**UNIT V - SATELLITE, OPTICAL FIBER – POWERLINE, SCADA**

Orbits : types of satellites : frequency used link establishment, MA techniques used in satellite communication, earth station; aperture actuators used in satellite – Intelsat and Insat: fibers – types: sources, detectors used, digital filters, optical link: power line carrier communications: SCADA

**SESSION PLAN**

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| --- | --- |
| Session 1 | * Satellite Orbits, Low Earth Orbit, Medium Earth Orbit, Geosynchronous Orbit
 |
| Session 2 | * Types of Satellite, Geosynchronous satellite
 |
| Session 3 | * Satellite system link models, Uplink model, Downlink model
 |
| Session 4 | * Satellite system link equation, Uplink equation, Downlink equation
 |
| Session 5 | * Multiple access techniques used in satellite, FDM/FM satellite system, FDMA,TDMA, CDMA
 |
| Session 6 | * Direct Sequence Spread Spectrum, Frequency hopping spread spectrum, Aperture actuators used in satellite, Intelsat and Insat
 |
| Session 7 | * Fibers, Types of fiber, Single mode step index optical fiber, Multimode step index optical fiber, Multimode graded index optical fiber
 |
| Session 8 | * Optical source, LED, Homojunction LED, Heterojunction LED, Injection Laser Diode
 |
| Session 9 | * Optical detectors, PIN diode, Avalanche Photo Diode & Digital Filters
* Optical fiber system link budget & SCADA
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**UNIT - V**

**SATELLITE, OPTICAL FIBER – POWERLINE, SCADA**

**SESSION – 1**

Introduction: (Learning Aid & Methodology: Brainstorming)

‘SATELLITE, OPTICAL FIBER – POWERLINE, SCADA’ is being a well-known term; the faculty can begin the session by conducting a brainstorming activity so as to know the knowledge of the learners about the terms Human population.

Satellite Orbits, Low Earth Orbit (Learning Aid & Methodology: Board Presentation)

The points discussed are:

1. Satellite Orbits
2. Low Earth Orbit

References:

1. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&ved=0CDIQFjAB&url=http%3A%2F%2Fearthobservatory.nasa.gov%2FFeatures%2FOrbitsCatalog%2Fpage2.php&ei=1iJuUprfMszrrQeJ04DgDQ&usg=AFQjCNGaj06Kk7HuiCe3FpPufKtU5PehuQ&bvm=bv.55123115,d.bmk
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&ved=0CEgQFjAE&url=http%3A%2F%2Fwww.polaris.iastate.edu%2FEveningStar%2FUnit4%2Funit4\_sub3.htm&ei=1iJuUprfMszrrQeJ04DgDQ&usg=AFQjCNGA4j\_TYpFnjHRdgFyyRiPJX2Cd9A&bvm=bv.55123115,d.bmk

Complex design of embedded system (Learning Aid & Methodology: Board Presentation)

 The points discussed are:

1. Medium Earth Orbit
2. Geosynchronous Orbit

References:

1. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CCgQFjAA&url=http%3A%2F%2Fpeople.cs.nctu.edu.tw%2F~cjtsai%2Fcourses%2Fsoc%2Fclassnotes%2Fsoc11\_01\_Introduction.pdf&ei=\_SJuUoa3CouYrgedyoCICQ&usg=AFQjCNF0JKcvk1ZG8S61HtM\_BQZuzfC6cQ&bvm=bv.55123115,d.bmk
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&ved=0CEoQFjAE&url=http%3A%2F%2Fcordis.europa.eu%2Ffp7%2Fict%2Fesd%2Fdocs%2Freport-esd-v14.pdf&ei=\_SJuUoa3CouYrgedyoCICQ&usg=AFQjCNH5OfZeazPlZBzf\_b39xl8IbcOjmg&bvm=bv.55123115,d.bmk

Conclusion & Summary (Learning Aid & Methodology: Recall by keywords)

 The students are instructed to list out the important technical words. The following are some of the keywords: Satellite Orbits, Low Earth Orbit, Medium Earth Orbit, Geosynchronous Orbit.

