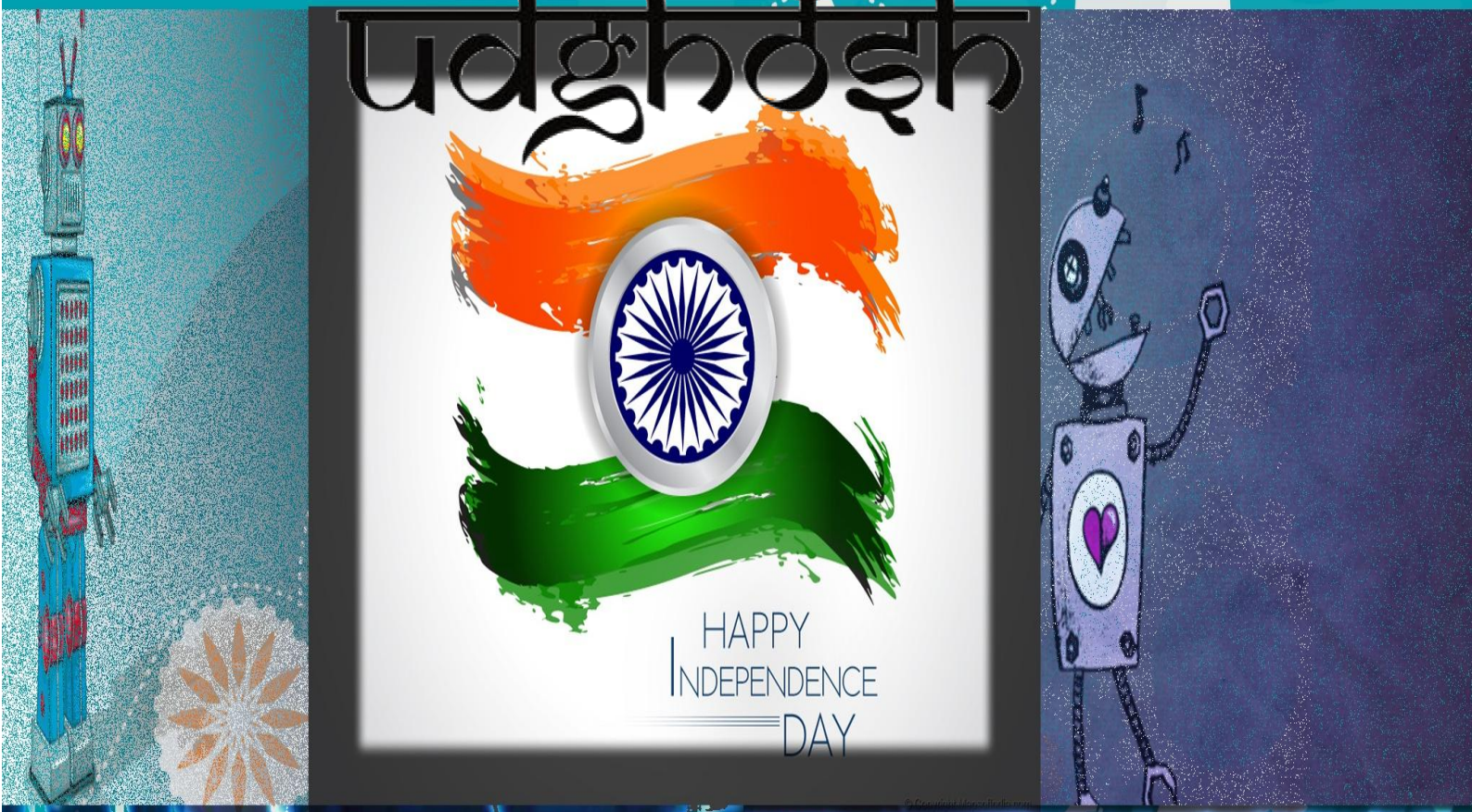
RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY



THE VOICE OF ECE DEPARTMENT

EDITORIAL BOARD:

WHAT'S INSIDE

OUR NEW TEAM

"A SMILE IS THE UNIVERSAL WELCOME"

We greatly welcome the members of our UDGHOSH team to our esteemed family. We feel proud to be surrounded with such hardworking and excellent team to our society .wishing you all the best for your works, efforts and endeavors.

On behalf of entire team of UDGHOSH, we welcome:

1. SPARSH MATHUR
2. ADARSH PAL
3. SIDDHANT SRIVASTAVA
4. KAMAL CHAHUBEY
5. AKANKSHA BHARAGAVA
6. UNNATI KAMAL
7. UJJWAL SAXENA
8. KHUSHI SAXENA
9. SURAJ BANI

INDEPENDENCE DAY

On 15th August 2017,RKGIT celebrated the festival of independence with great enthusiasm .The programme started at sharp 9'0 clock with flag hoisting by dignitaries of college followed by the National Anthem .After anthem, poetry "Ruketunaa"was presented by Rahul Tiwari followed by a

another poetry from Akash Tripathi.A first year student also presented a poetry written by "**Shri Atal Bihari Vajpayee**". Then director R.P Maheshwari gave important message to all the students and also told them the importance of freedom.. Adv. B.K. Gupta (R&D)also enlightened the students and told them to enjoy the day.The programme was hosted by Rohan and the celebration was endedwith distribution of sweets.

