St. Johns college of Engineering & Technology

Approved By AICTE, New Delhi, Recognized by UGC under 2(f) & 12(B),
An ISO 9001:2015 Certified Institution and Affiliated to JNTUA, Antapuramu.
Yerrakota, Yemmiganur-518360,Kurnool Dt., AP

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

TECHNICAL MAGAZINE

Education with Innovation

Volume-3

2022-2023

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ABOUT THE COLLEGE

St. Johns College of Engineering Technology, the pride of Yemmiganur town, was established in the year 2001. Seven kilometers away from the Yemmiganur town, the college campus nestles amidst lush and luxuriant greenery in a sprawling 27 acres land. The College has specious, well ventilated, well equipped, and well furnished Laboratories, Workshops, Class Rooms, Drawing Halls, Hostels and a well stocked Central Library in addition to departmental libraries.

The college is affiliated to JNTUA, Anantapur and it is approved by AICTE, New Delhi and the Government of Andhra Pradesh. Beginning with a modest intake of 180 students in 4 branches in 2001, the college has grown in size and infrastructure to admit 540 students in 6 branches of B.Tech. Responding to the demand for Post Graduate courses in engineering, Management and Computer Applications, the college has started M.Tech Courses in 9 Specializations, and offer MBA course.

VISION OF THE COLLEGE

1. To be a preferred technical institution by the first generation learners from rural background.
2. The institute in turn will holistically elevate the students into technically strong and ethically sound individuals thereby moulding characters and career.
3. Partnering with them to contribute towards the advancement of community, region and nation as a whole.

MISSION OF THE COLLEGE

Engage all the stake holders and utilize the infrastructure to develop technically sound employable human resources to translate our vision into a reality.

ABOUT THE DEPARTMENT

ECE is the engineering course to learn about electronics and communications. Its implementation is wide spread, and it is almost found in all streams. Sporty presents this course backed up with stellar teaching performance and high end labs.

The beauty of electronics is it is used everywhere. From electronic goods manufacturer to hospitals, it is implemented in many devices. So, the future for this stream is highly positive.

The microprocessors, mother boards, picture tubes, LED, LCD, etc. are various electronic items, and you know about the impact they have created on billions of people and world's economy. You can be a part of this huge niche by getting into ECE at the engineering level.

Apart from the electronics, you also have communications in this engineering. It is important in industries like telecommunications, posts & telegraph, defense, etc. The communications department is very crucial for important aspects, like country protection, etc.

The Department of ECE was established in 2001 with an intake of 60 students in the UG program.

The ECE department offers Undergraduate programs. Electronics & Communication Engineering is one of the rapidly advancing fields in technological development arena with emerging ideas. The department aims at training students advanced cutting edge technologies and imparts values so that they are equipped to deal successfully any challenges in life, by exploring and creating new avenues. Students are taught to recognize their potential & use it for their best advantage. Our students are performing well in academics and they are encouraged in R&D activities and publishing papers in journals. They are participating in symposiums and seminars in various colleges and universities. They won the prizes in these events.

VISION OF THE DEPARTMENT

To impart Technical education to the rural students and making them employable in the respective domain

MISSION OF THE DEPARTMENT

1. Up gradation of laboratories with state of the art equipment as the right tools of pedagogy for better lesson delivery
2. Providing bridge classes for average and slow learners.
3. Arranging interactive sessions with industries and thereby enhance the practical knowledge and technical skills of the student.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

1. Graduates will be able to stimulate continuing education with their existing knowledge in the field of Electronics and Communication Engineering.
2. Prepare graduates to practice their profession with ethics, integrity, and social responsibility in a global context.
3. Participate in lifelong learning activities to continue their professional development.

PROGRAM OUTCOMES (POs)

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PROGRAM SPECIFIC OBJECTIVES (PSOs)

1. Should be able to understand the concepts of Electronics & Communication engineering and their applications in the field of semiconductor technology, consumer electronics, embedded system, communication/ networking and other relevant areas.
2. Should have an ability to apply technical knowledge and usage of modern hardware and software tools related to Electronics & Communication engineering for solving real world problems.

3.

WORD'S FROM THE PRINCIPAL

I am happy to meet all of you through this News Letter and I thank all the staff who strived to give professional education in a new perspective manner and achieve perfection in all the fields. The main reason for our tremendous performance in various activities is the involvement of the faculty members who motivated students whole heartedly to participate in the seminars, industrial visit, inter activity session and other extracurricular activities to inculcate in them sound moral values, strong personality and eagerness to work in the society. Because of these efforts we have been successful in moulding the personality of our students and imbibe in them moral values and the spirit to team work. I wish this solidarity continues for successive years and we would be proud to release many more news letter like this, highlighting our achievements. I have no doubts in near future SJCET will be termed as one of the leading technical institutions in our district.

