

# GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : ME207(Practical)

SUBJECT NAME : ELECTRICAL AND ELECTRONICS ENGINEERING

FACULTY NAME : PINKEY KULSHRESTHA

DESIGNATION : LECTURER (ELECTRICAL ENGINEERING)

| TOPIC   | LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC | MONTHS IN WHICH THE TOPIC WILL BE COVERED | ACTUAL DATE OF COVERING OF THE TOPIC | REASON FOR NOT COVERING THE TOPIC IN DUE TIME | E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC |
|---|---|---|--------------------------------------|---|--|
| 1. Study of D.C. machines.  | 1+1   | August                                    |                                      |   |  |
| 2. Study of D.C. starter  | 1+1   | September                                 |                                      |   |  |
| 3. Connecting starting and reversing the direction of D.C. motor                      | 1+1   | September                                 |                                      |   |  |
| 4. Determination of turn ratio of transformer   | 1+1   | September ' October                       |                                      |   |  |
| 5. Open circuit and short circuit test on a single phase transformer                  | 1+1   | October                                   |                                      |   |  |
| 6. Connecting, starting and reversing the direction of 1-phase induction motor        | 1+1   | October, November                         |                                      |   |  |
| 7. Starting of 3 phase Induction motor by D.O.L. starter / star- delta starter motor. | 1+1   | November                                  |                                      |   |  |
| 8. Study of various types of transducers.   | 1+1   | November, December                        |                                      |   |  |
| 9. Use of megger and multimeter.  | 1+1   | December, January                         |                                      |   |  |
| 10. To plot V-I characteristics of P-N diode.   | 1+1   | January                                   |                                      |   |  |
| 11. To plot V-I characteristics of Zener diode.                                       | 1+1   | February                                  |                                      |   |  |
| 12. To plot V-I characteristics of NPN transistor in CE, CB, CC configuration.        | 1+1   | February                                  |                                      |   |  |
| 13. To plot V-I characteristics of PNP transistor as above                            | 1+1   | March                                     |                                      |   |  |
| 14. Study of logic gates of- AND, OR, NOT , NAND, NOR, Ex-OR, Ex-NOR                  | 1+1   | March                                     |                                      |   |  |
| 15. Study and testing of solar cell and photo cells                                   | 1+1   | March, April                              |                                      |   |  |

|       |       |  |  |  |  |
|-------|-------|--|--|--|--|
|       |       |  |  |  |  |
| TOTAL | 15+15 |  |  |  |  |

1. Study of D.C. machines.
2. Study of D.C. starter
3. Connecting starting and reversing the direction of D.C. motor
4. Determination of turn ratio of transformer
5. Open circuit and short circuit test on a single phase transformer
6. Connecting, starting and reversing the direction of 1-phase induction motor
7. Starting of 3 phase Induction motor by D.O.L. starter / star- delta starter motor.
8. Study of various types of transducers.
9. Use of megger and multimeter.
10. To plot V-I characteristics of P-N diode.
11. To plot V-I characteristics of Zener diode.
12. To plot V-I characteristics of NPN transistor in CE, CB, CC configuration.
13. To plot V-I characteristics of PNP transistor as above
14. Study of logic gates of- AND, OR, NOT , NAND, NOR, Ex-OR, Ex-NOR
15. Study and testing of solar cell and photo cells

# GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **109 (A- Electrical Workshop)**

SUBJECT NAME : **Electrical & Electronics Workshop**

FACULTY NAME : **PINKEY KULSHRESTHA**

DESIGNATION : **LECTURER (ELECTRICAL ENGINEERING)**

| TOPIC   | LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC | MONTHS IN WHICH THE TOPIC WILL BE COVERED | ACTUAL DATE OF COVERING OF THE TOPIC | REASON FOR NOT COVERING THE TOPIC IN DUE TIME | E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC |
|---|---|---|--------------------------------------|---|--|
| <b>A - ELECTRICAL WORKSHOP</b>  |   |   |                                      |   |  |
| 1. Study of Symbol, Specification and Approximate Cost of Common Electrical Accessories, Tools and Wires & Cables Required for Domestic Installation.   | 6   | October                                   |                                      |   |  |
| 2. Study of :<br>2.1 Basic Electricity Rules for a Domestic Consumer<br>2.2 Safety Precautions & use of Fire Fighting Equipments  | 3   | October, November                         |                                      |   |  |
| 3. Use of series of Phase Tester, Series Test Lamp, Tong Tester and Megger in Testing of Electrical Installation.   | 3   | November                                  |                                      |   |  |
| 4.<br>4.1 Prepare a Potential Divider and Measure Resistance of a Filament Lamp Using Voltmeter and Ammeter.<br><br>4.2 Measurement of Power and Energy Consumption by an Electric Heater using Watt Meter and Energy Meter.  | 3   | November, December                        |                                      |   |  |
| 5. Preparation of Wiring Diagram, Wiring, Testing, Fault Finding & Costing for :<br>5.1 Control of one Lamp by one Switch (using Batten and Tumbler Switch)<br><br>5.2 Control of Stair Case Wiring (using Casing Capping, CFL and Flush Type Switches)<br><br>5.3 Control of one Bell Buzzer and Indicator by one Switch (using Conduit and Flush type Switch) | 9   | December, January                         |                                      |   |  |
| 6. Prepare one Switch Board as per Institutional Requirement . (using Flush type Switches, Sockets, MCB, ELCB, Etc.)  | 3   | January                                   |                                      |   |  |
| 7. Study, Connecting, Testing and Fault Finding of<br>7.1 Fluorescent Tube and its Accessories<br>7.2 Ceiling Fan with resistance type and Electronic Regulator   | 6   | January, February                         |                                      |   |  |

|   |    |          |  |  |  |
|---|----|----------|--|--|--|
| 8. Study, Functioning, Fault Finding & Repairing of following Domestic Appliances -<br>8.1 Automatic Electric Iron<br>8.2 Air Cooler<br>8.3 Electric Water Pump | 6  | February |  |  |  |
| 9. Design, Draw and Estimate the Material required for Installation For a small Residential Building/ Office/ Hall.   | 6  | March    |  |  |  |
|   |    |          |  |  |  |
| TOTAL   | 45 |          |  |  |  |

# GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **EE 204**

SUBJECT NAME : **ELECTRICAL MEASUREMENT AND INSTRUMENTATION**

FACULTY NAME : **PINKEY KULSHRESTHA**

DESIGNATION : **LECTURER (ELECTRICAL ENGINEERING)**

| TOPIC   | LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC | MONTHS IN WHICH THE TOPIC WILL BE COVERED | ACTUAL DATE OF COVERING OF THE TOPIC | REASON FOR NOT COVERING THE TOPIC IN DUE TIME | E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC |
|---|---|---|--------------------------------------|---|--|
| <b>1. Introduction to Measuring Instruments :</b><br>1.1 Classification of M.I.<br>1.1.1 Absolute & Secondary Instruments<br>1.1.2 Analog & Digital Instruments | 1   | November                                  |                                      |   |  |
| 1.2 Different Principles used in M.I.   | 1   | November                                  |                                      |   |  |
| 1.3 Sensitivity<br>1.4 Accuracy and precision   | 1   | December                                  |                                      |   |  |
| 1.5 Types of errors   | 1   | December                                  |                                      |   |  |
| 1.6 Deflecting, controlling and damping torque  | 1   | December                                  |                                      |   |  |
| <b>2. Different Measuring Instruments :</b><br>2.1 PMMC, moving iron and rectifier type ammeters and voltmeters   | 3   | January                                   |                                      |   |  |
| 2.2 Electrostatic voltmeter   | 1   | January                                   |                                      |   |  |
| 2.3 Dynamometer type ammeter, voltmeter and wattmeter   | 1   | January                                   |                                      |   |  |
| 2.4 Induction type wattmeter & energy meter   | 1   | January                                   |                                      |   |  |
| 2.5 Blondels theorem and measurement of power by two wattmeter method in 3-Phase circuits   | 1   | January                                   |                                      |   |  |
| 2.6 Testing of single phase induction type energy meter by direct and phantom loading<br>2.7 Adjustments of single phase induction type energy meter            | 1   | January                                   |                                      |   |  |
| 2.8 Brief study of static energy meter (single and 3 phase)<br>2.9 Range extension using shunts and series multipliers  | 1   | January                                   |                                      |   |  |
| <b>3. Measurement of Resistance :</b><br>3.1 Classification of resistance<br>3.2 Measurement of low resistance by Kelvin's double bridge                        | 1   | February                                  |                                      |   |  |
| 3.3 Measurement of medium resistance by Ammeter and Voltmeter, Whetstone's bridge, Substitution methods   | 1   | February                                  |                                      |   |  |
| 3.4 Measurement of high resistance and insulation resistance  | 1   | February                                  |                                      |   |  |
| 3.5 Megger, Earth tester and Ohmmeter   | 2   | February                                  |                                      |   |  |
| <b>4. Potentiometers :</b><br>4.1 Types of A.C. and D.C. potentiometers   | 1   | February                                  |                                      |   |  |

|   |   |           |  |  |  |
|---|---|-----------|--|--|--|
| 4.2 Construction  | 1 | February  |  |  |  |
| 4.3 Standardisation   | 1 | February  |  |  |  |
| 4.4 Applications  |   |           |  |  |  |
| <b>5. A.C. Bridges :</b>  | 1 | March     |  |  |  |
| 5.1 General equation for bridge balance   |   |           |  |  |  |
| 5.2 Maxwell's inductance bridge   | 1 | March     |  |  |  |
| 5.3 Maxwell's inductance - capacitance bridge   |   |           |  |  |  |
| 5.4 Anderson's bridge   | 1 | March     |  |  |  |
| 5.5 Schering Bridge   |   |           |  |  |  |
| 5.6 Wien's bridge for frequency measurements  | 1 | March     |  |  |  |
| <b>6. Brief study of:</b>   | 1 | March     |  |  |  |
| 6.1 CRO   |   |           |  |  |  |
| 6.2 Electronic voltmeter  | 1 | March     |  |  |  |
| <b>7. Instrumentation System :</b>  | 1 | August    |  |  |  |
| 7.1 Introduction to measurement system  |   |           |  |  |  |
| 7.2 Generalised block diagram representation of instrumentation system                  | 1 | August    |  |  |  |
| 7.3 Brief description of components of instrumentation system                           | 1 | August    |  |  |  |
| <b>8. Transducers :</b>   | 2 | August    |  |  |  |
| 8.1 Classification of transducer  |   |           |  |  |  |
| 8.1.1 Primary transducers   |   |           |  |  |  |
| 8.1.2 Secondary transducer  |   |           |  |  |  |
| 8.1.3 Active transducer   | 1 | September |  |  |  |
| 8.1.4 Passive transducer  |   |           |  |  |  |
| 8.1.5 Analog transducer   | 1 | September |  |  |  |
| 8.1.6 Digital transducer  |   |           |  |  |  |
| 8.2 Construction, principle of operation and application of the following transducers : | 2 | September |  |  |  |
| 8.2.1 Potentiometer   |   |           |  |  |  |
| 8.2.2 LVDT and RVDT   | 1 | September |  |  |  |
| 8.2.3. Resistance strain gauge  | 1 | September |  |  |  |
| 8.2.3.1 Gauge factor  |   |           |  |  |  |
| 8.2.3.2 Gauge materials   | 1 | September |  |  |  |
| 8.3.3.3 Temperature compensation  |   |           |  |  |  |
| 8.2.4 Thermocouple  | 1 | September |  |  |  |
| 8.2.5 Thermister  |   |           |  |  |  |
| 8.2.6 RTD   | 1 | September |  |  |  |
| 8.2.7 Photo cell  |   |           |  |  |  |
| 8.2.8 Piezo Electric  | 1 | October   |  |  |  |
| 8.2.9 Capacitive  |   |           |  |  |  |
| <b>9. Measurement of Following Physical Parameter Using Suitable Transducers :</b>      | 1 | October   |  |  |  |
| 9.1 Linear displacement   |   |           |  |  |  |
| 9.2 Angular displacement  |   |           |  |  |  |
| 9.3 Strain, Stress and force  | 2 | October   |  |  |  |
| 9.4 Velocity and Speed  |   |           |  |  |  |
| 9.5 Temperature   | 1 | October   |  |  |  |

