**Govt. Polytechnic, Manesar**

**Lesson Plan**

**Name of the Faculty** : - MS. Manju

**Discipline** : - Electronics & Communication Engg.

**Semester** : - 3rd

**Subject** : - NFTL

**Lesson Plan Duration** : - 15 weeks

Work Load (Lecture/Practical) per Week (In Hours):- Lecture - **03**, Practical - **02**

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| **WEEK** | **THEORY** | | **PRACTICAL** | |
| **LECTURE DAY** | **TOPIC**  **(including assignment/test)** | **PRACTICAL DAY** | **TOPIC** |
| 1st | 1st | **Networks**: Two port (four terminals) network: | 1st  Group-1 | Introduction about Practical of NFTL |
| 2nd | Basic concept of :Symmetrical and asymmetrical networks, Balanced and unbalanced network, T-Network |
| 3rd | Π-Network, Ladder network, Lattice network, L-network and Bridge T-network. | 2nd  Group-2 | Introduction about Practical of NFTL |
| 2nd | 4th | Symmetrical Network: concept and significance of the terms characteristic impedance. | 3rd  Group-1 | To measure the characteristic impedance of symmetrical T and Л networks |
| 5th | Concept and significance of the terms propagation constant |
| 6th | Phase shift constant and insertion loss | 4th  Group-2 | To measure the characteristic impedance of symmetrical T and Л networks |
| 3rd | 7th | T-network and Π-Network (No Derivation) | 5th  Group-1 | To measure the image impedance of a given asymmetrical T and Л networks |
| 8th | Asymmetrical Network- Concept and significance of iterative impedance |
| 9th | Concept and significance of image impedance | 6th  Group-2 | To measure the image impedance of a given asymmetrical T and Л networks |
| 4th | 10th | The half section (L-section) | 7th  Group-1 | Revision |
| 11th | Symmetrical T and Л sections into half sections (No Derivation) |
| 12th | **Attenuators**: Units of attenuation (Decibels and Nepers) | 8th  Group-2 | Revision |
| 5th | 13th | General characteristics of attenuators | 9th  Group-1 | For a prototype low pass filter: a) Determine the characteristic impedance experimentally  b) Plot the attenuation characteristic |
| 14th | Assignment-1 |
| 15th | Sessional Test-1 | 10th  Group-2 | For a prototype low pass filter: a) Determine the characteristic impedance experimentally  b) Plot the attenuation characteristic |
| 6th | 16th | Analysis and design of simple attenuator of T –type | 11th  Group-1 | To design and measure the attenuation of a symmetrical T/ Л type attenuator |
| 17th | Analysis and design of simple attenuator of Л and L type |
| 18th | **Filte**r: Brief idea of the use of filter networks in different communication systems | 12th  Group-2 | To design and measure the attenuation of a symmetrical T/ Л type attenuator |
| 7th | 19th | Concept of low pass, high pass, band pass and band stop filters | 13th  Group-1 | For a prototype high pass filter: a) Determine the characteristic impedance experimentally  b) To plot the attenuation characteristic |
| 20th | Impedance characteristics vs frequency Characteristics of a low pass filter and their significance |
| 21st | Impedance characteristics vs frequency Characteristics of a high pass filter and their significance | 14th  Group-1 | For a prototype high pass filter: a) Determine the characteristic impedance experimentally  b) To plot the attenuation characteristic |
| 8th | 22nd | Attenuation Vs frequency; Phase shift Vs frequency of T filters | 15th  Group-1 | a) To plot the Impedance characteristic of a prototype band-pass filter  b) To plot the attenuation characteristic of a prototype band pass filter |
| 23rd | Characteristics impedance vs frequency of T filters and their significance |
| 24th | Phase shift Vs frequency, characteristics impedance vs frequency of Л filters and their significance | 16th  Group-2 | a) To plot the Impedance characteristic of a prototype band-pass filter  b) To plot the attenuation characteristic of a prototype band pass filter |
| 9th | 25th | Simple design problems of prototype low pass section | 17th  Group-1 | a) To plot the impedance characteristic of m- derived low pass filter  b) To plot the attenuation characteristics of m-derived high pass filter |
| 26th | M-Derived Filter Sections:  Limitation of prototype filters, need of m-derived filters |
| 27th | Crystal Filters : crystal and its equivalent circuits, | 18th  Group-2 | a) To plot the impedance characteristic of m- derived low pass filter  b) To plot the attenuation characteristics of m-derived high pass filter |
| 10th | 28th | Special properties of piezoelectric filters and their use | 19th  Group-1 | **Revision** |
| 29th | Active Filters: Basic concept of active filters and their comparison with passive filters.  Assignment-2 |
| 30th | Sessional Test-2 | 20th  Group-2 | **Revision** |
| 11th | 31st | **Transmission Lines**: Transmission Lines their types and applications | 21st  Group-1 | To observe the information of standing waves on a transmission line and measurement of SWR and characteristic impedance of the line |
| 32nd | Distributed constants |
| 33rd | T and Л representation of transmission line section | 22nd  Group-2 | To observe the information of standing waves on a transmission line and measurement of SWR and characteristic impedance of the line |
| 12th | 34th | Concept of infinite line | 23rd  Group-1 | **Revision** |
| 35th | Condition for minimum distortion and minimum attenuation of signal on-the-line |
| 36th | Introduction to loading methods | 24th  Group-2 | **Revision** |
| 13th | 37th | Concept of reflection and standing waves, definition of reflection coefficient | 25th  Group-1 | Draw the attenuation characteristics of a crystal filter |
| 38th | SWR& VSWR and their relation (no derivation) |
| 39th | Concept of transmission lines at high frequencies. | 26th  Group-2 | Draw the attenuation characteristics of a crystal filter |
| 14th | 40th | Introduction to stubs. (single, open and short stubs) | 27th  Group-1 | **Revision** |
| 41st | HVDC (High Voltage DC transmission) – Concept. |
| 42nd | Advantage, Disadvantage and areas of application | 28th  Group-2 | **Revision** |
| 15th | 43rd | Revision | 29th  Group-1 | **Viva** |
| 44th | Assignment-3 |
| 45th | Sessional Test-3 | 30th  Group-2 | **Viva** |