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<i>Name</i> :	
Roll No.:	In Annual Of Standing and Explana
Invigilator's Signature :	

CS/M.TECH(ME)/SEM-2/MMT-202/2012

2012 NON-TRADITIONAL AND MODERN MACHINING

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

		Answer any five questions. $5 \times 5 = 2$	25
1.	a)	What do you mean by process capability study?	2
	b)	What are the applications of AI in manufacturing?	3
2.	a)	Discuss about major non-contact inspection methods.	3
	b)	How is computer networking used in CIM?	2
3.	a)	State the characteristic features of MI class parts codin	ıg
		system.	2
	b)	Enumerate the philosophy of "Composite Par	rt
		Approach".	3
4.	a)	How does FMS differ from Transfer Line?	3
	b)	What are the various components of FMS?	2
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300	52(M	-Tech) [Turn over	er

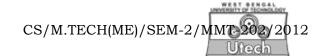
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5.	a)	State the hardware requirements of CIM. 3
	b)	State the benefits of concurrent engineering.
6.	a)	What are the different modules of CAD?
	b)	What is meant by feature based design? 3
7.	a)	State the factors that affect material removal in High
		Speed Machining. 2
	b)	How CAPP is different from Manual Process Planning? 3
		GROUP - B
		Answer any <i>three</i> of the following. $3 \times 15 = 45$
8.	a)	Derive an expression of ECM to justify that "feed is
		required to continue the process over a prolonged time".
		7
	b)	During the ECM of Fe with Cu-electrode working in
		5(N) NaCl solution in water, an interelectrode gap of 0.2
		mm has been achieved. Operating dc voltage has been
		12 V, Specific resistance of NaCl solution is 2 ohm-cm,
		Valency at which Fe is dissolved is 2, Atomic weight of
		Fe is 55.85 and density of Fe is 7.8 gm/cm ³ . Consider
		Faraday's constant to be 96540 coulombs.
		i) Determine the MRR
		ii) Find out the feed rate of the tool. 4 + 4
9.	a)	In EDM process prove that the condition for maximum power delivery to the discharging circuit is V_c = 0.76 V_o ,

condenser in volts.

where V_{c} is the charged voltage of the condenser in volts and V_{o} is the e.m.f across the circuit for charging the

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- b) During an electric discharge drilling of a 10 mm square hole in a low carbon steel plate of 5mm thickness, brass tool and kerosene are used. The resistance and the capacitance in the relaxation circuit are 50 Ω and 10 μF , respectively. The supply voltage is 200 volts and the gap is maintained at such a value that the sparking takes place at 150 volts. Find the time required to complete the drilling operation.
- 10. a) Identify logical part families and machine groups by applying the rank order clustering technique to the part-machine indices matrix in the following table below. Parts are identified by letters and machines are identified numerically.

	PARTS						
		A	В	С	D,	Е	F
MACHINES	1	1				1	1
	2				1		1
	3	1	1				
¥	4			1	1		
	5					1	
	6			1	1		1

b) Using the following From-to-Chart determine the machine sequence. 5

From	1	2	3	4
1	0	5	0	25
2	30	0	0	15
3	10	40	0	0
4	10	0	0	0

c) Explain various modules of CAD.

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Explain the main factors that affect the AWJM removal 11. a) rate. b) Illustrate the geometry of a drilled hole using LBM 6 process. What are the effects of cutting speed, feed rate and tool c) 5 geometry on precision machining? Calculate the velocity of electron impingement in an 12. a) electric filed having a strength of 2.5×10^6 volts. Also determine the power of the electron beam if the beam current is 2×10^{-5} amps. 3 b) With the aid of a sketch describe the IBM process. 5

Explain the tool feeding mechanism in USM process.

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c)