Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA - SEMESTER–II EXAMINATION – WINTER 2020

Subject Code:4529205 Date:09/02/2021

Subject Name:Production & Operations Management

Time:10:30 AM TO 12.30 PM Total Marks: 47

Instructions:

1. **Attempt any THREE questions from Q1 to Q6.**
2. **Q7 is compulsory.**
3. **Make suitable assumptions wherever necessary.**
4. **Figures to the right indicate full marks.**

Q. No.		Question Text and Description	Marks
Q.1	**(a)**.	Definitions the following terms. (a) Batch manufacturing (b) Infinite Load (c) Cellular Layout	**06**
	(b).	Definitions the following terms. (a) Reengineering (b) Line Balancing (c) Lead Time	**06**
Q.2	**(a)**	Discuss the scope of production and operations management.	**06**
	(b)	Each manufacturing system has its own importance. Discuss Continuous Manufacturing System with its merits and demerits	**06**
Q.3	**(a)**	Discuss various methods to calculate order size in MRP.	**06**
	(b)	Trinity Hospital at Bangalore sources 20,000 disposable syringes every year from a supplier. The OC per order is RS. 100 and the CC is Rs. 1 per unit per year. The price of syringes is RS.5. The supplier offers a 5% discount if purchases are made in lots of 10,000 syringes or more. Determine whether the discount model is better than the EOQ model in this situation.	**06**
Q.4	**(a)**	Discuss aggregate production planning strategies.	**06**
	(b)	Following table gives the processing times (in hours) of seven jobs to be processed on three machines M1, M2, and M3 in the order M1, M2, M3. Sequence these jobs using Johnson's method and find the overall processing time. Also find the waiting time for the jobs and idle times for the machines.	**06**

Jobs	A	B	C	D	E	F	G
M1	1	3	7	9	4	5	2
M2	7	3	8	2	8	6	1
M3	8	10	9	11	9	14	12

Q.5	**(a)**	Discuss various causes for accidents along with preventive measures of it in Industries.	**06**
	(b)	The table below gives following details about various activities of a project	**06**

Activity	Node	a	m	b
A	1-2	10	11	12
B	2-3	6	10	14
C	2-4	5	8	11
D	2-5	1	5	9
E	3-6	3	5	13
F	4-6	4	9	14
G	5-7	1	2	3
H	6-7	3	7	11
I	7-8	9	12	15
J	7-9	3	5	7

Find i) the critical path of the project and its expected duration, and ii) the probability that the project will be completed within 50 days

Q.6 **(a)** Discuss various elements of Lean Manufacturing System along with advantages of it. **06**

(b) 15 samples of size 100 units each are taken from consignment of electric bulb. Prepare a stable P chart by using following data. **06**

Sample No.	**No. of defective bulbs**
1	6
2	3
3	0
4	5
5	2
6	8
7	18
8	7
9	3
10	9
11	8
12	1
13	4
14	6
15	5

Q.7 **CASE STUDY:**

Around 1970 Government of India mooted the idea of expanding steel production under public sector units to be established at suitable locations. A committee of eminent personalities was formed to go through claims of (i) Vijaynagar Steel plant near Bellary in Karnataka, (ii) Salem Steel in TN and (iii)Vishakapatam steel plant in A.P. The most important raw materials for steel plant are iron core power and coal. Again in iron ore the iron percentage should be preferably more than 60% and ash content in coal should be less than 30%. These factors enable production of iron and steel at competitive price. From experts' reports the following brief was available:

(a)Vizag – The Iron ore is rich with 65% Iron and coal can be arranged from MP and Bihar and Vizag is well connected by broad gauge railway line to all important cities and the place has sea port and airport. Hence this place has more natural advantage than other cities.

(b) Salem – Iron ore was having 60 to 65%. Iron content and hence be economically exploited. The coal is in lignite form which is low quality coal. Hence this needs to be converted as coke for use. The place has broad gauge line and Madras sea port and airport are nearby. This place was considered second preference.

(c)Vijaynagar – Bellary belt has Iron ore of 60% iron but coal has to come from AP (SingareniColliery). The place had meter gauge railway line and hence not well connected to all India network. The seaport and airports were far away and hence this place was not found suitable.

As per the expert committee report steel plant work started Vizag and Salem and these plants came up as per the plan and are doing well. Steel plants are quite huge with township having about 50,000 to 1,00,000 people. Hence requirements of housing, electricity, water, hospitals, education, institutions, and entertainment facilities are very essential. The investment is huge and this helps to develop the surrounding area quite well and there is abundant scope for ancillary units, engineering services and employment inside and outside the steel plant. Both Vizag and Salem got these advantages and production standard as per the plan and these industries continue to run profitably.

The expert committee had made comment on Vijaynagar proposal that, the unit can be viable if it uses latest foreign technology. Though PSU was not started a private enterprise it took interest and applied for license to the Central Government. By the year 1990 they obtained license and Vijaynagar Steel plant with foreign technology and decided to make only sheet products, which fetch higher prices. They also kept bare minimum workforce and executives to make it economical right from inception. By this time broad gauge lines were formed and nearest seaport was Goa and hence some problems were taken care. This unit became operative in about 3 years and is also running profitably.

(a) What are essential factors for locating a Steel plant and why? **5.5**

(b) Explain how it was possible to make Vijaynagar plant viable. **5.5**

OR

Q.7 (a) Why Vizag and Salem became profitable locations for steel production? **5.5**

(b) The selection of a region plays an important role while locating a steel plant. Discuss. **5.5**

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