FRESHER PARTY

ABHYUDAYA'17

Abhyudaya Fresher's Party 2k17 was held on 19th, August.The party was held to welcome first year students to the RKGIT family.The whole event was organised and co-ordinated by second year students with constant support and help from faculty and seniors from third and second year . The whole event was held under the special presence of diginatries and higher authorities of college.The event started by welcoming the diginatries and first year students by giving themgifts and bouquets. The event started with Ganesh Vandana and it is followed by various performance by first year students such as singing, dance, XT (Extra Talent) and skit. Every performance presented was co-ordinated by respective co-ordinators and volunteers of the event. The whole progrram was carried out smoothly an successfully.

Ramp walk was a complete show of glamour and intellect. It was judged

by Abhinav Bansal Sir and Priya Ma'am .The title of Mr. and Miss fresher

2k17 was won by Aaryan Srivastava(CSE) and AnukritiPudmja(CSE).

The dance performed was both classical and western .The songs sung were soothing and mesmerising. The skit was performed on both kind of genres that is comedy and serious. Few students showed extra talent of painting and playing instruments. The event concluded with H.G. Garg sir presenting vote of of thanks to everyone who performed and organised the event.

The whole event was organized to welcome and give proper exposure to the first year students. The event not only enhanced the relation of senior and junior but also motivated them in a positive way. The students have enjoyed themselves a lot.

TEACHER'S DAY

In ECE Department, students celebrated Teacher's Day with all Faculty members of ECE department. The noon commenced with the cutting of cake followed by the singing, and dancing performances by second and third year students which were duly applauded. A small skit was performed by second year students and a guitar performance by third year student. A fun questionnaire and singing session were held among the teachers which was enthusiastically participated and enjoyed by various faculty members. Students also presented gifts as a token of gratitude to our esteem faculty members .The event ended with a group dance performance later in which the rest of the students as well as faculty members joined and enjoyed.The event was anchored by Rohan Sharma , Uzma Afaque, Ayushi Pal & Twinkle Tekiwal.


Happy

ELECTRONICA INDIA

Messe München organized The Electronica trade fare in India this time. The event was held at Pragati Maidan, New Delhi and was of three days starting from 14th Sept. to 16th Sept. 2017. Electronica is a trade fair for the Electronics industry. The exhibitors who participate in it, present electronic components, systems, applications and services. But this time young budding engineers were also allowed to attend the exhibition which was a great learning experience for them.

Many students of IIIrd & IVth Yr. of Electronics and Communication Engineering branch as well as of Electronics and Electrical engineering branch and respective Departmental Faculties of Raj Kumar Goel Institute of Technology attended this exhibition. This events showcased products like semiconductor, embedded system, display, Micro and Nano systems, sensor Technology, automotive, wireless and much more in the Electronic and Electrical industry. The fair took place in conjunctions

with Productronica India and presented the entire world's technologies in this sector. The major benefit of Electronica was that it brought all the industry stake holders under one roof where students, employees and trainees could learn various things regarding the industry.

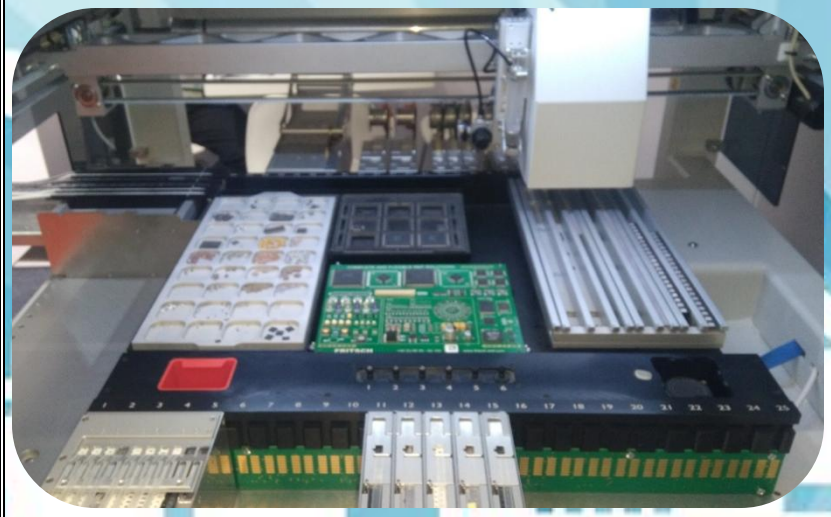
Apart from this, many programs like IPC India technical conference, IPC India professional development workshops, and IEEE short courses were also organized. An IPC hand soldering competition was also held which was conducted by IPC India. The trade fare had many sections like PCB designing and manufacturing, Tech/CEO forum, lasers section, optics, 3D printing, etc. through which everyone gained knowledge. At last, it can be said that **"The Electronica is a key show in India promoting the manufacturers, buyers and viewers in the Electronic industry"**. It was well organized event valuable for community and provided a great platform which brought buyers, supplies from the industry together and showcased the true strength of the industry.


electronica India 2017
LASER PHOTONICS INDIA
ENTRY TOKEN
12–16 September, 2017


FUNCTION FOLLOWS FORM
VISITOR


FRITSCH


Edmund

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ENGINEER'S DAY CELEBRATION

Engineering is not merely knowing and having knowledge, Engineering is not merely the analysis or the profession of capacity to get organized forcing of technical change.

