**MAHAMAYA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCE,**

**NUAPADA**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

# SUBJECT: TH-2: CIRCUIIT & NETWORK THEORY CONCERNED FACULTY: ER. BARADA PRASAD SAHOO SEM: 3RD SEMESTER SESSION- 2022-23 SEMESTER FROM DT: 15-09-2022 TO DT: 22-12-2022 NO. OF WEEKS: 14 NO. OF DAYS/ PER WEEK CLASS ALLOTED: 4L + 1T PERIODS/WEEK

**LESSON PLAN**

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| WEEK  | DATE  | MODULE  | THEORY / PRACTICAL TOPICS  | CLASS DAY  | REMARKS  |
| 1ST  |   | 03  | CIRCUIT ELEMENTS, LAWS, NETWORK ANALYSIS  | 06 PERIODS  |   |
| 15-09-2022  | 3.1 Introduction to Electrical circuits Charge, Voltage, current, power and energy OHM’s law, Resistance, Inductance & capacitance as parameters  | 1  |   |
| 16-09-2022  | Types of circuit elements, Active, Passive, Unilateral & bilateral, Linear & Nonlinear elements  | 1  |   |
| 2ND  | 19-09-2022  | 3.2 KVL and KCL, Voltage division & current division.  | 1  |   |
| 20-09-2022  | 3.3 Mesh Analysis, Mesh Equations by inspection 3.3.1 Super mesh Analysis  | 1  |   |
| 21-09-2022  | 3.4 Nodal Analysis, Nodal Equations by inspection 3.5 Super node Analysis  | 1  |   |
| 22-09-2022  | 3.6 Source Transformation Technique 3.7 Solve numerical problems (with independent source only)  | 1  |   |
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|   | 04  | NETWORK THEOREMS:  | 08 Periods  |   |
| 23-09-2022  | 4.1 Star – delta transformation  | 1  |   |
| 3RD  | 26-09-2022  | 4.2 Super position Theorem  | 1  |   |
| 27-09-2022  | 4.3 Thevenin’s Theorem  | 1  |   |
| 28-09-2022  | 4.4 Norton’s Theorem  | 1  |   |
| 29-09-2022  | 4.5 Reciprocity Theorem  | 1  |   |
| 30-09-2022  | 4.6 Compensation Theorem  | 1  |   |
| 4TH  | 10-10-2022  | 4.7 Maximum power Transfer theorem  | 1  |   |
| 11-10-2022  | 4.8 Milliman’s Theorem  | 1  |   |
|   |   |   |   |   |
|   | 01   | MAGNETIC CIRCUITS  | 07 Periods  |   |
| 12-10-2022  | 1.1 Introduction  | 1  |   |
| 13-10-2022  | 1.2 Magnetizing force, Intensity, MMF, flux and their relations  | 1  |   |
| 14-10-2022  | 1.3 Permeability, reluctance and permeance  | 1  |   |
| 5TH  | 17-10-2022  | 1.4 Analogy between electric and Magnetic Circuits  | 1  |   |
| 18-10-2022  | 1.5 B-H Curve  | 1  |   |
| 19-10-2022  | 1.6 Series & parallel magnetic circuit  | 1  |   |
| 20-10-2022  | 1.7 Hysteresis loop  | 1  |   |
|   |   |   |   |   |
|   | 02  | COUPLED CIRCUITS:  | 05 Periods  |   |
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|  | 21-10-2022  |  | 2.1 Self Inductance, mutual inductance  | 1  |   |

