GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Approved by AICTE, New Delhi, Affiliated to JNTUK)
Madhurawada , Visakhapatnam. 530048.

Vidyut-2k22

VIDYUT-2K22

Issue-6

Your body is the ENGINE
Your mind is ENGINEER

INDEX

PRINCIPAL'S MESSAGE

It is indeed a matter of immense pride that the Electrical Department of GVPCEW is bringing out its magazine "Vidut 2K22. I am very sure that this magazine will not only enhance the technical knowledge of the readers in the field of Electrical Engineering but will also foster their professional development.

There has been an endeavour of the college to focus on providing our students with a supportive and inclusive learning environment that promotes diversity and inclusiveness finally leading to the holistic development. The publishing of the department magazine is a formidable step in this direction, which will not only provide networking opportunities but will also inspire to generate new ideas and instill the innovative thinking in the minds.

I would like to complement the editorial team for their efforts in bringing out such a professional magazine.

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HOD'S MESSAGE

The EEE dept at G.V.P. College of Engineering for Women facilitates to take the responsibility of producing highly skilled and competent engineer who are capable of handling wide range of challenges related to nations energy scenario. Our faculty and students have contributed various research papers that have been published in national and international journals and conferences.

Through internal trainings, workshops, and trainings outside the campus , students and faculty members are given plenty of chances to advance their knowledge in the field of science and technology to work individually and in a group , especially in IT and power industries. Hence, we are committed to build a professional graduate community that is vibrant and encourages life-long learning. To meet the new challenges in Electrical and Electronic Engineering we strengthen our academic practices by incorporating more social and entrepreneurial ideas

On the whole ,I encourage everyone to join us particularly students' parents and faculty members by reviewing these e-magazines

EDITORIAL

Educational institutions are the " temples of learning "in parlance of great thinkers. It is institutions which create individual values as contributing citizens of India.

Profession of Engineering is old as human life is yet to be synchronized globally thereby giving deserved respectability to the engineer. It is in this direction much work needs to be done through continuous productive interactions between institutions, industrial associations and global regulatory bodies.

It is interesting to learn about the institution's services rendered in shaping lives of youngsters who arrive as raw individuals at the portals of this institution. Deep rooted conviction of management combined with dedicated faculty has made us stand out as an institution of reckoning for the past 10 years. Our best wishes to every member of the team for making expressions become much awaited magazine of Indian fraternity.

We are happy to bring out this issue of " VIDYUT" for the year 2022.This is followed by the regular sections of Technology Review, Know a Scientist, Short Story and Puzzles, Arts. This issue also contains the contributions and achievements of the students and faculty of the department during the year. We are thankful to the entire department for their continuous support in bringing this issue successful.

VISION

To develop into a centre of learning that empowers students with contemporary knowledge in Electrical and Electronics Engineering.

MISSION

- Impart skills both in traditional and modern areas of Electrical & Electronics Engineering
- Provide exposure to latest developments in the field through Seminars, Industrial visits, Workshops and Paper presentations.
- Prepare the young minds to apply professional engineering practices by considering environmental and societal needs

PROGRAM EDUCATIONAL OBJECTIVES

After successful completion of the program, the graduates will be able to:

- PEO-1: Possess a strong educational foundation in mathematics, science, electrical engineering and soft skills in the diversified sectors of the industry.
- PEO-2: Exhibit critical thinking, problem-solving skills, and design systems in professional engineering practice.
- PEO-3: Establish leading and supportive positions in society by adopting lifelong learning skills with a commitment to their ethical and social responsibilities.

PROGRAM SPECIFIC OUTCOMES

Engineering Graduates will be able to:

- PSO-1: Design and analyse systems that efficiently generate, transmit, distribute and utilize electrical power.
- PSO-2: Demonstrate proficiency in the use of hardware and software tools for solving the complex engineering problems in renewable energy and other emerging areas.

KNOW A SCIENTIST

Tessy Thomas (born April 1963) is an Indian scientist and Director General of Aeronautical Systems and the former Project Director for Agni-IV missile in Defence Research and Development Organisation.] She is the first ever woman scientist to head a missile project in India.

Early life

Tessy Thomas was born in April 1963 in Alappuzha, Kerala, to a Syrian Christian family. She was named after Mother Teresa (Tessy being a derivative of Teresa or Tressia). There is conflicting information on whether her father was an IFS officer or a small-time businessman or an accountant. When Thomas was 13 her father suffered from a stroke which left his right side paralyzed. Her mother who was a teacher remained a home maker to look after the family in such dire condition. She grew up near Thumba Rocket Launching Station and says her fascination with rockets and missiles began then. She was stimulated even by the wonderment of aircraft flying.

Education

Tessy Thomas studied in St. Michael's Higher Secondary School and St. Joseph's Girl's Higher Secondary School in Alleppey (Alappzuha). She had a natural flair for mathematics and physics. She scored one hundred percent in mathematics during her 11th and 12th years in school. In the same years she had also scored more than ninety five percent in science. She took an education loan of Rs. 100 per month from State Bank of India to study engineering from Government Engineering College, Thrissur. She also received a scholarship that covered her tuition fees having been entered into the first ten students of the merit list during her admissions. The loan gave her the courage to live in a hostel while pursuing her B. Tech. In both school and college Thomas was involved in extracurricular activities including political issues. She excelled in sports especially badminton bringing much recognition to her alma maters. She also has an M. Tech in Guided Missile from the Institute of Armament Technology, Pune (now known as the Defence Institute of Advanced Technology). She also pursued MBA in Operations Management and Ph.D. in guidance missile under DRDO.

Career

Tessy Thomas joined DRDO in 1988, where she worked on the design and developments of the new generation ballistic missile, Agni. She was appointed by Dr. APJ Abdul Kalam for the Agni Project. In addition, Tessy was the associate project director of the 3,000 km range Agni-III missile project. She was the project director for mission Agni IV which was successfully tested in 2011. Later, Tessy was appointed as the project director of the 5,000 km range Agni-V in 2009, which was successfully tested on 19 April 2012. In 2018, she became the Director-General, Aeronautical Systems of DRDO.

Awards:

Thomas received the Lal Bahadur Shastri National Award for her contribution for making India self-reliant in the field of missile technology. She was also the recipient of the Dr Thomas Cangan Leadership Award at the Faculty of Management Studies – Institute of Rural Management, Jaipur (FMS-IRM) in 2018.

Publications:

- Tessy Thomas, (1 July 2005). "Guidance Scheme for Solid Propelled Vehicle during Atmospheric Phase". Defence Science Journal. **55** (3): 253–264.
- Sudhakar, R.; Venkanna, M.; Rao, B. V. Papa; Thomas, Tessy (2017). "Prediction of Real Gas and Non-Equilibrium Effects in the Gas Dynamics of Canister Launch Missile". 30th International Symposium on Ballistics.

FACULTY ARTICLE

Design and Implementation of a New Inverter Topology with Reduced THD and Part Count

Devendra Potnuru,
Associate prof GVPCEW

Abstract

The quality of power generation from various energy sources is essential for industrial and household applications. To achieve the quality of power by reducing the Total Harmonic Distortion (THD) through multilevel inverters (MLIs) is an attractive solution. MLIs have drawn tremendous performance as compared to the classical two-level inverter for reducing the %THD and lower electromagnetic interference (EMI). However, MLIs having more device count and intricacy of the circuitry and reducing the THD further might affect the cost, size, and complexity of the circuit. In this paper, a new inverter topology is proposed to have a low level of THD and reduced part count. The proposed topology consists of a combination of the synchronous buck converter and cascaded with an H-bridge. This approach reduces the requirement of the number of isolated dc voltage sources, switches, and other components in addition to low %THD. More specifically, the proposed inverter does not need dc voltage sources of different values, minimizes the cost and size of the system as compared with the conventional and hybrid topologies. The effectiveness of the proposed converter is validated using the results of both simulations and experiments on the laboratory prototype of the 150W converter.

***Index Terms*—Inverter, Power quality, Total Harmonic Distortion (THD), Multilevel inverter**

I.INTRODUCTION

Power converter plays a significant role in the utilization of conventional and non-conventional energy sources for industrial and household applications. The concept of Microgrid, Distributed Generation (DG), and solar energy conversion have been done using power converters such as DC-DC/AC or vice-versa, which are used in various applications such as UPS, induction heating, HVDC, electrical vehicles, FACTS devices [1-4].

In the last decade, many works have been proposed to reduce the Total Harmonic Distortion (THD), especially in multilevel inverters and which can deliver high power. These inverters have more number voltage levels and low dv/dt stress on switches [5-8] and are classified as Cascaded H-Bridge (CHB), Neutral Point Clamped, and Flying Capacitor inverters, and (CHB) [9], [10]. In several applications with pumps, compressors, fans, etc, have been powered by the CHB inverters [11]. Several basic units are connected in cascade with H-bridge for generating the positive and negative sequence of output voltages in cascaded MLI topology [12]. However, it requires more energy sources, further increase in the cost and the size of the converter. A 41 level MLI topology with a less number of active switches and THD is implemented in [13]. Nevertheless; it is equipped with several diodes leads to an increase in the conduction losses and comparatively reduced efficiency. New MLI topology is presented in [14] and is designed without an H-bridge topology but has a lesser number of switches comparatively with conventional MLI's.

The cascaded sub multilevel inverters are proposed with symmetric and asymmetric configurations in [15]. This topology has more voltage levels and thereby reduced THD, further results in a more complex circuit configuration. A novel cascade of MLI's with a diode switch is suggested in [16], in this topology one DC source is used for each switched diode level. However, it is not feasible to have more voltage levels for achieving desired THD as this leads to an increase in the part count. A hybrid structure of symmetrical MLI is developed in [17] and it gives improved performance with the reduced number of active switches, dc sources, and power diodes. However, capacitor balancing is treated as one of the key issues in this topology. Asymmetrical cascaded MLI has been experimented in [18] and different algorithms were used for generating the 17-level and compared with various existing topologies. It has a parallel connection of switches and sources. A novel cascade switched-diode MLC is presented with the symmetric and asymmetric configurations in [19]. It gives a higher voltage level with the minimum number of switches and sources with a reduced level of THD. However, it has a drawback of increased part count to achieve the desired %THD. In [20], a novel topology is proposed based

on the concept of switched DC sources with reduced power switches, in turn, improved the performance of the converter. However, it has a high THD value. The topologies developed in [21], [22], are concentrated on getting lower THD by using cascaded symmetrical and asymmetrical H-bridge MLI's. However, this topology has drawbacks of higher device count cost, bigger size, and more complexity of the converter.