Engineers operate at the interface between science and society. To identify the great works done by hard working engineers, each year 15th September is celebrated as Engineer's day marking the birthday of Sir Mokshagendam Visvesvarayn, recognizing his contribution in the field of Hydroelectric energy in India. This year the 50th Engineer's day was celebrated in our prestigious institution in presence of our esteemed dignitaries of the institution. The function started with the lightning of lamp by Prof B.K Gupta (Group advisor R.K.G.I.T group of Institute) that remarked a good beginning.

Prof. Vinay Kumar Pathak (vice-chancellor), Dinesh Kumar Goel (Chairman RKG a group of institute), Prof B.K Gupta (group advisor RKG group of institute), Dr. Laxman Prasad (Director R&D), Prof. R.P Maheshwari (Director RKGIT), Prof. Dhirendra Kumar (HOD –ECE),

Prof. A.K Verma (Adjunct Professor) and faculty members of all departments as well as students of all branches were present on the occasion of Engineer's day.

Prof. Laxman Prasad gave his speech on the topic "Roll of Engineering in developing India" and he told the importance of Engineer in our nation. He also said that there is nothing possible without the Engineers. The rest of the dignitaries also shared their views. A cultural Program was organized in the latter half of the event after which mementoes where presented to the distinguished guests .A vote of thanks was also given by Dr. S.C. Gupta (secretary, IEI-GLC) in which he thanked RKGIT for organizing the event and encouraged the youth to set higher goals and work hard to achieve them. The program then ended with aLunch.

INDUSTRIAL VISIT

The Third Year students had an Industrial Visit to Mankiran Electronics (P) Ltd. On 20th and 21st of September 2017. ManKiran Electronics is supplier and manufacture of panels, extruder, distribution, automation, power savers, amplifer, APFC, DC drivers, AC drivers, PID controllers.Mr Manmeet Singh Bhatia,Changing Director, enlightened the students about his industry and the core companies of ECE. He further acknowledged the students on what the company expects of the upcoming generation, the basic need of a company in a student. Moving ahead, he elaborated about the motors and suggested the students to get a job in the core area rather getting jobs in IT field.

He showed the students some of the basic components which their industry provides the student during their training period and which are much important for an ECE student to know. Refreshments were served to the students at the midst of the session.40 students of Section A(Third Tear) visited the Industry on 20th September and 40 students of Section B(Third Year) visited the Industry on 21st September.

FACULTY TECHNICAL CORNER

TIMING GETS SMART

By: Charu Tyagi

Ethernet has come a long way since IEEE 802.3 was first published in 1980. First envisioned as a technology to connect PCs and workstations, it has gradually evolved to become the networking technology of choice for a broad range of applications across enterprise computing, data centre, wireless networks, telecommunications and industrial sectors.

Its ubiquity and the ever-decreasing cost of the hardware needed to support it, means Ethernet will continue to gain in popularity in these applications.

Some of the most interesting technology transformations are underway as 100G Ethernet is being adopted in data centres and wireless radio access networks. These migrations to high-speed optical Ethernet are driving the need for higher performance clock and frequency control products.

Traditional enterprise workloads are migrating quickly to public cloud infrastructures, driving an investment boom in data centres. In addition to increasing demands for lower latency, data centres share a challenge in that most data traffic stays within the data centre as workload processing is distributed across multiple compute nodes.

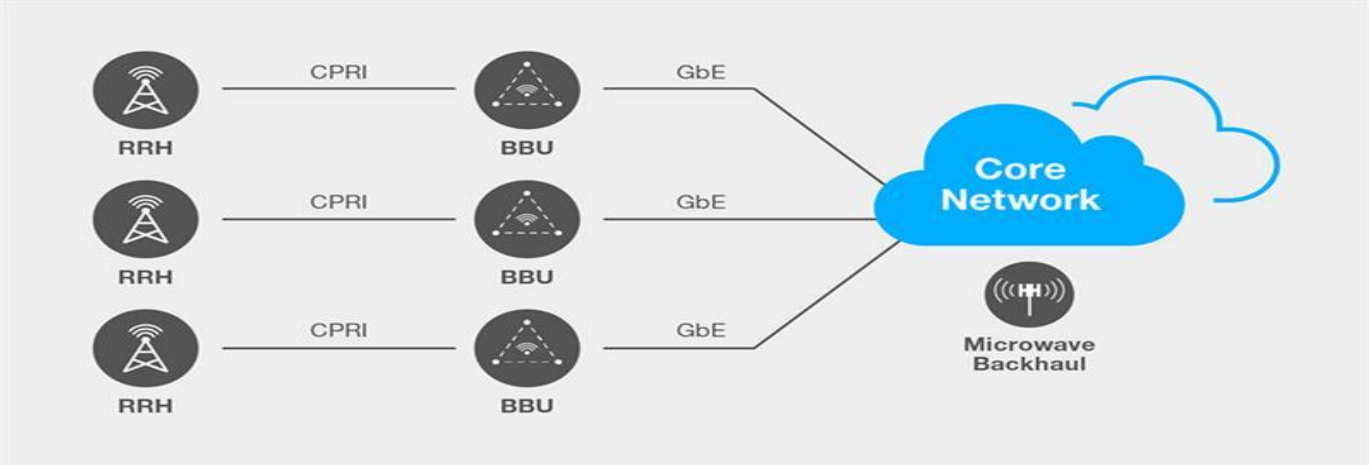
Modern data centres are optimising their network architecture to support distributed, virtualised computing by connecting every switch to each other, a trend known as hyper scale computing.

