LESSON PLAN

**Name of the faculty:** Sh. Kuldeep Mittal

**Discipline :** Electrical Engg.

**Semester :** 5th

**Subject :** Programmable logic controllers and Microcontrollers

**Lesson Plan Duration :**  w.e.f. **15/09/2022 to 16/01/2023**

Work load (Lecture/Practical) per week : Lectures-05, Practicals-04

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| **Week** | **Theory** | | **Practical** | |
| **Lecture**  **day** | **Topic** | **Practical**  **day** | **Topic** |
| 1st | 1 | What is PLC, concept of PLC | 1st | Components/ subcomponents of a PLC and learning functions of different modules of a PLC system |
| 2 | Building blocks of PLC |
| 3 | Functions of various blocks of PLC |
| 4 | Limitations of relays, Advantages of PLCs over electromagnetic relays |
|  | 5 | Revision and class test |
| 2nd | 6 | Different programming languages, | 2nd | Practical steps in programming a PLC using hand held programmer |
| 7 | PLC manufacturers and applications of PLC |
| 8 | Basic operation of PLC- |
| 9 | Principles of PLC |
|  | 10 | Revision and class test |
| 3rd | 11 | Architectural details of Processor-Part-I | 3rd | Practical steps in programming a PLC using computer interfacing |
| 12 | Architectural details of Processor-Part-II |
| 13 | Memory Structures |
| 14 | Input/output structures |
|  | 15 | Revision and class test |
| 4th | 16 | Programming Terminals of PLC | 4th | Introduction to step 5programming language, ladder diagram concepts, instruction list syntax |
| 17 | Power supply to PLC |
| 18 | Basic instructions for latch |
| 19 | Master control self holding relays |
|  | 20 | Revision and class test |
| 5th | 21 | Timer instructions-ON and OFF delay | 5th | Basic logic operations, AND, Or, NOT functions |
| 22 | Retentive timers, resetting of timers |
| 23 | Counter instructions like up counter, down counter, resetting of counters |
| 24 | Arithmetic Instructions (ADD,SUB,DIV,MUL etc.) |
|  | 25 | Revision and class test |
| 6th | 26 | MOV instruction, RTC (Real Time Clock function) | 6th | Logic control systems with time |

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|  | 27 | Comparison instructions like equal, not equal, greater, greater than equal, less  than, less than equal |  | response as applied to clamping operation |
| 28 | Programming on Basic instructions |
| 29 | Programming on Timer instructions |
|  | 30 | Revision and class test |
| 7th | 31 | Programming on Counter instructions | 7th | Sequence control system in lifting a device for packaging and counting |
| 32 | Programming on Sequencer instructions |
| 33 | Programming on comparison  instructions |
| 34 | Revision of Ladder diagram  Programming |
|  | 35 | Revision and class test |
| 8th | 36 | Assembly line, Packaging, Process  control | 8th | Use of PLC for Door Bell operation |
| 37 | Car parking, Doorbell operation, Traffic light control |
| 38 | Microwave oven, Washing machine, Motor in forward and reverse direction |
| 39 | Star delta, DOL Starter, paint industry ,filling of bottles, room  Automation |
|  | 40 | Revision and class test |
| 9th | 41 | Microcontroller -Overview | 9th | Use of PLC for Traffic light system |
| 42 | Block diagram and architecture of Microcontroller |
| 43 | Overview of MCS-51 |
| 44 | 8051 -Pin details |
|  | 45 | Revision and class test |
| 10th | 46 | Input port structures | 10th | Use of PLC for Packing process control |
| 47 | Output port structures |
| 48 | Memory organisation |
| 49 | Special function registers |
|  | 50 | Revision and class test |
| 11th | 51 | Revision of Microcontroller | 11th | Use of PLC for Car parking system |
| 52 | Instruction set of MCS-51 |
| 53 | Addressing modes |
| 54 | Timer operation |
|  | 55 | Revision and class test |
| 12th | 56 | Serial port operation and communication | 12th | Familiarization with the study of architecture of 8085 kit, basic sub systems and input output connectors, function keys |
| 57 | Interrupts and its types |
| 58 | Assemblers operations & compilers |
| 59 | Assembler directives |
|  | 60 | Revision and class test |
| 13th | 61 | keypad interfacing | 13th | Familiarization of Microcontroller 8051 kit |
| 62 | 7- segment interface, LCD |
| 63 | Stepper motor interfacing |
| 64 | A/D, D/A interfacing |
|  | 65 | Revision and class test |
| 14th | 66 | RTC interfacing | 14th | Testing of general input/output on |

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|  | 67 | Introduction of PIC Micro controllers |  | microcontroller board |
| 68 | Features of PIC 16C84  Architecture of PIC 16C84 |
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|  | 70 | Revision and class test |
| 15th | 71 | Applications of microcontrollers | 15th | Development of Electrical, Instrumentation applications using 8051 microcontroller |
| 72 | Radio control system |
| 73 | Revision of complete syllabus |
| 74 | Revision and class test |
| 75 | Discussion of previous year HSBTE question papers |