

GANPAT UNIVERSITY

CBCS Regular Exam

M.Tech. Sem. IInd (CAD/CAM) Mechanical May 2014 Examination

3ME213 Computer Aided Production Management

Time: 3 Hrs]

[Total Marks: 70

Instructions:-

1. Attempt **all** Questions.
2. Figure to the **right** indicate full marks.
3. Answers to the two section must be written in **separate** drawing papers
4. Assume suitable data if **necessary**.
5. Draw neat sketch wherever essential.

SECTION - I

- Q.1 (A) "A process engineer needs to consider a number of factors while laying down the manufacturing process of a job" what are those factors? And how do they influence process planning? (4)
- (B) Define the term "BOM". Explain various characteristics of BOM in details. (4)
- (C) What are the differences between retrieval type and generative type of CAPP? Which is better? Explain retrieval type CAPP system. (4)

OR

- Q.1 (A) Discuss and develop a close loop system of material requirement planning, starting from forecasting and ending up with finish product dispatches in any manufacturing organization of large size. (4)
- (B) Enlist the principles of scheduling; also list down the inputs to scheduling. Explain methods of scheduling with suitable sketches. (4)
- (C) Solve the following sequencing problem giving an optimal solution when passing is not allowed. (4)

Machine	Job				
	I	II	III	IV	V
M1	11	13	9	16	17
M2	4	3	5	2	6
M3	6	7	5	8	4
M4	15	8	13	9	11

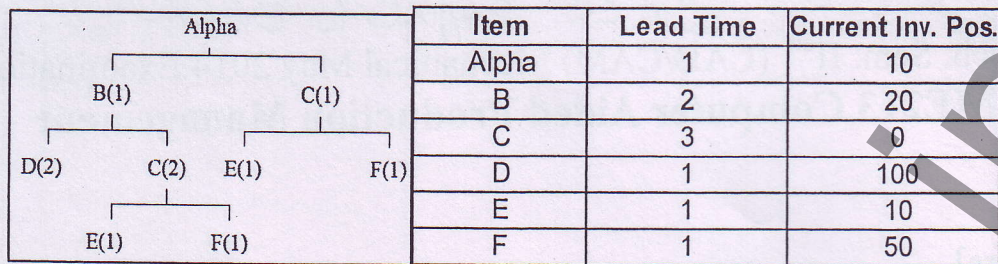
Find the optimal sequence, total processing time and idle time of the machines.

OR

- Q.2 (A) Zap corporation manufactures fax machines. it has developed an aggregate plan for the next several months, and has tentatively allocated 220 units of production to its model 330 machines during the next five weeks. Zap wants to produce this model in lot sizes of between 100 and 120 units at a time. Zap expects to begin week 1 with 40 machines on hand, and the forecast demands for the model 330 for the next five weeks are given blow. Construct an MPS (planned weekly production) for this item. (5)

Week	1	2	3	4	5
Forecast demand	60	30	40	40	45

- (B) Prepare the MRP schedule for the following product structure. (6)



Gross Reqs for Alpha													
Period	1	2	3	4	5	6	7	8	9	10	11	12	13
Gross Reqs.								50			50		100

OR

- Q.2 (A) A General Motors bike plant manufactures several bike models. The company has forecast its quarterly demands during the next four quarters, which are listed below. The plant can produce approximately 25 bikes per quarter for each worker on staff. Workers receive an average of 15,000 Rs. per quarter in wages and benefits and it costs 7000 Rs. to hire and train a new worker and 10,000 Rs. to lay off a worker. Workers can be hired or layoff at the beginning of any quarter. GM expects to have 480 workers on staff and 2000 bike in inventory at the end of the current quarter. Any bike held in inventory at the end of a quarter incurs a holding cost of 1000 Rs. (6)

- Construct an aggregate plan for the next four quarters using the chase demand strategy and compute its total cost.
- Construct an aggregate plan for the next four quarters using a level production strategy and compute its total cost.

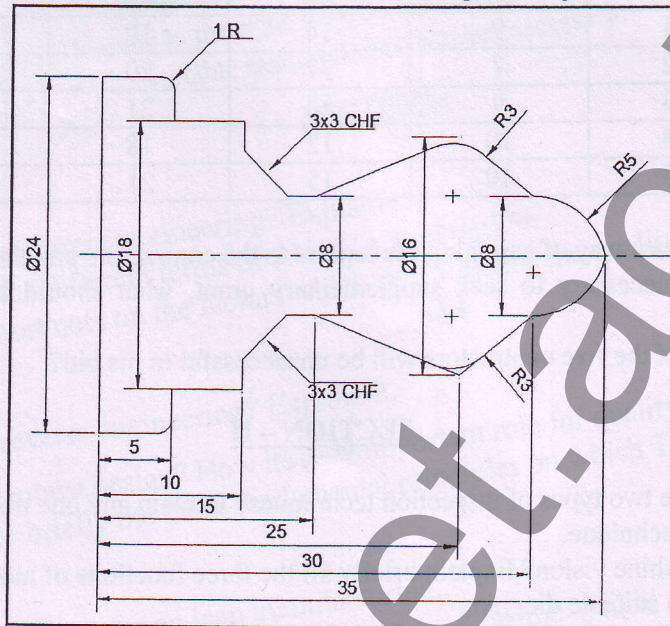
Period (Quarter)	1	2	3	4
Aggregate Demand (units)	10,000	12,000	9,000	11,000