The migration from 10G to 25/50/100G Ethernet is driving data centre equipment manufacturers to upgrade switch and access ports to higher speeds. This, in turn, fuels the need for higher performance, lower jitter timing solutions. Ultra-low jitter clocks and oscillators are necessary in these applications because high clock noise can result in unacceptably high bit-error rates or lost traffic.

Wireless radio access networks

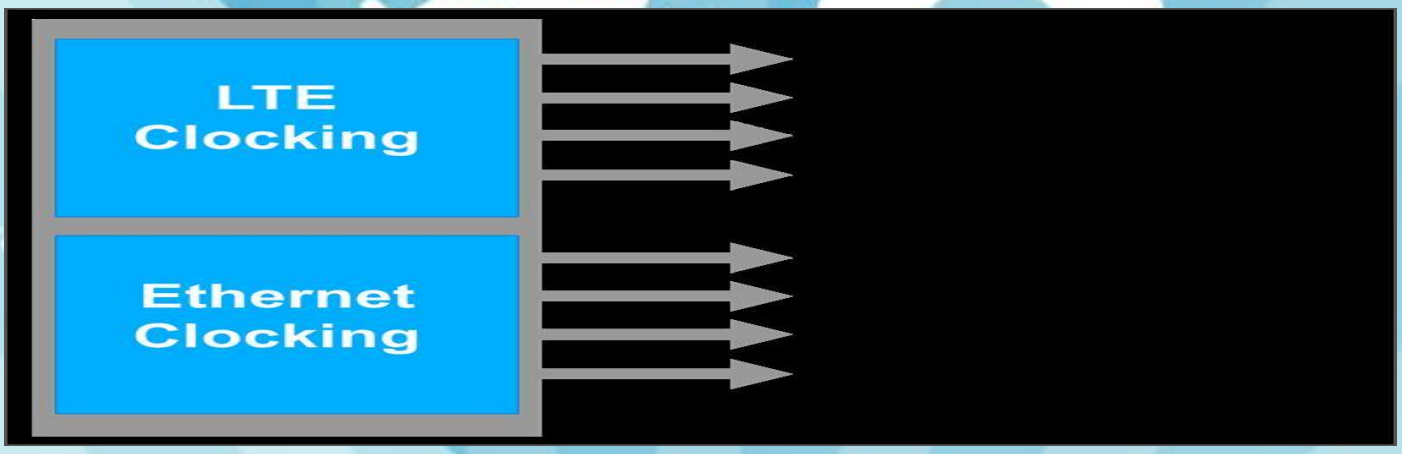
Wireless networks are poised to go through tremendous change as they migrate from 4G/LTE to LTE-Advanced and 5G. Next-generation wireless networks will be optimised for carrying mobile data which is expected to grow to 49Exabyte per month by 2021, a sevenfold increase over 2016. As a result, wireless networks are being re-architected and optimised for data transport. The wide-scale adoption of high-speed Ethernet in radio access networks (RAN) is expected to play a critical role.

In 4G/LTE radio access networks, the RF and baseband processing functions are split into separate remote radio heads (RRH) and base band units (BBU). Each RRH is connected to a BBU over a dedicated fibre connection based on the Common Public Radio Interface (CPRI) protocol (see fig 1). This architecture enables the replacement of dedicated copper and coax cable connections between the radio transceiver and the base station and enables the BBU to be placed in a more convenient location to simplify deployment and maintenance.



While more efficient than legacy 3G wireless networks, this network architecture is limited because bandwidth is constrained by the speed of the CPRI link – typically up to 10Gbit/s. In addition, the CPRI connection is a point-point link and RRH and BBUs are typically deployed in close proximity – from 2km to 20 km – constraining network flexibility.

As part of the evolution to 5G, the wireless industry is having to rethink base station architectures and the connection between baseband and radio elements, known as the front haul network, is a key area for optimisation. Higher bandwidth front haul networks are required to support new LTE features that support high-speed mobile data, including Carrier Aggregation and Massive MIMO. In addition, network densification and the adoption of small cells, Pico cells and micro cells will put additional bandwidth requirements on front haul networks.



Ethernet is being broadly adopted in data centre and wireless networks to enable higher network utilisation and lower cost data transmission and to enable new service provider features and services. The transition to packet-based Ethernet networks in these infrastructure applications is driving the need for more flexible, lower jitter timing solutions based on innovative architectures that enables frequency flexibility and ultra-low jitter.

