Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Mechanical Engineering
Assignment (Fundamentals of Mechanical Systems - 020020210)

Unit-1 Introduction

2 marks

1] Explain Monkey wrench and ring spanner.
2] Write the function of screwdriver?
3] Give classification of keys.
4] What is the purpose of oil seal?
5] What is Fasteners? Classify fasteners.
6] What is Pitch in screw thread?
7] What is the function of spanner?
8] Write the different types of nuts.
9] Give the name of various types of bolts.
10] Give any example of permanent and temporary fasteners.
11] Explain O Ring in detail?
12] What is Rivet?
13] Write various types of plastic pipes.
14] What is Lead?
15] Enlist types of fittings used in piping and plumbing system.

3 marks

1] Differentiate between Right Hand and Left hand thread.
2] Prepare the list of various types of pipes and explain any one.
3] What is Hacksaw? Name the different parts of Hacksaw.
4] Define power tool and give examples of it.
5] List out the various types of bolts according to their applications.
6] Draw and explain elements of thread.
7] With application explain shaft and Axle in detail.
8] Draw the neat sketch of Bent nose plier and Combination plier.
9] Give information about about threaded fasteners.
10] Define “power tool” and prepare list of popular power tools.
11] Draw the pair of nut and bolt.
12] What is the purpose of hammer? Enlist the various types of hammers.
13] Explain Chisel with neat sketch.
14] Differentiate between Shaft and Axle.
15] Differentiate Single start thread and Double start thread.
16] Define anti friction bearing in brief.
17] What is the function of spanner? Write the different types of Spanners.
18] List out the various types of pliers and explain any one with neat sketch.
19] List out the various types of screw driver and explain any one with neat sketch.

20] Classify bearings and explain the sliding contact Bearing.
21] List out the various types of pipe fittings and explain any two.
22] Draw elements of Threads and Define: (a) Pitch (b) lead
23] What is function of valves? Write the various types of valves.
24] Explain various forms of thread with neat sketch.

Unit-2 Power Transmission and Safety

2 marks

1] Define coupling.
2] Draw a neat sketch of bevel gear.
3] Enlist the advantages of belt drive.
4] Enlist the different mode of Power transmission.
5] Draw a neat sketch of Compound gear train.
6] Write guidelines to avoid accidents.
7] Write down the advantages of rope drive and demerits of Belt drive.
8] Explain flat belt drive.
9] Draw the simple gear train.

3 marks

1] Explain the difference between flat belt and v belt.
2] Explain spur gear with neat sketch.
3] Classify the gears in detail.
4] Enlist the advantages and disadvantages of chain drive.
5] Explain difference between flat belt and V-belt.
6] Write applications of gear train and disadvantages of Gear drive.
7] Write a short note on coupling.
8] Give the importance and application of power transmission.
9] Explain effect of slip in belt.
10] Write a short note on helical gear.
11] Write a short note on different method of power transmission.
12] Explain classification of gear.

Unit-3 Processes on Material

2 marks

1] Which color is used for Acetylene cylinder and Oxygen cylinder?
2] What is the purpose of flux in gas welding?
3] Draw the diagram of blanking operation.
4] What are the applications of welding?

5] Make list of operations performed on lathe machine.
6] Draw the diagram of punching operation.
7] Make list of operations performed in drilling machine.
8] List the application of welding.
9] Draw the diagram of punching operation.
10] Enlist equipment used for arc welding.
11] Give difference between cutting torch and welding torch.
12] Explain working principle of lathe machine with neat sketch.
13] Enlist equipment used for oxy acetylene welding.
14] Which safety precautions should be taken during the use of gas cylinder?
15] Explain principle of forging process.
16] Give classification of lathe machine.
17] When special purpose machine tools are used?

3 marks

1] Draw the neat sketch of rolling process.
2] Make list of operations performed in milling machine. Explain any one with neat sketch.
3] Write safety guidelines for safe working with lathe machine.
4] Explain in brief the casting process
5] Compare welding, soldering and brazing processes.
6] Explain reaming operation.
7] Explain in brief the principle of casting process with basic steps.
8] Write a short note on welding.
9] Define manufacturing process. Give the classification of same.
10] How soldering is done for any metal? Write down steps of it.
11] Explain classification of welding in detail.
12] How brazing of any metal is done? Write down steps of it.
13] Write a short note on oxy acetylene gas welding.
14] Draw the schematic diagram of rolling process.
15] List out main types of milling machine.
16] List any five techniques of brazing.
17] Enlist the different application of gas welding.
18] Write safety guidelines for safe working with lathe machine.
19] xplain drilling operation.
20] Explain boring operation.
21] Write safety guidelines for safe working with drilling machine.
22] Make a list of operations performed in Drilling machine. Explain any one with neat sketch.
23] Make a list of operations performed in lathe machine. Explain any one with neat sketch.
24] Explain in brief the principle of casting process with basic steps.
25] Explain arc welding principle with neat sketch.