**SESSION – 2**

Recap: Design issue and technique; Introduction - Complex design of embedded system (Learning Aid & Methodology: Unspoken word)

 The faculty has to give the description of concepts in short and getting the relevant technical term as the answer from the students.

Types of Satellite Geosynchronous satellite (Learning Aid & Methodology: Board activity Presentation)

 The Types of Satellite, Geosynchronous satellite are explained through presentation slides and discussed with the students by the faculty.

1. Types of Satellite
2. Geosynchronous satellite

References:

1. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&sqi=2&ved=0CCgQFjAA&url=http%3A%2F%2Fwww.satellites.spacesim.org%2Fenglish%2Fengineer%2Fcopy%2F&ei=MSNuUoewBsKBrQf0yIGQDQ&usg=AFQjCNGQwsuETrTl9HPRZ\_coIAvCsQUHkQ&bvm=bv.55123115,d.bmk
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&cad=rja&sqi=2&ved=0CFEQFjAH&url=http%3A%2F%2Fhistoryday.crf-usa.org%2F2702%2Fsatellitetypes.htm&ei=MSNuUoewBsKBrQf0yIGQDQ&usg=AFQjCNG7M6nTYd2-5UVWTqiPiEPX\_F2R\_A&bvm=bv.55123115,d.bmk
3. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&cad=rja&ved=0CGAQFjAJ&url=http%3A%2F%2Fwww.nasa.gov%2Fmultimedia%2Fimagegallery%2Fimage_feature_388.html&ei=UCNuUp72E8yArgfxpoDYBg&usg=AFQjCNFoRDvm66o2DdzqN5hH-rYPWt3yqg&bvm=bv.55123115,d.bmk>
4. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=13&cad=rja&ved=0CHIQFjAM&url=http%3A%2F%2Fwww.isro.org%2Fsatellites%2Fgeostationary.aspx&ei=UCNuUp72E8yArgfxpoDYBg&usg=AFQjCNFEjjstCQJNFauE8d9-2L7icGt7cQ&bvm=bv.55123115,d.bmk

Conclusion & Summary: (Learning Aid & Methodology: Recall by keywords)

 The students are instructed to list out the important technical words. The following are some of the keywords: catastrophic doomsday model, overshoot or dieback.

**SESSION – 3**

Recap: Types of Satellite, Geosynchronous satellite (Learning Aid & Methodology: Brainstorming)

 The faculty has to prepare the list of terms related to Population explosion. The students were asked to think about the last session discussion and answer the questions.

1. Types of Satellite
2. Geosynchronous satellite

Satellite system link models: (Learning Aid & Methodology: Board Presentation)

Satellite system link models a well-known to the students; the faculty can begin the session by conducting a brainstorming activity so as to know the knowledge of the learners about the Satellite system link models.

References:

1. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CCgQFjAA&url=http%3A%2F%2Fwww.geocities.ws%2Fffbouges%2Fffb.htm&ei=byNuUo2uI8XtrAews4HgDA&usg=AFQjCNEHV1OxTWTq-NVgTV6pnS67VCnnDA&bvm=bv.55123115,d.bmk
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&cad=rja&ved=0CEIQFjAF&url=http%3A%2F%2Fitblogs.in%2Fcommunication%2Ftechnology%2Fsatellite-system-link-models%2F&ei=byNuUo2uI8XtrAews4HgDA&usg=AFQjCNFqaZoZQ7S8dk2pcYunGJJBLG\_PbQ&bvm=bv.55123115,d.bmk

Uplink model, Downlink model (Learning Aid & Methodology: Board and LCD Presentation)