STUDENT TECHNICAL CORNER

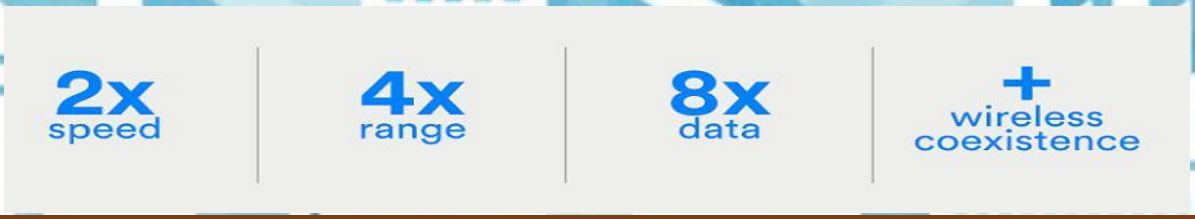
BLUETOOTH 5:

BY: ADARSH PAL

Introduction

The following article takes technical information from the Bluetooth 5 Core Specification and presents it in abridged form.

The Bluetooth LE 5 specification is the latest iteration of the BluetoothLE standard and includes new physical (PHY) specifications that allow increased speed (x2) or increased range (x4.) This technical article looks at the bit data paths of the three different variants, LE 1M, LE 2M, and LE 1M Coded.



Overview

The lowest level of the Open Systems Interconnection (OSI) model is the physical layer, often simply referred to as PHY. In wireless semiconductors, this is the part of the circuitry where

bits are converted to radio signals and then back to bits on a remote device. BLE5 created two new PHY implementations that allow improved performance over the Bluetooth LE 4.0 specification. The two new variants allow for increased speed or increased range without increasing the transmit power. The improvements come from improved receiver sensitivity and improved error correction, not increased transmitting power.

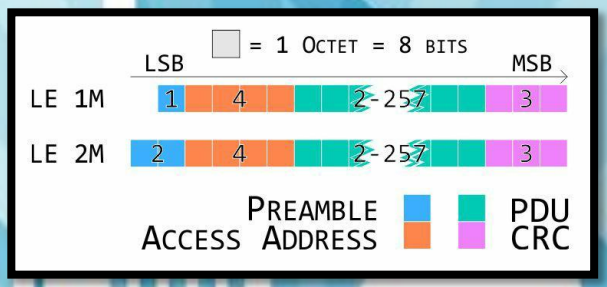
[1] LE 1M PHY — 1 Megasymbol / second options :

(i) LE 1M : Uncoded data is transmitted at 1 Mb/s.

(ii) LE Coded : Access Address, Coding Indicator, and TERM1 fields coded at 125 kb/s, and payload coded at either (s=8) 125 kb/s or (s=2) 500 kb / s253.

Packet Format for LE 1M Uncoded and LE 2M PHY Uncoded

Packets consist of a preamble, access address, variable length Protocol Data Unit (PDU), and a Cyclic Redundancy Check (CRC).



Link layer packet format for LE uncoded PHYs 2562

Preamble

The preamble is used by the receiver to perform frequency synchronization, symbol timing estimation, and automatic gain control training. For the uncoded LE 1M and 2M PHYs, it consists of an alternating Ssequence of 0 and 1, where the first bit is equal to the LSB of the access address.2562

Access Address

The Access Address (AA) value is set in the SyncInfo field during advertising or is set to 0x8E89BED6. Each Link Layer connection between any two devices and each periodic advertisement has a different Access Address.2563

PDU

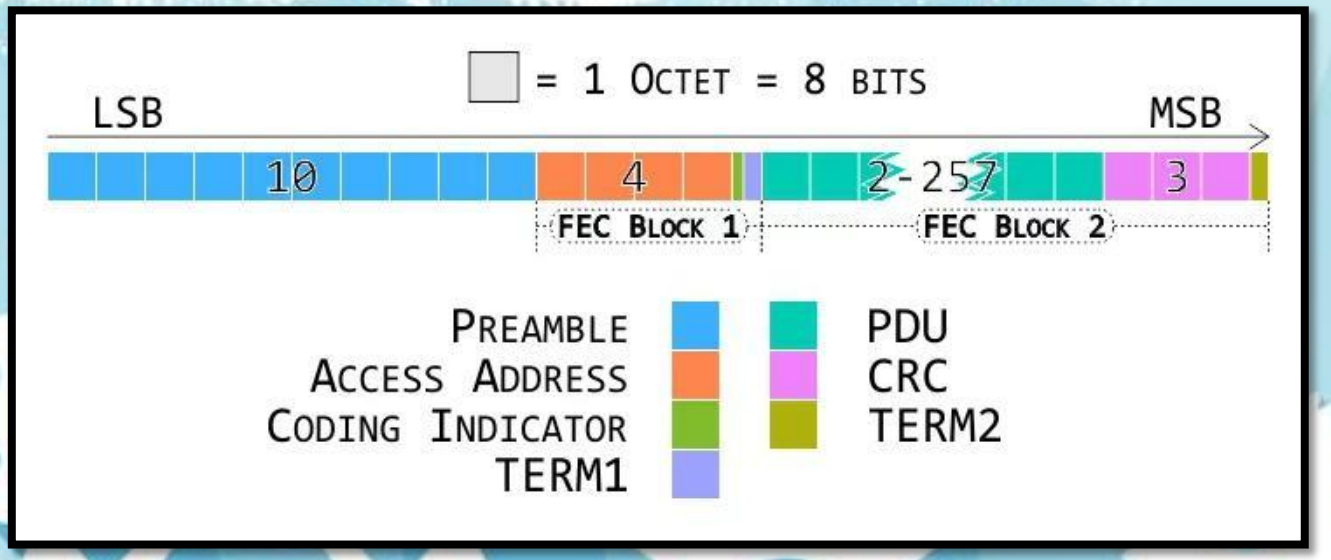
The Protocol Data Unit (PDU) follows the Access Address. If the packet is on the primary or secondary advertising channel, it will be the Advertising Channel PDU. If the packet is transmitted on a data channel, the PDU shall be a Data Channel PDU. 2564

CRC

A 24 bit (3 Octet) Cyclic Redundancy Check (CRC) is calculated with the bits from the PDU 2564. It is transmitted at the end of the packet.