- Dr V Veeranna

WORD'S FROM THE HOD

THE DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING (ECE) has consistently maintained an exemplary academic record. The greatest asset of the department is its highly motivated and learned faculty. The available diversity of expertise of the faculty with the support of the other staff prepares the students to work in global multicultural environment. The graduates of the Electronics & Communication Stream have been selected by some of the world's leading corporations & as well as by most of the leading Indian counter parts.

We hope that we will continue to deliver our best to serve the society and mankind. It is also expected and that our students will continue to pass-on the skills which they have developed during their stay at this department to whole of the world for a better society. We will be happy to receive your suggestions for further improvement and development of our department.

All the best students!

- Dr K Sudhakaru

FROM THE EDITOR'S DESK

Dear Students,

We heartly welcome you to the newly launched ECE Department's first issue of the Magazine for the academic year 2022-23.

The objective of the magazine is to mainly focus on Achievement of the students from the ECE department in the Co-curricular and Extra-Curricular Activities.

I congratulate all my team members for their constant effort in launching this Magazine. We are also thankful to our Management and Principal for their support and encouragement. Finally we are gratified to our reviewers for their frank opinions and constructive suggestions, namely our colleagues and students.

DEPARTMENT TOPPERS

ACADEMIC YEAR 2022- 23

S NO	PHOTO	STUDENT NAME	PERCENTAGE
IV YEAR			
1.	 19G31A0448	PUJARI SRAVANI (IV Year II Sem)	88
2.	 19G31A0413	DOCTOR AHMED ASWAQ (IV Year I Sem)	79.20
III YEAR			
3.	 20G31A0413	CHILAKA ANITHARANI (III Year II Sem)	85.78
4.	 20G31A0401	ADIKI TEJASRI (III Year I Sem)	84.33

II YEAR			
5.	 21G31A0451	KOLIMI VASIHA (II Year II & I Semesters)	91.67
6.			87.40
I YEAR			
7.	 22G31A04A3	V MAHALAKSHMI (I Year II & I Semesters)	90.22
8.			88.67

Students Achievements (2022-23)

"Nothing in the world is worth having or worth doing unless it means effort, pain, difficulty… I have never in my life envied a human being who led an easy life. I have envied a great many people who led difficult lives and led them well."

- Theodore Roosevelt

ATAGARA JAYANTH KUMAR (20G31A0403) – Sports:

Represented St. Johns College of Engineering and Technology in Chess and secured 1st place in SVR ENGINEERING COLLEEGE, NANDYAL. National Level Celebration.

KANCHU SAI BALAJI (20G31A0433) – Sports:

Represented St. Johns College of Engineering and Technology in Carroms and secured 1st place in ESWAR COLLEGE OF ENGINEERING, NARASARAOPET. National Level.

HARIJANA PRASAD (21G31A0434) – Sports:

Represented St. Johns College of Engineering and Technology in 400M RUN Run and secured 1st place in ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES, VISAKHAPATNAM.

A National Level Inter – Engineering Sports Fest Celebrations

KAMMARI SHIVA KUMAR ACHARI (20G31A0432) – Sports:

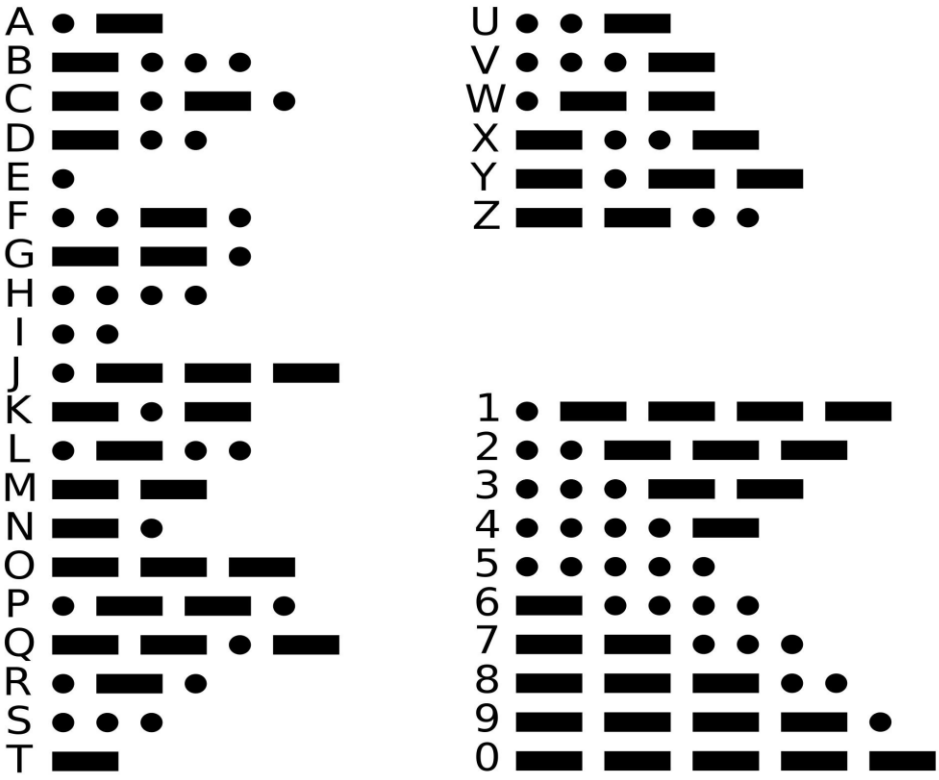
Represented St. Johns College of Engineering and Technology in BADMINTION and secured 2st place PSRC MALLIKARJUNA RAO COLLEGE OF ENGINEERING & TECHNOLOGY, VIJAYAWADA.

National Level Sports Fest

Let’s Learn

Morse Code

- BAILUPPALA RAFIYA SULTHANASHA, II ECE B SEC (2021-25)



Morse code is a character encoding scheme used in telecommunication that encodes text characters as standardized sequences of two different signal durations called dots and dashes or dits and dahs. Morse code is named for Samuel F. B. Morse, an inventor of the telegraph.

What "Mother" Means

"Mother" is such a simple word,

But to me there’s meaning seldom heard.

For everything I am today,

My mother’s love showed me the way.

I’ll love my mother all my days,

For enriching my life in so many ways.

She set me straight and then set me free,

And that’s what the word "mother" means to me.

Thanks for being a wonderful mother, Mom!

----- K Sai Pranavi, IV ECE (2019-23)

Teacher for All Seasons

A teacher is like Spring,
Who nurtures new green sprouts,
Encourages and leads them,
Whenever they have doubts.
A teacher is like Summer,
Whose sunny temperament
Makes studying a pleasure,
Preventing discontent.
A teacher is like Fall,
With methods crisp and clear,
Lessons of bright colors
And a happy atmosphere.
A teacher is like Winter,
While it's snowing hard outside,
Keeping students comfortable,
As a warm and helpful guide.
Teacher, you do all these things,
With a pleasant attitude;
You're a teacher for all seasons,
And you have my gratitude!

----- UPPARI MOKSHAGNA I ECE(2022-26)

ARTICLES

Satellite TV

Satellite TV is a type of television programming that is wirelessly delivered to TV sets across the world via a network of radio signals, communications satellites, broadcast centers and outdoor antennas. Broadcast signals are transmitted from satellites orbiting the Earth and received by local and regional satellite TV systems.

How Satellite TV service works

Satellite TV technology makes use of specialized antennas known as satellite dishes. These satellite dishes transmit signals to a satellite receiver such as a set-top box or satellite tuner module within a TV set. The programming source transmits signals to a satellite provider broadcast center and these waves are then picked up by a compact satellite dish and broadcast onto television sets.

Overview of Satellite TV Video Content Delivery

Satellite TV service can also be referred to as direct-broadcast satellite (DBS or DBSTV) service. A DBS provider will select programming—often a wide range of channels and services—and will then broadcast this content to satellite TV subscribers as part of a larger TV package. DBS programming can either be sent to a digital satellite receiver or an analog satellite receiver. Analog satellite television is slowly being replaced by digital satellite programming. Digital satellite television has

become increasingly available in better quality known as HD TV (high-definition television). Digitally-broadcast content is characterized by greater picture and sound quality.

Satellite stations and broadcast television stations both transmit TV programming through radio signals. Years ago, the first satellite television TV technologies were broadcast in the C-band radio frequency range. Today, digital satellite TV content is transmitted in the Ku frequency range.

