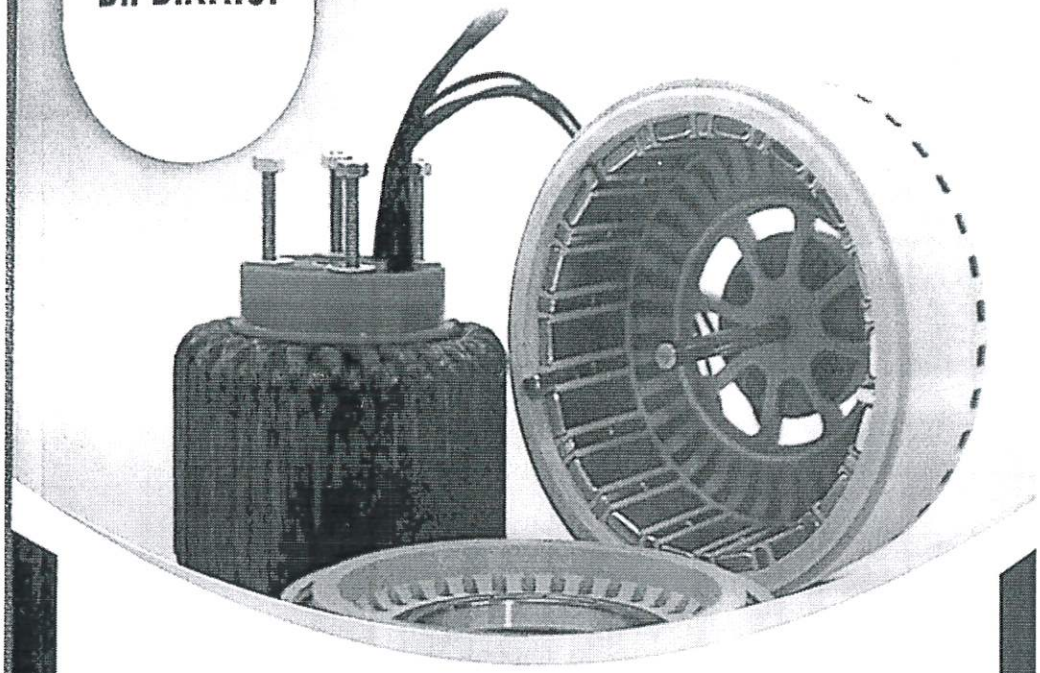

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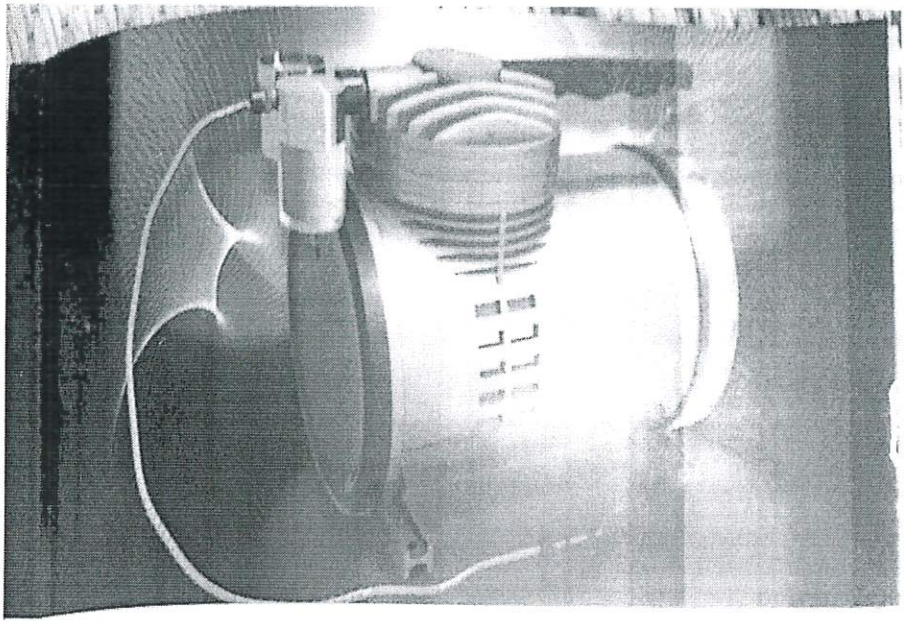

