



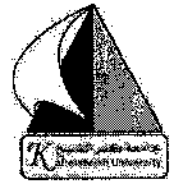
**Answer the following questions**

**Question no. 1**

- 1- Tabulate a comparison between jigs and fixtures?
- 2- State the goals that must be realized by tool designer engineer?
- 3- State and explain the advantageous of jigs and fixtures?
- 4- Identify the main categories of plastics shaping processes, as classified by the resulting product geometry.
- 5- Briefly describe the injection molding process.
- 6- State and define the elements of Jigs and Fixtures?
- 7- Why simple clamping mechanisms should be adopted over complex ones?
- 8- When slotted clamps with an adjustable heel pin is used?
- 9- What are some of the reasons why plastic shaping processes are important?
- 10- Viscosity is an important property of a polymer melt in plastics shaping processes. Upon what parameters does viscosity depend?

**Question no. 2 (answer by true or false, and correct the false)**

- 1- Pin type locators are used for smaller holes and for aligning members of the tool.
- 2- The principal components of an injection molding machine are clamping & injection unit.
- 3- The function of the ejection system is to separate the part from the cavity after molding.
- 4- The defects or problems of injection molding are flash, short shots, sink marks.
- 5- The two most common polymer forms are polystyrene, polyurethane.
- 6- The minimum thickness required by the plastic for vacuum forming is 0.125 mm.
- 7- Sharp corners should be avoided in the locators by chamfers or radius.
- 8- Locators should be of hardened material to withstand wear and tear of loading and cutting forces.
- 9- General class of locators is cylindrical, and therefore, close tolerances should be maintained in the specification as well as in the manufacturing process.
- 10- Locators should have relief groove at the interface where the diameters change.
- 11- Diamond pin Locators are used in conjunction with principal cylindrical locators.
- 12- 'V' locators, both fixed and sliding are used to locate cylindrical objects and flat work.
- 13- 'V' locators, are downward chamfered at the locating faces to affect the clamping forces.
- 14- Slotted clamps with a heel pin is used when the rotation of the clamp is not needed as the clamp can be loosened and slid for the removal of components
- 15- 'V' clamps are used to clamp cylindrical components only in the case of fixtures.
- 16- Thermoforming starts with a thermoplastic hollow container.



- 17- In the feed section in polymer extruders, the polymer changes to a viscous fluid.
- 18- Viscoelasticity is a combination of viscous and elastic properties which cause the melt to return to its previous shape.
- 19- Plastic films have a thickness less than 0.5 mm
- 20- The types of clamping units are mechanical, hydraulic and hydromechanical.
- 21- Many types of plastics degrade from sunlight and certain other forms of radiation.
- 22- In certain occasions, a casting could take a special profile, which needs to be machined. So, the locator is manufactured like a nest to suit the component profile.
- 23- The clamping device should be quick acting as the loading and unloading time should be as quick as possible.
- 24- The purpose of the clamping is to exert a pressure to press a work piece against the locating surfaces and hold it there in a position to the cutting forces.
- 25- "Diamond Pin Locator" is considered a principal locator?
- 26- Turnover jig is designed to accommodate hollow cylindrical components.
- 27- Pressure pads are part of the clamping systems and are used while clamping tough materials like hardened steel and its alloys.
- 28- Clamping force should be applied to a heavy/thick part of the workpiece.
- 29- Spherical washers enable the screw to be vertical even when the clamps become inclined such that buckling loads do not come into picture.
- 30- Increasing the productivity and accuracy are the two basic aims of mass production.
- 31- Plate jigs are the simplest of all types of jigs.
- 32- Cast steel bodies of Jigs exhibit superior toughness and strength while cast iron bodies are brittle.
- 33- In milling fixture, the work piece should be supported as near the tool thrust as possible.
- 34- Mechanical Fixtures are used in heavy milling operations requiring uniform clamping force.
- 35- 'V' blocks are widely used in milling fixtures.
- 36- Magnetic chuck is used to fix too thin parts or that may be damaged if held in a conventional chuck.
- 37- the form of the starting material in thermoforming are thermoplastic sheet or film?
- 38- The principal components of an injection molding machine are clamping unit, and injection unit.
- 39- In turning fixtures, three jaw chucks are ideal for gripping round, square, hexagonal and irregularly shaped workpieces.
- 40- Magnetic chuck has the advantage of holding expensive carbon fiber reenforced polymer parts.
- 41- The main defects or problems associated with injection molding are flash, short shots, and sink marks.
- 42- Nest fixtures eliminate the time and money spent in designing, building, and storing dedicated fixtures.

*With best wishes ===== Dr. Mohamed Egiza*