Many Multi-level Inverters with increased voltage levels have been proposed in the literature for less %THD and thereby to achieve good power quality, however, it increases the complexity of the converter due to the more number of active switches and sources. In this paper, a simplified inverter topology with reduced part count and percentage of THD is proposed and with a simple control strategy. The designed inverter has the following advantages:

a) Reduced part count of power semiconductor devices
b) No need for auxiliary diodes
c) It is based on a single source
d) Less %THD
e) Simple design and low control complexity

The manuscript is structured as follows; the design of circuit configuration and its operation are presented in Section. II. The description of loss and efficiency calculation is given in section III. Further, Comparative performance analysis is presented in Section-IV. Results are described in Section V and the conclusion is presented in Section VI.

II.CIRCUIT TOPOLOGY AND OPERATION OF THE PROPOSED CONVERTER

A new simplified inverter topology has been designed, with a simple switching structure with lower device count as shown in Fig.1; the topology is based on the combination of the synchronous buck converter and conventional H-bridge with compact size and reduced control complexity. The switches T_1-T_4in the conventional H-bridge and other front-end switches S_1-S_2 are a complement to each other during the operation of the converter. The modes of operation of this topology are explained in Fig. 2(a) and (b) respectively. The proposed converter gives the two-level output.

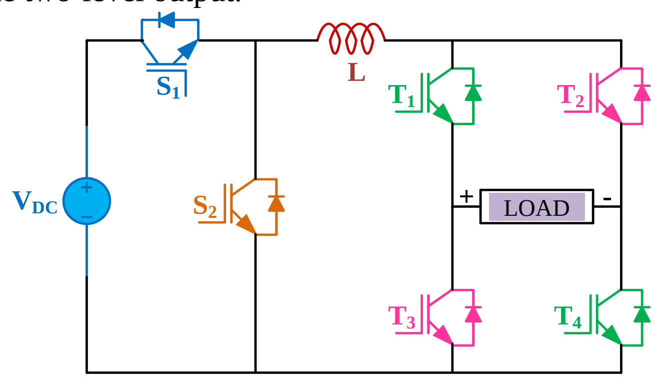


Fig. 1. Proposed high power density inverter topology

Modes of operation

Mode1:

In this mode, the front end switch $S_1$and switches T_1, T_4 from conventional H-bridge are turned ON simultaneously. During the mode of operation, the inductor is energized due to the current flow through the V_{DC+} -S_1-L-T_1-Load-T_4-V_{DC}as marked in the dotted line in Fig. 2(a). The duty ratio for this mode of operation is considered to be 0.61.

Mode2:

In this mode, switch T_1 and T_4 are turned ON while other switches are kept turned OFF. Then the inductor (L) is de-energized through switch $S_{2,}$ as the path dotted line shown in Fig. 2(b). It is observed that with Modes 1&2, the polarity of the output voltage is positive across the load.

Mode3:

The operation of the circuit in this mode is shown in Fig. 2(c), during this mode the switches S_1, $T_{2,}$ and

T_3 are conducting. The inductor (L) is energized as the path of currently marked in Fig. 2(c) through S_1.

Mode4:

This mode operation is shown in Fig.2 (d), through the equivalent circuit, and during this mode, the devices T_2, T_3, and S_2 are kept turned ON. It is observed that the inductor is de-energized as the path is as marked in Fig.2 (d). Now during modes 3 &4, the polarity of the output voltage across the load is negative.

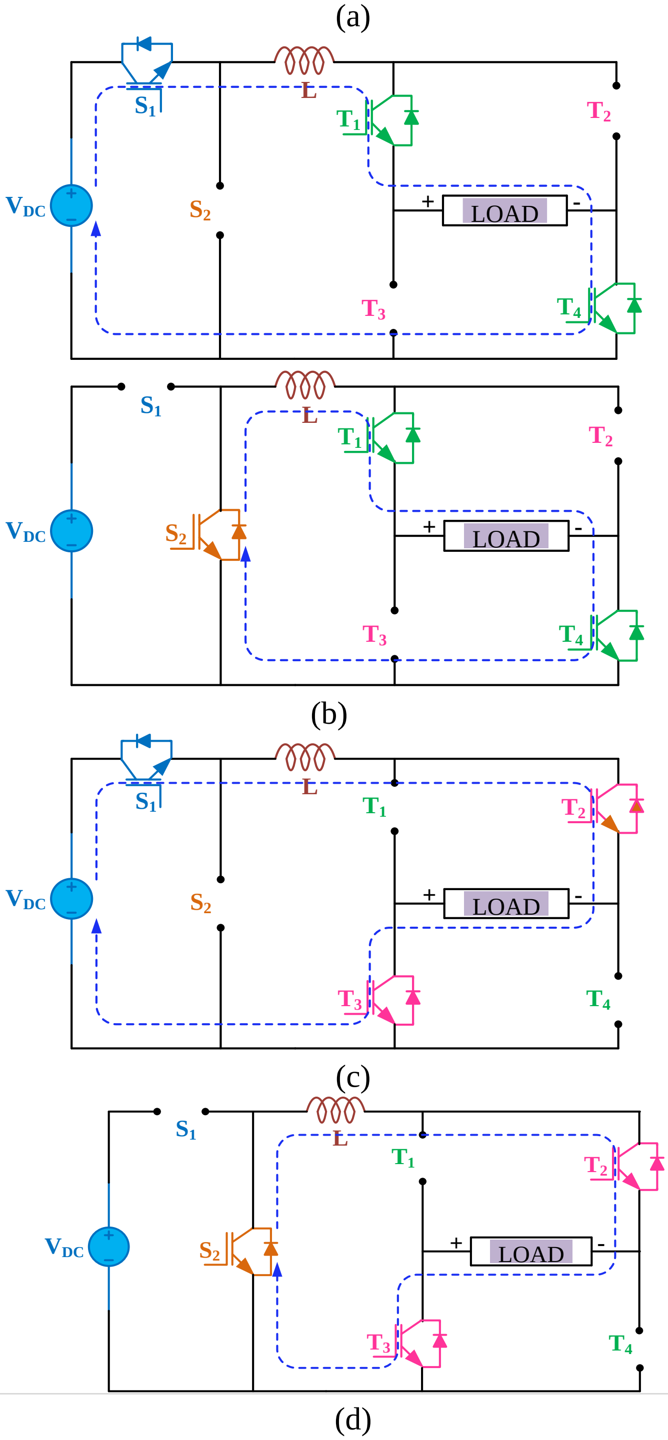


Fig. 2. Switching combination and current path: (a) Mode 1, (b). Mode 2, (c). Mode 3 and (d). Mode 4

III.PARAMETERS DESIGN

The design of a power converter circuit essentially depends on finding values of inductors, capacitors, duty cycle, type power switch, and switching frequency for the specified power rating. Even though inductors and transformers are both magnetic components, there is a very important difference in their functioning and design aspects. The design procedure of the converter parameters is given equations (1) – (5) [23].

$$P_{out\,max} = V_0 I_{0\,max}$$
$$P_{out\,min} = V_0 I_{0\,min}$$
(1)

$P_{out\ max}$= maximum output power, $P_{out\ min}$ = minimum output power, V_0= Output voltage (peak-peak), I_{0max}= maximum output current and I_{0min}= maximum output current

$$R_{L\,min} = \frac{V_0}{I_{0\,max}}$$
$$R_{L\,max} = \frac{V_0}{I_{0\,min}} \qquad (2)$$

R_{Lmin}= minimum load resistance and R_{Lmax}= maximum values load resistance

The minimum and maximum values of the dc voltage transfer function are

$$M_{V\ DC\,min} = \frac{V_0}{V_{DCmax}}$$
$$M_{V\ DC\,max} = \frac{V_0}{V_{DCmin}} \qquad (3)$$

$$d_{min} = \frac{M_{V\ DCmax}}{\eta}$$
$$d_{max} = \frac{M_{V\ DCmin}}{\eta} \qquad (4)$$

d_{min} = minimum value of the duty cycle , and d_{max}= maximum value of the duty cycle

Where 'η' denotes the efficiency

Equation (4) gives the proper selection of the duty ratio which is related to voltage conversion and efficiency of the converter. The minimum inductance

$$L_{min} = \frac{R_{L\,min}(1-d_{min})}{2 f_s} \qquad (5)$$

f_s = switching frequency

The above expression is shown the relation between the duty ratio, load, and required inductance for different load values; the corresponding required inductance is obtained from equation (5). The design parameter details of the proposed converter are presented in Table 1.

Table. I Designed Parameters Details

Parameter	Symbol	Value	Unit
Output power	P_{out}	150	W
Supply voltage	V	50	V
voltage	V_{rms}	35.35	V
current	I_{rms}	4.2	A
Inductor	L	16.5m	H

Output RMS voltage expression of the proposed converter in terms of the duty ratio d_1, $d_2$is derived from various modes of operation is shown below.

$$V_{rms} = \sqrt{\left[\frac{1}{T}\int_0^t V_{DC}^2(t)dt\right]}$$

(6)

$$V_{rms}^2 = \frac{1}{T}\left[\int_0^{t_1} V_{DC}^2 (1 - e^{\frac{-t}{\tau}})^2 dt + \int_{t_1}^{t_2} V_{DC}^2 (e^{\frac{-t}{\tau}})^2 dt\right]$$

(7)

$$V_{rms}^2 = \frac{V_{DC}^2}{T}\left[d_1 T + \frac{L}{2R} + \frac{2L}{R} e^{\frac{-d_1 TR}{L}} - \frac{2L}{R} - \frac{L}{2R} e^{-(\frac{d_1 + d_2}{L})R}\right]$$

(8)

IV.POWER LOSS AND COMPARATIVE ANALYSIS

A.Power Loss Analysis

Power losses involve the conduction loss (P_{con}) and switching loss (P_{sw}) in any power semiconductor switch[24], [25].

$$P_{loss\_IGBT} = P_{con} + P_{sw} \quad (9)$$

The conduction losses (P_{con}) can be evaluated as

$$P_{con} = \frac{1}{T}\int_0^T (R_{on} i_F + V_{Fo}) i_F dt \quad (10)$$

Where, i_F = Forward current, V_{Fo} = Threshold voltage, R_{on} = Switch ON-state resistance and T = Switching period.

Switching losses are generated during the switch turn-OFF and turn-ON period. In these processes, the current and voltages of the power switches have significant values simultaneously.

The switching losses (P_{sw}) are computed as

$$P_{sw} = \frac{1}{T}\sum_{j=1}^{n}\left[E_{OFF\_IGBT_j} + E_{ON\_IGBT_j}\right]$$

(11)

$$P_{sw} = (E_{OFF,j} + E_{ON,j}) \times f$$

(12)

$$P_{sw} = \frac{1}{6} \times V_B \times I \times (t_{on} + t_{off}) \times f$$

(13)

Where T is time period, n is no. of transition on and off during T, E_{ON_IGBT} and E_{OFF_IGBT} are the energy involved during turn-on and turn-off at the ‘j^{th}’ switch, VB is the blocking voltage, ‘I’ is the current through the switch, t_{on} is the turn-on time and, t_{off} is the turn-off time of the switch.