To further understand the technology behind direct-broadcast satellite systems, it is important to review the top features and elements involved in direct-broadcast satellite TV video content delivery: programming sources, satellite provider broadcast centers, satellites, satellite dishes and the satellite receivers. Programming sources refer to networks or channels that offer TV shows and movies for the enjoyment of subscribers. A broadcast center plays an integral role in video content delivery. At broadcast centers, TV providers receive and send broadcast signals to satellites orbiting the Earth Before sending out a signal, a broadcast center will convert programming into a digital stream of content. Once satellites have received and processed all of these uncompressed signals, they ultimately rebroadcast them to satellite dishes on Earth. Next, a subscriber's outdoor satellite dish will pick up the broadcast signal and transmit it to the satellite receiver located inside of a home. A satellite receiver then completes the information transmission by processing the signal and passing it on to a viewer's television set.

Reliability and Reception:

If a satellite dish or antenna is knocked out of place by inclement weather, homeowners may need to climb a roof to adjust these settings

Online Streaming Service:

If you are interested in streaming live TV and watching video content online, you may want to carefully review package details to ensure you sign on with a provider—whether Internet, cable or satellite—that offers a wide array of live TV streaming content, both in-

home and on-the-go. Do you want to stream your favorite TV shows and movies online or would you prefer to watch live TV on your mobile devices?

Direct broadcast via satellite:

Direct broadcast satellite, (DBS) also known as "Direct-To-Home " can either refer to the communication s satellites themselves that deliver DBS service or the actual television service . Most satellite television customers in developed television markets get their programming through a direct broadcast satellite provider. Signals are transmitted using Ku band and are completely digital which means it has high picture and stereo sound quality.

Programming for satellite television channels comes from multiple sources and may include live studio feeds. The broadcast centre assembles and packages programming into channels for transmission and, where necessary, encrypts the channels. The signal is then sent to the uplink where it is transmitted to the satellite. With some broadcast centres, the studios, administration and uplink are all part of the same campus. The satellite then translates and broadcasts the channels.

----- MOHAN RAO KOUJALAGIKAR MADHURA, IV ECE (2019-23)

TAG COUPLING AND COMMUNICATION

Passive RFID tags obtain their operating power from the electromagnetic field of the reader's communication signal. The limited resources of a passive tag require it to both harvest its energy and communicate with a reader within a narrow frequency band as permitted by regulatory agencies. Passive tags typically obtain their power from the communication signal either through inductive coupling or far field energy harvesting.

Inductive coupling uses the magnetic field generated by the communication signal to induce a current in its coupling element (usually a coiled antenna and a capacitor). The current induced in the coupling element charges the on-tag capacitor that provides the operating voltage, and power, for the tag. In this way, inductively coupled systems behave much like loosely coupled transformers. Consequently, inductive coupling works only in the near-field of the communication signal. For a given tag, the operating voltage obtained at a distance d from the reader is directly proportional to the flux density at that distance.

There is a fundamental limitation on the power detected a distance d away from a reader antenna. In a loss less medium, the power transmitted by the reader decreases as a function of the inverse square of the distance from the reader antenna in the far field. A reader communicates with and powers a passive tag using the same signal. The fact that the same signal is used to transmit power and communicate data creates some challenging trade-offs

The electronic toll Collection systems are a combination of completely automated toll collection systems and semi-automatic lanes. Various traffic and payment data are collected and stored by the system as vehicles pass through. The different technologies involved are logically integrated with each other but remain flexible for upgrades. They also include sophisticated video and image capturing equipment for full-time violation enforcement. So this basic arrangement developed by us will applicable for the future developments in road transport by proper modifications. RFID systems have a secure

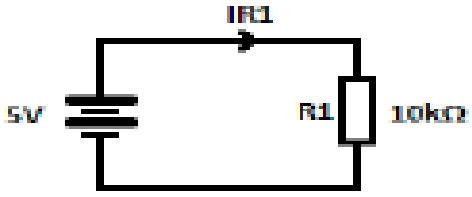
place in the automatic identification sector. The system can made free from the challenges and will be cost effective in near future.

Humiliation is behind them and they can start to build the kind of team that Iraq deserves.

----- KAMMARA LAVANYA, III ECE (2020-25)

Quiz

What is the value of IR1 (current through R1)?

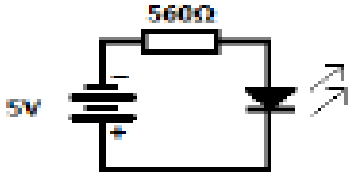


1) IR1 = 0.1mA
2) IR1 = 5mA
3) IR1 = 0.5mA
4) IR1 = 1mA

What type of transistor is this one ?