|   |           |          |  |  |  |
|---|-----------|----------|--|--|--|
| 9.6 Pressure  | 1         | October  |  |  |  |
| 9.7 pH value<br>9.8 Flow measurement  | 1         | October  |  |  |  |
| <b>10. Instrument Transformers :</b><br>10.1 Definition of terms related to instrument transformers | 1         | November |  |  |  |
| 10.2 Current Transformer (CT)   | 1         | November |  |  |  |
| 10.3 Potential Transformer (PT)   | 1         | November |  |  |  |
| 10.4 Difference between CT and PT   | 1         | November |  |  |  |
| 10.5 Application of CT and PT   | 1         | November |  |  |  |
| Revision of Important Topics  | 3         | March    |  |  |  |
| Privious Years Papers Sol.  | 3         | Apr-16   |  |  |  |
| <b>TOTAL</b>  | <b>60</b> |          |  |  |  |

# GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **EE 204 Practical**

SUBJECT NAME : **ELECTRICAL MEASUREMENT AND INSTRUMENTATION**

FACULTY NAME : **PINKEY KULSHRESTHA**

DESIGNATION : **LECTURER (ELECTRICAL ENGINEERING)**

| TOPIC   | LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC | MONTHS IN WHICH THE TOPIC WILL BE COVERED | ACTUAL DATE OF COVERING OF THE TOPIC | REASON FOR NOT COVERING THE TOPIC IN DUE TIME | E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC |
|---|---|---|--------------------------------------|---|--|
| 1. Calibration of ammeter and voltmeter.  | 1+1   | October                                   |                                      |   |  |
| 2. Calibration of dynamometer type wattmeter and induction type energy meter.   | 1+1   | November                                  |                                      |   |  |
| 3. Measurement of power in 3-phase circuits by two wattmeter method   | 1+1   | November                                  |                                      |   |  |
| 4. Measurement of resistance by Kelvin's double bridge  | 1+1   | November<br>December                      |                                      |   |  |
| 5. Measurement of resistance by Whetstone bridge  | 1+1   | December                                  |                                      |   |  |
| 6. Measurement of Earth's resistance by Earth tester  | 1+1   | December<br>January                       |                                      |   |  |
| 7. Calibration of ammeter and voltmeter measurement of resistance by D.C. potentiometer                                 | 1+1   | January                                   |                                      |   |  |
| 8. Measurement of inductance and capacitance with the help of a suitable A.C. Bridge                                    | 1+1   | January                                   |                                      |   |  |
| 9. Measurement of frequency using CRO   | 1+1   | January                                   |                                      |   |  |
| 10. Measurement of displacement using following transducers :<br>10.1 Potentiometer<br>10.2 L.V.D.T.<br>10.3 Capacitive | 2+2   | August ,<br>September                     |                                      |   |  |
| 11. Measurement of temperature with the help of<br>11.1 Thermocouple<br>11.2 Thermister<br>11.3 R.T.D.                  | 2+2   | September                                 |                                      |   |  |
| 12. Measurement of strain with the help of strain gauge.  | 1+1   | September                                 |                                      |   |  |
| 13. Velocity and speed measurement by suitable transducer   | 1+1   | October                                   |                                      |   |  |
| 14. Study of instrument transformers & measurement of turn ratio of current transform and potential transformer.        | 1+1   | October                                   |                                      |   |  |
| <b>TOTAL</b>  | <b>16+16</b>  |   |                                      |   |  |



# GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **IE 202**

SUBJECT NAME : **ELECTRICAL ENGINEERING AND MEASUREMENTS**

FACULTY NAME : **PINKEY KULSHRESTHA**

DESIGNATION : **LECTURER (ELECTRICAL ENGINEERING)**

| TOPIC  | LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC | MONTHS IN WHICH THE TOPIC WILL BE COVERED | ACTUAL DATE OF COVERING OF THE TOPIC | REASON FOR NOT COVERING THE TOPIC IN DUE TIME | E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC |
|--|---|---|--------------------------------------|---|--|
| <b>1. D.C. Machine :</b>   | 1   | August                                    |                                      |   |  |
| 1.1 Principle of D.C. motor  | 1   | August                                    |                                      |   |  |
| 1.2 Construction of D.C. motor   | 1   | August                                    |                                      |   |  |
| 1.3 Back e.m.f., speed, torque and power relationship  | 1   | August                                    |                                      |   |  |
| 1.4 Characteristics of D.C. motor  | 1   | August                                    |                                      |   |  |
| 1.5 Type and application of D.C. motor   | 1   | September                                 |                                      |   |  |
| 1.6 Simple idea of motor starter   | 1   | September                                 |                                      |   |  |
| <b>2. A.C. Machine :</b>   | 3   | September                                 |                                      |   |  |
| 2.1 Basic Principle of operation, Construction, Phasor diagram, equivalent circuit, Efficiency & Regulation of | 3   | September                                 |                                      |   |  |
| 2.1.1 Single phase transformer   | 3   | September                                 |                                      |   |  |
| 2.1.2 Three phase induction motor  | 3   | September, October                        |                                      |   |  |
| 2.1.3 Synchronous Machine  | 3   | October                                   |                                      |   |  |
| <b>3. Polyphase Circuit :</b>  | 1   | October                                   |                                      |   |  |
| 3.1 Star delta connection  | 1   | October                                   |                                      |   |  |
| 3.2 Current, voltage and power relation for star delta connection  | 2   | October                                   |                                      |   |  |
| 3.3 Advantage and disadvantage of polyphase circuit  | 1   | October                                   |                                      |   |  |
| 3.4 Simple problem on star delta circuit   | 2   | November                                  |                                      |   |  |
| <b>4. A.C. Bridges :</b>   | 1   | November                                  |                                      |   |  |
| 4.1 Generalized treatment of four arm A.C. bridges   | 1   | November                                  |                                      |   |  |
| 4.2 Sources and detectors  | 1   | November                                  |                                      |   |  |
| 4.3 Maxwell's inductance and capacitance bridges   | 1   | November                                  |                                      |   |  |
| 4.4 Hay's bridge   | 1   | November                                  |                                      |   |  |
| 4.5 Anderson bridge  | 1   | November                                  |                                      |   |  |
| 4.6 Heaviside bridge   | 1   | November                                  |                                      |   |  |
| 4.7 Schering bridge  | 1   | December                                  |                                      |   |  |
| 4.8 De-sauty's bridge and Wein's bridge  | 1   | December                                  |                                      |   |  |
| <b>5. Measuring Instruments :</b>  | 1   | December                                  |                                      |   |  |
| 5.1 Classification of measuring instruments  | 1   | December                                  |                                      |   |  |

