

Master of Mechanical Engineering 2nd Semester Examination 2019

Advanced Manufacturing Systems

Time: Three hours

Answer any five questions

Full marks: 100

- What are the four functions of manufacturing support systems? Discuss any one of them.
 - Name the six advanced manufacturing systems.
 - How do you measure manufacturing lead time and work-in-process for a particular production system?
 - What are the characteristics and limitations of job shop, batch production and mass production? [5+5+5+5]
- How does MRPII differ from MRP?
 - What is the relationship among the capacity planning, aggregate planning and master production schedule?
 - What are the advantages and disadvantages of ERP system?
 - Product X is made of 2 units of Y and 3 of Z. Y is made of one unit of A and 2 of B. Z is made of 2 units of A and 4 of C. Lead times for X, Y, Z, A, B and C are 1,2,3,2,1 and 3 weeks respectively. Develop an MRP planning schedule for A, B, and C. [4+4+4+8]
- What are group technology and cellular manufacturing?
 - Explain Opitz parts classification and coding system and cite an example of a part design to develop the form code in this system.
 - What are the applications of group technology in product design?
 - Discuss briefly the procedural steps in production flow analysis. [4+6+4+6]
- What is an FMS? What makes it flexible?
 - Name four tests of flexibility that a manufacturing system must satisfy in order to be classified as flexible.
 - Distinguish between flexible manufacturing cell and CNC machining centre.
 - Name six technology related advances in manufacturing that enhance production and productivity and discuss briefly any one of them. [4+4+4+8]
- What are the constraints in assembly line balancing?
 - What is a heuristic? Name three heuristics that be used in assembly line balancing
 - Given the following data of a line-balancing problem. Develop a solution allowing a cycle time of 3 minutes. What is the efficiency of that line? How many units can be produced in a 480-minute day? What is the total idle time per day? [5+5+10]

Task	a	b	c	d	e	f	g	h	i
Time	1	1	2	1	3	1	1	2	1
Predecessor(s)	---	a	b	b	c, d	a	f	g	e, h

- Define aggregate planning.
 - What is the relationship between aggregate plan and master production schedule?
 - Discuss different costs associated with aggregate production planning.
 - What are the different aggregate planning strategies? [5+5+5+5]
- What are the advantages and disadvantages of JIT?
 - What are seven wastes of lean manufacturing? Discuss any one of them.
 - Distinguish between retrieval and generative CAPP.
 - A company uses kanbans to support its transmission assembly line. Determine the size of the kanban for the assembly and no. of kanbans needed. Setup cost=Rs. 20; annual holding cost=Rs. 250/unit; daily production=300; daily usage=80; annual usage =20000; lead time=3 days; safety stock=1/2day's production. [4+4+4+8]