

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MBA – SEMESTER -III– EXAMINATION – WINTER 2021**

Subject Code: 4539273

Date: 25-02-2022

Subject Name: Production Planning and Control

Time: 10:30 AM TO 01:30 PM

Total Marks: 70

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q. No.	Question Text and Description	Marks
Q.1	Definitions / terms / explanations / short questions based on concepts of theory/practical (a) Aggregate planning (b) Batch production (c) Production order (d) Capacity planning (e) Assembly Line Balancing (f) Corrective maintenance (g) Subsidiary orders	14
Q.2	(a) What do you understand by Production Planning and Control? Discuss its main elements.	07
	(b) How do the major layout concerns vary between job shop and line processing layouts?	07
<b>OR</b>		
	(b) How does the systematic layout planning approach differ from the basic load distance analysis?	07
Q.3	(a) Define the term "capacity" how can it be measured? State the factors affecting determination of plant capacity.	07
	(b) "Plant layout involves, besides grouping of machinery, an arrangement of other facilities also" Discuss	07
<b>OR</b>		
Q.3	(a) What is master production scheduling? What are its objectives?	07
	(b) "An ideally laid out plant goes a long way in reducing manufacturing costs through reduced materials handling, reduced personnel and equipment requirements and reduced in-process inventory" elaborate.	07
Q.4	(a) What is the difference between forward and backward scheduling? Which one is better?	07
	(b) "PPC regulates and controls "how", "where" and "When" work is to be done". What do you understand by this statement?	07
<b>OR</b>		
Q.4	(a) What do you understand by operations scheduling? What are the problems faced in the absence of scheduling?	07
	(b) Name the various types of production systems. Describe the production system suitable for job work	07

## Q.5

### CASE STUDY:

In the Canadian manufacturing plant of a global automotive company with headquarters in Canada, a large number of engineering activities are carried out in a wide range of areas. These activities include design, production of parts, assembly, testing, and quality assurance.

Many of the manufacturing processes in the plant are performed using automated technologies and equipment. People also perform some of the manufacturing tasks and the plant employs over 400 workers. The decision on whether people or machines will be used for a particular task is dependent on many factors, including costs, time, quality and worker health and safety.

The plant considered here produces a many parts for vehicles and assembles them. Among the parts produced are engine materials and parts, pumps, fans, some exterior parts, and electronics components. The plant normally operates three shifts per day and has production lines including machining equipment, conveyers and overhead cranes, punch presses, and paint-spray booths. The plant utilizes electricity and natural gas extensively.

A number of workers at the plant have over the last six months been subject to several different health problems. The following information has been received by the head engineer at the plant.

- a) In an assembly area that was installed recently, workers have to bend to the ground throughout the day to attach several small parts onto a large and heavy vehicle component. Some workers have begun to develop lower back pain, likely due to the repetitive bending. The problem has become so severe for one of the workers that he has been told by his doctor to stay off work for two weeks so his back can recover. The manufacturing engineers who designed the assembly operation had wanted to use an automated system, but that option was deemed not to be economic. So they used a manual operation, but did not take into account industrial ergonomics, as they had no expertise in that discipline.
- b) An increased incidence of respiratory illnesses has been reported over the last month by workers operating near the paint-spray booths. Many of the substances used in the booths (paints, solvents, etc.) are known to be causes of the observed respiratory illnesses. But the workers are not supposed to come into contact with any of the substances because the paint-spray booths are designed to ensure that all materials exit the plant through a high capacity ventilation system and that no materials can leak back into the plant. No tests had been carried out on the ventilation system, or on the air quality around the paint spray booths, so it is uncertain whether or not there have been any leaks into the plant from the paint-spray booths.
- c) In an area of the plant where metal cutting occurs and workers use protective eyewear, workers have reported minor eye injuries. The area in question is one where it is common knowledge that the workers do not routinely use the protective eyewear. It is often observed to be hanging on nearby hooks or to be loosely hanging around the necks of workers. Workers complain that they find the protective eyewear uncomfortable and do not think it is needed or important. The plant manager knows of this behavior but overlooks it, since enforcing the use of the protective eyewear seems may make the workers unhappy and, consequently, less productive. That, he feels, could render the plant non-competitive.

- (a) How would you go about investigating the causes of the observed health problems? What are the unsafe conditions and acts in the plant? 07
- (b) Which of the unsafe conditions and acts identified in part b are (1) of a technical nature, or (2) related to human behavior or management? What are some steps can be taken to rectify the health problems observed? 07

OR

- (a) Should the head engineer endeavor to rectify the health problems on her own, or should she report the problems to the plant manager beforehand? The head engineer is not sure if she will receive the support of the plant manager in rectifying the problems; what should she do if support is not provided? 07
- (b) Do you feel that some of the health problems that have occurred are due to worker health and safety being unduly compromised to allow the plant to be more productive or profitable? 07

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