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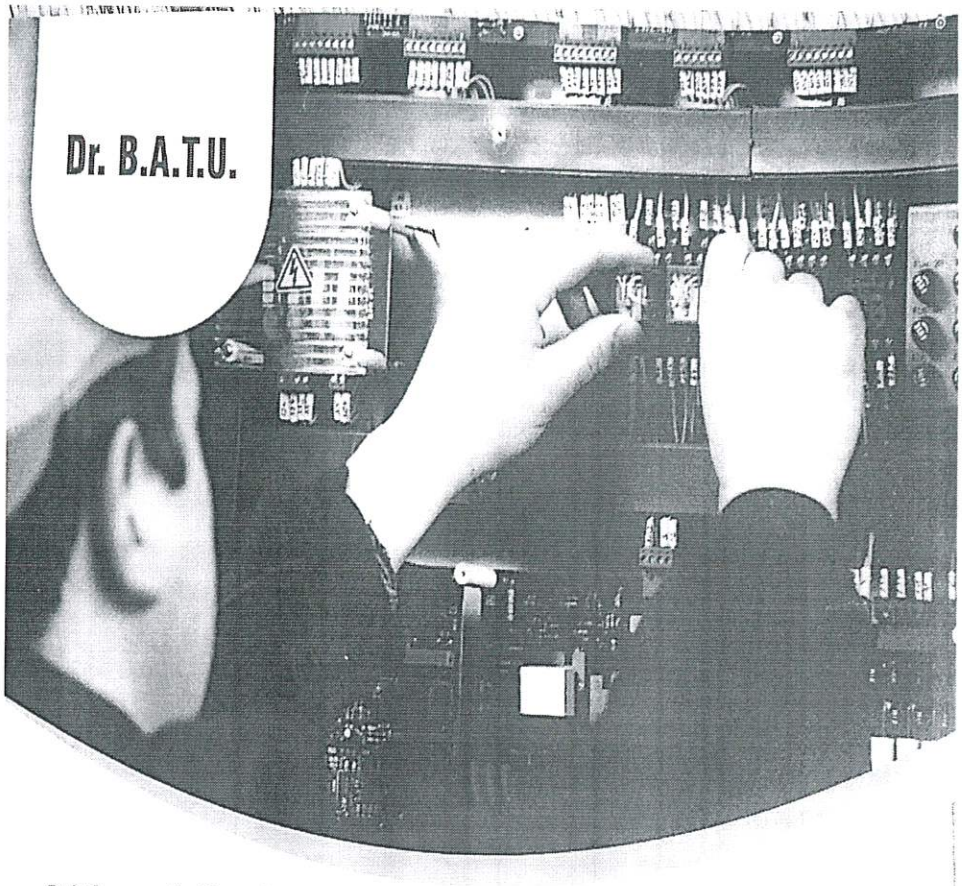

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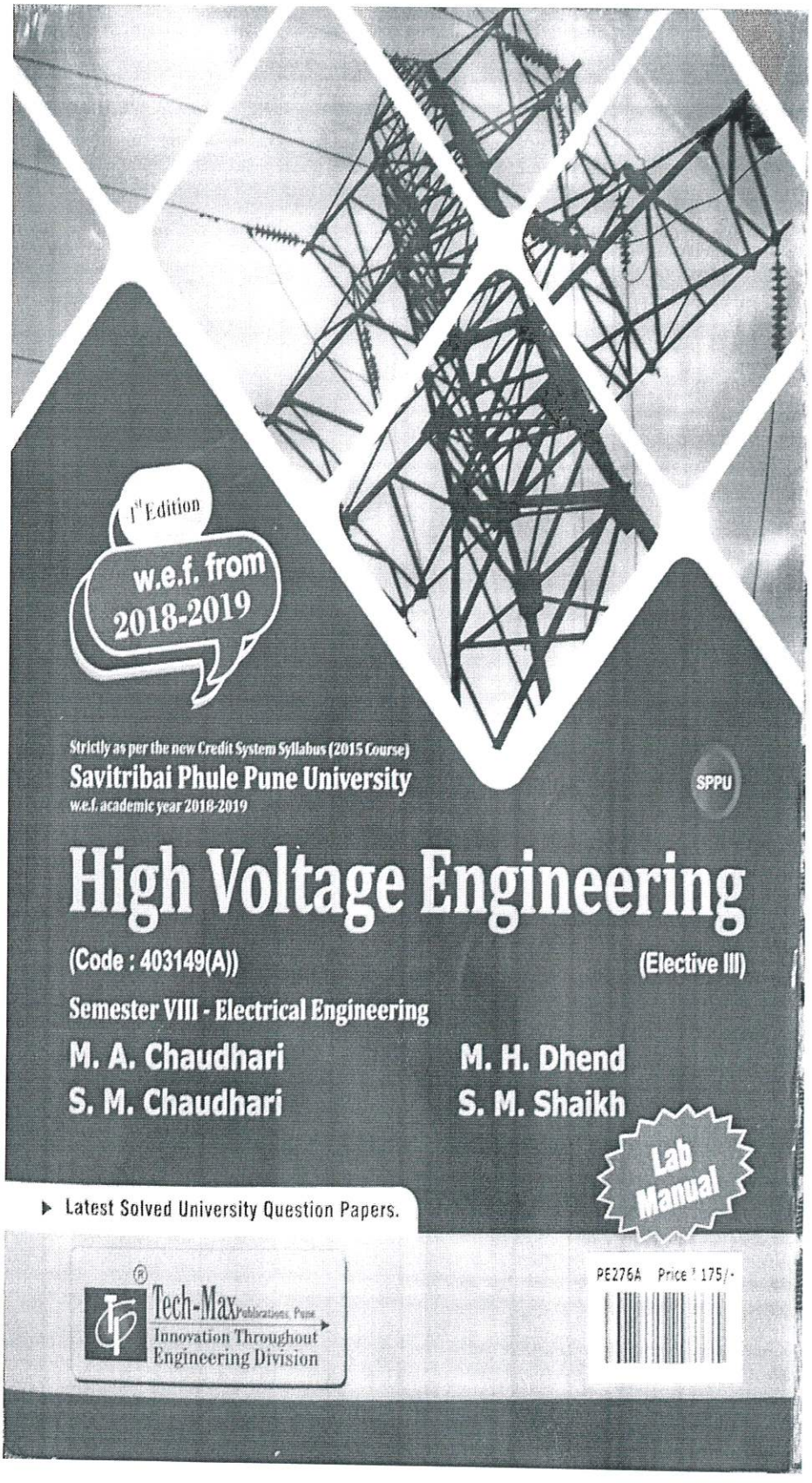

