Final State Exam Topics

Engineering Management MSc Program

Engineering module

**Industrial Process Engineering Specialization**

1. Introduction to operations research, their main optimizing approaches, categorization of decisions and steps of model building.
2. 2-alternative decision-making based on Linear programing, graphical solution
3. Evaluation of a linear programming solution based on sensitivity analysis
4. Quality control systems. Traditional quality control, statistical quality control, and quality at the source. Concept and elements of JIDOKA.
5. Process modelling. Modelling language (EPC, Flow chart, BPMN 2.0) Rules of process modelling.
6. Process improvement by DMAIC cycle. Concepts and methods of DMAIC cycle.
7. Business Process Management and Business Process Reengineering.
8. Cell manufacturing supported logistics systems. (Conventional pull logistic, sequential pull logistic, combined pull logistic, CONWIP)
9. Wastes in production. 3MU, 7 wastes, TPM, 6 big losses, calculation of Overall Equipment Effectiveness.
10. Introduction and overview of manufacturing: Classification and definition of the engineering materials and manufacturing processes.
11. Black box model based Production Process model. Inputs, outputs, measurement of process' efficiency. (Lead time, Total Process Cost, Cycle time, Productivity, and Takt time), forecasting methods, and measurement of forecasting error.
12. Analysis of costumer's needs. Voice of Costumer, classification of needs by KANO model. Value Stream Mapping.
13. Concept of Design Science Research. Steps and methods of complex problem solving process. Structure of research plan. Artefact building, artefact evaluation.
14. Production equipment and tooling used for manufacturing processes. Manufacturing as a technical process, and as an economic process.
15. Process improvement and diagnostics tools. Failure-Mode and Effect analysis, Ishikawa diagram, Faulty tree, 5 why, 5S.