|   |           |                    |  |  |  |
|---|-----------|--------------------|--|--|--|
| 5.2 General consideration of torques employed in indicating type instrument (deflection torque, control torque, damping torque) | 2         | December - January |  |  |  |
| 5.3 Construction and working of voltmeter and ammeter<br>5.3.1 Moving iron type   | 1         | January            |  |  |  |
| 5.3.2 Moving coil type  | 1         | January            |  |  |  |
| 5.3.3 Rectifier type  | 1         | January            |  |  |  |
| 5.3.4 Dynamometer type  | 1         | January            |  |  |  |
| 5.4 Construction and working of wattmeter<br>5.4.1 Dynamometer type<br>5.4.2 Induction type                                     | 4         | January - February |  |  |  |
| 5.5 Induction type energy meter   | 1         | February           |  |  |  |
| 5.6 Ohmmeter<br>5.6.1 Series type<br>5.6.2 Shunt type   | 2         | February           |  |  |  |
| <b>6. Range Extension and Calibration :</b><br>6.1 Significance of range extension  | 1         | February           |  |  |  |
| 6.2 Use of series and shunt multipliers   | 1         | February           |  |  |  |
| 6.3 Instrument transformer for range extension  | 1         | February           |  |  |  |
| 6.4 Working principle of potentiometer  | 1         | February           |  |  |  |
| 6.5 Calibration method of ammeter and voltmeter (D.C.) by potentiometer   | 1         | March              |  |  |  |
| 6.6 Multirange ammeter and voltmeter  | 1         | March              |  |  |  |
| 6.7 Simple problems   | 1         | March              |  |  |  |
| 6.8 Vector impedance meter  | 1         | March              |  |  |  |
| 6.9 Madder  | 1         | March              |  |  |  |
| 6.10 Cable fault locator  | 1         | March              |  |  |  |
| Previous year Papers discussions  | 3         | March              |  |  |  |
| Revision of important topics, solution of students problems   | 4         | April              |  |  |  |
| <b>TOTAL</b>  | <b>60</b> |                    |  |  |  |

# GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **IE 202 (Practical)**

SUBJECT NAME : **ELECTRICAL ENGINEERING AND**

FACULTY NAME : **PINKEY KULSHRESTHA**

DESIGNATION : **LECTURER (E**

| TOPIC   | LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC | MONTHS IN WHICH THE TOPIC WILL BE COVERED | ACTUAL DATE OF COVERING OF THE TOPIC | REASON FOR NOT COVERING THE TOPIC IN DUE TIME |
|---|---|---|--------------------------------------|---|
| 1. Study of D.C. motor parts  | 1   | August                                    |                                      |   |
| 2. Study the load characteristics of D.C. shunt and series motor      | 1   | September                                 |                                      |   |
| 3. Study of induction motor   | 1   | September                                 |                                      |   |
| 4. Study of synchronous motor   | 1   | September                                 |                                      |   |
| 5. Study of stepper motor   | 1   | October                                   |                                      |   |
| 6. Study of construction of moving coil, moving iron type instruments | 1   | October                                   |                                      |   |
| 7. Study of Maxwell's impedance, capacitive bridge.                   | 1   | November                                  |                                      |   |
| 8. Study of Hay's bridge  | 1   | December                                  |                                      |   |
| 9. Study of Schering's bridge   | 1   | January                                   |                                      |   |
| 10. Study of De-sauty's bridge and Wein bridge                        | 1   | January                                   |                                      |   |
| 11. Use of series multiplier for voltmeter range extension            | 1   | February                                  |                                      |   |
| 12. Use of shunt multiplier for ammeter range extension               | 1   | February                                  |                                      |   |
| 13. Calibration of voltmeter and ammeter (D.C.) using potentiometer   | 1   | March                                     |                                      |   |
| 14. Measurement of insulation resistance by megger                    | 1   | March                                     |                                      |   |
| 15. Study of induction type energy meter                              | 1   | March                                     |                                      |   |
| 16. Perform open circuit test on single phase transformer.            | 1   | March                                     |                                      |   |
| 17. Perform Closed circuit test on single phase transformer.          | 1   | April                                     |                                      |   |
| <b>TOTAL</b>  | <b>17</b>   |   |                                      |   |