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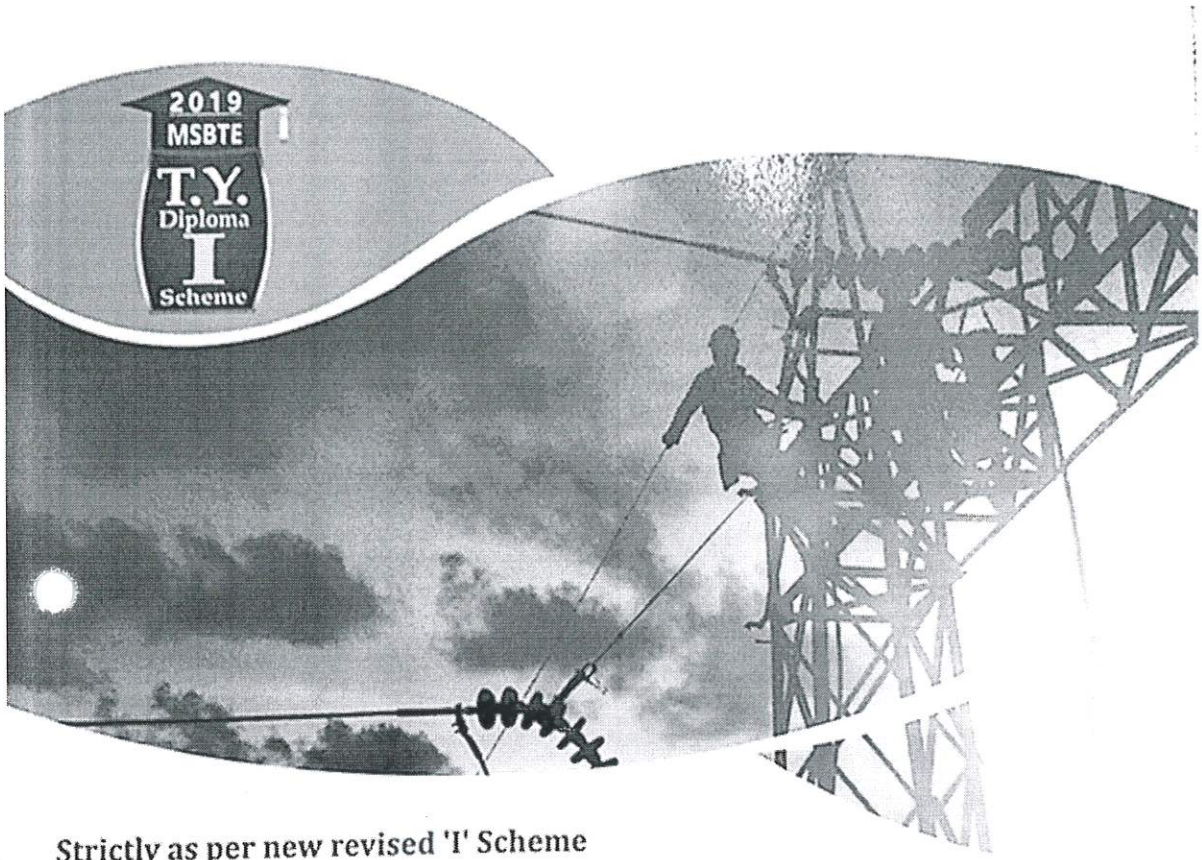

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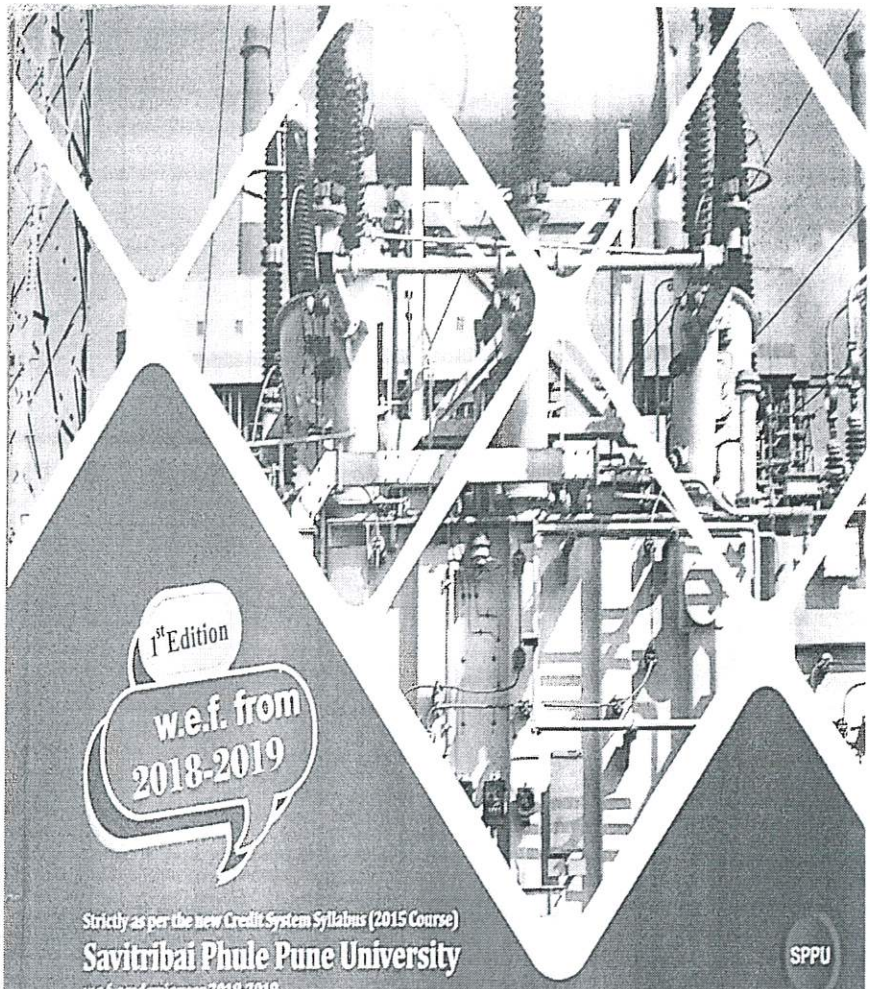

