			Q. Co	de:7	77698						
		Reg. No.					(ii) V	Write short	notes on re	trieval type (	CAPP s
		B.E / B.TECH. DEGREE EXAMINATION, MAY 2023	<b>I</b>	<u> </u>		12. (a)	(i) I	Flaborate t	he productic	on flow analy	zsis wit
	Seventh Semester						_				
	ME18702 – COMPUTER INTEGRATED MANUFACTURING					(ii) Give an example for OPITZ parts classific (OR)					
		(Mechanical Engineering)				(b)	(i) I	Explain the	concept of r	oart family wi	` '
тп	ИЕ. 2	(Regulation 2018) HOURS MAX	X. MAF	DVG.	100	(-)		-		e a GT cell. T	
		Students will be able to understand the concepts of CIM, automation and CA	APP and		100		a	re shown i	n the table.		
		select appropriate automation technology for a given manufacturing scenario					(	i) Determin	ne the most l	ogical sequer	nce of r
		Students will be able to derive GT code for the given drawing using Opitz c system and do quantitative analysis for the performance of cellular manufac Students will be able to apply the concept of FMS and its applications and	turing.	e to s	olve					rk diagram fo it the system.	
		simple quantitative analysis problems in FMS. Also understand AGVS, its									То
		applications and vehicle guidance management and safety.	C					From –	1	2	3
(	204	Students will be able to select an appropriate type of robot, end effector, and application.	sensor I	or a g	iven			A	0	10	70
(	C <b>O 5</b>	Students will be able to understand OSI, MAP, and TOP. Also, will be able	to					В	0	0	0
		understand various data modelling and architecture of databases.						C	0	0	0
		PART-A (10 x 2 = 20 Marks)						D	70	0	20
		(Answer all Questions)		CO	RBT			E	0	70	0
1.	A co	mpany produces parts with a wide product variety. Which type of automatic	on will	1	3	<b>13.</b> (a)	A flex	tible machi	ining system	n consists of	two m
2.	•	recommend? is an "Expert System" needed for Generative CAPP system?		1	2		milling	g operatior	ns and const	1 is the load ists of two s	servers
	Why	recommend?		1 2	2 2		milling machin	g operatior nes). Statio	ns and const n 3 has one s	ists of two s server that per	servers rforms (
2.	Why State What	recommend? ' is an "Expert System" needed for Generative CAPP system? e the conditions suitable for GT. t are the various types of part movements that can be identified in a mixed-		1 2 2	2 2 2		milling machin The sta The m	g operation nes). Statio ations are c ean transpo	ns and const n 3 has one s onnected by ort time is 3.0	ists of two s server that per a part handlin 0 min. The Fl	servers rforms ng syste MS pro
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<ol> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> </ol>	Why State What part p How	recommend? resonance is an "Expert System" needed for Generative CAPP system? the conditions suitable for GT. t are the various types of part movements that can be identified in a mixed- production system? do you classify an FMS based on the number of machines?			2 2 2		milling machin The sta The m part m	g operation nes). Statio ations are c ean transpo ix fraction pelow. The	ns and const n 3 has one s onnected by ort time is 3.0 s and proces operation fre	ists of two s server that per a part handlin 0 min. The Fl	servers rforms ong syste MS pro for the tr 1.0 for a
<ol> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> <li>6.</li> </ol>	Why State Wha part J How Justi	recommend? recommend? ris an "Expert System" needed for Generative CAPP system? the conditions suitable for GT. t are the various types of part movements that can be identified in a mixed- production system? do you classify an FMS based on the number of machines? fy why beacons are needed in Automated Guided Vehicle System (AGV).		3 3	2 2		milling machin The sta The m part m table b (a) (b)	g operation nes). Statio ations are c ean transpo ix fraction below. The Maximum Correspor	ns and const n 3 has one s onnected by ort time is 3.0 s and proces operation fro production nding produc	ists of two s erver that per a part handlin 0 min. The Fl ss routings for equency $f_{ijk}=1$ rate of the Fl etion rates of	servers rforms ong syste MS pro for the tr 1.0 for a MS
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CAPP system.	(7)	1	2
ysis with an example.	(7) (7)	2	2
lassification and coding system. (OR)	(7)	2	3
ith an example.	(7)	2	2
The From/To data for the machines	(7)	2	3

logical sequence of machines for this cell

ork diagram for the data, showing where and how

То		
3	4	5
70	0	0
0	80	0
0	0	0
20	0	0
0	15	0

m consists of two machining workstations and a (14) 1 is the load/unload station. Station 2 performs sists of two servers (two identical CNC milling server that performs drilling (one CNC drill press). a part handling system that has four work carriers. .0 min. The FMS produces two parts A and B. The ess routings for the two parts are presented in the requency  $f_{ijk}=1.0$  for all operations. Determine:

ction rates of each product

Description	Station	Process Time
1	i	$t_{ijk}$ (min)
Load	1	3
Mill	2	40
Drill	3	15
Unload	1	2
Load	1	3
Mill	2	50
Drill	3	10
Unload	1	2

3 3

## (OR)

		(011)			
(b)	(i)	What is an Automated Guided Vehicle? Justify the need for an AGV in a manufacturing industry. Discuss automated guided vehicle system in detail.	(7)	3	3
	(ii)	Briefly discuss the traffic control, vehicle dispatching and vehicle safety of AGVs.	(7)	3	2
14. (a)	(i)	Explain the polar coordinate robot with a neat diagram. Give its advantages and disadvantages.	(7)	4	2
	(ii)	Explain the point-to-point and continuous path robot systems with neat diagram. Also give suitable applications for each of them.	(7)	4	2
		(OR)			
<b>(b)</b>	(i)	Write short notes on the various sensors used in robots.	(7)	4	2
	(ii)	List the various applications of an industrial robot.	(7)	4	2
15. (a)	(i)	Explain the Manufacturing Automation Protocol (MAP).	(7)	5	2
	(ii)	Explain the Technical Office Protocol (TOP).	(7)	5	2
		(OR)			
<b>(b)</b>	(i)	Explain the entity-relationship with a suitable diagram.	(7)	5	2
	(ii)	Explain the concept of relational database and give its advantages.	(7)	5	2

## <u>sPART- C (1 x 10 = 10 Marks)</u>

(Q.No.16 is compulsory)

Marks	CO	RBT
		LEVEL
(10)	2	3

**16.** Apply the rank order clustering technique to the part-machine incidence matrix given in the table to arrange parts and machines into groups.

	Part Number							
		P1	P2	P3	P4	P5		
	M1			1		1		
ne	M2		1	1				
Machine	M3	1			1			
M <sup>2</sup>	M4		1	1		1		
	M5	1			1			

## Q. Code:777698