The efficiency is calculated given in (14)

$$\eta = \frac{P_{out}}{P_{out} + P_{con} + P_{sw}}$$

(14)

Where, P_{out} = output power

B.*Comparative Analysis*

The proposed topology is compared with the inverter topologies existing in the literature and more specifically their approaches towards reducing the %THD in Table.II. The performance of the developed topology is comparatively superior in many aspects and is highlighted in Fig.3. There are many MLIs given the significant attraction in reducing the THD and giving other advantages. Similarly, the suggested approach also has a better THD% with a reduced device count. Fig. 3 shows the comparison between different MILs with the proposed converter

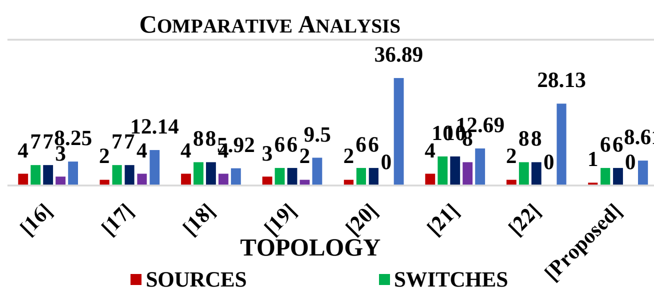


Fig. 3. Comparative Analysis

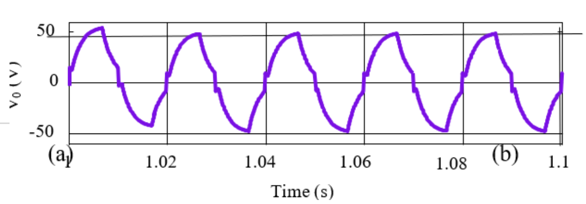
S.no	Name of the Component	MLIs (Classical)	Hybrid MLIs	Proposed
1	Number of sources	4	2	1
2	Switches	24	14	6
3	Diodes	24	0	0
4	Driver circuit	24	14	6
5	Capacitor	16	2	0
6	Size	big	big	< both
7	Power density	Low	Low	High

Table. II Comparison between the proposed and different MLIs for achieving the < 9% THD

V.RESULT ANALYSIS

A.Simulation Verification

Simulation of the proposed converter is tested in the MATLAB/Simulink environment and the parameters are shown in Table 1. In simulation input voltage (V_{DC}) is 50 V and the switching frequency of 100 Hz. The simulation results of the proposed inverter are shown from Fig. 4 to Fig.7. The output voltage V_0across the H-bridge legs is shown in Fig. 4(a) with a peak voltage of 50Vand the corresponding load current is depicted in Fig. 4(b) and is depicted in Fig. 4(c). The voltage across the switches (S_1, S_2, and T_1-T_4) and current flows through the switches (S_1, S_3, and T_1-T_4) are illustrated in Fig. 5 (a-b) and 6 (a-d) respectively. These plots are shown in Fig.5 and Fig.6 represent the voltage and current stresses on the power semiconductor switches, when the power switch is turned ON, the voltage across the switch is zero and the current is flowing through the switch. Similarly, the active switch is OFF, the voltage across the switch is the input voltage and the current flow through the switch is zero. The FFT analysis of the proposed inverter for its output voltage is depicted in Fig. 7 and it is observed that % THD is only 8.61% without using any low pass filter. Moreover, the vertical coordinates in Fig.7 present the relative harmonic amplitude of the output voltage.



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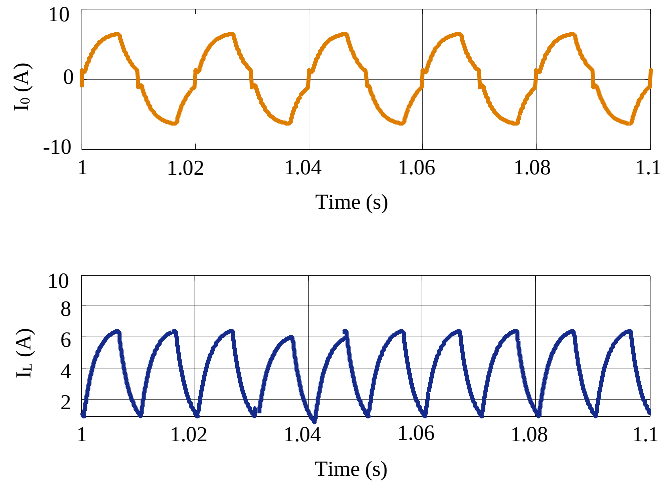


(c)Fig. 4. Simulation of waveforms of (a) Output voltage, (b) corresponding load current, and (c) Inductor current

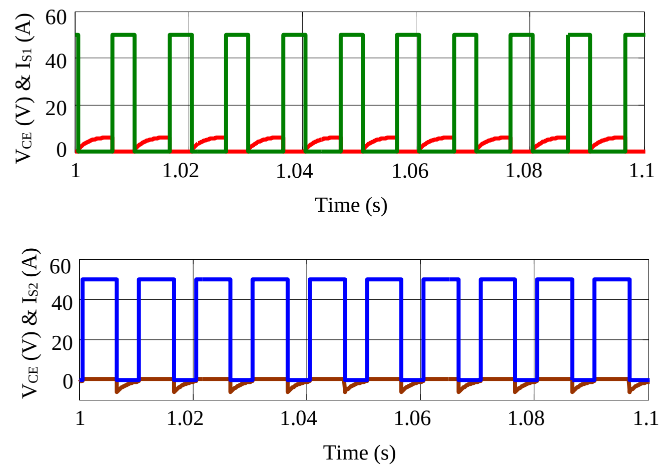


Fig. 5. Semiconductor stress of the switch (S_1-S_2): (a) S_1 and (b) S_2

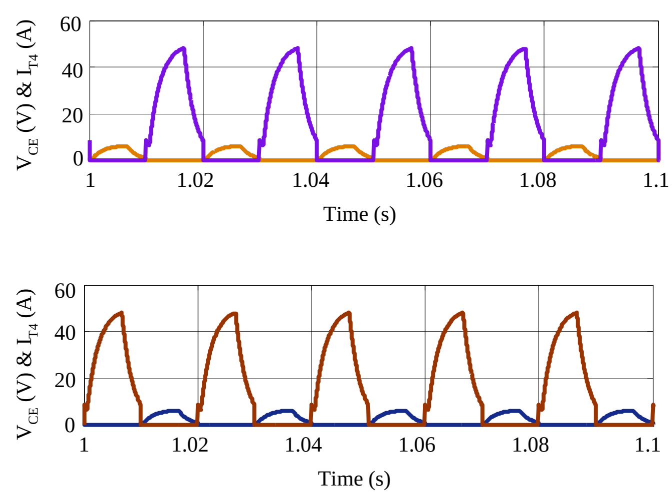


Fig. 5. Semiconductor stress of the switch (S_1-S_2): (a) S_1 and (b) S_2

flows through the switches are presented in Fig. 9(a-b) and 10(a-d) respectively. From Fig. 9 and 10 the maximum voltage stress on active switches is the supply voltage. FFT analysis of the experimental voltage waveform is illustrated in Fig. 11(a), it is observed that %THD is 9.4. The efficiency of the proposed inverter is shown in Fig. 11(b) and is plotted as efficiency vs output power as a function of load variation. The snapshot of the experimental setup of the proposed inverter is shown in Fig. 11(c).

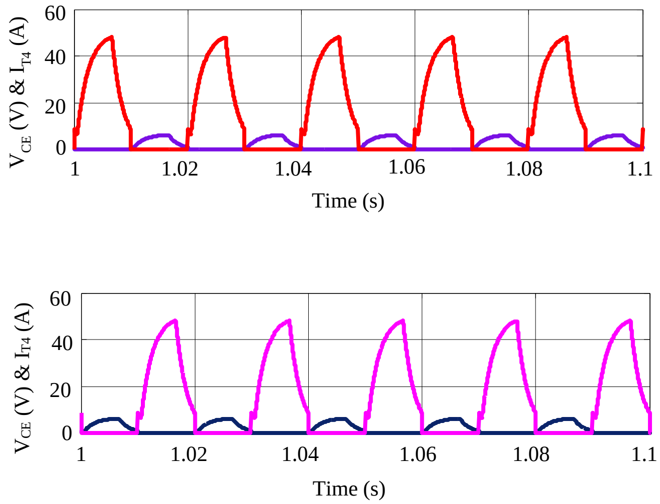


Fig. 6. Semiconductor stress of the switch (T_1-T_4): (a) T_1(b) T_2 (c) T_3 (d) T_4

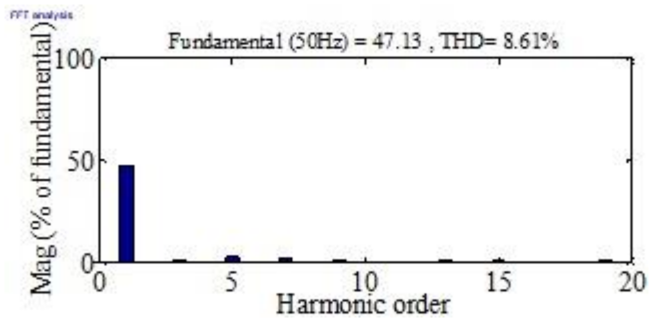
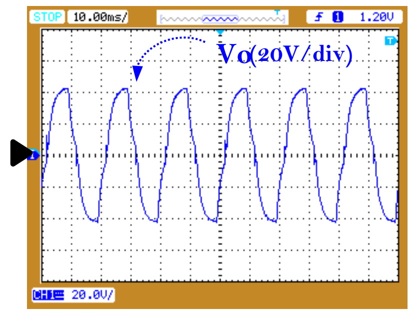


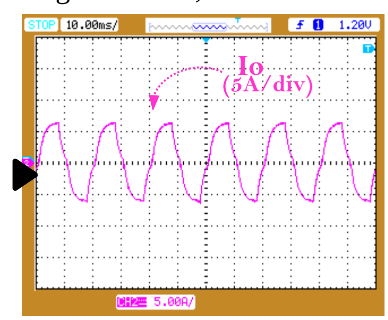
Fig. 7. FFT analysis of the proposed topology.