Unit-4 Steam Generation and Prime Movers

2 marks

1] Write the function of air preheater and super heater.
2] Draw a neat sketch of pressure gauge.
3] Write function of Economizer and Super-heater.
4] Define: Water Turbine and Steam Turbine.
5] Write the requirements of good boiler.
6] Draw neat sketch of dead weight safety valve.
7] Define high pressure boiler and list out the names of it.
8] Give name of various source of energy.
9] Write application of Steam turbine and Gas turbine.
10] Differentiate the forced circulation boiler and natural circulation boiler.
11] Define boiler. What is the pressure range in high pressure boiler?
12] What are factors should be considered while selecting boiler?
13] What is a Prime mover? Give types of prime mover.
14] Draw a neat sketch of spring laded safety valve.
15] Explain working principle of steam turbine.
16] Which devices are used to measure the pressure, preheat the air, supply water and superheat the steam in boiler?
17] Draw a neat sketch of an Air preheater.
18] Write the name of boiler mounting and accessories.
19] Give classification of steam turbine according to steam, stream reaction, steam flow and steam pressure.

3 marks

1] Write a short note on steam stop valve.
2] Explain difference between Impulse and Reaction Turbine.
3] Differentiate between boiler mountings and boiler accessories.
4] Differentiate between fire tube boiler and water tube boiler.
5] Explain working of Economizer. (Figure not needed).
6] Draw Cochran boiler with neat Sketch.
7] Give short note on Water turbine.
8] Draw a neat sketch of Cochran boiler.
9] Give the classification of prime movers.
10] Explain following Terminology of boiler: a) Shell (b) Grate (c) Blowing off
11] Give applications of Boiler in detail.
12] Draw a neat sketch of Babcock and Wilcox boiler.
13] Explain working of fusible plug.
14] Explain Steam stop valve with the help of neat sketch.
15] Give the classification of Boiler.
16] Explain working of Babcock and Wilcox boiler.
17] Draw a neat sketch figure of water level indicator.
18] Draw a neat sketch dead weight safety valve.
19] Draw a neat sketch Blow off cock.
20] Draw a neat sketch of Economizer.
21] Write a short note on gas turbine.
22] Draw a neat sketch of Locomotive boiler.

Unit-5 Internal Combustion Engines and Material Handling

2 marks

1] What are the hoisting equipment's are used for material handling?
2] Define Swept Volume and Clearance Volume.
3] Give the name of main parts used in I.C engine.
4] What are the name of four stroke of Otto cycle?
5] Write the any four name of conveying equipment.
6] What is the meaning of I.C engine? Define Compression ratio for it.
7] Explain top dead center and bottom dead center in IC engine.
8] List out the main parts of IC engine.
9] Explain meaning of internal combustion engine.
10] Draw a schematic diagram of two stroke engine.
11] What is I.C. engine?
12] Define (a) Compression ratio (b) Stroke length.
13] What are the hoisting equipment's are used for material handling?
14] Enlist the names of Cranes.
15] Make a list of the systems which are used in I.C. Engine.
16] List the different earth moving equipments.
17] Write the any four name of conveying equipments.
18] Write the advantages of belt conveyor.
19] Draw the four strokes of petrol engine.
20] Why the fuel injector is used Diesel engine?
21] Explain swept volume and clearance volume.
22] What is the use of elevator? Classify it according to hoist mechanism.

3 marks

1] Why the fuel injector is used Diesel engine and spark plug in Petrol Engine?
2] Give classifications of IC Engine based on (a) fuel used (b) Cylinder arrangements (c) No. of strokes.
3] Write a short note on working of four stroke Petrol IC engine. (Figure not needed)
4] What is the usage of elevator and classify it according to hoist mechanism?
5] Explain function of cooling, lubrication and ignition systems for I.C. engine.
6] Name the different earth moving machinery and explain any one of them in short.
7] Explain given earth moving machinery. (a)Tractors (b)bulldozer
8] Write a short note on diesel engine.
9] Write factors affecting the selection of crane.
10] Explain classification of elevators in brief.
11] Explain working of four stroke petrol engine.
12] Differentiate between I.C Engine and E.C engine.
13] Differentiate between Petrol Engine and Diesel engine.
14] Explain function of I.C. Engine.
15] Differentiate between four stroke and two stroke engine.
16] Explain working of four stroke diesel engine.
17] Give classification of reciprocating internal combustion engine.
18] Explain function of Crank shaft and Cam shaft in I.C. engine.
19] Enlist any ten conveying equipments used for material handling and explain any one.

20] Classify material handling equipments.
21] Write a short note on Surface handling equipment.
22] Explain thermal efficiency and indicated thermal efficiency of I.C. Engines.
23] Name the different earth moving machinery and explain any one of them in short.
24] Explain indicated power and brake power of I.C. Engines.
25] Explain function of Inlet Valve and Exhaust valve in I.C. engine.
26] Write a short note on I.C. engine.

Unit-6 Hydraulic and Pneumatic Devices

2 marks

1] Define: Laminar Flow and Turbulent Flow.
2] Write S.I. Unit of Specific Volume and Density.
3] Write the advantaged of centrifugal pump.
4] Define: Uniform flow and Non-uniform flow.
5] Write SI unit of Density and Surface Tension.
6] Enlist application of pneumatics system.
7] Explain working principle of pump.
8] What is laminar flow?
9] Explain the two dimensional flow with example.

3 marks

1] Draw the neat sketch of single stage reciprocating air compressor.
2] Explain Hydraulic lift.
3] Write a short note on centrifugal pump.
4] Explain uniform and non-uniform flow.
5] Explain single stage reciprocating air compressor in brief.
6] Explain Centrifugal compressor.
7] Specify different points for Turbine maintenance.
8] Explain Hydraulic press in brief.
9] Draw a neat sketch of single stage reciprocating air compressor.
10] Write a short note on water turbine.
11] Explain types of flow in brief.
12] Explain hydraulic lift.