- (B) One unit of product, A is made-up of two units of B and four units of C. B is made of two units of D and three units of E. C is made up of three units of D and two units of F. (5)
- Draw a product structure tree.
 - Show a single level bill of material and an indented bill of materials.
 - A, C, D and E have lead time of one week and B and F have lead time of two weeks. If 100 units of A are required in week 5, develop the material requirement plan specifying when items are to be ordered and received. There are no units of inventory on hand.

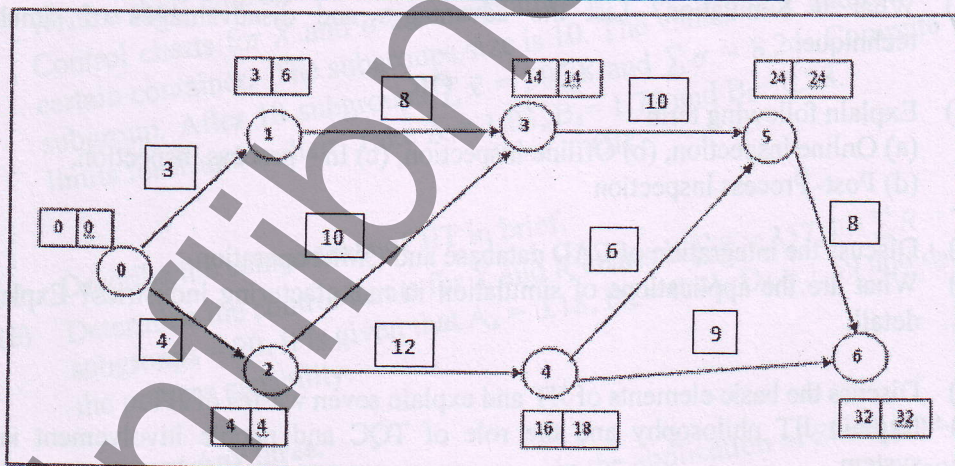
Q.3 Write the following answer (Any Three)

(12)

- (A) Define Master Production Scheduling. Explain the factors that need to be taken into account while developing master production schedule
- (B) Prepare the detail process sheet for given components. And raw material size is 250 mm X 38 mm Long. Assume feed rate and r.p.m of spindle.



(C)



Network diagram for a project is shown below. A review of the project after 10 days reveals that:

- Activities 0-1, 0-2, and 1-3 completed,
- Activities 2-3 is in progress and will take 6 days more,
- Activities 2-4 is in progress and will take 7 days more,
- Also it is estimated that due to the arrival of a new machine, activity 3-5 will take only 6 days.

Formulate a new network after updating the project and determine the new critical path.

- (D) A city corporation has decided to carry out road repairs on four main arteries of the city. The govt. has agreed to make a special grant of Rs. 50 lakh towards the cost with a conditions warrant, a supplementary token grant will also be considered

favorably. The corporation has floated tenders and five contractors have spent in their bids. In order to expedite work, one road will be awarded to only one contractor.

Contractor	Cost of repairs on road (Rs. Lakhs)			
	R1	R2	R3	R4
C1	9	14	19	15
C2	7	17	20	19
C3	9	18	21	18
C4	10	12	18	19
C5	10	15	21	16

- Find the best way of assigning the repairs to the contractors and the costs.
- If it is necessary to seek supplementary grant, what should be the amount sought?
- Which of the five contractors will be unsuccessful in his bid?

SECTION - II

- Q.4** (A) What are the two types of inspection techniques? Explain any one non-contact type inspection technique. (4)
- (B) What is machine vision? Explain briefly all the three functions of machine vision in brief with suitable diagram. (4)
- (C) What is Simulation? List the advantages and disadvantages of simulation technique. (4)

OR

- Q.4** (A) Explain following term (4)
- (a) Online inspection, (b) Offline inspection, (c) In – process inspection, (d) Post- Process inspection
- (B) Discuss the integration of CAD database and CMM operation. (4)
- (C) What are the applications of simulation in manufacturing industries? Explain in detail. (4)
- Q.5** (A) Discuss the basic elements of JIT and explain seven wastes of JIT. (5)
- (B) Explain JIT philosophy and the role of TQC and people involvement in JIT system. (6)

OR

- Q.5** (A) Explain briefly KANBAN system. List types of KANBAN system and explain them. (6)
- (B) Comparison between JIT and MRP. Explain Reengineering. (5)
- Q.6** **Write the following answer (Any Three)** (12)
- (A) What are the reasons for growth of ERP market?
- (B) What are the causes for ERP implementation? Explain.
- (C) Describe the construction of a CMM and List the components of a co-ordinate measuring machine (CMM).
- (D) Define ERP. Explain the various phases of ERP implementation.