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**MEASUREMENTS**

**ELECTRICAL ENGINEERING)**

| <b>E-CONTENTS<br/>PROVIDED TO<br/>STUDENTS RELATED<br/>TO TOPIC</b> |
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# GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : ME 207

SUBJECT NAME : ELECTRICAL AND ELECTRONICS ENGINEERING

FACULTY NAME : PINKEY KULSHRESTHA

DESIGNATION : LECTURER (ELECTRICAL ENGINEERING)

| TOPIC   | LECTURE / PRACTICAL CLASSES REQUIRED TO COVER TOPIC | MONTHS IN WHICH THE TOPIC WILL BE COVERED | ACTUAL DATE OF COVERING OF THE TOPIC | REASON FOR NOT COVERING THE TOPIC IN DUE TIME | E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC |
|---|---|---|--------------------------------------|---|--|
| <b>1. D.C. Machines:</b><br>1.1 Construction<br>1.2 Operation of D.C. generator<br>1.3 Operation of D.C. motor                  | 1   | August                                    |                                      |   |  |
| 1.4 Types of D.C. generator and motor   | 1   | August                                    |                                      |   |  |
| 1.5 Starters  | 1   | August                                    |                                      |   |  |
| 1.6 Speed control methods   | 1   | August                                    |                                      |   |  |
| 1.7 Characteristics of D.C. motors  | 1   | September                                 |                                      |   |  |
| <b>2. Transformer:</b><br>2.1 Construction of single phase transformer<br>2.2 Types of transformer                              | 1   | September                                 |                                      |   |  |
| 2.3 Principle of operation<br>2.4 E.M.F equation  | 1   | September                                 |                                      |   |  |
| 2.5 Testing of T/F<br>2.5.1 Polarity test<br>2.5.2 Open circuit test<br>2.5.3 Short circuit test                                | 1   | September                                 |                                      |   |  |
| 2.6 Efficiency and losses<br>2.7 Voltage regulation   | 1   | September                                 |                                      |   |  |
| 2.8 Single phase auto transformer<br>2.9 Types of 3 phase transformers<br>2.10 Cooling methods                                  | 1   | September                                 |                                      |   |  |
| <b>3. Induction Motor:</b><br>3.1 Construction and working principle of single-phase induction motor                            | 1   | September                                 |                                      |   |  |
| 3.2 Types of single phase induction motors (description only)   | 1   | October                                   |                                      |   |  |
| 3.3 Production of rotating magnetic field by three phase currents.  | 1   | October                                   |                                      |   |  |
| 3.4 Construction and working principle of three-phase induction motor<br>3.5 Torque equation<br>3.6 Torque slip characteristics | 1   | October                                   |                                      |   |  |
| 3.7 Starting and speed control of 3-phase induction motor   | 1   | October                                   |                                      |   |  |
| 3.8 Various types of starters   | 1   | October                                   |                                      |   |  |
| 3.9 Methods of increasing starting torque<br>3.10 Application   | 1   | October                                   |                                      |   |  |

