



## Numerical Control Machines

### Question 1

(70 Marks)

1. With the help of sketch, describe both the CNC stepper and servo motor control systems.
2. What is the difference between the absolute and incremental positioning ?
3. What is the type of power screw used in CNC machines? Why?
4. With the help of sketches, describe the different types of tools used in CNC milling machine.
5. Identify the location of the machine home coordinate system.
6. Plain the purpose of the fixture offset XY.
7. List the sequence of operations in a typical CNC program.
8. Write the peck hole canned cycle to give the same operation in the following program and explain this canned cycle using sketches.

N70 Z0.06

N75 Z0.04

N80 G01 Z-0.19 F9.

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9. What is the difference between the drilling cycles G81 and G83?
10. What is the function of the codes R, G98, and G99 in the drilling cycles?

### Question 2

(30 Marks)

Write a CNC program to machine the length, thickness, pocket, and hole of the part shown below. The part is saw cut to approximately 10.5 cm length and 5cm width and 2.2 cm high. Perform a Face milling, partial contour, and pocketing with a 4 flute, 20mm diameter, HSS endmill, 10000rpm speed, 400mm/min feed which is tool number 1 and drilling with a drill, 10mm diameter, 1000rpm speed, 300mm/min feed which is tool number 2. Use the following sequences of operations.

Partial contour – Zigzag face milling – Pocketing - Drilling.