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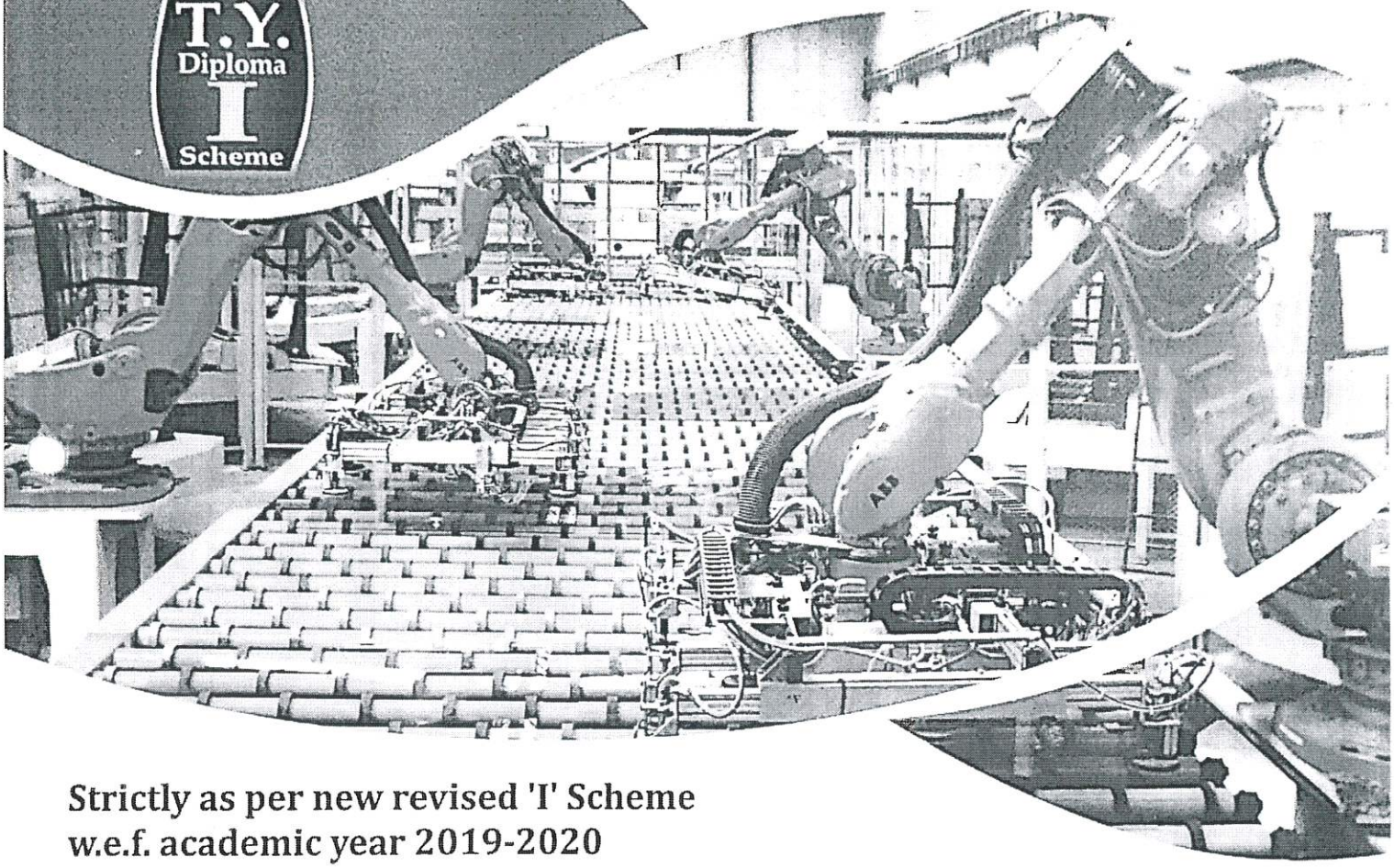

