

Appendix of Notificacⁿ no. 102/2015 ~~Proposed~~
for Sr.No(5)

Appendix 'A'

7ME05 PROFESSIONAL ELECTIVE - I
(2) TOOL ENGINEERING

SECTION - A

Unit I : Single Point cutting Tool: shear angle, shear strain, velocity relations, un-deformed chip thickness, Merchant's circle, energy relations, nomenclature, single point cutting tool design, recommended speed, feed and depth of cut.
Form tools. Graphical approach of circular form tool design. (09 Hours)

Unit II: Jig & Fixture: Design economics, principles of locations, types of locations, prevention of jamming, problems of chip & dust in location, use of dowels, Redundant location, Principles of clamping, types of clamps, power clamping, Tool guiding & tool setting, types of drill Jigs & fixtures, (10 Hours)

Unit III: Jig & Fixture: Design of Plate, Channel, Box, Turnover and Post type Drill Jigs.
Design of Turning, Milling, Fixture, Broaching, Assembly & Welding Fixtures. (10 Hours)

SECTION - B

Unit IV : Multipoint Cutting Tools: Types , Geometric elements and forces in various tools like Twist drills & Reamers, Circular Broaches, Milling Cutters, Taps and Dies, Gear shaper cutter & Gear Hobs. (09 Hours)

Unit V : Press tools, Classification of presses, Theory of sheet metal cutting, clearance, cutting force calculations, Methods of reducing cutting forces, centre of pressure & its significance, classification of press working operations, Theory of bending, spring back action in metals, drawing fundamentals, calculation of drawing & bending forces, planning for cupping operation, stock layout. (09 Hours)

Unit VI : Design of press working tools, Types of die construction, function & nomenclature of die components Cutting Dies- Blanking & Punching, Forming Dies-Forming, Drawing and Bending etc. Design of Compound, Combination and progressive dies. Miscellaneous dies- Horn die, cam-action die, rubber & building die, sub-press die. (9 Hours)

TEXT BOOKS :

1. Fundamentals of Tool Design, -A.Kumar (Dhanpatrai & Sons)
2. A text book of Production Engineering -P.C.sharma (S.Chand Publication)

REFERENCE BOOKS :

1. Tool Design - Cyril Donaldson (Tata Mcgram Hill)
2. Jigs & Fixtures - P.H.Joshi (Tata Mcgram Hill)
3. Metal Cutting Theory & Cutting Tool Design- Arshinov (Mir Publications)
4. Tool Design - ASTME (ASTME)
5. Fundamentals of Metal Cutting & M/c Tools - Juneja (Age Internatioal) .

Pr7ME10 PROFESSIONAL ELECTIVE - I

TOOL ENGINEERING - LAB.

TERM WORK : ANY SIX OF THE FOLLOWING.

1. Measurement of forces in Orthogonal cutting by Lathe Tool Dynamometer.
2. Measurement of forces & Torque in Drilling by Drill Tool Dynamometer.
3. Design & drawing of single point cutting tool.
4. Design & drawing of Form Tools(By Graphical Method).
5. Study of geometric Elements & Forces in Multi-Point Cutting Tool.
5. Design & drawing of Post Drill Jigs.
6. Design & drawing of Turnover Drill Jigs.
7. Design & drawing of Milling Fixture.
8. Design & drawing of Turning Fixture.
9. Design & Drawing of Compound Die.
10. Design & Drawing of Progressive Die. Die.
11. Design & Drawing of Drawing Die.

Practical Examination :

Practical Examination shall consist of viva voce based on the term -work and syllabus.

Appendix of Notification No.102/2015
For Sr. No. (8)

8ME02

Appendix-B

PROFESSIONAL ELECTIVE - III
(I) REFRIGERATION & AIR CONDITIONING

Unit I-

Introduction to Vapour compression and Vapour Absorption Refrigeration System. Analysis of simple vapour compression system. Use of pressure enthalpy. Temperature entropy charts. Effect of operating conditions such as evaporation and condensation pressure, superheating and sub cooling Actual vapour compression system.

Unit II

Refrigerants :- classification: primary & secondary refrigerants, desirable properties of refrigerants; merits & demerits of commonly used refrigerants such as Ammonia R- 12, R-22 and their selections and eco friendly refrigeration 134 a, HFC.

Refrigeration systems components & controls:- brief study of refrigerants compressor, condensers, evaporators, expansion valves. Introduction to Defrosting systems, testing & charging of refrigeration systems, leak detection.

Introduction to cryogenics -Air liquefaction processes: Linde-Hampson (10 Hours)

Unit III :

Multi stage pressure systems:- multistage compression: choice of intermediate pressure, complete multi-stage compressions. Multi evaporator systems; single compression individual expansion valve, single compression multi expansion valve, individual compressor multi expansion valves, cascade refrigeration systems.

Unit IV :

Psychrometric properties of moist air, psychrometric chart, concept of thermodynamic wet -bulb temperature, representations of Psychrometric process on Psychrometric charts, mixing of air. Human comfort:- metabolism of human body, factors influencing comfort, concept of effective temperature. (7 Hours)

Unit V :

Load calculation & applied Psychrometry-basic consideration at heat gains/losses sensible & latent, heat due to occupancy lighting, appliances, products, process, Sensible heat factor, by pass factor, apparatus dew point.

Classification of air conditioning systems & applications. Unitary system package, window type & split type air conditioning. Introduction to duct design. (9 Hours)

Unit VI :

RSHF, GSHP, effective sensible heat factor, air conditioning systems, safety factor cooling load estimates, heating load estimates. Summer air conditioning systems (8 Hours)