First Semester Examination
2021/2022 Academic Session

February/March 2022

EPM321 – Manufacturing System

Duration : 3 hours

Please check that this examination paper consists of SEVEN [7] printed pages before you begin the examination.

INSTRUCTIONS : Answer **ALL FOUR [4]** questions.

In the event of any discrepancies, the English version shall be used.

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1. Figure 1 depicts the factory plan of Atom Sdn Bhd producing two types of products, ABS and ARS. Raw materials arrived from supplier delivery have to go through the sequence of washing, machining, deburring and assembly before shipping. Please answer the following questions.

   [a] Identify and locate TWO(2) types of production layout present in the factory.

   (2 marks)

   [b] Identify TWO (2) advantages for each production layout stated in 1[a].

   (2 marks)

   [c] Give TWO (2) reasons why the two layouts coexist in the production area and explain ONE (1) resulted management complication.

   (3 marks)

   [d] A worker is responsible for tending machines in the machining process. The service time per machine is 200 sec and the time to walk between machines is 15 sec. The machine automatic cycle time is 25 minute. The worker's hourly wage rate is RM10 and the hourly operating cost rate for each machine is RM30. Calculate the number of machines that should be tended by the worker to result in the minimum cost per unit of product.

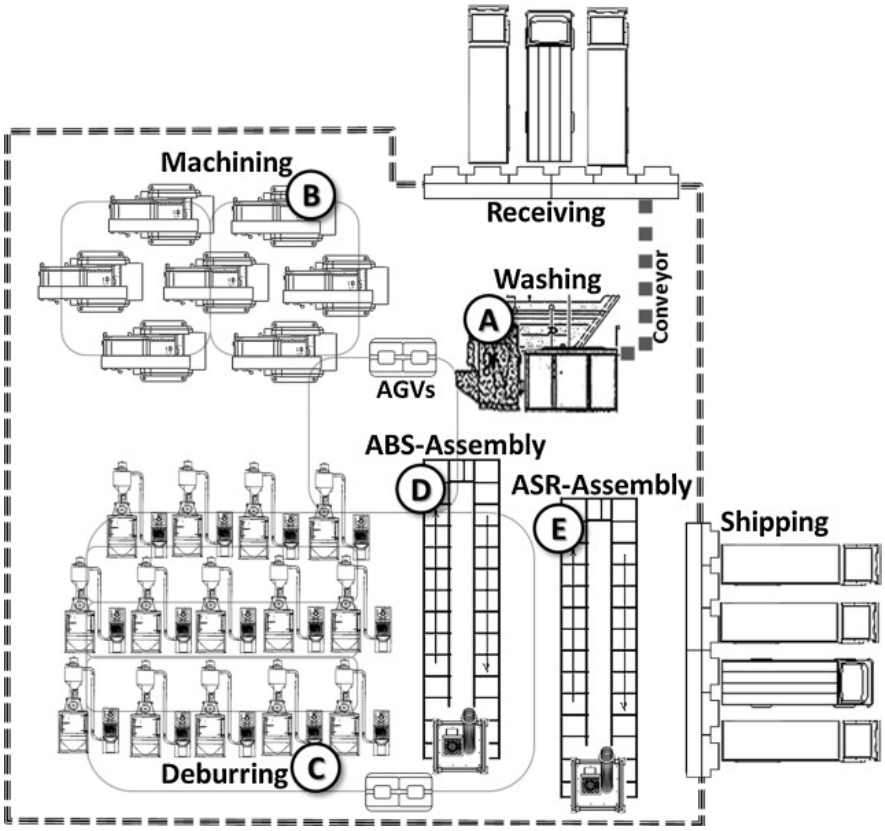

Figure 1

(3 marks)

2. A product can be manufactured by going through six processes as depicted in Figure 2. The standard batch size is 100 units. Based on the information given in the figure, answer the following questions:

[a] Determine the average production time and the production rate of Process 3.

(1 marks)

[b] Identify the bottleneck of the production system.

(1 marks)

[c] Determine FIVE (5) considerations need to make for Process 3 to run unattended and in mixed model mode.

(3 marks/*markah*)

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[d] The production is running five days per week, two shifts per day and 8 hours per shift. The production has the availability of 90%, utilization of 80% and defect rate of 0.12%.

(i) Calculate the weekly capacity.

(ii) Estimate the level of work-in-process (WIP).

(iii) A customer places an order of 1,000 units on Monday. Determine how soon the order can be fulfilled.

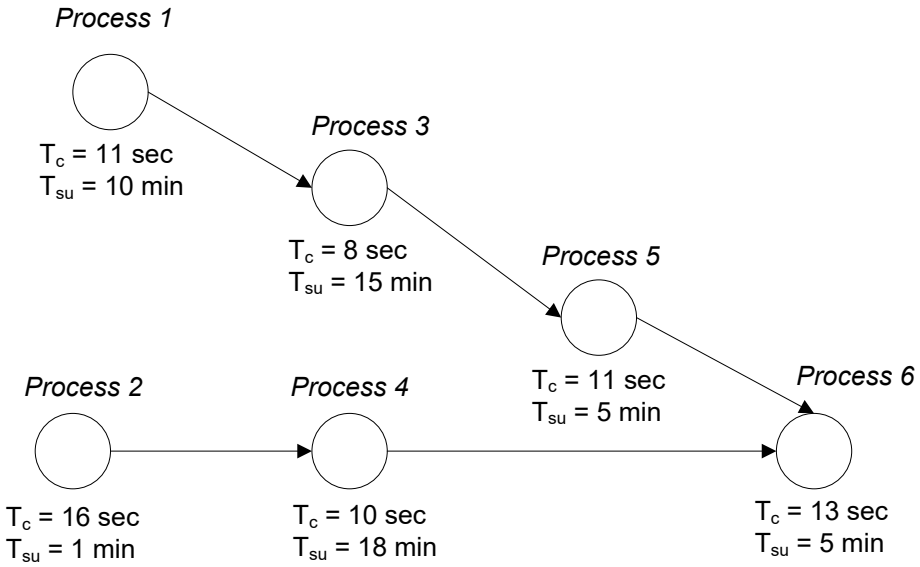

Figure 2

(5 marks)

3.

4.

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