Packet Format for LE 1M Coded PHY

Each Packet consists of an uncoded preamble, FEC Block 1, and FEC Block 2.2565



Link Layer Packet Format for the LE 1M Coded PHY2565

Preamble

The preamble is uncoded and consists of 10 repetitions of 0x3C (001111002).

Access Address

The access address is set in the SyncInfo field during advertisement or is set to 0x8E89BED6.

Coding Indication

The coding indicator consists of two bits, 002 indicates that FEC Block 2 is encoded using S=8, and 012 indicates that FEC Block 2 is encoded using S=2. The FEC encoder generates two output bits for every one input bit. When used, the pattern encoder generates four output bits for every one input bit. S=2 indicates that the number of bits is doubled after leaving the FEC encoder.

S=8 indicates that the input bits are doubled in the FEC encoder, and those bits are then quadrupled by the Pattern.

$$\text{Encoder 1 bit} \times \frac{2 \text{ bits}}{1 \text{ bit}}_{\text{FEC}} \times \frac{4 \text{ bits}}{1 \text{ bit}}_{\text{Pattern}}$$

TERM1

Three consecutive zeros indicate a termination sequence and reset the FEC encoder (0002).

FEC Block 2

Everything in FEC Block 2 is encoded according to encoded according to the Coding Indicator in Block 1.

PDU

The Protocol Date Unit is either the Advertising Channel PDU or the Data Channel PDU. Before encoding, the data length ranges between 16 and 2056 bits. After encoding, the range becomes either 128 ~ 16448 bits (S=8) or 32 ~ 4112 bits (S=2).

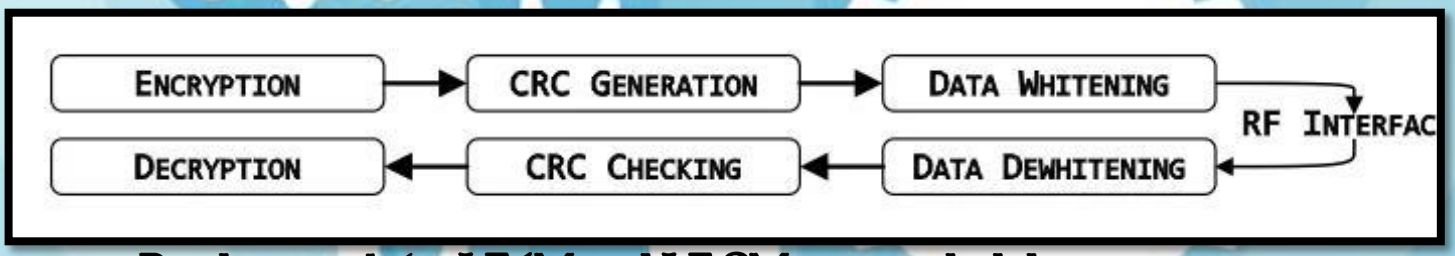
CRC

The 24 bit (3 Octet) Cyclic Redundancy Check (CRC) is calculated with the bits from the PDU 2564. It is transmitted at the end of the packet.

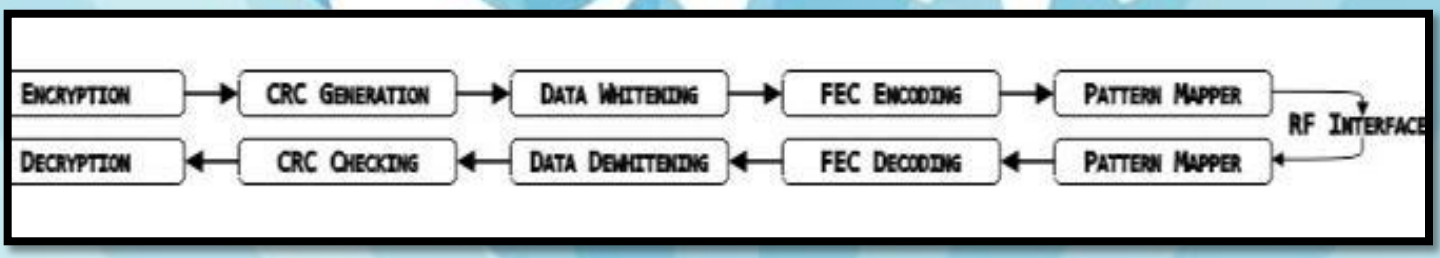
TERM2

Three consecutive zeros terminate the transmission and reset the FEC encoder (0002).

