

GROUP-3

Mechanical Engineering Jobs (Level- Matric+ Dip in Mech. Engineering)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.- (Weightage 20%)

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc. -

(Weightage 10%)

3) Subject related syllabus-

(Weightage 70%)

A) STRENGTH OF MATERIALS

1. Stresses and Strains 2. Resilience 3 Moment of Inertia 4. Bending Moment and Shearing Force

5. Bending stresses 6 Columns 7 Torsion 8. Springs

B) THERMODYNAMICS

1. Fundamental Concepts 2. Laws of Perfect Gases 3. Thermodynamic Processes on Gases

4. Laws of Thermodynamics 5. Ideal and Real Gases 6. Properties of Steam 7. Steam Generators

8. Air Compressors 9. Introduction to Heat Transfer

C) BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

1. Application and Advantage of Electricity 2. Basic Electrical Quantities 3. Electromagnetic Induction

4. Transmission and Distribution System 5. Domestic Installation 6. Electric Motors and Pumps

7. Electrical Safety 8. Basic Electronics

D) WORKSHOP TECHNOLOGY

1. Welding 2. Pattern Making 3. Moulding and Casting 4. Metal Forming Processes 5. Plastic processing 6.

Cutting Tools and Cutting Materials 7. Lathe 8. Drilling 9. Boring 10. Shaping, Planning and Slotting 11.

Broaching 12. Jigs and Fixtures 13. Cutting Fluids and Lubricants

E) MATERIALS AND METALLURGY

1. Introduction 2. Crystallography 3. Metals and Alloys 4. Theory of Heat Treatment 5. Engineering

Plastics 6. Advanced Materials 7. Miscellaneous Materials

F) HYDRAULICS AND HYDRAULIC MACHINES

1. Introduction 2. Pressure and its Measurement 3. Flow of Fluids 4. Flow through Pipes 5. Flow through

Orifices 6. Hydraulic Machines 7. Water Turbines and Pumps

G) I.C. ENGINES

1. IC Engines 2. Fuel Supply in Petrol Engine 3. Fuel System of Diesel Engine 4. Ignition System of IC

Engines 5. Cooling and Lubrication 6. Testing of IC Engines

H) MACHINE DESIGN AND DRAWING

1. Introduction 2. Design Failure 3. Design of Shaft 4. Design of Key 5. Design of Screwed Joints

6. Cams 7. Gears

I) THEORY OF MACHINES

1. Simple Mechanisms 2. Power Transmission 3. Flywheel 4. Governor 5. Balancing 6. Vibrations

J) REFRIGERATION AND AIR CONDITIONING

REFRIGERATION

1. Fundamentals of Refrigeration 2. Vapour Compression System 3. Refrigerants 4. Vapour Absorption System. 5. Refrigeration Equipment 5.1 Compressor - Function, various types of compressors 5.2

Condenser - Function, various types of condensers 5.3 Evaporator - Function, types of evaporators
5.4 Expansion Valve - Function, various types such as capillary tube, thermostatic expansion valve,
low side and high side float valves, application of various expansion valves 5.5. Safety Devices-
Thermostat, overload protector LP, HP cut out switch.

AIR CONDITIONING

6. Psychrometry Definition, importance, specific humidity, relative humidity, degree of saturation, DBT, WBT, DPT, sensible heat, latent heat, Total enthalpy of air. Psychrometry chart and various processes of psychrometry 7. Air-Conditioner Study of window air-conditioning, split type air conditioning, concept of central air- condition, automobile air-conditioning

K) ENVIRONMENTAL EDUCATION

1. Definition, Scope and Importance of Environmental Education 2. Basics of ecology, biodiversity, eco system and sustainable development 3. Sources of pollution - natural and manmade, causes, effects and control measures of pollution (air, water, noise, soil, radioactive and nuclear) and their units of measurement 4. Solid waste management – Causes, effects and control measures of urban and industrial waste 5. Mining and deforestation – Causes, effects and control measures 6. Environmental Legislation - Water (prevention and control of pollution) Act 1974, Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role and Function of State Pollution Control Board, Environmental Impact Assessment (EIA) 7. Role of Non-conventional Energy Resources (Solar Energy, Wind Energy, Bio Energy, Hydro Energy) 8. Current Issues in Environmental Pollution – Global Warming, Green House Effect, Depletion of Ozone Layer, Recycling of Material, Environmental Ethics, Rain Water Harvesting, Maintenance of Groundwater, Acid Rain, Carbon Credits.

L) CNC MACHINES AND AUTOMATION

1. Introduction

Introduction to NC, CNC & DNC, their advantages, disadvantages and applications. Basic components of CNC machines, Machine Control Unit, input devices, selection of components to be machined on CNC machines, Axis identification

2. Construction and Tooling 3. System Devices 4. Part Programming 5. Problems in CNC Machines 6. Automation and NC system Robot Technology 7. Introduction to robot technology, basic robot motion and its applications

M)AUTOMOBILE ENGINEERING

1. Introduction 2. Power System 3. Transmission System 4. Steering System 5. Braking system

6. Suspension System 7. Auto Electrical System:

N) INSPECTION AND QUALITY CONTROL

1. Inspection 2. Measurement and Gauging 3. Statistical Quality Control 4. Modern Quality Concepts

5. Instrumentation Measurement of mechanical quantities

O) INDUSTRIAL ENGINEERING

1. Productivity 2. Work Study 3. Method Study 4. Motion Analysis 5. Work Measurement 6. Wages and Incentive Schemes 7. Production Planning and Control 8. Estimating and Costing

P) ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT

SECTION – A ENTREPRENEURSHIP

1. Introduction 2. Market Survey and Opportunity Identification 3. Project report Preparation

SECTION –B MANAGEMENT

4. Introduction to Management 5. Leadership and Motivation 6. Management Scope in Different Areas 7. Miscellaneous Topics

a) Customer Relation Management (CRM) • Definition and need • Types of CRM b) Total Quality Management (TQM) • Statistical process control • Total employees Involvement • Just in time (JIT) c) Intellectual Property Right (IPR) • Introductions, definition and its importance • Infringement related to patents, copy right, trade mark

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.