The concept of Uplink model, Downlink model was explained through Board and LCD presentation.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&ved=0CC4QFjAB&url=http%3A%2F%2Fspectrum.library.concordia.ca%2F8064%2F1%2FMQ94710.pdf&ei=jiNuUqeTJYaMrAfO6IBw&usg=AFQjCNFMG3QmzA6uMEaWqEIUViPqNK--bA&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&cad=rja&ved=0CGkQFjAJ&url=http%3A%2F%2Fpema.ie%2Fenews%2FDSA8093.pdf&ei=jiNuUqeTJYaMrAfO6IBw&usg=AFQjCNGZB093dZGOAY-MGcsQv6mY8xUC0w&bvm=bv.55123115,d.bmk

Conclusion & Summary (Learning Aid & Methodology: Recall by keywords)

 The students were asked to recall and write the important technical key words of this session:

Some of the keywords are: Satellite system link models, Uplink model, Downlink model

**SESSION – 4**

Recap: Satellite system link models, Uplink model, Downlink model (Learning Aid & Methodology: Brainstorming)

 A particular group was assigned, the last day itself; from that group after a small discussion one student from that group have to give presentation on Satellite system link models, Uplink model, Downlink model.

Satellite system link equation (Learning Aid & Methodology: Board Presentation)

 The Satellite system link equation topic explained through presentation slides and discussed with the students by the faculty.

References:

1. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=9&cad=rja&ved=0CFYQFjAI&url=http%3A%2F%2Fmy.safaribooksonline.com%2Fbook%2F-%2F9781119945840%2Fchapter-3-system-architectures-of-satellite-communication-radar-navigation-and%2Fnavpoint-34&ei=vSNuUpSSHoKRrQfjpoDQAg&usg=AFQjCNGv5o0JmLGE39n2LVVaUKgCXnqB4w&bvm=bv.55123115,d.bmk
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&cad=rja&ved=0CFgQFjAJ&url=http%3A%2F%2Fwww.satsig.net%2Fsatellite-links.htm&ei=vSNuUpSSHoKRrQfjpoDQAg&usg=AFQjCNEteKCkC1gcc7eoRl31mFfO8XF\_7g&bvm=bv.55123115,d.bmk

Satellite system link equation (Learning Aid & Methodology: Board Presentation)

 students by the faculty.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&cad=rja&ved=0CFAQFjAH&url=http%3A%2F%2Ffaculty.kfupm.edu.sa%2Fee%2Fsamara%2FLinkBudget1.ppt&ei=vSNuUpSSHoKRrQfjpoDQAg&usg=AFQjCNH99vwgCgigp5vE-Xn-OWx15AjhDw&bvm=bv.55123115,d.bmk>
2. http://www.google.co.in/aclk?sa=l&ai=CBXREvSNuUof\_JMyGkQXjiIGQBKKysucDouCKpWvGusEICAMQAVDH9K6u-v\_\_\_\_8BYOWCgIDYDqABvtKI3APIAQGqBChP0He2CMefZtyB8ZWOtsIldwC7yo9f9evEEbKmKMjsHgRNRL3AXEzdgAeqrfcjkAcD&sig=AOD64\_3dYXRDGRIgxNK8tdH4jkewdrkUZQ&rct=j&q=Satellite+system+link+equation+&ved=0CGMQ0Qw&adurl=http://gvf.org/training/andrew-werth-scholarship-discount.html

Conclusion & Summary (Learning Aid & Methodology: Learner-led presentation)

 A student (who is already assigned) was asked to come on to the stage to give the presentation on the today’s session in short.

**SESSION – 5**

Recap: Satellite system link equation, Uplink equation, Downlink equation (Learning Aid & Methodology: Recall by Key words)

 The recap on the last session topic was discussed through key words. Some key words are: Satellite system link equation, Uplink equation, Downlink equation

Multiple access techniques used in satellite (Learning Aid & Methodology: Presentation)