1) Triac
2) Thyristor
3) NPN
4) PNP

Will the LED turn on?

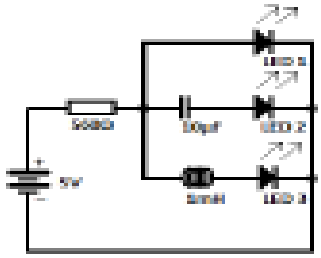


1) YES
2) NO

A bipolar transistor usually has:

1) 2 Terminals
2) 3 Terminals
3) 4 Terminals
4) 5 Terminals

Which LED will turn ON?



1) only LED 1
2) only LED 2
3) LED 1 and LED 3
4) LED 1 and LED 2

Alumni Experience

Hear it from the people who've been here and enjoyed the journey.
--- Mr. Charuboyala Ramu, Associate Software Engineer' at Bosch Global Software Technologies (BSGL) (2018-22 Batch B Tech ECE)

One of the most interesting stages in life that gives you an opportunity to explore is the 'college phase.' Life at college is the time when the teenage years end and we all dive deep into the ocean of new beginnings and possibilities. This golden period better equips you for all the challenges you'll face in life and creates a strong foundation of knowledge.

My experience at Velammal Institute of Technology has taught me one fundamental thing – life is unpredictable. It might be good, it might be bad, it might be weird, and it might not interest you, but expect anything to happen. For example, you might have a wonderful job this moment, and be fired the very next moment. College life prepares you for all of this.

It is a perfect blend of joy and hardships. You meet different people, you interact with them, you learn about their cultures and grow as a person. You will understand how to talk to different people, how to judge their behavior, thus helping you with important life skills.

You learn to sit through a boring lecture; you try to cope up with the surprisingly strenuous syllabus, and you have the opportunity to learn from some great research minds. Academia, as they say, never lets you go free. People might try to motivate you by telling that you need to study only through your school years and chill during the college life, but that isn't true.

Another life lesson you will remember – the learning never ends. You find campus groups or student groups where you can explore your co-curricular skills along with many other students like you. So, one fine day when you see pictures from the college of you and your friends having a good time, you'll definitely land up smiling silently. That's the beauty of college

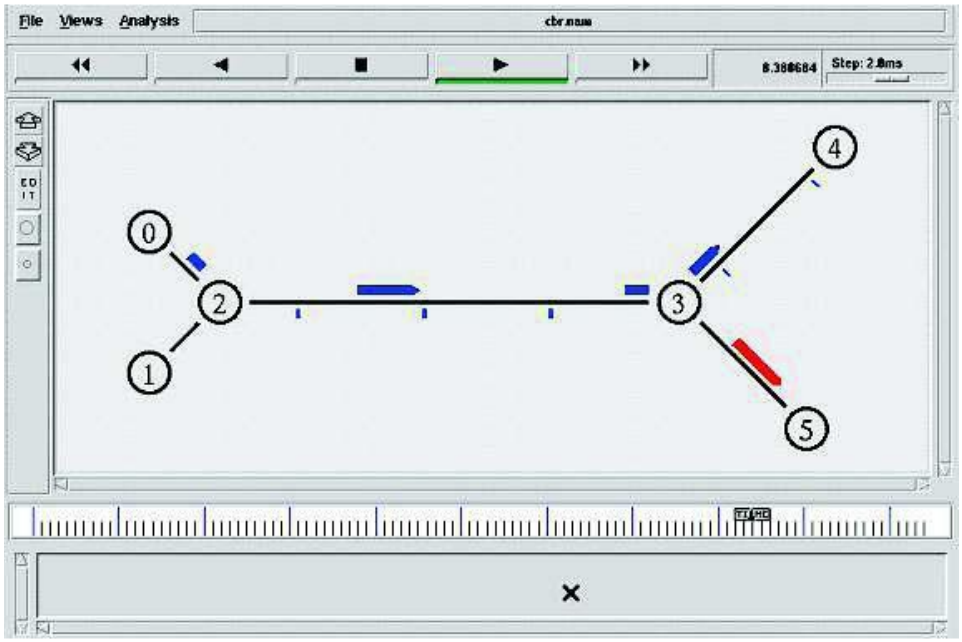
life. It stays with you long after you've climbed those ladders of success and forgotten the name of that cute crush you used to drool over.