Experimental verification

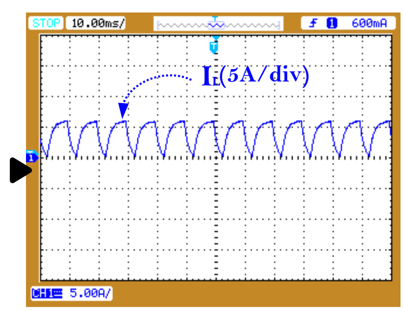
The practical feasibility of the proposed topology is validated on the laboratory prototype of the inverter. The experimental setup consists of a power supply (0-30V, 0-10A HMP 4030), IGBT switches (STGW30NC120HD IGBTs) with internal anti-parallel diodes along with protection and A3120 gate driver circuits embedded in a module. The control logic has been implemented using the dSPACE1104 digital controller. The gate pulses to the switches are provided from the digital controller through the digital I/O pins. These gate signals are the input to the gate driver circuits. The parameter specifications of the proposed prototype are given in Table II. The corresponding output voltages, load current, and current flows through the inductor are illustrated in Fig. 8(a-c) respectively. Fig. 8(a) closely matches the theoretical and experimental results. The voltage across the switches and current



(a).(Voltage: 20V/div, Time: 10ms/div)

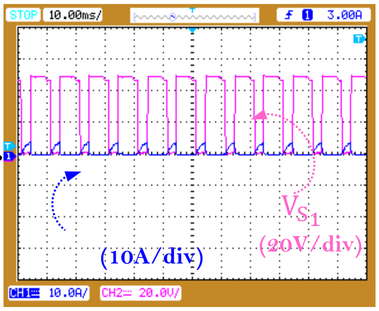


(b).(Current: 5A/div; Time: 10ms/div)

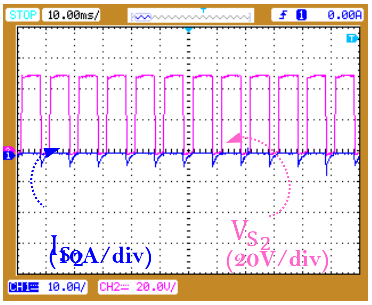


(c). (Current: 5A/div, Time: 10ms/div)

Fig. 8. Experimental waveforms: (a) Output voltage of the converter, (b) Load current, and (c) Inductor current

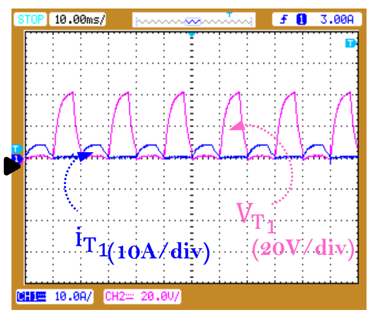


(a)

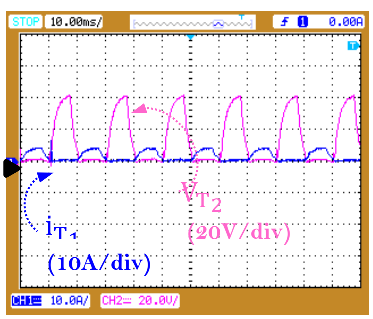


(b)

Fig. 9. Experimental stresses of switches (S_1-S_2): (a) S_1, and (b) S_2



(a)



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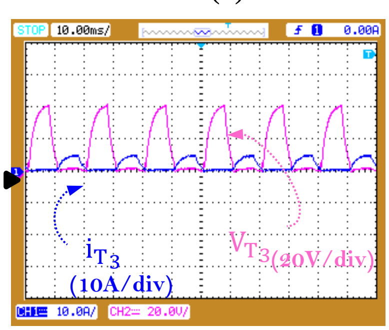
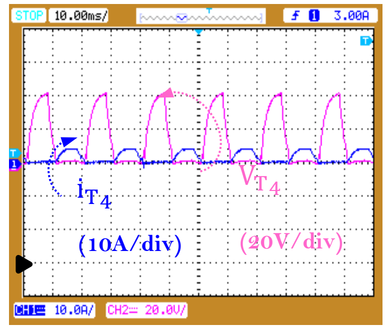
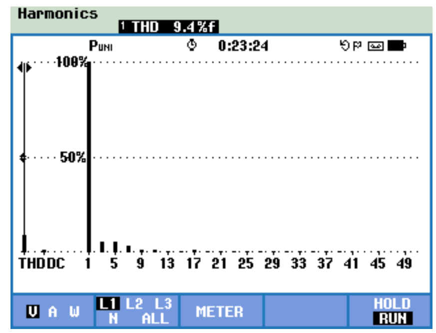


(c)

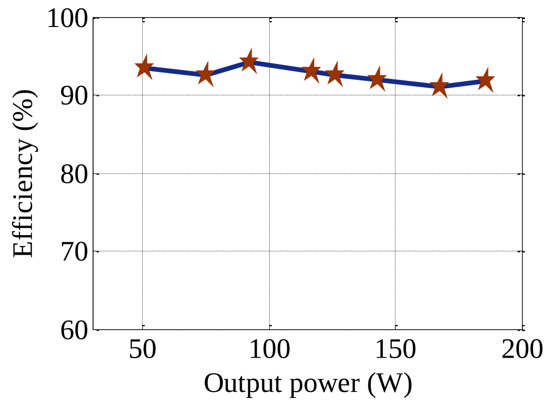


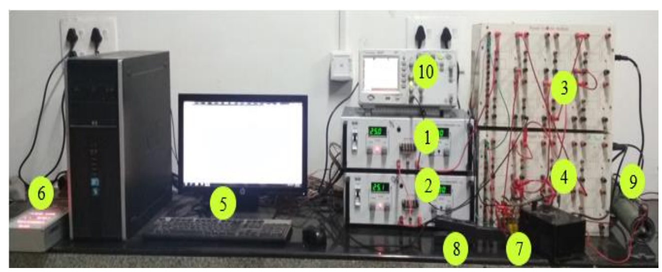
(d)

Fig. 10. Experimental stresses of switches (T_1-T_4): (a) T_1, (b) T_2, (C) T_3, and (d) T_4



(a)





(b)

(c)

Fig. 11. (a) FFT analysis of the proposed topology, (b). The efficiency of the proposed converter, and (c).Schematic of the prototype circuit in the laboratory: (1) and (2) Voltage sources (V_1+V_2), (3), (4) IGBT switches with driver circuit, (5) Host PC, (6) dSPACE Controller, (7) Inductor (L), (8) Current probe, (9) Load

(R) (10) DSO.

VI. CONCLUSION

In this paper, a new inverter topology is proposed and the configurations with modes of operation have been presented. It has the advantages of low %THD, switch count, cost, size, and complexity and is suitable for low voltage and high current applications. A comprehensive analysis has been done with different aspects of the existing inverters to show the novelty and advantages of the proposed inverter. The performance of the proposed inverter is validated using a low-power (150W) laboratory prototype circuit and with simulation results.

COMPLIANCE WITH ETHICAL STANDARDS

No funding was received for conducting this study. The authors have no conflicts of interest to declare that are relevant to the content of this article.

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STUDENT ARTICLE

FLOATING SOLAR POWER SYSTEM

K. Anusha Devi

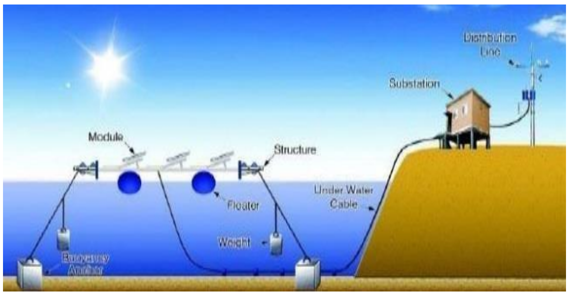
III EEE Dept. GVPCEW

ABSTRACT:

Floating photovoltaic (FPV) systems are one of the globally emerging technologies of renewable energy production that tend to balance the water–energy demand by effectively saving the evaporated water from reservoirs while generating electrical power. This study presents the performance analysis of a model FPV plant in an Indian reservoir. The Mettur dam reservoir located in Tamil Nadu, India with a hydroelectric power plant of 150-MW capacity is considered as a test case. The preliminary design of the FPV plant is proposed based on a detailed study of the key design elements and their suitability for Indian reservoirs. The proposed plant is numerically analysed for various tilt angles, mounting systems and tracking mechanisms in order to assess its potential power generation. A flat-mount system in landscape orientation was found to exhibit high performance ratio. Further, a fixed-tilt FPV system with a panel slope of 10° and an FPV system with single-axis tracking were found to be suitable for the Mettur reservoir. Further, cost analysis of the FPV system is also presented along with the carbon-footprint estimation to establish the economic and environmental benefits of the system. The results show that the total potential CO_2 saving by a FPV system with tracking is 135 918.87 t CO_2 and it is 12.5% higher than that of a fixed-mount FPV system.

1. INTRODUCTION:

India proposes the generation of solar power from renewable energy sources up to 1.75 GW and 1 GW of solar PV power in next 10 years. The country is forwarding as per the policies declared. As on date around 5000 MW has been commissioned in different parts of country, as per the Jawaharlal Nehru National Solar Mission. [1] To match the targets declared, the progress noted so far is not sufficient and requires hard effort by each state and state departments to achieve the desired targets and make the country consuming green power in the world. Floatingsolar PV plants are an emerging form of PV systems that float on the surface of irrigation canals, water reservoirs, quarry lakes, and tailing ponds. Several systems exist in France, India, Japan, Korea, the United Kingdom and the United States [31-34] These systems reduce the need of valuable land area, save drinking water that would otherwise be lost through evaporation, and show a higher efficiency of solar energy conversion, as the panels are kept at a cooler temperature than they would be on land [35]. The energy obtained from solar PV system is renewable, eco-friendly and sustainable with long life of system. There are various advantages of floating solar PV power plant compared to roof top and ground mounted such as better efficiency of solar panels due to cooling of panel by air above the water bodies, it reduces water evaporation and because of shading of water it reduces algae growth. [11]. The perennial problem with solar power stations is the need for land availability to install the panels. With increasing cost and scarce availability of land, global attention is focused on using water body surfaces for lodging PV panels as an alternative to ground-mounted systems. This method efficiently utilizes the nation's soil without damaging environment which the pre-existing PV systems cause when they are installed in farmlands or forests. Studies have shown that if the rear surfaces of solar panels are kept cooler, then their ability to generate power goes up by 16%. Solar panels installed on land face reduction of yield as the ground heats up.When such panels are installed floating on lakes, lagoons or ponds, they are naturallycooled and generate more power than those setup on land. The floating panels shade the water by reducing the amount of sunlight entering into the water body, and in turn limit algae growth and reduce evaporation during hot summers. This reduces water contamination and promotes marine life sustainability. If spate of initiatives announced by all leading nations in the recent past is an indicator, floating solar systems are



bound to change the technology scenario for water bodies and Solar energy applications globally, in near future. In this work, a low- cost solution is developed and demonstrated to setup floating solar power generation module. These modules are ideally suited for village ponds and lakes to facilitate aeration, cleaning and illumination. They can also be used to power advertisement display boards, which can generate revenues for the village authorities.

