**SIMULATION OF POLAR 3D PRINTER MACHINE**

**EXPT No : 4 DATE:**

**AIM:**

To simulate the construction of polar 3D printer and to get in-depth knowledge of mechatronics of polar 3D printers.



**REQUIREMENTS:**

* System - Windows 7 or higher, 1 GB RAM.

**PROCEDURE:**

**Assembly of Polar 3D Printer**

* Select 'Assembly of Polar 3D Printer' from the visible list.
* All the parts related to Polar 3D Printer will be shown on the screen.
* Select the parts in sequence in which they are shown.
* When the first part is selected then it will open in the blank space in the left side of the screen.
* Further, when the correct part will be selected then it will get assembled with the previously selected part/parts.
* If the user follows an incorrect sequence then a pop-up will appear on the screen showing the name of the part to be selected.

**Playing with Axes**

* Move the r-axis slider and observe the movement of the r-axis assembly.
* Move the y-axis slider and observe the movement of the y-axis assembly.
* Move the z-axis slider and observe the movement of the z-axis assembly.

**OUTPUT:**

|  |  |
| --- | --- |
|  | Y-Axis Base : The vertical axis is usually called the y-axis. The point where the x- and y-axis intersect is called the origin. |
| Z-Axis Frame : The Z axis is perpendicular to the ground plane; think of it as a line drawn between the device and the center of the Earth |
| Smooth Rods : A smooth rod is a metal rod usually used on the axis for components such as the X-carriage or print bed of a RepRap to slide on. |
| Motors : They are used in a variety of applications depending on the type of printer. |
| Extruder Supporter : This enables you, in particular, to print two materials simultaneously in order to obtain 3D prints in two colours. |
| Threaded Rod : Threaded rods and stud bolts are widely used wherever a fastener of greater length and rigidity is needed to secure two items together. |
| Y-Axis Frame : The vertical axis is usually called the y-axis. The point where the x- and y-axis intersect is called the origin |
| Motor with Gear : A gear motor is a mechanical system consisting of an electric motor and a gearbox containing a series of gears. |
| Motor-with-Pulley : Pulleys or “sheaves” are commonly used for connecting pumps to motors or engines via drive belts. |
| Gears : Gears can serve as an efficient means to reverse the direction of motion, change rotational speed, or to change which axis the rotary motion is occurring on. |
| Plate : plate is one of the most important parts of a 3D printer. Both resin and FDM 3D printers have a build plate. |
| Extruder : extruder is a filament feeding mechanism used in many fused filament fabrication (FFF) 3D printers. There are several types of 3D printer extruders. |
| Filament : filaments can be made with specific additives to either improve their mechanical properties or aesthetic appearance. Typical 3D printing filament types used include PLA, PETG, or ABS. For the purpose of comparison, ABS-filled 3D printer plastic will be used. |

**Fig 1: Assembly of Polar 3D Printer**



**Fig 2: Playing with Axes**

**Result:** Thus the simulation on construction of polar 3D printer is completed & movement of axis along X, Y, & Z has been studied.