The points discussed are Multiple access techniques used in satellite discussed through ppt presentation.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&ved=0CC4QFjAB&url=http%3A%2F%2Fwww.jsati.com%2Fwhy-satellite-how-MultipleAccess.asp&ei=HSRuUsPOAoWCrAeKyoHQBw&usg=AFQjCNFOlxGmej3gFn_Ul7V4JY8Ewx9PVg&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&ved=0CDcQFjAC&url=http%3A%2F%2Fsatelliteco.wordpress.com%2F2012%2F08%2F27%2Fsatellite-multiple-access%2F&ei=HSRuUsPOAoWCrAeKyoHQBw&usg=AFQjCNHTGyVE5f86QkpHWDyPxMzEFdJ7jQ&bvm=bv.55123115,d.bmk

FDM/FM satellite system, FDMA,TDMA, CDMA (Learning Aid & Methodology: Board Presentation)

 The ‘FDM/FM satellite system, FDMA,TDMA, CDMA’ topic explained through presentation slides and discussed with the students by the faculty.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&ved=0CD0QFjAE&url=http%3A%2F%2Felectronicdesign.com%2Fcommunications%2Ffundamentals-communications-access-technologies-fdma-tdma-cdma-ofdma-and-sdma&ei=MyRuUsLaDcG4rgfTooHwDA&usg=AFQjCNEYamWV5_naKd2mhhtrIG_WD10Qbw&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&cad=rja&ved=0CFkQFjAJ&url=http%3A%2F%2Fwww.stanford.edu%2Fclass%2Fee360%2FsuppRead%2Fread1%2Fcapacity\_CDMA\_91Gilhousen.pdf&ei=MyRuUsLaDcG4rgfTooHwDA&usg=AFQjCNGYxKeaMCNUuTUe6DfM-JAaexjmYA&bvm=bv.55123115,d.bmk

Conclusion & Summary (Learning Aid & Methodology: Rapid fire quiz)

 This session was concluded with the rapid fire of simple questions to the audience.

**SESSION – 6**

Recap: Multiple access techniques used in satellite, FDM/FM satellite system, FDMA,TDMA, CDMA (Learning Aid & Methodology: Show and tell)

 The block diagram of the “Multiple access techniques used in satellite, FDM/FM satellite system, FDMA,TDMA, CDMA” was shown to the student which was explained in the last session. That was explained in short by the student.

Direct Sequence Spread Spectrum, Frequency hopping spread spectrum (Learning Aid & Methodology: Board activity & Presentation)

 The Objectives of Direct Sequence Spread Spectrum, Frequency hopping spread spectrum were discussed through board and powerpoint presentation

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=7&cad=rja&ved=0CFAQFjAG&url=http%3A%2F%2Fsearchnetworking.techtarget.com%2Fdefinition%2Fdirect-sequence-spread-spectrum&ei=ViRuUsnFIIazrgePqIHYCQ&usg=AFQjCNHrgXNIH5Sn8fZU7q6D3dsSDJnQyQ&bvm=bv.55123115,d.bmk>
2. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&cad=rja&ved=0CGsQFjAJ&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxpls%2Fabs_all.jsp%3Farnumber%3D1689229&ei=ViRuUsnFIIazrgePqIHYCQ&usg=AFQjCNEacv1ULtzHN2eSmpNrJTx7RobKEQ&bvm=bv.55123115,d.bmk>
3. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=9&cad=rja&ved=0CGUQFjAI&url=http%3A%2F%2Fwww.ele.uri.edu%2FCourses%2Fele436%2Flabs%2FDSSS.pdf&ei=ViRuUsnFIIazrgePqIHYCQ&usg=AFQjCNFK66EY6Ml4OyLxgt7\_mnoHvBE6ww&bvm=bv.55123115,d.bmk

Aperture actuators used in satellite, Intelsat and Insat (Learning Aid & Methodology: RolePlay)

 The students were given with the concept of Aperture actuators used in satellite, Intelsat and Insat.

