Total No. of Questions: 23

Enrollment No : _____

MEDICAPS UNIVERSITY

Faculty of Engineering

End Semester Examination May 2025

RA3CO30 CNC Machine & Metrology

Programme	:	B.Tech.	**Branch/Specialisation**	:	RA
Duration	:	3 hours	**Maximum Marks**	:	60

Note: *All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.*

Section 1 (Answer all question(s))

		Marks	CO	BL
Q1.	Several machine tools can be controlled by a central computer in- ○ NC ◉ DNC ○ CNC ○ None of these	1	1	1
Q2.	Full form of MPG mentioned on CNC controller is _____. ○ Machine power Grip ◉ Manual Pulse generator ○ Machine Plot Generator ○ None of these	1	1	2
Q3.	Which of the following operation can't be perform on a drilling machine? ◉ Lapping ○ Reaming ○ Tapping ○ None of these	1	2	2
Q4.	Full form of BLDC is _____. ○ Best load Direct Current ○ Bundle Load Direct Current ◉ Brushless Direct Current ○ None of these	1	2	1
Q5.	Code to call the sub program is- ○ G90 ○ G94 ◉ M98 ○ G98	1	3	1
Q6.	MO9 represent the following instruction in CNC part programming- ◉ Coolant off ○ Spindle on ○ Coolant on ○ Tool change	1	3	1
Q7.	Process of wringing in slip gauge is due to _____. ○ Molecular cohesion ◉ Molecular adhesion ○ Air friction ○ Air vacuum	1	4	1
Q8.	Which of the following is not an angle measuring device? ◉ Feeler gauge ○ Sine bar ○ Bevel protector ○ Combination set	1	4	1
Q9.	CMM stand for _____. ○ Canned Machine Motion ◉ Coordinate Measuring Machine ○ Correct Measurement Machine ○ None of these	1	5	1
Q10.	Arrange the various key stages of machine vision systems sequentially- P) Decision-making Q) Image processing R) Image acquisition ○ R -P - Q ○ P -Q - R ◉ R -Q - P ○ Q - R- P	1	5	2

Section 2 (Answer all question(s))

Marks CO BL

Q11. Explain the advantages to be gained by using CNC compared to NC. **4 1 1**

Rubric	Marks
4 marks for 4 advantages	4

Q12. (a) Explain the various types of guideways used in CNC machine. **6 1 2**

Rubric	Marks
1.5 marks for each guideway	6

(OR)

(b) Draw and explain the constructional block diagram of a CNC Machine.

Rubric	Marks
Diagram 2 marks Explanation-4 marks	6

Section 3 (Answer any 2 question(s))

Marks CO BL

Q13. Explain working principle of rotary encoder with neat sketch. **5 2 2**

Rubric	Marks
Diagram- 2 marks Explanation and working principle of rotary encoder-3 marks	5

Q14. Explain any five work holding devices with diagram. **5 2 2**

Rubric	Marks
Each work holding device 1 mark	5

Q15. Explain any five tool material with their specific properties and application. **5 3 1**

Rubric	Marks
Each tool material 1 mark	5

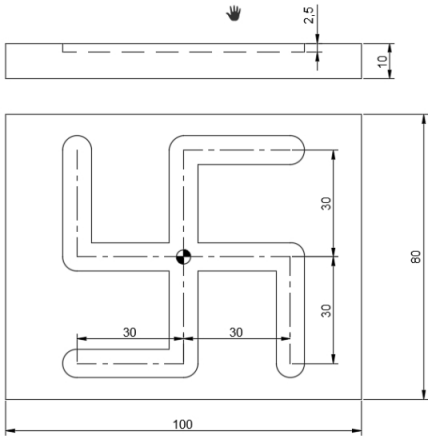
Section 4 (Answer all question(s))

Marks CO BL

Q16. Explain the use of tool length compensation and cutter radius compensation in part programming. **3 3 2**

Rubric	Marks
Explanation of Length compensation 1.5 marks Explanation of Radius compensation 1.5 marks	3

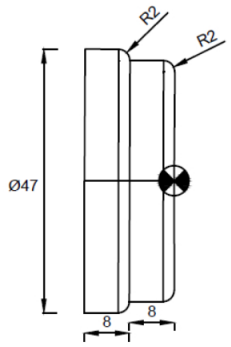
Q17. (a) Interpret the given data and generate a Part Program as per Fanuc Controller for the given slot to be generated in CNC Milling. Take, feed as 300 mm/minute and maximum depth of cut 1.5 mm. (All Dimension in mm) **7 3 3**



Rubric	Marks
Correct part Programming 7 marks	7

(OR)

(b) Interpret the given data and generate a Part Program for given product as per Siemens Controller. Raw material Dia 48 mm, Take Max. Depth of Cut 1 mm,
Feed 0.2 mm per rev. (All Dimension are in mm)



Rubric	Marks
Correct part Programming 7 marks	7

Section 5 (Answer all question(s))

Marks CO BL

Q18. Explain the concept of interchangeability. **2 4 2**

Rubric	Marks
Explanation of concept of interchangeability 2 marks	2

Q19. Define least count and sensitivity of a measuring instrument. **2 4 1**

Rubric	Marks
Definition of Least count 1 mark Definition of sensitivity 1 mark	2

Q20. (a) Draw and explain the working of angle alignment telescope. **6 4 2**

Rubric	Marks
Diagram 2 marks Explanation of working 4 marks	6

(OR)

(b) Draw and explain the working principle of Sine bar. show how to take reading by it.

Rubric	Marks
Diagram 2 marks Explanation of working 4 marks	6

Section 6 (Answer any 2 question(s))

Marks CO BL

Q21. Explain the various probes used in the CMM. **5 5 2**

Rubric	Marks
1 mark for each probe	5

Q22. Explain the basic concepts of machine vision systems with application. **5 5 2**

Rubric	Marks
Explanation of concept 2 marks Application 2 marks Diagram 1 mark	5

Q23. Explain the principle, advantage and application of laser. **5 5 2**

Rubric	Marks
Principle of laser 2 marks Advantage of laser 2 marks Application of laser 1 marks	5

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