2. FLOATING SOLAR PV SYSTEM:

Floating solar arrays are PV systems that float on the surface of drinking water reservoirs, quarry lakes, irrigation canals or remediation and tailing ponds. A small number of such systems exist in France, India, Japan, South Korea, the United Kingdom, Singapore and the United States. The systems are said to have advantages over photovoltaic on land. The cost of land is more expensive, and there are fewer rules and regulations for structures built on bodies of water not used for recreation. Unlike most land-based solar plants, floating arrays can be unobtrusive because they are hidden from public view. They achieve higher efficiencies than PV panels on land, because water cools the panels. The panels have a special coating to prevent rust or corrosion.

3. FEATURES OF FLOATING SOLAR PV SYSTEM:

By installing solar panels over a pond, the panels are naturally cooled, resulting in improved power production performance. The cooler environment also reduces stress on the sys-tem, extending the system's lifespan. Floating solar is cost competitive with roof and ground-based single-axis tracking solar systems and uses the same commercially available solar panels. Similar to land-based solar, the floating installations qualify for federal and local grant and incentive programs. Aside from generating power, the systems also provide other environmental benefits. As an example, the solar power generating system shades the water

and can reduce evaporation by up to 70%. The systems can also improve water quality. As water bodies are exposed to the sun,

4. COMPONENTS OF FLOATING SOLAR PV SYSTEM:

1. Pontoon/Floating Structure –

A pontoon is flotation structure and has buoyancy enough to float on water and support a heavy load. The structure is designed such as it can hold number of panels.

2. Mooring System –

A mooring refers to any permanent structure to which a floating structure maybe secured. A floating structure is secured to a mooring to forestall free movement of the floating structure on the water. An anchor mooring fixes a floating structure's position relative to a point on the bottom of a waterway without connecting the floating structure to shore.

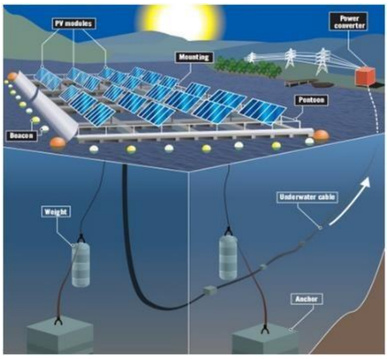
3. Solar Module –

A single solar module can produce only a limited amount of power; most installations contain multiple modules. A photovoltaic system typically includes a panel or an array of solar modules, a solar inverter, and sometimes a battery and/or solar tracker and interconnection wiring. Mostly crystalline solar PV modules have been used for the floating solar systems.

4. Cabling –

Due to their outdoor usage, solar cables are specifically designed to be resistant against UV radiation and extremely high temperature fluctuations and are generally unaffected by the weather.

photosynthesis promotes growth of organic matter, including algae. By shading the water, algae growth is reduced, minimizing the associated treatment and labor costs.



5. VARIOUS FLOATING SOLAR PV INSTALLATION IN INDIA:

A) Small Size Power Plants (up to 100 kWp)

- In Kolkata 10 kW also known as first solar power plant of India.

B) Medium Size Power Plants (100 to 500 kWp)

- In Kerala 100kW, this plant is operated by NTPC.

- 2 MW project by Greater Visakhapatnam Smart City Corporation Limited (GVSCCL) in Vishakhapatnam

C) Large Size Power Plants (above 1500 kWp)

- 1GW India plans world's largest floating solar power plant at Madhya Pradesh. The propriety nature of the technology somewhat limits the literature available on floating PV installations. Illustrates the floating PV projects developed worldwide to date for electricity generation

6. PROJECT HISTORY:

The Aichi project was the first solar project known to have ever been constructed on water. It was realized by a group of researchers from the National Institute of Advanced Science and Technology in Japan [12] and financed by the Japanese Ministry for the Environment. The aim of this research was to introduce the concept of floating PV systems as well as an analysis of the effect of module temperature on the PV system performance. The Far Nanette Wineries claimed to have the first significant, grid- connected solar system installed on water. The installation was managed by SPG Solar. The so-called photovoltaic system ismade up of modular

crystalline PV panels mounted on pontoons in a pond (Fig. 3). The floating structure hasin-built walkways between each row of panels to allow for ease of access for cleaning and maintenance of the panels.

7. FLOATING SOLAR POWER PLANT PROJECTS IN INDIA:

• In Kolkata 10 kW also known as first solar power plant of India.

• In Kerala 100kW, this floating solar plant is operating by NTPC.

• 2 MW project by Greater Visakhapatnam Smart City Corporation Limited (GVSCCL) in Vishakhapatnam.

• 1GW India plans world's largest floating solar power plant at Madhya Pradesh.

8. WORKING OF SOLAR PANEL:

The working of floating solar plant is ground mounted solar power plant and the basic Steps of Solar Energy Generation in floating solar power plant:

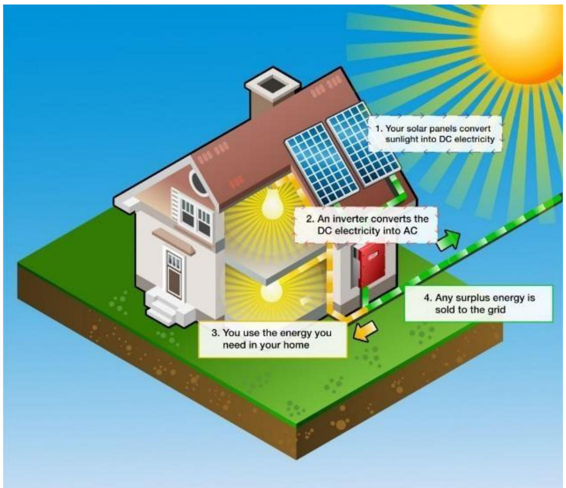
1. Sunlight hits the solar panels, and creates an electric field.

2. The electricity generated flows to the edge of the panel, and into a conductive wire.

3. The conductive wire brings the electricity to the inverter, where it is transformed from DC electricity to AC, which is used to power buildings.

4. Another wire transports the AC electricity from the inverter to the electric panel on the property (also called a breaker box), which distributes the electricity throughout the building as needed.

5. Any electricity not needed upon generation flows through the utility meterand into the utility electrical grid. As the electricity flows through the meter, it causes the meter to run backwards, crediting your property for excess generation.



9. WHY FLOATING SOLAR PV NOW A DAYS:

Solar panels actually work better when they are cooled. That's why if you have two identical systems, one on land and one on the water, the one on the water is going to actually perform better. This is why a country like Germany, which is notknown for its tropical climate, can be oneof the leading countries when it comes tosolar power.

Another advantage of floating solar panels is that they can shade the water they float on and reduce evaporation by up to 70%. For example, if a 3-acre water storage pond was covered with solar panels, 4 million gallons of water could potentially be savedfrom evaporating every year. Also, the solar panels prevent sunlight from hitting the water which can slow down algae growth. When it comes to energy generation, one square acre of floating solar panels is capable of generating 500,000 kWh. These solar panels are also a smart new technology because they can be deployed in cities and towns without a lot of space. Obviously, a country like Japan is a good example, as they are alwaysdealing with a lack of space. However, municipalities across the world are findingout that when they don't have anywhere else to put solar panels, they can always putthem on the water.

10. ADVANTAGES:

There are several advantages that's why weuse floating solar power plants which are: -

- Water saving and water quality
- Storage opportunity
- Environment control
- Efficiency improvement

11.DISADVANTAGES

- Cost. - The initial cost of purchasing a floating solar is fairly high.
- Weather Dependent. Although solar energy can still be collected during cloudy and rainydays, the efficiency of the solar system drops.
- Solar Energy Storage Is Expensive.
- Uses a Lot of Space after installing floating solar power plant not any type of work can be done.
- Associated with Pollution.

12. FUTURE SCOPE OF FLOATINGSOLAR POWER PLANTS IN INDIA:

India has the potential to set up 300 Gigawatt of power generation capacity by tapping into floating solar technology, Mitesh Patel, Director of Renewables, Asia and EMEIA at Engineering, Procurement and Construction (EPC) giant Black & Veatch tells ET Energy world in an interview.

FACULTY JOURNALS

Journals Published in the Year 2022

Sl. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Link to the recognition in UGC enlistment of the Journal
1	New class of Power Converter for Performing the Multiple Operations ina Single Converter: Universal Power Converter	Dhananjaya Mudadla, **Devendra Potnuru**, Raavi Satish, Almoataz Y. Abdelaziz and Adel El-Shahat	EEE	Energies 2022		https://doi.org/10.3390/en15176293
2	Design and Implementation of Single- Input- Multi- Output DC- DC Converter Topology for Auxiliary Power Modules of Electric Vehicle	Mudadla Dhananjaya, **Devendra Potunuru** Prem Kumar Manoharan And Hassan Haes Alhelou	EEE	IEEE ACCESS		
4	Implementation of Harris Hawks optimization for load frequency control of hydropower plant	**Devendra Potunuru**, Lagudu Venkata SureshKumar, Bankuru Sonia, Yellapragada Venkata Pavan Kumar, Darsy John Pradeep, Challa Pradeep Reddy	EEE	International Journal of Power Electronics and Drive Systems (IJPEDS)	2088 - 8694	
5	A New Multi-Output DC- DC Converterfor Electric	Mudadla Dhananjaya, **Devendra Potunuru**, Thanikanti	EEE	IEEE ACCESS		r 10.1109/ACCESS.2022.3151128

	Vehicle Application	Sudhakar Babu, Belqasam Aljafari, Hassan Haes Alhelou				
6	Transformer Based 25-Level T-Type MLI for Renewable Energy Integration	**Krishna Molli,** P. Ajay D Vimal Raj, N.P. Subramaniam	EEE	IEEE Journal of Emerging and Selected Topics in Industrial Electronics	2687 - 9735	-

FACULTY CONFERENCES

Sl. No.	Name of the teacher	Title ofthe paper	Title of the proceedings of theconference	Nation al/ Interna tional	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication
1	Dr ASV Vijaylakshmi	Robust Stability Constrai nts for Optimal Lead LagPSS Design using interval approach	International Conference on Artificial Intelligence Techniques for Electrical Engineering Systems(AITEES 2022) (Springer Nature)	Inter national	doi.org/10.299 /978-94-6239-266-3.	GVPW
2	Dr P Devendra	Control of Continuous stirredtank reactor using Arithmetic Optimization Algorithm	Green and ResilientEnergy Systems (GVCON 2K22)	National		GVPW