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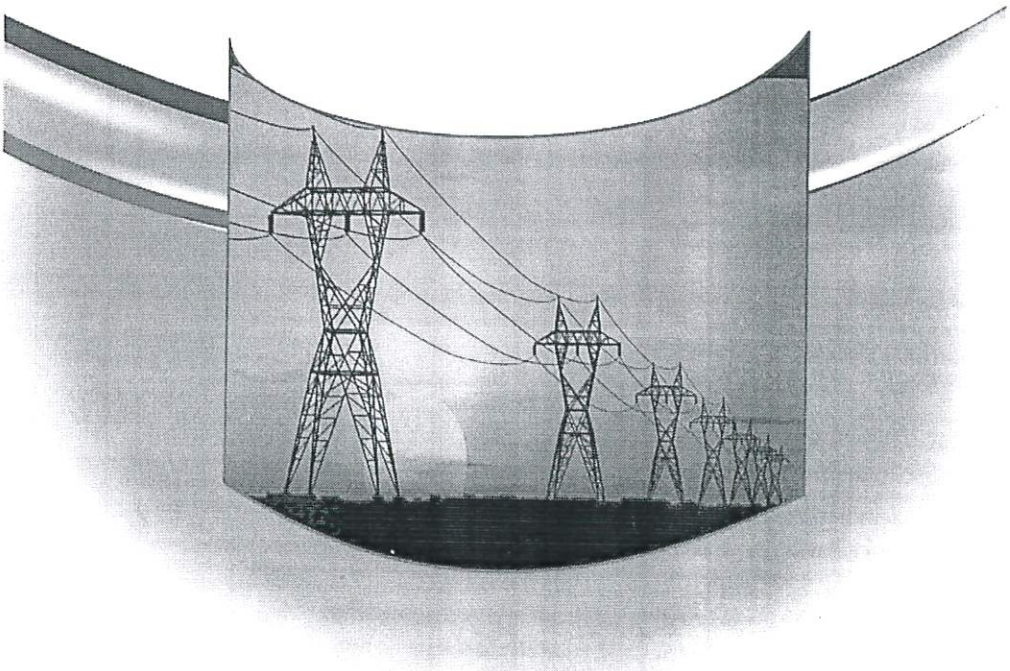

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Department of Mechanical Engineering, Amrutvahini College of Engineering, Sangamner; 21-22 June 2019

Introduction of EGR Strategies for Conversion of Heavy Duty Natural Gas Engine from BS IV to BS VI Norms

D. N. Katkoria[A], Prof. S. V. Chaitanya[B],

Abstract—

As the emission standards were tightened, more advanced management methods were applied that enclosed modifications in engine design and equipment, management of engine parameters and use of exhaust after treatment devices. Reduction of toxic substances emission from combustion engines will be achieved by primary (inside engine) measure and secondary (outside engine) measures. To fulfill the specified demand, the alternative fuels utilized in petrol and diesel engines have become the topics of interest nowadays. For this reason, natural gas is employed as another fuel. The present work is to provide a characterization of oxides of nitrogen emitted from a BS IV engine which is to be converted to BS VI complaint engine. This paper analyses the impacts of the application of an exhaust gas recirculation (EGR) system on the performance and emissions of 103 kW port injection, turbocharged inline four cylinder 4 stroke natural gas heavy duty engine with exhaust gas recirculation. Engine performance and emissions will be evaluated for different load and EGR settings. The results were compared with the engine operating with its original configuration without the EGR system.

Index Terms— **CNG, EGR, NOx, SCR, WHTC**

I. Introduction

Nowadays, the world is facing serious problem of the air pollution with the increase in population and its increasing demand of the energy. To meet the required demand, the alternative fuels used in gasoline and diesel engines are becoming the subjects of interest today. Most of the concerns are driven by two factors first is various new laws pertaining to clean air and second is energy independence from petroleum based fuel. Natural gas, observed as green fuel, has emerged as an answer to depleting fossil fuel resources further as deteriorating urban air quality drawback. There are 3 types of gas: liquefied gas (LNG) liquefied petroleum gas (LPG) and compressed natural gas (CNG). Each LNG and CNG are supported alkane series [1-5].

D. N. Katkoria[A], PG Student, Department of Mechanical Engineering, AISSMS College of Engineering, SPPU, Pune, Maharashtra, India. (divyanilkatkora@gmail.com)
Prof. S. V. Chaitanya[B], Associate Professor, Department of Mechanical Engineering, AISSMS College of Engineering, SPPU, Pune, Maharashtra, India. (svchaitanya@aissmscoe.com)

Exhaust gases coming back from burning engine contains oxides of carbon (COx), oxides of gas (NOx), unburnt organic compound, oxides of sulphur (SOx), carbon particles, etc that are terribly venturous and produces dangerous impact on atmosphere. With current technology it's inconceivable to develop such an engine that creates terribly less amount of emission [6-9]. To cut back these harmful gases, they need to be reduced among the cylinder or treated after exhaust. EGR is often used to scale back quantity of Nox in S.I. engines in addition to C.I. engines [10-14].

Production of nitrogen oxide is function of combustion temperature, highest close to stoichiometric condition wherever temperature is at peak value. Most Nox emission happens at slightly close to lean condition, wherever the combustion temperature is high and excess chemical element is accessible to react with nitrogen. Therefore easiest way to cut back Nox emission is to lower the temperature of combustion chamber. For this, EGR is used [15-18].

Heavy-duty CNG engines and vehicles, like buses, were normally mass-produced in the mid-2000s. Until EURO-V emission regulation, lean-burn fossil fuel engines were wide used as a result of those area unit favourable for fuel economy and thermal sturdiness [19-20]. Until now, the lean-burn natural gas engine has been able to cope with EURO-V emission rules while not requiring pricy after-treatment systems.

However, in keeping with the most recent technology trend, once the EURO-VI emission laws were issued, the combustion methodology for large gas engines is step-by-step changing from lean combustion to a stoichiometric air fuel ratio [21].