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| <b>4. Industrial Drives:</b><br>4.1 Elementary idea for industrial drives<br>4.2 Application of industrial drives in following fields -<br>4.2.1 Rolling mill<br>4.2.2 Textile mills             | 1 | October              |  |  |  |
| 4.2.3 Paper mill<br>4.2.4 Crane<br>4.2.5 Mines   | 1 | November             |  |  |  |
| 4.2.6 Lathe machine<br>4.2.7 Pumps<br>4.2.8 Food processor, refrigerators punches  | 1 | November             |  |  |  |
| <b>5. Electric Heating:</b><br>5.1 Advantages of electric heating over other types of heating  | 1 | November             |  |  |  |
| 5.2 Principle of operation, construction and uses of electrical heating in -<br>5.2.1 Resistance heating<br>5.2.2 Induction heating<br>5.2.3 Arc heating   | 1 | November             |  |  |  |
| 5.3 Brief idea of high frequency heating, dielectric heating and its application.  | 1 | November             |  |  |  |
| <b>6. Illumination:</b><br>6.1 Nature of light<br>6.2 Standard terms and definitions<br>6.3 Laws of illumination   | 1 | December             |  |  |  |
| 6.4 Types of lamps<br>6.4.1 Tungston<br>6.4.2 Halogen<br>6.4.3 Sodium  | 1 | December             |  |  |  |
| 6.4.4 Neon<br>6.4.5 Mercury vapour lamp<br>6.4.6 Fluorescent tubes.  | 1 | December             |  |  |  |
| <b>7. Instrumentation and Measurement:</b><br>7.1 Principle, construction and working of the following measuring instruments -<br>7.1.1 Ammeter and voltmeter (moving coil and moving iron type) | 2 | December and January |  |  |  |
| 7.1.2 Dynamometer types wattmeter  | 1 | January              |  |  |  |
| 7.1.3 Single phase AC energy meter   | 1 | January              |  |  |  |
| 7.1.4 Multimeter and megger  | 1 | January              |  |  |  |
| 7.2 Transducers  | 3 | January              |  |  |  |
| 7.3 Measurements of mechanical quantities like pressure, strain, temperature   | 3 | January, February    |  |  |  |
| <b>8. Semiconductor and P-N Junction Diode:</b><br>8.1 Intrinsic and extrinsic semiconductor<br>8.2 Description of conductor, insulator and semiconductor  | 1 | February             |  |  |  |

|   |           |          |  |  |  |
|---|-----------|----------|--|--|--|
| 8.3 P-N junction diode<br>8.4 Space charge and barrier potential  | 1         | February |  |  |  |
| 8.5 Volt-ampere characteristics (forward and reverse bias)  | 1         | February |  |  |  |
| 8.6 Zener and avalanche breakdown<br>8.7 LED and LCD  | 1         | February |  |  |  |
| 9. Bipolar Junction Transistor:<br>9.1 Fundamentals of BJT operation  | 1         | February |  |  |  |
| 9.2 Amplification phenomenon  | 1         | February |  |  |  |
| 9.3 CE, CB and CC configuration and DC current relationship   | 1         | February |  |  |  |
| 9.4 Input and output characteristic of CE, CC and CB.   | 1         | February |  |  |  |
| <b>10. Digital Electronics:</b><br>10.1 Binary, Decimal, Octal and Hexadecimal number system<br>10.2 Logic gates - OR, AND, NOT, NAND, NOR, Ex-OR, Ex-NOR | 2         | March    |  |  |  |
| <b>11. Power Electronics:</b><br>11.1 Introduction of SCR's, Diac, Triac, UJT   | 1         | March    |  |  |  |
| 11.2 Series and parallel connection of SCR's  | 1         | March    |  |  |  |
| 11.3 Half wave and full wave rectifiers using SCR's with resistive and inductive load   | 1         | March    |  |  |  |
| 11.4 Snubber circuit  | 1         | March    |  |  |  |
| 11.5 Application of SCR's in speed control of AC and DC motors.   | 1         | March    |  |  |  |
| <b>12. Relays Contactors and Timers:</b><br>12.1 Type of relays<br>12.2 Relay parts   | 1         | March    |  |  |  |
| 12.3 Construction and working of relays, contactors and timers.   | 1         | March    |  |  |  |
| 12.4 DC operated time delay relay<br>12.5 AC operated time delay relay  | 1         | March    |  |  |  |
| <b>13. Photo Electric Devices:</b><br>13.1 Photo cells<br>13.2 Photo transistors  | 1         | April    |  |  |  |
| 13.3 LDR's<br>13.4 Solar cells – working principle and applications   | 1         | April    |  |  |  |
| Revision of important topics  | 3         | April    |  |  |  |
|   |           |          |  |  |  |
| <b>TOTAL</b>  | <b>60</b> |          |  |  |  |