***ACADEMIC LESSION PLAN FOR SESSION - 2023-24 .***

**Dept. of Electrical Eng, BIT Polytechnic , Balasore.**

**Name Of the Faculty :- Er. Chandrasekhar panigrahi**

**ELECTRICAL MEASUREMENT & INSTRUMENTATION**

Course Code: Th.3

Theory : 4 P/W Total Period s: 75P/ Sem End Semester Exam : 80 marks

Examination : 3 Hours TOTAL MARKS : 100 Marks

Sem : 4TH EE

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|  WEEK | PERIOD |  TOPIC |
|  1st | 1st | Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance  |
| 2nd | Classification of measuring instruments.  |
| 3rd | Explain Deflecting arrangements in indicating type of instruments.  |
| 4th | Explain controlling arrangements in indicating type of instruments.  |
|  | Explain damping arrangements in indicating type of instruments.  |
|  2nd | 1st | Calibration of instruments.  |
| 2nd | Describe Construction, principle of operation, errors, ranges merits and demerits of Moving iron type instruments.  |
| 3rd | Describe Construction, principle of operation, errors, ranges merits and demerits of Moving iron type instruments(continue..) |
| 4th | Describe Construction, principle of operation, errors, ranges merits and demerits of Permanent Magnet Moving coil type instruments.  |
|  | Describe Construction, principle of operation, errors, ranges merits and demerits of Permanent Magnet Moving coil type instruments(continue..) |
|  3rd | 1st | Describe Construction, principle of operation, errors, ranges merits and demerits of Dynamometer type instruments  |
| 2nd | Describe Construction, principle of operation, errors, ranges merits and demerits of Dynamometer type instruments(continue..) |
| 3rd | Describe Construction, principle of operation, errors, ranges merits and demerits of Rectifier type instruments |
| 4th | Describe Construction, principle of operation, errors, ranges merits and demerits of Induction type instruments  |
|  | Extend the range of instruments by use of shunts resistor |
|  4th | 1st | Extend the range of instruments by use of Multipliers.  |
| 2nd | Solve Numerical  |
| 3rd | Solve Numerical(continue..) |
|  | 4th | Describe Construction, principle of working of Dynamometer type wattmeter. |
|  | 5th | Errors in Dynamometer type wattmeter |
|  5th | 1st | methods of their Error correction |
|  | 2nd | Discuss L P Ftype Dynamometer wattmeter  |
|  | 3rd | Discuss U P F type Dynamometer wattmeter |
| 4th | Discuss Induction type watt meters |
|  | Single Phase Induction type Energy meters (introduction) |
|  6th | 1st | Single Phase Induction type Energy meters – construction & working principle |
| 2nd | Single Phase Induction type Energy meters – construction & working principle(continue..) |
| 3rd | their compensation and adjustments. |
| 4th | Testing of Energy Meters |
|  | Different types of Tachometers(introduction) |
|  7th | 1st | working principles of Tachometers |
| 2nd | Principle of operation and construction of Mechanical Type frequency meters |
| 3rd | Principle of operation and construction of Mechanical Type frequency meters(continue…) |
| 4th | Principle of operation and construction of Electrical resonance Type frequency meters.  |
|  | Principle of operation and construction of Electrical resonance Type frequency meters(continue…) |
|  8th | 1st | Principle of operation and working of Dynamometer type single phase power factor meters.  |
| 2nd | Principle of operation and working of Dynamometer type three phase power factor meters |
| 3rd | * 1. Classification ofresistance
 |
| 4th | Measurement of low resistance by potentiometer method |
|  | Measurement of medium resistance by wheat Stone bridge method |
|  9th | 1st | Measurement of high resistance by loss of chargemethod |
| 2nd | Construction, principle of operations of Megger for measurement of insulation resistance  |
| 3rd | Construction, principle of operations of Earth tester for earth resistance measurement |
| 4th | * 1. Construction and principles of Multimeter. (Analog)
 |
| 5th | * 1. Construction and principles of Multimeter. (Digital)
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|  10th | 1st | Measurement of inductance by Maxewell’s Bridge method |
| 2nd | Measurement of capacitance by Schering Bridge method |
| 3rd | Define Transducer, sensing element or detector element and transduction elements |
| 4th | Classify transducer. Give examples of various class oftransducer, Resistivetransducer. |
|  | Linear motionpotentiometer |
|  11th | 1st | angular motionpotentiometer |
| 2nd | Thermistor and Resistance thermometers |
| 3rd | Wire Resistance StrainGauges ,InductiveTransducer |
| 4th | Principle of linear variable differential Transformer(LVDT), Uses ofLVDT |
|  | CapacitiveTransducer. General principle of capacitive transducer |
|  12th | 1st | Variable area capacitive transducer, Change in distance between plate capacitive transducer |
|  | 2nd | Piezo electric Transducer( their applications) |
| 3rd | Hall Effect Transducer ( theirapplications) |
| 4th | Principle of operation of Cathode Ray Tube |
| 5th | Principle of operation of Oscilloscope (with help of block diagram |
|  13th | 1st | Measurement of DC Voltage &current by CRO |
|  | 2nd | Measurement of AC Voltage, current by CRO. |
|  | 3rd | Measurement of AC phase &frequency BY CRO. |
| 4th | Overall Discussion |
| 5th | Overall Discussion |
|  14th | 1st | Overall Discussion |
| 2nd | Previous year question Discussion |
| 3rd | Tutorial |
| 4th | Tutorial |
| 5th | Tutorial |
|  15th | 1st | Tutorial |
| 2nd | Tutorial |
| 3rd | Tutorial |
| 4th | Tutorial |
| 5th | Tutorial |

**HOD in BIT Electrical department Lectr. In Electrical department**

 **Principal in BIT Polytechnic, BLS**