In the case of gas engines, lean burning alone cannot satisfy N oxides (NOx) laws for EURO-VI laws and emission standards from the U.S.A. Environmental Protection Agency, thus an pricy after-treatment system, like absorption De-NOx catalyst or selective chemical action reduction, ought to be put in. Therefore, most gas engines are expected to use a mixture of stoichiometric combustion, three-way catalyst, and cooled exhaust gas recirculation (EGR) [22].

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Mechanical Engineering
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1

Vibration Analysis and Optimization of Automotive Front Bumper

Mr. Mangesh P. Wagh, PG Student, Department of Mechanical Engineering, AISSMS, COE, Pune.
Mr. O. A. More, Associate Professor, Department of Mechanical Engineering, AISSMS, COE, Pune.

FEA

Abstract--**The ideal concept behind the bumper design is to take the benefit of it plastic deformation to absorb the possible crash energy during collision of automobile. The goal of the study is to validate the experimental modal analysis of bumper results with numerical modal analysis of bumper. The bumper model is generated by using 3D software CATIA V5, model analysis done in ANSYS 19.2, The main objective of the modal analysis is to identify natural frequency, mode shapes in order to prevent failure of car parts. In presented work the attempt has been made with Simulation of forming process for generating the FE-model of the bumper and optimization of Bumper specimen with Vertical Stiffeners. To compare the modal analysis result with FFT analysis result.**

Keywords—bumper, Vibration, Stiffeners, FEA, ANSYS.

I. Introduction

World is now focused on the rapid developments in the various fields such as aerospace, space, automotive, electronics, and defense, infrastructure developments & power generation. Automotive sector has emerged as booster to the economy of nations over worldwide. As automotive manufactures are looking to bring light weight and fuel efficient vehicles in market. So there is continual research on reducing the cost of vehicle by utilizing the light weight composites which can give similar mechanical characteristics as compared to metals parts used in automobile.

Currently in world research works focus on use of aluminum and glass fiber composite to be utilized in manufacturing of bumpers of automobiles. It is anticipated that this aluminum glass fiber composite can absorb the lateral or transverse loading occurred during accidents or deliberately happed incidents. In this work Mild steel Specimen is used. method is used for modeling and simulation. Also the FEA results are validated with experimental results.

In automotive industries, factors, such as vehicle weight reduction and energy absorption through the large deformation but in a controlled manner of the frontal vehicle structure, is getting researcher major focus over the last few years, with particular reference to pedestrian safety. Now a day an increasing knowledge of mechanical properties of composite materials makes this group of material as a potential candidate for these applications. A bumper is front-most or Rear most part of automobile, ostensibly designed to allow the car to withstand in an impact without causing damage to the vehicle's safety systems. During high speed impact, they are not capable of reducing injury to vehicle occupants but being increasingly designed to mitigate the injury to pedestrians struck by cars.

II. LITERATURE REVIEW

After studying the various papers of author Lu Wei [1], Mahesh Kumar v. Dange [2], Suresh Doddi [3], E.D. Francis [4] and Alen John [5] and others, all the researcher brings to attention many points that need to take care while designing the automobile bumper.

Bumper comes under the category of passive safety [1]. Transportation is identified as the major sector contributor to the accidents. The main challenges in front of designer are the safety concern which plays a very major role in all kind of vehicle. The main theory behind the designing of bumper is that it should absorb the major energy during the low speed or high speed collision. Bumper play major role in low speed impact not in high speed. During low speed impact it not only prevent injury to passenger but also helps other system of vehicle like Hood, Head lamps, fuel tank and exhaust and cooling system. Material, shape and condition of impact need to study to enhance crashworthiness. During research of author Mahesh Kumar [2] for studying the bumper of different material and found that M220 material minimizes impact force, stress distribution, bumper beam deflection and maximize the elastic strain energy.

Alloys of aluminum are generally used material in bumper because of its low density and high strength to weight ratio.

Head of Department
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Performance Assessment of Robust & Efficient Video Stabilization Algorithms based on L1- L2 Optimization and s-R-t Transform

Publisher: IEEE

S. M. Kulkarni ; D. S. Bormane ; Chankya Kumar Jha All Authors

Abstract: Video stabilization is the method of removing unwanted movement from a video stream. In this paper, we have proposed three algorithms for stabilization of jittery videos.... **View more**

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Abstract:
Video stabilization is the method of removing unwanted movement from a video stream. In this paper, we have proposed three algorithms for stabilization of jittery videos. 1.Video stabilization based on LI norm 2.Video stabilizatior based on s-R-t transform 3.Video stabilization based on LI&L2 norm The first algorithm is based on L1 norm. L-I norm is related with Least Absolute Deviation (LAD). It is minimising sum of absolute difference between consecutive video frames. In the second Algorithm, hybrid technique which is the combination of RANSAC (Random Sample consensus Algorithm) and s-R-t (scale-rotation-translation) transform is proposed to stabilize jittery videos. RANSAC algorithm is used to find effective inlier correspondences and afterward it derives the affine transformation to map the inliers in consecutive video frames. This transformation is capable to improve the image plane. This transform makes smoothening of video frames and also removes jitter in video. To obtain the optimal camera path composed of distinct constant, linear and parabolic segments, we have minimised the first, second, and third derivatives of the resulting camera path. The third algorithm based on LI-L2-norm. L2 optimization achieves the best estimation in least square sense. In order to keep the boundary information of original videos as much as possible optimal smooth camera path should be close to the original path. λ is a weight to adjust the smoothness of path. It can be treated as a factor which controls the degree of stabilization. Comparing the stabilized and shaky video it is confirmed that the processed video highly satisfy the human perception. Results indicate a remarkable elimination of high jitter from shaky videos.

