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Question Paper Code	12720
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fourth Semester

Mechanical and Automation Engineering

20MUPC403 - CNC MACHINES AND METROLOGY

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

	Marks	K- Level	CO
1. What are the types of control system?	2	K1	CO1
2. Enumerate feedback system in CNC machines.	2	K2	CO1
3. Classify the types of electrical motors.	2	K2	CO2
4. What is the function of synchros and resolver in CNC?	2	K1	CO2
5. Distinguish between machining and turning centre	2	K2	CO3
6. What are the 3 basic G codes?	2	K1	CO3
7. List out any four angular measuring instruments used in metrology.	2	K1	CO4
8. Write short note on bevel protractor.	2	K2	CO4
9. Why is laser preferred in engineering metrology?	2	K2	CO5
10. Briefly describe the term Machine vision.	2	K2	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

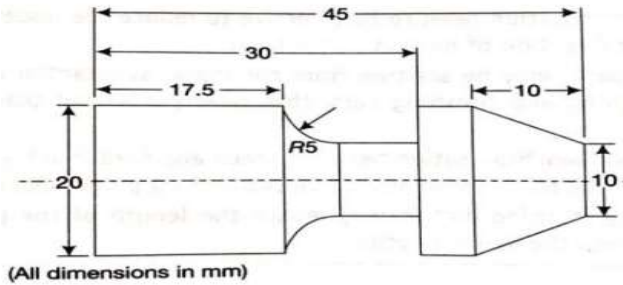
11. a) List down the basic elements of CNC machine with block diagram and write its advantages, disadvantages and applications.	13	K2	CO1
OR			
b) Explain the different types of anti-friction guide ways with neat sketches.	13	K2	CO1
12. a) Summarize the working principles of AC and DC servo motor in CNC machine with its applications.	13	K2	CO2
OR			
b) Explain the work holding devices for the rotating and fixed Parts in CNC machine.	13	K2	CO2
13. a) i) Discuss briefly any four important requirements of cutting tool materials.	7	K2	CO3
ii) Enumerate any four cutting tool materials used in CNC machine tools.	6	K2	CO3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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OR

- b) Write a CNC program using appropriate G and M code to turn 13 K2 CO3 component as shown in figure cutting speed $V=40\text{m/min}$ and feed=0.1, assume suitable data for depth of cut.



14. a) Explain read type of Mechanical comparator with neat sketch and also 13 K2 CO4 explain the concept of Sigma comparator with sketch.

OR

- b) Describe working principle of angle Dekkor with the neat sketch and 13 K2 CO4 also write its application.
15. a) Explain the working principle of DC Laser interferometer with neat 13 K2 CO5 diagram.

OR

- b) Explain the construction and working of various types of CMM. And 13 K2 CO5 write down its applications.

PART - C (1× 15 = 15 Marks)

16. a) Analyze and explain the components and working principle of CNC 15 K3 CO6 Electric Discharge Machining (EDM) with neat sketch.

OR

- b) Write CNC part program for the component shown in Fig. 15 K3 CO6