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| 6TH  | 25-10-2022  |  | 2.2 Conductively coupled circuit and mutual impedance  | 1  |   |
| 26-10-2022  | 2.3 Dot convention  | 1  |   |
| 27-10-2022  | 2.4 Coefficient of coupling  | 1  |   |
| 28-10-2022  | 2.5 Series and parallel connection of coupled inductors  | 1  |   |
|   |   |   |   |   |   |
| 7TH  |   | 5  | AC CIRCUIT AND RESONANCE:  | 08 Periods  |   |
| 31-10-2022  | 5.1 Review of A.C. through R-L, R-C & R-L-C Circuit  | 1  |   |
| 01-11-2022  | 5.2 Solution of problems of A.C. through R-L, R-C & R-L-C series Circuit by complex algebra method.  | 1  |   |
| 02-11-2022  | 5.3 Soluti on of problems of A.C. through R-L, R-C & R-L-C parallel &Composite Circuits  | 1  |   |
| 03-11-2022  | 5.4 Power factor & power triangle.  | 1  |   |
| 04-11-2022  | 5.5 Deduce expression for active, reactive, apparent power.  | 1  |   |
| 8TH  | 07-11-2022  | 5.6 Series resonance & band width in RLC Circuit  | 1  |   |
| 09-11-2022  | 5.7 Resonant frequency for a tank circuit  | 1  |   |
| 10-11-2022  | 5.8 Q factor & selectivity in series circuit.  | 1  |   |
|   |   |   |   |   |
|   | 8  | TWO-PORT NETWORK:  | 08 Periods  |   |
| 11-11-2022  | 8.1 Open circuit impedance (z) parameters  | 1  |   |
| 9TH  | 14-11-2022  | 8.2 Short circuit admittance (y) parameters  | 1  |   |
| 15-11-2022  | 8.3 Transmission (ABCD) parameters  | 1  |   |
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|  | 16-11-2022  |  | 8.5 Hybrid (h) parameters.  | 1  |   |
| 17&18-11-2022  | 8.6 Inter relationships of different parameters.  | 2  |   |
| 10TH  | 21-11-2022  | 8.7 T representation.  | 1  |   |
| 22-11-2022  | 8.8 π representation.  | 1  |   |
|   |   |   |   |   |
|   | 6  | POLY PHASE CIRCUIT:  | 06 Periods  |   |
| 23-11-2022  | 6.1 concept of poly-phase system and phase sequence  | 1  |   |
| 24-11-2022  | 6.2 relation between phase and line quantities in star & delta connection  | 1  |   |
| 25-11-2022  | 6.3 power equation in three phase balanced circuit  | 1  |   |
| 11TH  | 28-11-2022  | 6.4 solved numerical problems  | 1  |   |
| 29-11-2022  | 6.5 measurement of 3-phase power by two wattmeter method  | 1  |   |
| 30-11-2022  | 6.6 solved numerical problems  | 1  |   |
|   |   |   |   |   |
|   | 7  | TRANSIENTS:  | 06 Periods  |   |
| 01-12-2022  | 7.1 Steady state response.  | 1  |   |
| 02-12-2022  | 7.1 transient state response.  | 1  |   |
|  |  |  |  |  |
| 12TH  | 07-12-2022  |  | 7.2 Response to R-L circuit under DC condition.  | 1  |   |
| 09-12-2022  | 7.2 Response to R-C circuit under DC condition.  | 1  |   |
| 10&11-12-2022  | 7.2 Response to RLC circuit under DC condition.  | 2  |   |
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| 13TH  |   | 9  | FILTERS:  | 06 Periods  |   |
| 14-12-2022  | 9.1 Classification of filters.  | 1   |   |
| 9.2 Filter networks.  |   |
| 9.3 Equations of filter networks.  |   |
| 15-12-2022  | 9.4 Classification of pass Band, stop Band and cut-off frequency.  | 1  |   |

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|  |  |  | 9.5 Characteristic impedance in the pass and stop bands  |  |   |
| 16-12-2022  | 9.6 Constant – K low pass filter  | 1  |   |
| 17-12-2022  | 9.7 Constant – K high pass filter  | 1  |   |
| 18-12-2022  | 9.8 Constant – K Band pass filter  | 1  |   |
| 14TH  | 21-12-2022  | 9.9 Constant – K Band elimination filler  | 1  |   |
| 22-12-2022  |   | REVISION CLASSES Q&A DISCUSSION  | 1  |   |