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Head
Department of Electronics & Telecommunication
AISSMS's COE PUNE-411001.

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Enhancing Capacity of Existing Fiber Optic Link Performance to 128 Terabit/s-Km using Multi-Pumped Raman Amplification Scheme

T. S. Khatavkar,
Faculty at Dept. of E & TC,
PVG's COET, Pune
Research Scholar at JSPM's RSCOE, Maharashtra, India.

D. S. Bormane,
Principal at AISSMSCOE,
Research Guide at RSCOE,
Pune, Maharashtra, India.

Abstract— **Migrating the 2.5 Gb/s and 10 Gb/s existing optical links to 40 Gb/s and 100 Gb/s to provide a cost-effective and reliable solution to bandwidth-intensive applications such as Tele-Health-care networks, video-driven IP traffic, internet gaming etc.is a great challenge to the optical industry. We demonstrate the performance of Fiber Raman amplification scheme of 40 x 10 Gb/s system pumped by four pump lasers with moderate power levels to provide a maximum gain of 15.17 dB and gain variance of 0.02 dB in a transmission fiber with small effective area of 72 μm^2. A novel cost-effective approach with co-propagating scheme is investigated that resulted in an enhanced optical signal to noise ratio of 22.07 dB with a performance of 128 Terabit/s-km.**

Keywords—Fiber Raman amplifier; dense wavelength division multiplexing; multi-pumped Raman amplifier; co-propagating pump; optical signal to noise ratio.

I. INTRODUCTION

Telemedicine helps to provide healthcare where there is none and improve healthcare where there is some. Health care industry is continuously modernizing itself to extend the specialized and easily accessible tele-services-care to the people in urban, rural and remote areas. Live audio-video interaction, sophisticated tele- surgery, transfer of high quality pathology and radiology images, multi-media in telemedicine and timely transmission of life-saving medical care demand extremely huge *transmission rates* and *reach* from the fiber-optic backbone network. Recent improvements in technologies and ICT when used with terrestrial fiber-optic infrastructure, can provide a tremendous reduction in transmission times and reliable transfer of the health-care advice to the grass root level and that too at a lower cost. The availability of state of art components such as high power laser pumps, extremely high speed tunable laser modulators, multiplexers, de-multiplexers, reconfigurable add drop modules, filters, highlysensitive receivers and the ultra-low-loss – terabytes of bandwidth of glass fibers, enable the up-gradation of existing fiber-optic telecommunication networks to provide quality medical services to the needy patients across the country. Advanced medical systems (transmission of full motion videos) demand higher data rates of the order of 40 Gb/s to 100 Gb/s. To migrate the current fiber optic systems working at 10 Gb/s to 100 Gb/s line rates, the optical signal to noise ratio (OSNR) needs to be improved to compensate for the wider receiver bandwidth requirement [1]. The most straightforward way to improve the OSNR is the enhancement of linearity in optical fibers. Though erbium doped fiber amplifier (EDFA) is a mature amplification mechanism, Fiber Raman Amplifier (FRA) being a low noise amplifier, is an ideal candidate for ultra-long haul networks.

II. RAMAN AMPLIFICATION SYSTEM

To carry tremendous information such as voice, motion videos, internet games, Video - driven IP traffic, advanced IP services, Telemedicine, and network storage, there is a need to maximize the *capacity* and *reach* of the optical backbone networks. The installed transmission fiber acts as a gain medium because of Raman amplification effect. This effect occurs in the transmission fiber itself when Raman pump launches high power along with the input optical channels. Stimulated Raman Scattering (SRS) is a nonlinear effect due to interaction between optical waves with molecular vibrations in silica fiber. SRS occurs when the channel power exceeds the threshold power. For a single light wave channel, the threshold power Pth is given by:

$$Pth = \frac{16 * Aeff}{Kp * Leff * g_r}$$

where Kp is the polarization constant (typically Kp=2), *Aeff* is the effective area of fiber, *Leff* is the effective interaction length of fiber, and g is the Raman gain coefficient. The overall optical gain is expressed in terms of the pump intensity Ip as [2]:

$$g(v) = gr(v).Ip = gr(v) * (Pp/Aeff)$$

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18-19

Synthesis of Coconut Shell derived Activated Carbon NBR Composite for Automobile Application

Abhijit S Jadhav, Ashok N Gokarn, S. Mayadevi , G. T. Mohanraj

Abstract - In automobile sector, PVC/NBR rubber blend is filled with activated carbon to prepare fuel tube . Activated carbon alters surface properties.,Because Acid is used to activate the carbon. This acid treatment develops reaction sites on carbon surface and increases compatibility of carbon with rubber. To study this, activated carbon derived from lignocellulosic material *viz*: coconut shell is used.The carbon is activated by phosphoric acid as dehydrating agent in the stoichiometric ratio of 3:1.Activated carbon found comparable with commercial carbon Petrol swelling test ASTM standard D-471-98 (€) results, shows the least deviation in hardness and mechanical propertiesin comparison with commercial rubber. The composite prepared are of 20-Parts per hundred of rubber (PHR) basis. The results obtained are correlated with reference to proximate analysis and hence concluded , fuel tube can be prepared from coconut shell carbon NBR composite.

