



OR

- 6 a. Briefly explain group machine cell design with manual handling. List its advantages. (08 Marks)
- b. Apply the rank order clustering technique to the part machine incidence matrix is table to identify logical part families and machines groups parts and identified by letters and machines by numbers.

PARTS

Machines	A	B	C	D	E	F	G	H	I
1			1	1	1				
2	1	1					1	1	1
3						1	1	1	
4	1	1		1					
5			1		1				
6		1						1	1
7	1		1	1					
8		1				1		1	1

(08 Marks)

Module-4

- 7 a. What are the types of flexibility? Briefly explain FMS. (08 marks)
- b. List the application and benefits of applying FMS. (08 Marks)

OR

- 8 a. Briefly explain AGV's. List applications. (08 Marks)
- b. Write a note on vehicle management and safety. (08 Marks)

Module-5

- 9 a. With a neat sketch explain the anatomy of a robot. (08 marks)
- b. Briefly explain the types of end effectors, with necessary sketches. (08 marks)

OR

- 10 a. Briefly explain the uses of sensors in robotics. (08 marks)
- b. Explain : (08 Marks)
- Accuracy
  - Repeatability.

\*\*\*\*\*