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BBA in TM, 6th Sem.

Date: February 16, 2023 (Morning)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Mid-Semester Examination

Course No. : BTM 4603

Course Title : Operations Management

Summer Semester, A. Y. 2021-2022

Time : 1.5 hours

Full Marks : 75

Answer **all 3 (three)** questions. All questions carry equal marks. Marks of each question and corresponding CO and PO are written in the right margin with brackets.

1. a) The U.S. economy is becoming more and more service-based. The percentage of employment in manufacturing continues to decrease while the percentage employed in services continues to increase. However, it would be unwise to assume that manufacturing isn't important to the economy, or that service is more important. Let's see why. 15 (CO1)
(PO1, PO2)

Not only is the percentage of manufacturing jobs decreasing, but the actual number of manufacturing jobs is also decreasing. There are two main reasons for the decline: increases in productivity, which means fewer workers are needed to maintain manufacturing output; and outsourcing, especially to countries that have much lower wages, an attractive option for companies seeking to maintain their competitiveness and boost their bottom lines.

However, when companies outsource part (or in some cases, all) of their manufacturing to lower-cost countries, the loss of jobs results in the loss of service jobs as well. Some are lost in the community in retail businesses patronized by the manufacturing workers. Also included in that figure are factory service workers (e.g., workers who do machine repairs, maintenance, material handling, packaging, and so on). General estimates are that four service jobs are lost for each manufacturing job lost.

As the manufacturing base shrinks, workers who lose their manufacturing job are finding it tougher to find another opening in manufacturing. Instead, they join the ranks of the unemployed or take a service job, usually at a lower wage rate than what manufacturing companies paid.

From a national perspective, not only is work transferred to a foreign country, intellectual knowledge is transferred. Moreover, as time passes, the domestic base of manufacturing skills and know-how is lost.

There are important consequences for taxes as well. Unemployment benefits are costly, and the erosion of federal, state, and local tax bases results in lower tax revenues collected from individuals and from corporations.

Lastly, manufacturing is an important source of innovation. It is responsible for 70 percent of private-sector R&D and 90 percent of U.S. patents (Rana Foroohar, "Go Glocal," Time, August 20, 2012, p. 30). Much of the work in getting a product

ready for volume production is high-value-added knowledge work that supports future innovation. And innovation generates jobs. “Intel has invested tens of billions of dollars in its factories in Oregon, Arizona, and New Mexico so that they are able to produce the most advanced semiconductors”.

Questions:

- i. How important is the loss of manufacturing jobs to the nation?
 - ii. Can you suggest some actions the government (federal, state, or local) can take to stem the job loss?
 - iii. What evidence is there of the importance of manufacturing innovation?
- b) What are the key issues for today's business operations? What are some possible reasons a business person would make an unethical decision? 10 (CO2) (PO3)
2. a) A company that makes shopping carts for supermarkets and other stores recently purchased some new equipment that reduces the labor content of the jobs needed to produce the shopping carts. Prior to buying the new equipment, the company used five workers, who produced an average of 80 carts per hour. Workers receive \$10 per hour, and machine cost was \$40 per hour. With the new equipment, it was possible to transfer one of the workers to another department, and equipment cost increased by \$10 per hour while output increased by four carts per hour. 12 (CO3) (PO10, PO11)
- i. Compute labor productivity under each system. Use carts per worker per hour as the measure of labor productivity.
 - ii. Compute the multifactor productivity under each system. Use carts per dollar cost (labor plus equipment) as the measure.
 - iii. Comment on the changes in productivity according to the two measures, and on which one you believe is more pertinent for this situation.
- b) Explain the importance of identifying and differentiating order qualifiers and order winners. 5 (CO1) (PO1, PO2)
- c) Describe the rationale of an operations strategy that seeks to increase the opportunity for use of technology by reducing variability in processing requirements. 8 (CO2) (PO3)

3. a) 10 (CO3) (PO10, PO11)

Period	Number of Complaints
1	60
2	65
3	55
4	58
5	64

Prepare a forecast for period 6 using each of these approaches:

- i. The appropriate naive approach.
- ii. A three-period moving average.
- iii. A weighted average using weights of 0.50 (most recent), 0.30, and 0.20.
- iv. Exponential smoothing with a smoothing constant of 0.40.

b) The manager of a large manufacturer of industrial pumps must choose between two alternative forecasting techniques. Both techniques have been used to prepare forecasts for a six-month period. Using MAD, MSE and MAPE as criterion, which technique has the better performance record? Justify your answer.

15 (CO3)
(PO10,
PO11

Month	Demand	Forecast	
		Technique A	Technique B
1	492	488	495
2	470	484	482
3	485	480	478
4	493	490	488
5	498	497	492
6	492	493	493