Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – May / June 2026

Date: 20- 05-2026 **Time:**01:00pm – 04:00pm

School: SOE	**Program:** B.Tech	
Course Code: MEC3068	**Course Name**: Production and Operations Management	
Semester: IV,VI	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5	CO6
Marks	6	6	22	22	22	22

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each Question Carries 2 Marks. 10Q x 2M=20M

1.	Differentiate between production and operations management.	2 Marks	L2	CO1
2.	State any two characteristics of job shop production.	2 Marks	L1	CO1
3.	Define time utility and give one example.	2 Marks	L1	CO1
4.	Distinguish between production planning and production control.	2 Marks	L2	CO2
5.	Define group layout.	2 Marks	L1	CO2
6.	Tell about materials requirement planning (MRP).	2 Marks	L1	CO2
7.	Distinguish between FCFS and LCFS.	2 Marks	L2	CO3
8.	State any two conditions for extended Johnson's Rule.	2 Marks	L1	CO4
9.	Define lean manufacturing.	2 Marks	L1	CO5
10.	Define computer integrated manufacturing (CIM).	2 Marks	L1	CO6

Part B

Answer the Questions. **Total Marks 80M**

<table>
<tr><td>11.</td><td>a.</td><td>A Manufacturing facility has five jobs to be scheduled on a machine. Their sequence of arrival, processing time, and due date are given in the table.
<table><tr><td>Job (in sequence arrival)</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>Processing Time (Days)</td><td>7</td><td>4</td><td>5</td><td>2</td><td>6</td></tr><tr><td>Due Date (Days from now)</td><td>8</td><td>3</td><td>7</td><td>9</td><td>6</td></tr></table>Schedule the jobs using (i) FCFS and ii) SPT rules. Also Compare the results using the performance measures of total completion time, average completion time, and average lateness.</td><td>10 Marks</td><td>L3</td><td>CO3</td></tr>
<tr><td></td><td>b.</td><td>Consider the following two machines and six job scheduling problem. Using Johnson’s algorithm, obtain the optimal sequence which will minimize the makespan with a GANTT chart.
<table><tr><td>Job No</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Processing Time – Machine 1</td><td>20</td><td>90</td><td>80</td><td>20</td><td>120</td><td>15</td><td>65</td></tr><tr><td>Processing Time – Machine 2</td><td>25</td><td>60</td><td>75</td><td>30</td><td>90</td><td>35</td><td>50</td></tr></table></td><td>10 Marks</td><td>L3</td><td>CO3</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>12.</td><td>a.</td><td>A machine shop has five jobs waiting to be processed. The processing times and due dates are given below.
<table><tr><td>Job (in sequence arrival)</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>Processing Time (Days)</td><td>6</td><td>3</td><td>8</td><td>2</td><td>5</td></tr><tr><td>Due Date (Days from now)</td><td>7</td><td>5</td><td>9</td><td>4</td><td>9</td></tr></table>Schedule the jobs using (i) FCFS and ii) SPT rules. Also Compare the results using the performance measures of total completion time, average completion time, and average lateness.</td><td>10 Marks</td><td>L3</td><td>CO3</td></tr>
<tr><td></td><td>b.</td><td>A workshop has two machines (M1 and M2) and six jobs to be processed in the same order on both machines. Determine the optimal job sequence using Johnson’s Algorithm and find the minimum makespan with a GANTT chart.
<table><tr><td>Job No</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Processing Time – Machine 1</td><td>18</td><td>42</td><td>25</td><td>30</td><td>15</td><td>35</td></tr><tr><td>Processing Time – Machine 2</td><td>20</td><td>28</td><td>40</td><td>32</td><td>18</td><td>22</td></tr></table></td><td>10 Marks</td><td>L3</td><td>CO3</td></tr>
</table>

13.	a.	A scheduler has four jobs that can be done on any of four machines with respective times (minutes) as shown in	10 Marks	L3	CO4

		table. Determine the allocation of jobs to machines that will result in minimum time using extended Johnson's Rule. **Job / M1 / M2 / M3 / M4** **A: 5, 6, 8, 7** **B: 10, 12, 11, 7** **C: 10, 8, 13, 6** **D: 8, 7, 4, 3**			
	b.	**Consider 3 machines and 5 jobs flow shop scheduling problem as shown in table. Determine the optimal make span and job sequence using CSD Heuristic Procedure.** **Job / M1 / M2 / M3** **J1: 16, 18, 12** **J2: 14, 10, 11** **J3: 13, 20, 15** **J4: 19, 15, 19** **J5: 15, 16, 16**	**10 Marks**	**L3**	**CO4**
		Or			
14.	**a.**	**A scheduler has four jobs that must be processed sequentially on four machines (M1, M2, M3, M4). The processing times (in minutes) are given below. Determine the optimal job sequence using Extended Johnson's Rule to minimize the total elapsed time (makespan).** **Job / M1 / M2 / M3 / M4** **A: 4, 7, 6, 5** **B: 9, 8, 7, 6** **C: 6, 5, 8, 4** **D: 7, 6, 5, 3**	**10 Marks**	**L3**	**CO4**
	b.	**Consider 3 machines and 4 jobs in a flow shop scheduling problem. Determine the optimal job sequence and makespan using the CSD heuristic procedure**. **Job / M1 / M2 / M3** **J1: 12, 15, 10** **J2: 14, 11, 13** **J3: 10, 18, 16** **J4: 16, 14, 12**	**10 Marks**	**L3**	**CO4**

15.	**a.**	**Discuss any four strategies of just-in-time (JIT) inventory management system.**	**10 Marks**	**L2**	**CO5**
	b.	**Describe the four pillars of total quality management (TQM) and list its various elements.**	**10 Marks**	**L2**	**CO5**
Or					
16.	**a.**	**Explain the different types of Poka-Yoke and enumerate its importance.**	**10 Marks**	**L2**	**CO5**
	b.	**Describe the core principles of Kaizen and mention its key tools and methods.**	**10 Marks**	**L2**	**CO5**

17.	**a.**	**Explain supply chain management (SCM) with an example from manufacturing industry.**	**10 Marks**	**L2**	**CO6**
	b.	**Describe the core elements of computer integrated manufacturing (CIM) and list its benefits and challenges.**	**10 Marks**	**L2**	**CO6**
Or					
18.	**a.**	**Discuss business process re-engineering (BPR) and enumerate its various features.**	**10 Marks**	**L2**	**CO6**
	b.	**Describe the concept of voice of the customer into the design in quality function deployment (QFD).**	**10 Marks**	**L2**	**CO6**