Designing Networks Made Easy

Mr T Chakrapani

Associate Professor, ECE Dept

In communication and computer network research, network simulation is a technique where a program models the behavior of a network either by calculating the interaction between the different network entities (hosts/packets, etc.) using mathematical formulae, or actually capturing and playing back obser-vations from a produced network. A network simulator is software or hardware that predicts the behavior of a computer network without an actual network being present. In simulators, the computer network is typically modeled with devices, traffic, etc. and the performance of the network is analysed. Typically, users can then customize the simulator to fulfill their specific analy-sis needs. Simulators typically come with support for the most popular protocols and networks in use today, such as WLAN (Wireless Local Area Network), WIMAX, TCP (Transmission Control Protocol), WSN (Wireless Sensor Network), cognitive radio, etc.



There are many open-source and commercial network simulators. There are a wide variety of network simulators, ranging from the very simple to the very complex. Minimally, a network simulator must enable a user to represent a network topology, specifying the nodes on the network, the links between those nodes and the traffic between the nodes. More complicated systems may

allow the user to specify everything about the protocols used to handle traffic in a network. Graphical applications allow users to easily visualize the workings of their simulated environment. Text-based applications may provide a less intuitive interface, but may permit more advanced forms of cus-tomization. Most of the commercial simulators are GUI (Graphical User Interface) driven, while some network simu-lators are CLI (Command Line Interface) driven. The network model / configuration describes the state of the network (nodes, routers, switches, links) and the events (data transmissions, packet error, etc.). An important output of simulations is the trace files. Trace files log every packet, every event that occurred in the simulation and are used for analysis. Network simulators can also provide other tools to facilitate visual analysis of trends and potential trouble spots.

Most network simulators use discrete event simulation, in which a list of pending "events" is stored, and those events are pro-cessed in order, with some events triggering future events—such as the event of the ar-rival of a packet at one node triggering the event of the arrival of that packet at a down-stream node. Examples of notable network simulation software are:

- NS (open source) – NS2 and NS3
- OMNeT++ (open source)
- Glomosim (open source)
- OPNET (proprietary software)
- NetSim (proprietary software)
- QualNet (proprietary software)

Amongst all simulators, nearly 80% of researches in world are utilizing NS2. In 1996-97, NS version 2 (NS2) was initiated based on a refactoring by Steve McCanne. Simulation scripts are written in the OTCL (Object Tool Command Language) language, an extension of the TCL scripting language. The core of ns-2 is also written in C++, but the C++ simulation objects are linked to shadow objects in OTCL and variables can be linked between both language realms. Presently, ns-2 consists of over 300,000 lines of source code, and there is probably a comparable amount of contributed code that is not integrated directly into the main distribution. Network simulators serve a variety of needs. They allow engineers, researchers to test scenarios that might be particularly difficult or expensive to emulate using real hardware - for instance, simulating a scenario with several nodes or experimenting with a new protocol in the network. Network simulators are particularly useful in allowing researchers to test new networking protocols or changes to existing protocols in a controlled and reproducible environment. A typical network

simulator encompasses a wide range of networking technologies and can help the users to build complex networks from basic building blocks such as a variety of nodes and links. With the help of simulators, one can design hierarchical networks using various types of nodes like computers, hubs, bridges, routers, switches, links, mobile units, etc.

All Is In The Mind !

Ms K Suvarna
Associate Professor, ECE Dept

There was a man who worked for the railroad. One day, he went into the freezer compartment to do his routine work. The door accidentally closed and he found himself trapped in the compartment. He shouted for help but no one heard him since it was midnight.
He tried to break down the door but he could not. As he lay in the freezer compartment, he began to feel colder and colder. Then he began to feel weaker and weaker, and he wrote on the wall of the compart-ment, “I am feeling colder and colder; and I am getting weaker and weaker. I am dying, and this may be my last words”.

In the morning when the other workers opened up the compartment they found him dead. The sad twist to the above story is that the freezing apparatus there had broken down a few days ago. The poor worker did not know about it and in his mind the freezing apparatus was working perfectly. He felt cold, got weaker and literally willed himself to die.

Moral

Our sub-conscious mind can be cheated. The sub-conscious mind can only accept and act on information passed to it by the conscious mind. It has no capacity to reject or decline any instruction or infor-mation passed to it by the conscious mind. In the case of the poor worker, he consciously thought that he was getting colder, weak-er and dying and the sub-conscious mind accepted the above instructions and affected his physical body. That was how he willed himself to die.