#MostBluetooth LE 5devices willremain backwards-compatible with Bluetooth LE 4 devices. To take advantage of new features, you will need two BLE5 capable devices. You will not see the increased range or data rate unless both devices are BLE5 compatible.



Bit data path for LE 1M and LE 2M unencoded data



Bit data path for LE coded

Conclusion

The new PHY layers of the Bluetooth 5 specification allow for either high-speed (2x) or long-distance (4x) BLE connectivity. These PHYs bring greater functionality to the already ubiquitous BluetoothLE standard and will undoubtedly change the way we use the next generation of LE devices.

Bluetooth™ 5.0

STUDENT ACHIEVEMENT

ADARSH PAL

1. He attended The Anonymous Writer Offline Session in Delhi Technological University which was hosted by **Mr.Abhijit Chakraborty.**
2. **BIRDS EXTEMPORE 2K17** – He is appointed as 'CREATIVITY HEAD' of this event due to his past performance & experiences.

WINNERS OF SUDOKU COMPETITION

IEEE organized a SUDOKU event & here are the list of students who achieved some position in this competition.

1st – UTKARSH RAI (2nd YEAR)

2nd – PRIYANSHI PANWAR (2nd YEAR)

3rd – TARUN JAIN (2nd YEAR)

4th – SATYAM KASAUDHAN (2nd YEAR)

5th – SIDDHANT SINGH (2nd YEAR)

ALUMINI SPEAK

NAME-Shubhangi Shankar

BATCH-2013-2017

CURRENT PROFILE JOB-Network Executive

ANY PARTICULAR FACULTY WHICH HAD LEFT A DEEP IMPACT ON YOU? Yes, Vineeta Ma'am 1st Year Maths Faculty

WHAT WAS THE HIGHLIGHT OF YOUR COLLEGE EXPERIENCE?IS IS THERE SOMETHING THAT WILL STAND YOU OUT;SOMETHING THAT YOU WILL ALWAYS REMEMBER: College is always about learning new things in life, whether it be academics knowledge or be it new experiences related to life college helps us to grow in each aspect at every point of time.

ABOUT YOUR HOSTEL LIFE/ANY INCIDENT FROM YOUR HOSTEL LIFE: I had an amazing hostel life. Making Maggie at 3 am and talking with friends without realizing that it had been morning, laughing with them unnecessarily and creating the bond which never thought of. Really I miss all those days.

ABOUT YOUR FRIEND'S FROM RKGIT: The bond that is maintained between the faculties and students and the fact that small things are celebrated very nicely like a simple festival like Janmashtami or big things like college fests.

ONE THING WHICH RKGIT TAUGHT YOU: Whatever the bond you have with your faculty, always respect them because no matter what they will always think the best for you.

IS B.TECH PLAYING A MAJOR ROLE IN YOUR TODAY'S WORK PLACE?

A big YES!!

Never fear to take risks or make mistakes or never let failures hold you back but just keep one thing in mind, whatever mistake you make or whenever you fail always learn a lesson from them and never repeat it again.

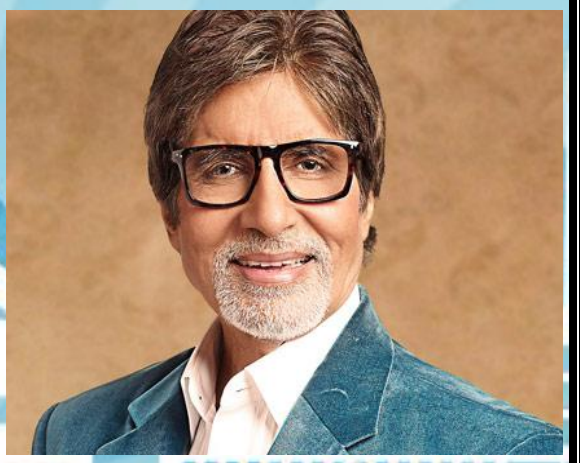
NOBLE PERSONALITIES

1. KISHORE KUMAR

Kishore Kumar (4 August 1929 – 13 October 1987) was an Indian playback singer, actor, lyricist, composer, producer, director, and screenwriter. He is considered one of the successful playback singers in the Hindi film industry.

Apart from Hindi, he sang in many Indian languages including Bengali, Marathi, Assamese, Gujarati, Kannada, Bhojpuri, Malayalam, Odia, and Urdu. He has also sung in private albums in several languages especially in Bengali which are noted as all time classics. He won 8 Filmfare Awards for Best Male Playback Singer and holds the record for winning the most Filmfare Awards in that category. He was awarded the "Lata Mangeshkar Award" by the Madhya Pradesh government in the year 1985-86. In the year 1997, the Madhya Pradesh Government initiated an award called the "Kishore Kumar Award" as a contribution to Hindi cinema. Recently, Kishore Kumar's unreleased last song was sold for Rs 15.6 lakh (1.56 million) at the Osian's Cinefan Auction, New Delhi in 2012.

2. AMITABH BACHCHAN



Amitabh Harivansh Rai Bachchan (born 11 October 1942, Allahabad)is an Indian film actor .He first gained popularity in the early 1970s for movies like Zanjeer and Deewaar ,and was dubbed India's first "angry youngman" for his onscreen roles

in bollywood. He is popularly referred as "SHAHENSHAH"OF BOLLWOOD.He has since appeared i over 190 IndianFilms in a career spanning almost five decades. He is widely regarded as one of the greatest and most influential Actors in the history of bollywood.