References:

1. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=9&cad=rja&ved=0CFYQFjAI&url=http%3A%2F%2Fwww.frontline.in%2Fstatic%2Fhtml%2Ffl1608%2F16080040.htm&ei=dyRuUrLTD4SRrAfP5oHwDg&usg=AFQjCNH\_EmmFuZYej-eTQieaLg1dGVAFkw&bvm=bv.55123115,d.bmk
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&cad=rja&ved=0CF0QFjAJ&url=http%3A%2F%2Fen.wikipedia.org%2Fwiki%2FAttitude\_control&ei=dyRuUrLTD4SRrAfP5oHwDg&usg=AFQjCNH5sNyrzoi2ecgahtU50tqK\_u\_hnQ&bvm=bv.55123115,d.bmk

Conclusion & Summary (Learning Aid & Methodology: Recall by keywords)

 The students were asked to recall and write the important technical key words of this session:

Some of the keywords are: Database, National Management Information System, Environmental Information System (ENVIS), Remote Sensing and Geographical Information System (GIS), Student Friendly Features, Teacher Friendly Features.

**SESSION – 7**

Recap: Direct Sequence Spread Spectrum, Frequency hopping spread spectrum, Aperture actuators used in satellite, Intelsat and Insat (Learning Aid & Methodology: Questions)

 The block diagram of the “Direct Sequence Spread Spectrum, Frequency hopping spread spectrum, Aperture actuators used in satellite, Intelsat and Insat” was shown to the student which was explained in the last session. That was explained in short by the student.

Fibers, Types of fiber, Single mode step index optical fiber (Learning Aid & Methodology: Board activity & Presentation)

 The Objectives of Fibers, Types of fiber, Single mode step index optical fiber were discussed through board and powerpoint presentation.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=13&cad=rja&ved=0CG4QFjAM&url=http%3A%2F%2Fvoscom.wordpress.com%2F2010%2F07%2F07%2Ftypes-of-fiber-optic-cables-singlemode-multimode%2F&ei=lSRuUu-PBIeNrgfN04Ew&usg=AFQjCNFYLSsH32TRjSILYdv0PyjBi3Pn-w&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=13&cad=rja&ved=0CG4QFjAM&url=http%3A%2F%2Fvoscom.wordpress.com%2F2010%2F07%2F07%2Ftypes-of-fiber-optic-cables-singlemode-multimode%2F&ei=lSRuUu-PBIeNrgfN04Ew&usg=AFQjCNFYLSsH32TRjSILYdv0PyjBi3Pn-w&bvm=bv.55123115,d.bmk

Multimode step index optical fiber, Multimode graded index optical fiber (Learning Aid & Methodology: Board activity Presentation)

 The students were given with the concept of ‘Multimode step index optical fiber, Multimode graded index optical fiber’ through board.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&cad=rja&ved=0CEEQFjAH&url=http%3A%2F%2Fwww.thorlabs.com%2Fnewgrouppage9.cfm%3Fobjectgroup_id%3D358&ei=rCRuUqWCGMi5rgeA0IHABg&usg=AFQjCNG7hH9vAiS9dcVsrZ79z8nXUZpjaQ&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=12&cad=rja&ved=0CFsQFjAL&url=http%3A%2F%2Fwww.rp-photonics.com%2Fmultimode\_fibers.html&ei=rCRuUqWCGMi5rgeA0IHABg&usg=AFQjCNEFYv1F59o1q8GwH2F\_QLt6m0b-xg&bvm=bv.55123115,d.bmk

Conclusion & Summary (Learning Aid & Methodology: Recall by keywords)

 The students were asked to recall and write the important technical key words of this session:

Some of the keywords are: Database, National Management Information System, Environmental Information System (ENVIS), Remote Sensing and Geographical Information System (GIS), Student Friendly Features, Teacher Friendly Features.

**SESSION – 8**

Recap: Fibers, Types of fiber, Single mode step index optical fiber, Multimode step index optical fiber, Multimode graded index optical fiber (Learning Aid & Methodology: Presentation Discussion)

 The block diagram of the “Fibers, Types of fiber, Single mode step index optical fiber, Multimode step index optical fiber, Multimode graded index optical fiber” was shown to the student which was explained in the last session. That was explained in short by the student.