DEPTEARTMENT ACTIVITIES

Department Activities Organised for The Year 2022

S.NO	Activity type	Name of the topic/subject	Date	Resource Person/Judge	Student Partcipation
1.	Guest Lecture	"An Overview on Shunt Active Power Filters"	28-12-2022	Dr. P. Kishore Associate Professor Department of EEE Jain University Banglore, Karnataka	IInd EEE IVth EEE
2.	Guest Lecture	"Power Systems"	13-12-202	Dr.P.K. Sen Emeritus Professor Colorado School of Mines, USA.	IInd EEE IVth EEE
3.	Industrial Visit	Floating Solar Power Plant	22-10-2022	Dr.A.S.V. Vijaya Lakshmi, Asst.Professor GVP College of Engineering for Women Dr.V. Sree Vidya, Asst.Professor GVP College of Engineering for Women Visakhapatnam	IIIrd EEE
4.	Department activity	Tesla Inuarguration	02-09-2022	Dr.A. Hemachander Asst.Professor EEE Department NIT Puducherry	IIIrd EEE IVth EEE
5.	Tesla Inauguration	Guest Lecture	02-09-2022	Dr. A. Hemachander	II & III
6.	Department day celebrations	Tesla valedictory function	27-05-2022	-	II&III EEE&IV EEE

7.	Two days worshop	Two days worshop on autocad	20-05-2022 to 21-05-2022	Mr.Ch Vijaya Lakshmi-Assitant Professor GVP College Of Engineering,Visakhapatnam	II&III EEE
8.	Field Visit	Roof Top Hybrid Power Plant	23-03-2022	Mr .M.Krishna-Assitant Professor GVP College Of Engineering,Visakhapatnam	II EEE
9.	Field Visit	Roof Top Hybrid Power Plant	19-03-2022	Mr .M.Krishna-Assitant Professor GVP College Of Engineering,Visakhapat-nam	III EEE
10.	Interactive Session	Career Development &Smart goals	25-02-2022	Dr.P.Venkata Rao-Chairman ,T&P GVP College Of Engineering,Visakhapat-nam	III EEE

Industrial Visit of Floating Solar Power Plant, Mudasarlova, Visakhapatnam

Inauguration of Tesla Event (2022)

A two-day Workshop on AUTO-CAD by Ms. Ch Vijaya Lakshmi-Assitant Professor,GVP College Of Engineering,Visakhapatnam.

Field Visit of Roof Top Hybrid Power Plant

STUDENT ACTIVITIES

IIIrd- EEE Students:

S.NO	NAME	ROLL NO	INTERNSHIP ATTENDED AT	TOPIC	TIME PERIOD
1.	A. Varalakshmi	20JG1A0201	Pantech e-learning	IOT with Machine learning	14-09-2022 to 15-10-2022
2.	A. Lakshmi Chaitanya	20JG1A0202	Pantech e-learning	IOT with Machine learning	14-09-2022 to 15-10-2022
3.	A. Renuka	20JG1A0203	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
4.	A. Jyotshna	20JG1A0204	1Stop	Artificial intelligence (AI)	01-10-2022 to 15-11-2022
5.	B. Shivani	20JG1A0205	1Stop	Web Development	01-10-2022 to 15-11-2022
6.	B. Vineela	20JG1A0206	1Stop	Web Development	01-10-2022 to 15-11-2022
7.	B. Sonia	20JG1A0208	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
8.	B. Samyukta	20JG1A0210	Pantech e-learning	IOT with Machine learning	14-09-2022 to 15-10-2022
9.	Ch. Sirisha	20JG1A0211	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
10.	Ch. Harshita	20JG1A0212	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
11.	D. Sreeja	20JG1A0213	Pantech e-learning	IOT with Machine learning	14-09-2022 to 15-10-2022
12.	G. Pavitra	20JG1A0214	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
13.	G. Neelima	20JG1A0215	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022

14.	G. Priyanka	20JG1A0216	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
15.	K. Priyanka	20JG1A0217	1-Stop	Web development	01-10-2022 to 15-11-2022
16.	K. Gayatri	20JG1A0218	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
17.	K. Vijaya Aashritha	20JG1A0219	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
18.	N. Poojitha	20JG1A0220	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
19.	K. Neelima	20JG1A0221	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
20.	P. Shyamili	20JG1A0222	IEEE Pantech e-learning	Python programming	16-08-2022 to 15-09-2022
21.	P. Sai Sushmitha	20JG1A0224	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
22.	R. Naga Sri Lakhsmi Sai	20JG1A0225	Internshala Trainings	Python programming	14-11-2022
23.	R. Aashritha	20JG1A0226	1-Stop	Web development	01-10-2022 to 15-11-2022
24.	S. Haritha Kumari	20JG1A0227	Pantech e-learning	IOT with Machine learning	14-09-2022 to 15-10-2022
25.	S. Meghana	20JG1A0228	IEEE Pantech e-learning	Python programming	16-08-2022 to 15-09-2022
26.	S. Akhila	20JG1A0229	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
27.	T. Kousalya	20JG1A0230	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
28.	V. Anitha	20JG1A0231	IEEE Pantech e-learning	Python programming	16-08-2022 to 15-09-2022

29.	A. Ruchita	21JG5A0201	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
30.	A. Lavanya	21JG5A0202	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
31.	B. Sharmila	21JG5A0203	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
32.	C. Divya	21JG5A0204	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
33.	D. Keerthi	21JG5A0205	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
34.	D. Chandrika	21JG5A0206	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
35.	G. Priyanka	21JG5A0207	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
36.	G. Devi	21JG5A0208	IEEE Pantech e-learning	Python programming	16-08-2022 to 15-09-2022
37.	K. Bhavani	21JG5A0211	Internshala Trainings	Machine learning with python.	17-10-2022 to 28-11-2022
38.	K. Deepika	21JG5A0212	Internshala Trainings	Machine learning with python.	15-09-22 to 07-11-22
39.	K. Megha Priya	21JG5A0213	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
40.	L. Gayatri	21JG5A0214	INTERNSHALA Trainings	Machine Learning with Python	2022-08-04 to 2022-09-04
41.	M. Vani	21JG5A0215	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022

42.	M. Basheera	21JG5A0216	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
43.	M. Vasanthi	21JG5A0217	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
44.	K. Mounika	21JG5A0218	IEEE Pantech e-learning	Python programming	16-08-2022 to 15-09-2022
45.	R. Kavya	21JG5A0220	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
46.	R. Sravani	21JG5A0221	IEEE Pantech e-learning	Renewable Energy Design using MATLAB	14-09-2022 to 15-10-2022
47.	S. Bhagya sri	21JG5A0222	IEEE (SB PIT)	Advance Python Programming	5-10-2022 to 20-10-2022
48.	V. Yogeshwari	21JG5A0223	Pantech e-learning	IOT with Machine learning	14-09-2022 to 15-10-2022

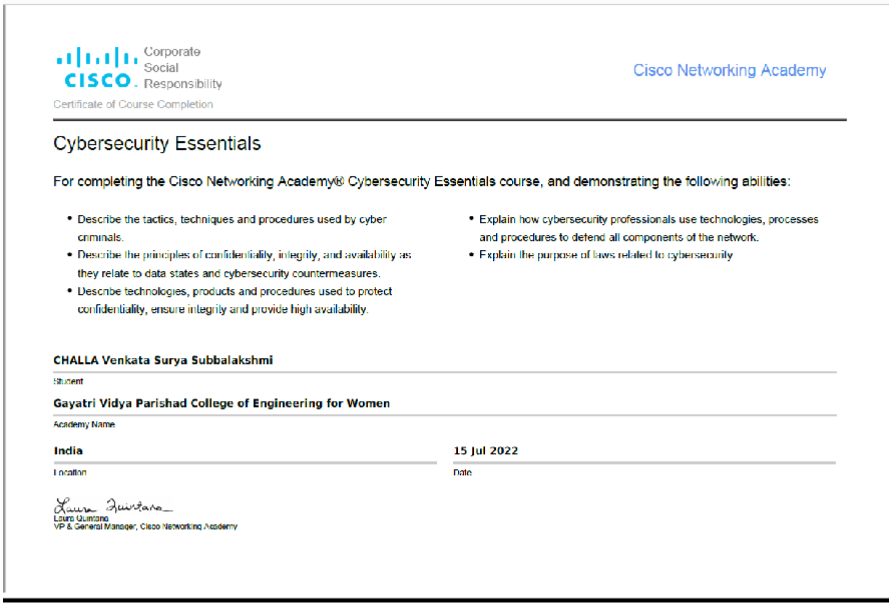
CERTIFICATION COURSES DONE BY STUDENTS

SL.NO	STUDENT NAME	ROLL NO	CERTIFICATE OF COUSRE COMPLETION	NAME OF THE COURSE	TIME PERIOD
1.	B. Sonia	20JG1A0208	MTA Microsoft Technology Associate	Introduction to Programming using Python	27-06-2022
2.	T. Kousalya	20JG1A0230	MTA Microsoft Technology Associate	Introduction to Programming using Python	27-06-2022
3.	N. Pujitha	20JG1A0220	Coursera	Introduction to Programming using Python	23-04-2022
4.	G. Priyanka	21JG150207	Verzeo	Hybrid and electric Vehicles	01-03-2022 to 30-04-2022.
5.	R. Sravani	21JG150221	Verzeo	Hybrid and electric Vehicles	01-03-2022 to 30-04-2022.

