BE I YEAR

Class Test: II,

MER1C3: Elements of Mechanical Engineering

Section: "CS-A"& "CS-B" (Date: 10/01/2023)

Max. Marks: 20

Duration: 70 Min.

Note: ***All questions*** *are compulsory USE OF STEAM TABLE IS PERMITTED. Sketch t suitable diagram wherever if necessary.*

Q.1 Explain critical point and triple point for water with the help of phase equilibrium diagram.

Q.3 A pressure cooker contains 2 kg of steam at 5 bar pressure and 0.9 dryness fraction. Calculate the quantity of heat which must be transferred so that quality of steam becomes 60% dry. Also calculate the pressure and temperature of steam that exists in cooker after heat rejection 6

Q.4 Explain briefly the types of oxy acetylene gas welding (5)

Q.1 Explain with the help of Phase equilibrium diagram the critical point and triple p of steam (2)

manufacturing process. ... overall budget of

Classification

6) Different types of welding ?

Plastic.

(1) Pressure welding :- Pressure welding refers to a process where heat is generated by the application of pressure along with the use of suitable temperature. In these processes external pressure is applied to the parts being joined, often along with heat, to create a solid-state weld. Common type of pressure welding include:

(a) Friction welding
(b) Forge Welding
(c) Resistance Welding
(d) Gas Welding.

2) Fusion / Non-Pressure Welding:- fusion welding is category of welding processes in which the materials being joined are melted to create a fusion or molten pool. Once the molten pool solidifies, a strong bond is formed between the welded materials. Common types of fusion welding includes:
(a) Gas welding
(b) Arc Welding
(c) Thermite Welding

(3) Cold Welding:- cold welding is a solid state welding process in which two materials are joined together at or near room temperature, without the need for melting or applying external heat. This process relies on the principal that when clean metal surface come intimate contact in inert environment, they can together through sharing of electrons. Common types of cold welding includes:-
(a) Butt and lap joints

(7) Different types of welding:

(i) Gas Welding:- Gas welding typically refers to oxy-acetylene welding, a process that use mixture of oxygen and acetylene gases to produce a flame for welding. Commonly us for cutting, welding, brazing and heating metals. Gas welding is futher classified as
(a) Oxyacetylene Welding
(b) Airacetylene Welding
(c) Oxyhydrogen Weldi

ii) Arc Welding :- Arc welding is a welding process that uses an electric arc to melt and join metals. Arc welding involves creating an electric arc between the welding electrode and the workpieces. The heat generated by the arc melts the material and upon cooling solid bond is formed. Types Further, types of arc welding are:-

(a) Carbon welding
(b) Plasma arc welding
(c) Submerged welding
(d) Metal arc welding
(e) Electroslag arc welding
(f) Fluxboard arc welding
(g) Metal inert gas welding
(h) Tungesten inert gas welding

iii) Resistance Welding:- Resistance welding is a process that joins metals by applying pressure and passing current through the metal parts being joined. Heat is generated by the resistance to electric current flow at the joint interface. This heat causes localised melting and the formation of weld. Types of Resistance welding include:-

(a) Spot Welding
(b) Projection Welding
(c) Butt welding
(d) Percution welding
(e) Seam welding.

iv) Thermite Welding:- It is process that joins two pieces of metal using a chemical reaction to create intense Heat. The process involves a chemical rxn between powdered metal and metal oxide. This rxn releases a large amount of heat, melting both metal powder and the workpieces. Types of Thermite welding Include:-

(a) Solid state welding
(b) Friction welding
(c) Explosive welding
(d) Ultrasonic welding
(e) diffusion welding.

(8.) What is Arc Welding?
Arc welding is a welding process that uses an electric arc to melt and join metals. Arc welding involves creating an electric arc between the welding electrode and the workpiece. The heat generated by the arc melts the material and upon cooling a solid bond is formed. It is widely used in construction, fabrication, automotive and other industries. Types of Arc Welding are:-
(a) Carbon welding
(b) Plasma arc
(c) Submerged
(d) metal arc
(e) electroslag
(f) Fluxboard arc
(g) Metal inert gas
(h) Tungesten inert gas
(i) Atomic Hydrogen gas.

(9) How many different flames are produced in gas welding?

(a) Carburizing flame:- Carburizing flame is one in which there is excess of acetylene.
(b) Neutral flame:- It is well defined inner cone consisting equal balance of oxygen and acetylene.
(c) Oxidising flame:- An oxidising flame is one in which there is an excess of oxygen.