The government of India honoured himwith the PADMA BHUSHAN in 2001 and the PADMA VIBHUSHAN in 2015.For his contributions to the arts .His immense contributionsand his bold character truly defineshe is the Shahenshah of Indian film industry.

3. RAJINIKANTH

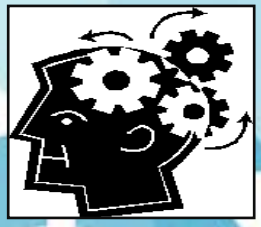
Shivaji Rao Gaekwaad (born 12 December 1950,Karnataka),known by his mononymous stage name Rajinikanth,is an Indian film actor, who works primarily in TAMIL cinema.He Began acting in plays whileworking in the Bangalore Transport Service as a bus conductor.His acting careercommenced with a brief phase of portraying antagonistic characters in Tamil films.He has long collections of award for his acting .in addition to acting,he has also worked as a Producer and screen writer.He serves as an influencein DRAVIDIAN politics.The government of India hashonoured him with the PADMABHUSHAN in 2000 and the PADMA VIBHUSHAN in 2016 for his contributions to the arts.

4. Sourav Ganguly

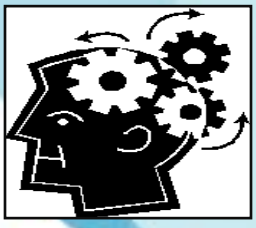
Sourav Chandidas Ganguly (born 8 July 1972), affectionately known as Dada (meaning "elder brother" in Bengali), is a former Indian cricketer and captain of the Indian national team, Currently, he is appointed as the President of the Cricket

Association of Bengal and President of the Editorial Board with Wisden India. During his playing career, Ganguly established himself as one of the world's leading batsmen, particularly in the one-day format. He was especially prolific through the off side, earning the nickname God of the Off Side for his elegant strokeplay square of the wicket and through the covers.

Sourav Ganguly is one of the four members of the Indian Premier League's Governing Council, responsible for all the functions of the tournament. He was appointed by Supreme Court in January 2016. He is also a member of Technical Committee, Indian Premier League.



BRAIN QUIZ



1. Three pipes A, B and C can fill a tank from empty to full in 30 minutes, 20 minutes, and 10 minutes respectively. When the tank is empty, all the three pipes are opened. A, B and C discharge chemical solutions P, Q and R respectively. What is the proportion of the solution R in the liquid in the tank after 3 minutes?

   A. $\frac{5}{11}$

   B. $\frac{6}{11}$

   C. $\frac{7}{11}$

   D. $\frac{8}{11}$

2. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

   A. 15
   B. 16
   C. 18
   D. 25

3. A boat running upstream takes 8 hours 48 minutes to cover a certain distance, while it takes 4 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and speed of the water current respectively?

   A. 2 : 1

   B. 3 : 2

C. 8 : 3

D. Cannot be determined

E. None of these

4. Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is:

A. 1 : 3

B. 3 : 2

C. 3 : 4

D. None of these

5. A hollow iron pipe is 21 cm long and its external diameter is 8 cm. If the thickness of the pipe is 1 cm and iron weighs 8 g/cm^3, then the weight of the pipe is:

A. 3.6 kg

B. 3.696 kg

C. 36 kg

D. 36.9 kg

6. Two dice are thrown simultaneously. What is the probability of getting wonumbers whose product is even?

A. $\frac{1}{2}$

B. $\frac{3}{4}$

C. $\frac{3}{8}$

D. $\frac{5}{}$

7. The average monthly income of P and Q is Rs. 5050. The average monthly income of Q and R is Rs. 6250 and the average monthly income of P and R is Rs. 5200. The monthly income of P is:

A. 3500

B. 4000

C. 4050

D. 5000

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1.At the resonant frequency, the feedback factor (R_2/R_1) of a Wien bridge oscillator using Op-Amp, is 1/2. Hence, the amplifier gain must be greater than 2 to maintain sustained oscillations.

2.Speed of data transmission in 4G network of telecom is from 100 mbps to 1 gbps.

3.Reactive power is given by the equation, $Q = \frac{V}{X} \times (E\,cos\theta - V)$ From the above equation, the reactive power generated or delivered is significantly depends on excitation. When excitation is rated or critical, E cosθ = V, which means Q = 0, the generator neither supplies nor draws any reactive power and operates at unity power factor.

4.The charge of one electron is 1.6×10^{-19} coulomb. Again 1 A current means transferring of 1 coulomb charge per one second.

$$1\ A = \frac{1}{1.6 \times 10^{-19}} = 0.625 \times 10^{19}$$

5.Superposition theorem can be applied for both AC as well DC excitation to calculate the voltage or current calculations. It holds for both DC and AC excitation, if the circuit is linear. But superposition theorem is not applicable for power calculations.

6.When response to excitation is constant even though we interchange the excitation and responses then the reciprocity theorem is verified for the given network.

7.In the cauer-2 form of single port LC filter network anlysis C is series element and L is shunt element respectively.

Contact us and mail your answer at

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