

Pokhara University Service Commission
Curriculum for Deputy Instructor (Mechanical) Level Examination
Full Marks: 75

1. Work shop technology & Metrology -	8
1.1 Basic tools and Basic hand operations	
1.2 Machine tools: Lathe, Shaper, Milling, Grinding, Drilling Machines	
1.3 Metal Joining: Soldering, Brazing, Gas welding, Arc welding	
1.4 Types of fits	
1.5 Linear Measurement: Block Gages, Length Bars, Comparators	
1.6 Errors in measurement	
2. Machine Drawing -	8
2.1 Finding out the missing views from two given projection and dimensioning	
2.1.1 Missing views of prismatic work pieces	
2.1.2 Missing views of cylindrical work pieces	
2.1.3 Missing views of pyramidal, conical, cylindrical cut work pieces	
2.2 Isometric drawing of machine parts including sections	
2.3 Drawing of joints	
2.3.1 Permanent joints	
2.3.2 Temporary joints	
2.3.3 Drawing Exercises	
2.3.3.1 Nut bolt and threaded joints	
2.3.3.2 Riveted joints	
2.3.3.1 Welded joints and symbols	
2.3.3.1 Gears, Keys and Spline joints	
2.3.4 Orthographic projection	
3. Heat Engines -	9
3.1 Different types of heat engines	
3.2 Different cycles involved in heat engines	
3.3 Basic difference in Steam Engine and Automotive engines	
3.4 Different types of power plants (engine) used in civil Aircraft	
4. Thermodynamics & Heat Transfer -	9
4.1 General	
4.1.1 Boyle's law, Charles' law and combined gas law	
4.1.2 Characteristics of gas constant	
4.1.3 Terms used in thermodynamics	
4.2 First law of thermodynamics	
4.2.1 Definition of the first law	
4.2.2 Total internal energy	
4.2.3 Mechanical equivalent of heat engine	
4.3 Second law of thermodynamics	
4.3.1 Definition of the second law	
4.3.2 Thermal efficiency of heat engine	
4.4 Thermodynamics Properties of Fluid (Definitions only)	
4.4.1 Internal energy	
4.4.2 Enthalpy	
4.4.3 Entropy	
4.4.4 Specific heat at constant volume	

4.4.5 Specific heat at constant pressure	
4.5 Basic thermodynamics process	
4.5.1 Constant volume process	
4.5.2 Constant pressure process	
4.5.3 Constant temperature process	
4.5.4 Adiabatic process	
4.5.5 Polytropic process	
4.6 Petrol and Diesel Engine Cycles	
4.6.1 Constant volume cycle	
4.6.2 Constant pressure cycle	
4.6.3 Mixed cycle	
4.7 Modes of heat transfer: Conduction, Convection and Radiation	
5. Basic Industrial Management -	8
5.1 Labour law	
5.2 Rights of Unions	
5.3 wages and compensation	
5.4 Labour and Management relations	
5.5 Basic functions of ILO	
5.6 Industrial Hygiene and safety	
5.7 Industrial Policy and Act, 2049	
5.8 Basic functions of ICAO	
6. Basic Knowledge of Hydraulic Machines and Electro- Mechanical Principle -8	
6.1 Basic Knowledge of AC and DC Motors	
6.2 Basic Knowledge of Generator	
6.3 Water turbines: Pelton, Francis, Kaplan and Cross flow (Working principle and Characteristic)	
6.4 Pumps: Centrifugal pump and Reciprocating pump (Working principle and Characteristic), Hydraulic ram	
7. Industrial Boiler -	8
7.1 Basic working principle	
7.2 Common types of Boilers	
7.3 Boilers Fules	
7.4 Boilers Efficiency	
8. Estimating and costing -	8
8.1 General	
8.1.1 Concept of profitability, break-even point, return on investment, liability, assets, fixed cost, variable cost, fixed capital, working capital equity, depreciation and amortization	
8.1.2 Elements of cost and classification	
9. Applied Mechanics -	9
9.1 Statics	
9.1.1 Coplanar system of intersecting forces	
9.1.2 Coplanner parallel forces, the moment of a force	
9.1.3 Centre of Gravity	
9.1.4 Friction	
9.2 Kinematics	

- 9.2.1 Definition of technical terms: speed, velocity, acceleration, distance traversed and their units
- 9.2.2 The trajectory of particles, distance and time
- 9.2.3 Rectilinear motion of a particle
- 9.3 Composition of a simple motion of a particle
 - 9.3.1 Curvilinear motion of a particle
 - 9.3.2 Simple motion of a solid body
- 9.4 Dynamics
 - 9.4.1 Fundamental laws of dynamics: Newton's law of motion
 - 9.4.2 Work, Energy and Power
 - 9.4.3 Mechanical Energy
 - 9.4.4 Relation between RPM, Torque and Power
 - 9.4.5 Law of conservation of energy