**GOVT. POLYTECHNIC EDUCATION SOCIETY, MANESAR**

**LESSON PLAN**

**Name of the Faculty: SH. N.K.ARORA**

**Discipline** : Electronics & Communication Engg.

**Semester** : 3rd

**Subject** : Principles of Communication Engineering

**Lesson Plan Duration:** Approx. 15 weeks (from15 Sep.2020 to16JAN. 2023) Work Load (Lecture / Practical) per week (in hours): Lectures-03, Practicals-06

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| **Week** | **Theory** | **Practical** |
| **Lecture Day** | **Topic (Including assignment / test)** | **Practical day** | **Topic** |
| 1st | 1st | Introduction about theSubject/course and its syllabus. | 1st | **Group 1: Exp 1-**1. To observe an AM wave on CRO produced by a standard signal generator using internal and external modulation.
2. To measure the modulation index of the wave obtained in above practical.
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| 2nd | **Unit-1: Introduction**Need for modulation, frequency translation. | 2nd | **Group 2: Exp 1-**1. To observe an AM wave on CRO produced by a standard signal generator using internal and external modulation.
2. To measure the modulation index of the wave obtained in above practical.
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| 3rd | Need for demodulationin communication systems. |
| 2nd | 4th | Basic scheme of aModern communication system. | 1st | **Group 1: Exp 1- contd. & Viva** |
| 5th | **Revision** | 2nd | **Group 2: Exp 1- contd. & Viva** |
| 6th | **Unit-2: Amplitude****modulation**Derivation of expression for an amplitude modulated wave. |
| 3rd | 7th | Carrier and side bandcomponents, Modulation index | 1st | **Group 1: Exp 2**1. To obtain an AM wave from a square law modulator circuit and observe waveforms.
2. To measure the modulation index of the obtained wave form.
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| 8th | Spectrum and BW of AM Wave. | 2nd | **Group 2: Exp 2**1. To obtain an AM wave from a square law modulator circuit and observe waveforms.
2. To measure the modulation index of the obtained wave form.
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| 9th | Relative powerdistribution in carrier and side bands. |
| 4th | 10th | Elementary idea ofDSB-SC, SSB-SC, ISBand VSB modulations | 1st | **Group 1: Exp 2 contd. & Viva** |
| 11th | Elementary idea of DSB-SC, SSB-SC, ISB | 2nd | **Group 2: Exp 2 contd. & Viva** |

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|  |  | and VSB modulations contd. |  |  |
| 12th | Comparison of variousAM systems and areas of applications. |
| 5th | 13th | **Revision & Assignment** | 1st | **Group 1: Exp 3**To obtain an FM wave and measure the frequency deviation for different modulating signals. |
| 14th | **Unit-3: Frequency****modulation**Expression forfrequency modulatedwave and its frequency spectrum | 2nd | **Group 2: Exp 3**To obtain an FM wave and measure the frequency deviation for different modulating signals. |
| 15th | Modulation index,maximum frequency deviation and deviation ratio |
| 6th | 16th | BW of FM signals,Carson’s rule. | 1st | **Group 1: Exp 3 Revision & Viva** |
| 17th | Effect of noise on FM carrier, Noise triangle | 2nd | **Group 2: Exp 3 Revision & Viva** |
| 18th | Role of limiter, Need forpre-emphasis and de- emphasis, capture effect. |
| 7th | 19th | Comparison of FM and AM in communication systems | 1st | **Group 1: Exp 4**To obtain modulating signal from an AM detectorcircuit and observe the pattern for different RC time constants and obtain its optimum value for least distortion. |
| 20th | **Revision and class test/quiz.** | 2nd | **Group 2: Exp 4**To obtain modulating signal from an AM detector circuit and observe the pattern for different RC timeconstants and obtain its optimum value for least distortion. |
| 21st | **Unit-4: Phase****modulation**Derivation of expression for phase modulatedwave, modulation index |
| 8th | 22nd | Comparison with frequency modulation | 1st | **Group 1: Exp 4 Revision & Viva** |
| 23rd | **Unit-5: Principles of****AM Modulators**Circuit Diagram and working operation ofCollector Modulator | 2nd | **Group 2: Exp 4 Revision & Viva** |
| 24th | Base Modulator |
| 9th | 25th | Square Law Modulator | 1st | **Group 1: Exp 5**To obtain modulating signal from FM detector. |
| 26th | Balanced Modulator,**Revision and Assignment** | 2nd | **Group 2: Exp 5**To obtain modulating signal from FM detector. |
| 27th | **Unit-6: Principles of****FM Modulators** Working principles and applications of reactance modulator |
| 10th | 28th | Varactor diodemodulator | 1st | **Group 1: Exp 5 Revision** |
| 29th | VCO Modulator | 2nd | **Group 2: Exp 5 Revision** |
| 30th | Armstrong phase modulator |

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| 11th | 31st | Stabilization of carrierusing AFC (Block diagram approach) | 1st | **Group 1: Exp 6**To observe the sampled signal and compare it with the analog input signal. Note the effect of varying the sampling pulse width and frequency on the sampled output. |
| 32nd | **Revision and class test/quiz.** | 2nd | **Group 2: Exp 6**To observe the sampled signal and compare it with the analog input signal. Note the effect of varyingthe sampling pulse width and frequency on the sampled output. |
| 33rd | **Unit-7: Demodulation****of AM Waves**Principles ofdemodulation of AM wave |
| 12th | 34th | Diode detector circuit | 1st | **Group 1: Exp 6 contd. &Viva** |
| 35th | Concept of Clipping | 2nd | **Group 2: Exp 6 contd. &Viva** |
| 36th | Formula for RC timeconstant for minimum distortion (no derivation) |
| 13th | 37th | **Revision & Assignment** | 1st | **Group 1: Exp 7**To observe and note the pulse amplitude modulated signal (PAM) and compare them with the corresponding analog input signal. |
| 38th | **Unit-8: Demodulation****of FM Waves**Basic principles of FM detection using slopedetector | 2nd | **Group 1: Exp 7**To observe and note the pulse amplitude modulated signal (PAM) and compare them with the corresponding analog input signal. |
| 39th | Principle of working ofFoster-Seeley discriminator |
| 14th | 40th | Ratio detector | 1st | **Group 1: Exp 7 contd.** |
| 41st | Block diagram of Phase locked Loop (PLL) FMdemodulators | 2nd | **Group 1: Exp 7 contd.** |
| 42nd | **Unit-9: Pulse****Modulation**Statement of sampling theorem and elementary idea of sampling frequency for pulsemodulation |
| 15th | 43rd | Basic concept of timedivision multiplexing (TDM) | 1st | **Group 1: Exp 8**To observe PPM and PWM signal and compare it with the analog input signal. |
| 44th | Frequency divisionmultiplexing (FDM) | 2nd | **Group 2: Exp 8**To observe PPM and PWM signal and compare it with the analog input signal. |
| 45th | Pulse Amplitude Modulation (PAM) |
| 16th | 46th | Pulse PositionModulation (PPM) | 1st | **Revision & Viva** |
| 47th | Pulse Width Modulation(PWM) | 2nd | **Revision & Viva** |
| 48th | **Revision and class test/quiz.** |