

**VPM's**  
**DR VN BRIMS, Thane**  
**Programme: PGDM (2017-19)**  
**PGDM Trimester III Examination April 2018**

<b>Subject</b>	<b>Operations Management -II</b>		
<b>Roll No.</b>		<b>Marks</b>	<b>60 Marks</b>
<b>Total No. of Questions</b>	<b>7</b>	<b>Duration</b>	<b>3 Hours</b>
<b>Total No. of printed pages</b>	<b>3</b>	<b>Date</b>	<b>16.04.2018</b>

**Note: Q1 is compulsory and solve any FOUR from the remaining SIX questions.**

**Q1) 20 Marks (Compulsory)**

**Q.1A Case Study (10 Marks)**

Yakult Australia Pty Ltd commenced production in 1994. In Australia, it manufactures and sells Yakult Original and Yakult LIGHT, which are fermented milk drinks. Yakult contains probiotic bacteria known as the *Lactobacillus casei* Shirota strain, which can help the digestive system to remain healthy. The factory now produces at least 250 000 bottles daily, supplying Yakult to Australian and New Zealand markets. Yakult's purpose-built factory and office complex in Dandenong was constructed in 1993, costing \$30 million.

Inside the automated factory, raw ingredients (skim milk powder, sugar and dextrose) are mixed together with filtered water and undergo sterilisation. Live *Lactobacillus casei* Shirota strain is added to the milk to begin the fermentation process. Citrus flavour is added to the mixture. During fermentation, the bacteria rapidly multiply. The mixture is homogenised so that it has a smooth consistency and then it is diluted with filtered water to produce the final product.

Yakult's unique plastic bottles (they are very small — 65 ml) are created on-site and manufacturing staff monitor the quality of the product to ensure it meets the highest standards. A filling machine which has the capacity to fill 36 000 bottles per hour fills the bottles with Yakult. They are then capped with a foil lid, printed with a use-by date, sealed and transferred along the conveyor belt to the packaging facility. Yakult needs to be stored and distributed at temperatures below 4°C.

### **Quality at Yakult**

Yakult's quality management system (QMS) complies with the International Organization for Standardisation's relevant Standard (ISO 9001:2000). This means that Yakult meets the highest international food manufacturing standards. All company procedures are documented and are regularly audited. In terms of quality control, individual bottles are randomly inspected for incorrect printing and lid sealing. Product samples are collected and assessed for quality, composition and taste in Yakult's on-site quality control area.

### **Waste management**

Yakult Australia is very much aware of the need to minimise its environmental impact. Its waste management strategies, such as recycling of paper products and plastic waste, have resulted in more than 99 per cent of raw ingredients being utilised. Cleaning waste goes into a holding tank in the on-site water treatment facility.

1. Describe all of the material which Yakult needs to manage? (4 Marks)
2. Describe Two quality strategies used at Yakult (4 Marks)
3. Define Inventory Control using examples from the Yakult Case Study. (2Marks)

### **Q.1B (10 Marks)**

A manufacturing organization needs to plan the material required for the next six weeks for the manufacture of its end-product (Product A), as per a master production schedule. In addition to the end product, there is an independent requirement of component C, as it is sold as a spare in the market. The MPS for both are given below. In order to assemble one unit of A, It requires three B & one C. Where One B is made up of two E and one D. C is composed of one D and one F. whereas for composing one unit of F requires one unit of G.

Perform MRP exercise to estimate the quantity and timing of the components required for manufacturing of Product A as per given Information:

MPS for the next six weeks						
Week	1	2	3	4	5	6
Product A	100	150	200	100	0	200
Component C		50	60			70

Inventory Status, Lead Time, Lot Sizing Rule			
Component	On Hand	Lead Time	Lot Size
A	150	1	L4L
B	1000	2	L4L
C	300	1	L4L
D	750	2	L4L
E	700	6	L4L
F	200	1	400
G	500	3	500

**Attempt Any FOUR from the Remaining SIX Questions**

**Q2) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- “Limit Suppliers in Pool” Explain with an example.
- A manufacturer of precision machine parts produces round shafts for use in the construction of drill presses. The average diameter of shaft is 0.56 inch. Inspection samples contain 6 shafts. The average range of these samples is 0.006 inch. Determine the upper and lower control chart limits.
- What are the functions of materials management?

**Q3) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- What is Quality Circle? State its importance.
- What are the methods for forming part families in Group Technology?
- What are the costs involved in the management of material?

**Q4) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- Explain PDCA with an example.
- “Materials Management department will have to work in close co-ordination with production, marketing and finance department” Justify this statement with an example
- Nocaf Drinks, INC., a producer of decaffeinated coffee, bottles Nocaf. Each bottle should have a net weight of 4 ounces. The machine that fills the bottles with coffee is new, and the operations manager wants to make sure that it is properly adjusted. The operations manager randomly selects and weighs n=8 bottles and records the average and range in ounces for each sample. The data for several samples is given in the following table. Note that every sample consists of 8 bottles. Is the machine properly adjusted and in control.

Sample	Sample Range	Sample Average
A	0.41	4
B	0.55	4.16
C	0.44	3.99
D	0.48	4
E	0.56	4.17
F	0.62	3.93
G	0.54	3.98
H	0.44	4.01

**Q5) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- a) What are the eight types of waste? Explain with an example.
- b) What are the elements of Procurement Cycle?
- c) Write a short note on Store accounting.

**Q6) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- a) Explain Carter's 10 C's of Supplier Selection.
- b) Explain 8 Pillars of TPM
- c) "JIT implementation impacts purchasing process" Justify.

**Q7) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- a) What do you mean by control chart? Explain its application with an example.
- b) Define three principles TQM with an example.
- c) Explain ISO 9001 Process Approach with a diagram.

**Table for reference**

Factors for three-sigma control limits for $\bar{x}$ and $R$ charts			
Number of Observations in Subgroup, $n$	Factor for $\bar{x}$ Chart, $A_2$	FACTORS FOR $R$ CHARTS	
		Lower Control Limit, $D_3$	Upper Control Limit, $D_4$
2	1.88	0	3.27
3	1.02	0	2.57
4	0.73	0	2.28
5	0.58	0	2.11
6	0.48	0	2.00
7	0.42	0.08	1.92
8	0.37	0.14	1.86
9	0.34	0.18	1.82
10	0.31	0.22	1.78
11	0.29	0.26	1.74
12	0.27	0.28	1.72
13	0.25	0.31	1.69
14	0.24	0.33	1.67
15	0.22	0.35	1.65
16	0.21	0.36	1.64
17	0.20	0.38	1.62
18	0.19	0.39	1.61
19	0.19	0.40	1.60
20	0.18	0.41	1.59