Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **18MS3051** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED PRODUCTION MANAGEMENT** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | List and briefly discuss different phases of production planning and control. | CO1 | 10 |
| b. | Explain the relationship among long, medium and short range production plans with suitable examples | CO1 | 10 |
| (OR) | | | | |
| 2 |  | Consider the manufacture of a toy. The master production schedule to manufacture the toy is given in the following table.  Master Production Schedule   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | Demand | 200 | - | 100 | 175 | 300 | 200 | - | 250 |   The bill of materials structure is given in the following figure.  A  C  B  D E  The details of Bill of Materials along with economic order quantity and stock on hand for the final product and subassemblies are shown in the following table.  Details of Bill of Materials   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Part Required | Order Quantity | No. of Units | Lead Time (week) | Stock on Hand | | A  B  C  D  E | 350  450  400  375  400 | 1  1  1  1  1 | 2  1  1  1  2 | 200  400  375  250  425 |   Complete the material requirements plan for the main product A as well for the subassemblies B, C, D and E | CO1 | 20 |
|  | | | | |
| 3. | a. | Illustrate the various strategies of aggregate planning. | CO2 | 10 |
| b. | Write the procedure for developing Master Production Schedule. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Write a note on scheduling. Distinguish between forward scheduling and backward scheduling. | CO2 | 10 |
| b. | Consider the following 4 machines and 4 jobs flow shop problem.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Job | Processing Time | | | | | Machine 1 | Machine 2 | Machine 3 | Machine 4 | | 1  2  3  4 | 4  3  1  3 | 3  7  2  4 | 7  2  4  3 | 8  5  7  2 |   Find out the optimal sequence and makespan for this problem. | CO2 | 10 |
|  | | | | |
| 5. | a. | How is a bottleneck defined in TOC? Illustrate with an example. | CO2 | 10 |
| b. | What is the drum-buffer-rope method? What do the drums, buffers and ropes represent? | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | What are the types of model of inventory system? Explain them in detail. | CO3 | 10 |
| b. | The demand for an item is 18,000 per year. Its production rate is 3000 per month. The carrying cost is Rs.0.15/unit/month and the set-up cost is Rs.500.00 per set-up. The shortage cost is Rs.20.00 per unit per year. Find the various parameters of the inventory system. | CO3 | 10 |
|  | | | | |
| 7. | a. | Distinguish between P and Q systems of inventory. | CO3 | 10 |
| b. | The annual demand of a product is 48,000 units. The average lead time is 4 weeks. The standard deviation of demand during the average lead time is 75 units/week. The cost of ordering is Rs. 400 per order. The cost of purchase of the product per unit is Rs. 10. The cost of carrying per unit per year is 15 percent of the purchase price. The maximum delay in lead time is 2 weeks and the probability of this delay is 0.25. Assume a service level of 0.95.  If Q system is followed, find the reorder level. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Discuss the inventory management of ABC analysis and draw out its procedure. | CO3 | 10 |
| b. | Annual demand for an item is 4800 units. Ordering cost is Rs.500 per order. Inventory carrying cost is 24% of the purchase price per unit, per year. The price breaks are shown as   |  |  | | --- | --- | | Quality | Price (in Rs) | |  | 10 | |  | 9 | |  | 8 |   Find the optimal order size. | CO3 | 10 |
|  | | | | |
|  | | **Compulsory**: |  |  |
| 9. |  | **Case Study**  People in their daily life need to travel to their place of work, market places, etc. If the distance of travel is short, by considering the green house effect and necessity of exercise to people, usage of bicycle is a desirable option, provided the person knows cycling. Considering the population of India, the demand for bicycle grows exponentially.  Work Horse is a leading manufacturer of bicycle for day-to-day use as well as for sports. Since human has to exert energy to ride bicycle, company felt that it should come out with a novel model of bicycle which uses all the principles of kinematics for easy riding. So, it pooled a group of engineers and management consultant to research on the proposed model and after two years, the company came out with the following four different models:   * Gents bicycle for long distance travel * Ladies bicycle for long distance travel * Gents bicycle for local travel * Ladies bicycle for local travel   Most of the cycle industry uses many bought out items. To be competitive in the industry, the company wants to manufacture key  Sub-assembly and components within the company and buy rest from vendors. Currently, the company receives all the bought out items as its company premises and then dispatches them along with other items which are manufactured within the company, in required numbers to its customers.  The material department of the company feels that the receipt of the items from suppliers at the company premises increases the lead time in fulfilling orders of its customers. So, the company confronted with the idea of whether to send the items which are manufactured in the company separately to its customer and simultaneously directing its suppliers to dispatch the required items in required numbers to that customer, through well coordinated order processing department.  But, the marketing department has reservation of proposed way of fulfilling the customer orders because it will be very difficult to integrate the supply of items from the company and bought items from the suppliers so that they reach at the same time at customer site. If there is any delay either the company or at least one of the suppliers of the bought out items in sending the materials/sub-assemblies, the items which are received in time by a customer will not be use for making sale of bicycle. |  |  |
|  | a | As a consultant to the company critically analyse pros and cons of both the systems of order fulfillment and suggest the best. | CO2 | 5 |
| b | Draw a bill of material structure (BOM) for the basic gents bicycle applied to each system of order fulfillment | CO2 | 5 |
| c | By assuming suitable data, construct MRP tables of the items/sub-assemblies in BOM structure applied to the new order fulfillment system if it is selected as the best. | CO2 | 10 |