Index terms: Lignocellulose, phosphoric acid, Activated carbon, nitrile butydiene rubber, Composites, D-471-98 (€)

I . Introduction

Lignocellulose refers to the specific structure of biomass. The main constituents of lignocellulosic biomass comprise lignin, hemicellulose and cellulose. This is a complex structure in which the cellulose is surrounded by a monolayer of hemicellulose and embedded in a matrix of hemicellulose and lignin. Esters and ethers are the integral parts of the lignocelluloses. Also, carbonyl groups are present over three of the carbohydrates, namely lignin, cellulose and hemicelluloses. This structure is as shown in figure 1.

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F.Abhijit S Jadhav is with the Department of AISSMS College of Enginnering, INDIA (corresponding author phone: +919226244007; fax: 91-20-2605 8943 ; e-mail: asj.paper@gmail.com).
S.Ashok N Gokarn was with CEPD,CSIR-National Chemical Laboratory,Pune INDIA (e-mail: ngokarn@yahoo.com).
T. Susheeladevi Mayadevi was with CEPD,CSIR-National Chemical Laboratory, Pune INDIA (e-mail: smdevimaya@gmail.com).
F.Govindraj T Mohanraj is Department of Chemical Engg.,Birla Institute fTechnology,Medra, Ranchi (Email: gtmohanraj@gmail.com) supporting the processing and testing of the rubber composites.).
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SUNRISE ELASTOMERS,M.I.D.C.CHAKAN, PUNE- 411044 INDIA (Maharashtra) India

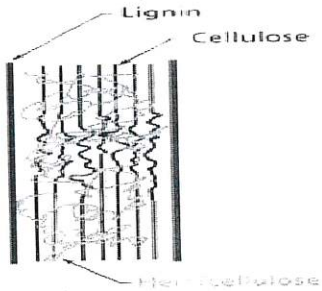

Fig 1: Structural representation of lignocellulose

Activated carbon is a versatile material with high porosity and surface area. The activation may be physical or chemical. Chemical activation reduces tar formation. Chemical activation is carried out with wood as the starting material. In the beginning, wood is impregnated with a concentrated solution of activating agents. It results in degradation of cellulosic material. Chemical-impregnated material is then pyrolysed at 400^0C in the absence of air. Pyrolysed product is cooled and washed to remove activating agent, which is recycled. On calcination, impregnated and chemically dehydrated raw material results in charring and aromatization, and creation of porous structure. Pottasium disulphide, alkali metal hydroxide, and carbonate and chlorides of Ca^{+2}; Mg^{+2} and Fe^{+3}. Activating agent acts like dehydrating agent which influences the pyrolytic decomposition and inhibit the formation of tar. Also, it decreases the formation of acetic acid, methanol etc. and enhance the yield of carbon. Due to enhanced surface properties, it has become one of the technically important material for selective separations commercially. Nevertheless, its application fields are restricted due to high cost.

This difficulty has led to search for the use of cheap and efficient alternative materials such as rice husk [1], bamboo [2], sugarcane stalks [3], tamarind kernel powder [4], palm shell [5] babool wood [6], bagasse, fly ash [7], ashoka leaf powder [8], coir pith [9] and banana pith [10] etc. Biomass wastes are considered to be a very important feedstock because they are renewable sources. Activated carbon such produced can be used as effective adsorbent because of high adsorptive capacity. However, continuous production of activated carbon with reproducibility of characteristics is restricted by the seasonal availability of the starting material.

To address this issue partly, Coconut shell which is available throughout the year irrespective of season, is used as starting materials for carbon preparation. Rubber industry is a huge consumer of carbon as reinforcing material. The filler is used to impart certain properties to

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Synthesis of EPDM rubber coconut leaves activated carbon composite for automobile application

Abhijit S Jadhav
AISSMS COE, India

This paper reports on usability of activated carbon obtained from coconut leaves (CL) as a filler to prepare Ethylene-propylene-diene monomer (EPDM) based composite for automobilebased application. The carbon is prepare and activated by phosphoric acid (H_3PO_4) as dehydrating agent and was sieved for mesh size of CL-355, CL-710, CL-500, and CL-53. The stoichiometric ratio of phosphoric acid to biomass is maintained as 3:1 for 300 g of batch size.CL-355 given optimised results for yield, methylene blue number, Iodine number and surface area found greater as compared with the CL-710, CL-500, CL-53. CL- 355. Hence CL-355 mesh size activated carbon was adapted for further study. SEM was studied to know the morphology of activated carbon. Compounding is carried out on a two-roll mill and at 160°C. As compared to commercially available carbon filler, the activated carbon derived from coconut leaves biomass waste responded better to the petrol swelling test. Activated carbon derived from coconut leaves was appeared to be the best for percent swelling and percent deviation in hardness. The composite prepared are of 40 parts per hundred (Phr) basis.

Speaker Biography

Abhijit S Jadhav is a founder faculty member of Department of Chemical Engineering, AISSMS College of Engineering, India. He earned a Bachelor of Chemical Engineering (1994), a Master of Engineering (2008), and is pursuing a PhD (Chemical Engineering) from Birla Institute of Technology, India. He has developed "STOPPER" a composite product from EPDM/Coconut leaves activated carbon in association with Pallavi rubber ltd. India for automobile application. He has conducted several lectures in Industry and colleges. For the past 20 years, Abhijit has taught various Chemical Engineering subjects in AISSMS College. His interests includes: interactive learning, scaffolding lessons for all skill levels; and incorporation of technical innovative ideas within his classroom. He is a member of the organization, "Institution of Engineers", "Indian Institute of Chemical Engineers", "Indian Society of Technical Education".

e: asj.paper@gmail.com

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