Online Value Added Courses Done by EEE Students

S.NO	STUDENT NAME	ROLL NO	CERTIFICATE OF COURSE COMPLETION	NAME OF COURSE	TIME PERIOD
1	C.V.S. SUBBALAKSHMI	19JG1A0204	CISCO	INTRODUCTION TO PACKET TRACER	17-7-22
2	C.V.S. SUBBALAKSHMI	19JG1A0204	CISCO	CYBERSECURITY ESSENTIALS	15-7-22
3	INKULA PRAVALLIKA	20JG5A0204	CISCO	CYBERSECURITY ESSENTIALS	14-7-22 to 17-7-22
4	INKULA PRAVALLIKA	20JG5A0204	CISCO	INTRODUCTION TO CYBERSECURITY	14-7-22 to 17-7-22
5	PATNANA DEVI SRAVYA	20JG5A0213	CISCO	CYBERSECURITY ESSENTIALS	8-7-22 to 11-7-22
6	PATNANA DEVI SRAVYA	20JG5A0213	CISCO	INTRODUCTION TO CYBERSECURITY	8-7-22 to 11-7-22
7	RAMYA SRI MUGADA	19JG1A0220	CISCO	INTRODUCTION TO CYBERSECURITY	2-7-22 to 4-7-22
8	THONDARAPU LAVANYA	20JG5A0220	MTA	INTRODUCTION TO PYTHON PROGRAMMING	29-6-22
9	RAMISETTI NAGASARANYA	20JG5A0218	MTA	INTRODUCTION TO PYTHON PROGRAMMING	28-6-22
10	THONDARAPU LAVANYA	20JG5A0220	CISCO	CYBERSECURITY ESSENTIALS	26-6-22 to 1-7-22
11	DEEPTHI SIDDDA	19JG1A0227	CISCO	INTRODUCTION TO PACKET TRACER	7-6-22 to 7-7-22
12	RAMYA SRI MUGADA	19JG1A0220	CISCO	INTRODUCTION TO PACKET TRACER	5-6-22 to 4-7-22
13	JYOSHNA YANDRAPU	20JG5A0222	CISCO	CYBER SECURITY ESSENTIALS	4-6-22 to 8-7-22
14	JYOSHNA YANDRAPU	20JG5A0221	CISCO	INTRODUCTION TO CYBERSECURITY	4-6-22 to 8-7-22
15	ROSHINI MUDDALA	19JG1A0219	CISCO	INTRODUCTION TO PACKET TRACER	4-6-22 to 4-7-22
16	ROSHINI MUDDALA	19JG1A0219	CISCO	CYBERSECURITY ESSENTIALS	3-6-22 to 2-7-22
17	RAMYA SRI MUGADA	19JG1A0220	CISCO	CYBERSECURITY ESSENTIALS	2-6-22 to 4-7-22
18	DEEPTHI SIDDDA	19JG1A0227	CISCO	CYBERSECURITY ESSENTIALS	1-6-22 to 3-7-22
19	THONDARAPU LAVANYA	20JG5A0220	CISCO	INTRODUCTION TO CYBERSECURITY	20-5-22 to 30-6-22

20	PUJITHA NALLANA	20JG5A0220	GREAT LEARNING	QUANTITATIVE APTITUDE BASICS	10-5-22 to 25-5-22
21	RONGALI SRAVANI	21JG5A0221	VERZEO	HEV	1-3-22 to 30-4-23
22	GARUGUBILLI PRIYANKA	21JG5A0207	VERZEO	HEV	1-3-22 to 30-4-22
23	PUJITHA NALLANA	20JG1A0221	UNIVERSITY OF MICHIGAN	PROGRAMMING FOR EVERYBODY	01-03-22 to 23-03-22
24	PUJITHA NALLANA	20JG1A0220	GREAT LEARNING	PYTHON FOR BEGINNERS LIVECOURSE	01-03-22 to 29-03-22


Corporate Social Responsibility

Cisco Networking Academy

Certificate of Course Completion

Cybersecurity Essentials

For completing the Cisco Networking Academy® Cybersecurity Essentials course, and demonstrating the following abilities:

- Describe the tactics, techniques and procedures used by cyber criminals.
- Describe the principles of confidentiality, integrity, and availability as they relate to data states and cybersecurity countermeasures.
- Describe technologies, products and procedures used to protect confidentiality, ensure integrity and provide high availability.
- Explain how cybersecurity professionals use technologies, processes and procedures to defend all components of the network.
- Explain the purpose of laws related to cybersecurity

CHALLA Venkata Surya Subbalakshmi

Student

Gayatri Vidya Parishad College of Engineering for Women

Academy Name

India

Location

15 Jul 2022

Date

Laura Quintana

VP & General Manager, Cisco Networking Academy

Students Participation in TESLA Activities

S.NO	ACTIVITY NAME	TOPIC	CONDUCTED ON	PARTICIPATION	WINNERS
1.	Technical Presentation		27-05-2022	II &III	1.M. Vasanthi-20JG5A0217
2.	JAM Session	Smart Grids, Artificial Intelligence	27-08-2022	III	1.P. Sai Sushmitha - 20JG1A0224 2.N. Poojitha-20JG1A0220 3. M. Vasanthi-20JG5A0217
3.	JAM Session	Smart City, Cashless Society, Educational Stress	28-09-2022	II	1. A. Girija 21JG1A0201 2.M. Prasanna 21JG1A0211 3.V. Reshma 21JG1A0222
4.	Aptitude Test	Mathematics, logics and reasoning	01-11-2022	III	1. T. Kousalya-(20JG1A0230 2. G. Anitha-20JG1A0231
5.	Tech Ladder	Electrical and General Knowledge	15-11-2022	III	1.R. Naga Sai-20JG1A0225

WORKSHOPS ATTENDED BY STUDENTS

SL.NO	STUDENT NAME	ROLL NO	WORKSHOP ATTENDED	NAME OF THE TOPIC	TIME PERIOD
1.	M. Basheera	20JG5A0216	Pantech e-learning	Master Class on Electric Vehicle Design.	20-06-2022 to 19-07-2022.
2.	G. Devi	20JG5A0208	GEEKS LOOP	Fundamentals of Java script for Algorithms and Web Development.	-
3.	I. Pravallika	20JG5A0204	NIT (Tadepalligudam, Andhra Pradesh)	Advanced Technologies in STEM.	05-07-2022 to 09-07-2022
4.	K. Karuna	20JG5A0207	NIT (Tadepalligudam, Andhra Pradesh)	Advanced Technologies in STEM.	05-07-2022 to 09-07-2022
5.	P. Devi Sravya	20JG5A0213	NIT (Tadepalligudam, Andhra Pradesh)	Advanced Technologies in STEM.	05-07-2022 to 09-07-2022
6.	P. Haritha	20JG5A0217	NIT (Tadepalligudam, Andhra Pradesh)	Advanced Technologies in STEM.	05-07-2022 to 09-07-2022
7.	T. Lavanya	20JG5A0217	NIT (Tadepalligudam, Andhra Pradesh)	Advanced Technologies in STEM.	05-07-2022 to 09-07-2022
8.	Y. Jyoshna	20JG5A0221	NIT (Tadepalligudam, Andhra Pradesh)	Advanced Technologies in STEM.	05-07-2022 to 09-07-2022

Workshop attended by IV.B.tech. EEE Students at NIT (Andhra Pradesh, Tadepalligudam) during July 5-9, 2022.


IEEE Vizag Bay & NIT AP

IEEE Advancing Technology for Humanity

Certificate of Participation

Cert. No. 60

This is to certify that Mr. /Ms. PATNANA DEVI SRAVYA

of GVPCE, VIZAG has participated

a 5-day Summer School on "Advanced Technologies in STEM" from 5-9 July 2022

organized jointly by IEEE Vizag Bay Section and National Institute of Technology, Andhra Pradesh at NIT Andhra Pradesh, Tadepalligudem.

He/She has secured A grade.

Dr. Lakshminarayana Sadasivuni, Chair, IEEE Vizag Bay Section

Dr. V Sandeep, HoD - EE, NIT Andhra Pradesh, Chair, IAS/PES/PLES Joint Chapter, IEEE Vizag Bay Section

Md. Khwaja Muinuddin Chisti, Secretary, IEEE Vizag Bay Section

CO-CURRICULAR ACTIVITIES

Name Of The Student	Roll No	Type Of Activity	Activity	Conducted By	Conducted on
P.Haritha	20JG5A0217	Karate	Secured **Gold Medal** in KAI State Level Championship	Karate Association of India.	15/5/2021
.K. Bhavani	20JG5A210	Patriotic Group Dance	Dance	Music club	30/8/2022
D.Keerthi Reddy	20JG5A205		Dance	Music club	30/8/2022
V. Yogeeswari	20JG5A223		Dance	Music club	30/8/2022
A.N.D.L.Lavanya	20JG5A202		Dance	Music club	30/8/2022
D.Chandrika	20JG5A206		Dance	Music club	30/8/2022
R.P.Bharathi	20JG5A219		Dance	Music club	30/8/2022
Ch. Divya	20JG5A204		Dance	Music club	30/8/2022
Kavya Prasanna Reddy	20JG5A220	Regional Dance	Dance	Music club	30/8/2022
B.Padmini	19JG1A0202	Semi classical	Dance	Music club	30/8/2022

FRESHERS 2022

STUDENT CORNER

SHORT STORY

Struggles of our Life

Once upon a time, a daughter complained to her father that her life was miserable and that she didn't know how she was going to make it. She was tired of fighting and struggling all the time. It seemed just as one problem was solved, another one soon followed. Her father, a chef, took her to the kitchen. He filled three pots with water and placed each on a high fire.

Once the three pots began to boil, he placed potatoes in one pot, eggs in the second pot and ground coffee beans in the third pot. He then let them sit and boil, without saying a word to his daughter. The daughter moaned and impatiently waited, wondering what he was doing. After twenty minutes he turned off the burners. He took the potatoes out of the pot and placed them in a bowl. He pulled the eggs out and placed them in a bowl. He then ladled the coffee out and placed it in a cup.

Turning to her, he asked. "Daughter, what do you see?" "Potatoes, eggs and coffee," she hastily replied.

"Look closer", he said, "and touch the potatoes." She did and noted that they were soft.

He then asked her to take an egg and break it. After pulling off the shell, she observed the hard-boiledegg.

Finally, he asked her to sip the coffee. Its rich aroma brought a smile to her face.

"Father, what does this mean?" she asked.