Optical source, LED, Homojunction LED (Learning Aid & Methodology: Presentation)

 The Objectives of women welfare, various organizations towards women & child welfare were discussed through board and powerpoint presentation

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CCgQFjAA&url=http%3A%2F%2Fiitk.vlab.co.in%2F%3Fsub%3D27%26brch%3D80%26sim%3D222%26cnt%3D501&ei=yCRuUqSQBoWJrgeTqYGAAw&usg=AFQjCNES6t-SscAwaEAopUZg9JNgDmnQZQ&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&ved=0CDQQFjAC&url=http%3A%2F%2Flink.springer.com%2Farticle%2F10.1007%252Fs11801-009-9211-7&ei=yCRuUqSQBoWJrgeTqYGAAw&usg=AFQjCNGAsQKd8prIHS0BWzDYJUg3JFxIdQ&bvm=bv.55123115,d.bmk

Heterojunction LED, Injection Laser Diode (Learning Aid & Methodology: Presentation, Brainstorming)

 The students were given with the concept of ‘Heterojunction LED, Injection Laser Diode’. The students have to discuss and present.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&ved=0CDkQFjAC&url=http%3A%2F%2Fwww.annualreviews.org%2Fdoi%2Fpdf%2F10.1146%2Fannurev.ms.10.080180.001443&ei=0SRuUoaqA8iLrQfhm4GoAw&usg=AFQjCNGrval7E2ElpXQGljkrbEhdmn80RA&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&ved=0CEcQFjAE&url=http%3A%2F%2Fwww.tf.uni-kiel.de%2Fmatwis%2Famat%2Fsemi\_en%2Fkap\_7%2Fbackbone%2Fr7\_1\_4.html&ei=0SRuUoaqA8iLrQfhm4GoAw&usg=AFQjCNH2ML5jrDOrdxA-GRBZ1-VDJFEtOg&bvm=bv.55123115,d.bmk

Conclusion & Summary (Learning Aid & Methodology: Recall by keywords)

 The students were asked to recall and write the important technical key words of this session:

Some of the keywords are: Optical source, LED, Homojunction LED, Heterojunction LED, Injection Laser Diode

**SESSION – 9**

Recap: Optical source, LED, Homojunction LED, Heterojunction LED, Injection Laser Diode (Learning Aid & Methodology: Questionnaires, Presentation)

 The block diagram of the “HIV/AIDS” was shown to the student which was explained in the last session. That was explained in short by the student.

Optical detectors, PIN diode, Avalanche Photo Diode & Digital Filters (Learning Aid & Methodology: Presentation & Block diagram analysis)

 The Objectives of Optical detectors, PIN diode, Avalanche Photo Diode & Digital Filters.

References:

1. <https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CCoQFjAA&url=http%3A%2F%2Fwww.ee.ryerson.ca%2F~courses%2Fee8114%2FPres5-receivers.ppt&ei=2yRuUuz0KoKKrgf6v4GYCw&usg=AFQjCNHjrFUHtAoXIV5zAzEIJ_nRdFrf_Q&bvm=bv.55123115,d.bmk>
2. https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=7&cad=rja&ved=0CE0QFjAG&url=http%3A%2F%2Fwww.lasercomponents.com%2Fde-en%2Fproduct%2Fmajor-a%2F&ei=2yRuUuz0KoKKrgf6v4GYCw&usg=AFQjCNHEEc5VOA8tdyHD6ThY0mBEKBisgg&bvm=bv.55123115,d.bmk

Optical fiber system link budget & SCADA (Learning Aid & Methodology: Presentation)

 The students were given with the concept of ‘Optical fiber system link budget & SCADA’. The students have to prepare them and assigning themselves as different characters and they played regarding the concept

References:

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Conclusion & Summary (Learning Aid & Methodology: Recall by keywords)

 The students were asked to recall and write the important technical key words of this session:

Some of the keywords are: Optical fiber system link budget & SCADA, Optical detectors, PIN diode, Avalanche Photo Diode & Digital Filters.