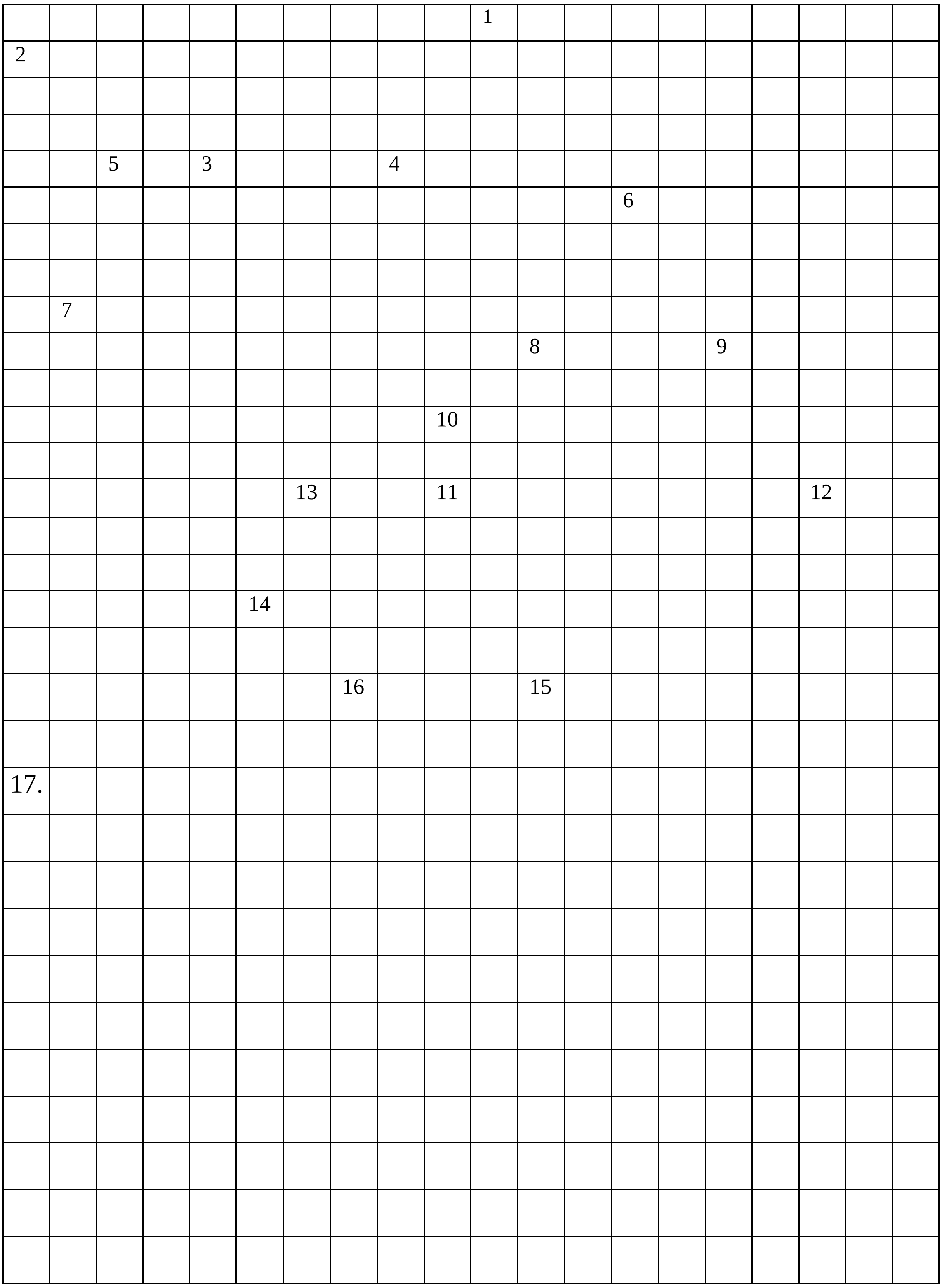
He then explained that the potatoes, the eggs and coffee beans had each faced the same adversity-the boiling water. However, each one reacted differently. The potato went in strong, hard and unrelenting, but in boiling water, it became soft and weak. The egg was fragile, with the thin outer shell protecting its liquid interior until it was put in the boiling water. Then the inside of the egg became hard. However, the ground coffee beans were unique. After they were exposed to the boiling water, they changed the water and created something new.

"Which one are you?" he asked his daughter. "When adversity knocks on your door, how do you respond? Are you a potato, an egg, or a coffee bean?"

Moral: In life, things happen around us, things happen to us, but the only thing that truly matters is how you choose to react to it and what you make out of it. Life is all about leaning, adopting and converting all the struggles that we experience into something positive.

Puzzles

CROSS WORD



Across

2. These cells convert solar energy to electricity.

5. Heat produced below the Earth's surface.

10. Electricity produced by the combustion of biomass.

13. The type of solar heating that uses technology to collect, move and store solar heat.

16. A device that converts wind energy to electricity.

17. The kinetic energy of moving water is used to generate electricity.

Down

1. A grouping of wind turbines.

3. Using mirrors to focus sunlight to generate electricity.

4. This heat pump uses the stable temperature of the soil a few feet under the ground.

6. A process where water is broken down into oxygen gas and hydrogen gas.

7. Energy produced from material produced by living organisms.

8. Liquid fuels from biomass sources

9. These batteries use hydrogen gas to produce electricity

11. Using the movement of the tides to generate electricity

12. The type of solar heating that involves building design that collects and stores solar energy naturally

14. Solar collectors that use heated fluid to heat water or air.

15. Abbreviation for the process that changes thermal energy in ocean water to electricity.

VOCABULARY- NEW ENGLISH WORDS (with meanings)

S.NO	WORD	MEANING	SENTENCE
1	**Adjure**	Formal exertion on someone to do something	The doctor adjured his patientto concur for heart surgery.
2	**Badinage**	Witty conversation.	We had badinage last night.
3	**Carp**	Complaint continually.	Our neighbours keep carpingabout poor facilities in our county
4	**Dogmatic**	Thrusting one's opinion or beliefs while reluctant to accept those of others.	The leader seems quitedogmatic.
5	**Effete**	No longer effective.	The chamber is currentlyexhausted.
6	**Fulminate**	Protest strongly against something.	There is always some fulmination to new rules.
7	**Gofer**	Person who runs errands	I am hunting for a gofer.
8	**Hark**	Remind something from the past.	She was harking back to childhood upon seeing herschool.
9	**Neffable**	Too sacred to be spoken.	Sculptures of temple deities are impossible to be describedin words.
10	**Jink**	Sudden quick change of direction.	The pilot jinked the plane foran emergency landing.
11	**Knoll**	Small hill or mound.	The resort is ideally locatedamidst knolls.
12	**Languish**	Be kept in an undesirable place or situation	He was languishing in jail.
13	**Mettle**	Spirit or strength during difficulty.	One must try to practicemettle in crisis.
14	**Nimble**	Quick or agile in movement.	The dwarf nimble easilythrough the crowd.
15	**Oppugn**	Question the truth or validity of something.	Youngsters often oppugnsuperstitions.

16	**Plenary**	Full; absolute.	The minister has plenarypowers over the state.
17	**Quaff**	Drink something heartily.	The kitten quaffed its plate ofmilk.
18	**Rectitude**	Morally correct behaviour	All always appreciate honesty.
19	**Sartorial**	Relating to clothes or a person's style of dress.	Their sartorial has been imitated around the world.
20	**Terse**	Using few words or abrupt	It was a brief and ambiguousstatement
21	**Uncanny**	Strange or mysterious.	The portrait's appearance wasuncanny.
22	**Vestal**	Chaste or pure.	A vestal ambiance can beexperienced at the shrine.
23	**Wreathe**	Envelope or surround.	The cops wreathed the crimesite immediately.
24	**Xenophobia**	Fear of people from other countries.	Xenophobia is not a goodsign.
25	**Yonder**	Referring to something far away.	Consider the yonder side ofany issue before deciding.
26	**Zilch**	Nil.	Environmental concern iszilch these days.

TOPPERS OF THE YEAR

Year	Roll No	Name of the Student	Average GPA	Position
II	20JG1A0208	B. Sonia	9.02	First-class with Distinction
III	20JG5A0202	B. Padma	8.43	First-class with Distinction
IV	19JG5A0207	K. Anusha Devi	9.38	First-class with Distinction

2018-2022 Batch Placements

S.NO	NAME	ROLL.NO	PLACEMENT	NO. OF OFFERS
1.	A. Bhavya Sri	18JG1A0201	TCS	1
2.	B. M.V. Varaha Lakshmi	18JG1A0202	INFOSYS	1
3.	B. Sahithi	18JG1A0204	Wipro, Infosys	2
4.	D. Sowndarya Lahari	18JG1A0206	Wipro	1
5.	D. Bhavya	18JG1A0207	Wipro	1
6.	G. Ramya Likhitha	18JG1A0208	Wipro	1
7.	G. Vaishali	18JG1A0209	Wipro, Infosys, Capgemini	3
8.	G. Shanmukhi	18JG1A0211	Wipro, Zensar, Capgemini	3
9.	John Fragrance Mercy	18JG1A0212	Wipro	1
10.	J. Achsah Suchalitha	18JG1A0213	Wipro	1
11.	K. Harshitha	18JG1A0214	Capgemini, Wipro	2
12.	L. Bhavana	18JG1A0216	PWC AC Bangalore	1
13.	M. Kavya Priya	18JG1A0217	Wipro, LTTS, Tech Mahindra, Re New Power	4
14.	M. Sai Sreeja	18JG1A0218	DXC Technologies, Infosys	2
15.	M. Jahnavi	18JG1A0219	Revature India, Capgemini, Infosys	3
16.	M. Jahnavi	18JG1A0220	DXC Technologies	1
17.	P. Sujitha	18JG1A0222	ZOHO	1
18.	S. Srivalli	18JG1A0225	Infosys	1
19.	S. Navya Sruthi	18JG1A0226	Rhea Knowledge Technolgies	1
20.	C. Nalini	19JG5A0202	PWC AC Bangalore	1
21.	K. Ravalee	19JG5A0205	LTTS, Tech Mahindra	2
22.	K. Anusha Devi	19JG5A0207	Wipro, Infosys	2
23.	K. Anu Keerthana	19JG5A0208	Infosys	1
24.	N. VVVSS Pravallika	19JG5A0210	Infosys	1
25.	V. Satya Sai	19JG5A0218	Capgemini	1
26.	V. Jyoshna	19JG5A0219	Mindtree	1
27.	B. Swapna	19JG5A0220	Beston Technologies LLC	1

28.	B. Bhavani	19JG5A0221	LTTS, Capgemini, Wipro	3
29.	K. Monika	19JG5A0222	Wipro, LTTS	2

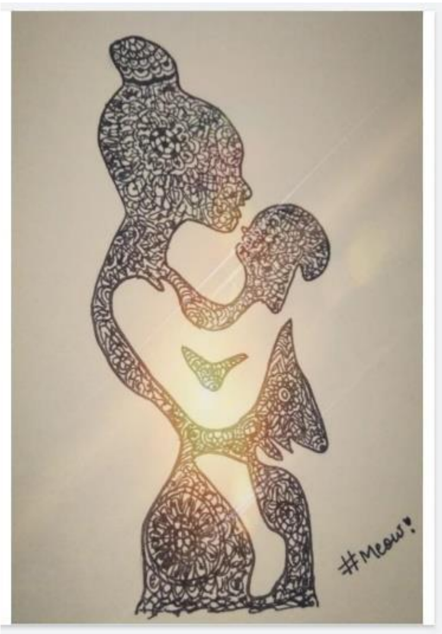
Infosys

wipro

TATA
TATA CONSULTANCY SERVICES

Capgemini

Tech Mahindra



By G. Priyanka

(20JG1A0216)

EDITORIAL TEAM

Dr.R.V.S. Lakshmi Kumari: HOD, Department of Electrical& Electronics Engg.

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C.V.S.S.Lakshmi :19JG1A0204

P. Sai Sushmitha : 20JG1A0224

G. Priyanka : 20JG1A0216

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