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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF INFORMATION SCIENCE

MAKEUP EXAMINATION - JULY 2024

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| **Semester : VI** | **Date : 09.07.2024** |
| **Course Code : MEC3068** | **Time : 09.30 AM to 12.30 PM** |
| **Course Name : Production and Operations Management** | **Max Marks : 100** |
| **Program : B. Tech – Mechanical Engineering** | **Weightage : 50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 2M=10M** | | | |
| 1 | Differentiate production and manufacturing. | (CO 1) | [Knowledge] |
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| 2 | What are the 5M’s of production management? | (CO 1) | [Knowledge] |
|  | | | |
| 3 | What is Production Planning and Control?. | (CO 2) | [Knowledge] |
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| 4 | What is facility location problem? | (CO 3) | [Knowledge] |
|  | | | |
| 5 | What is the purpose of Gantt chart in production settings? | (CO 3) | [Knowledge] |
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| 6 | What is the use of Quality Function Deployment (QFD)? | (CO 4) | [Knowledge] |
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| 7 | What is the meaning of Poka-Yoke? Mention the purpose of it. | (CO 4) | [Knowledge] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 8 | Explain various type of production systems in detail with suitable examples. | (CO 1) | [Comprehension] |
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| 9 | Explain in detail about Aggregate planning and Master Production Scheduling. | (CO 2) | [Comprehension] |
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| 10 | What is production scheduling? Elaborate various priority rules followed in production scheduling. | (CO 3) | [Comprehension] |
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| 11 | Explain in detail about Just in Time (JIT) manufacturing. | (CO 4) | [Comprehension] |
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| 12 | A new location for a manufacturing facility is being considered. The facility has frequent relationships with its five major suppliers and since the supplied material is bulky and transportation costs are high the closeness to the five suppliers has been determined as the major factor for the facility location. The current coordinates of the suppliers are S1=(1,1), S2=(5,2), S3=(2,8), S4=(4,4) and S5=(8,6). The cost per unit distance traveled is the same for each supplier, but the number of trips per day between the facility and each of its suppliers are 5,6,2,4 and 8. | (CO 2) | [Application] |
|  | | | |
| 13 | A company which has already eight facilities intends to build another one and is currently looking for the most convenient location. It was determined that the most appropriate place is the one which is closest to the existing facilities. The locations of the current facilities are given below. Find the best minimax locations for an additional facility. What will be the maximum distance to any other facility?   |  |  |  | | --- | --- | --- | | i | ai | bi | | 1 | 0 | 0 | | 2 | 4 | 6 | | 3 | 8 | 2 | | 4 | 10 | 4 | | 5 | 4 | 8 | | 6 | 2 | 4 | | 7 | 6 | 4 | | 8 | 8 | 8 | | (CO 2) | [Application] |
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| 14 | Consider the following two machines and six job scheduling problem. Using Johnson’s algorithm, obtain the optimal sequence which will minimize the makespan.   |  |  |  | | --- | --- | --- | | Job ‘i’ | Processing Time in  Machine 1 | Processing Time in  Machine 2 | | 1 | 5 | 4 | | 2 | 2 | 3 | | 3 | 13 | 14 | | 4 | 10 | 1 | | 5 | 8 | 9 | | 6 | 12 | 11 | | (CO 3) | [Application] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 20M=40M** | | | |
| 14 | Solve the following 5 jobs and 3 machines problems using extended Johnson’s algorithm and find the minimum makespan. Also find out the idle time of each machine.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | JOB | A | B | C | D | E | | M1 | 8 | 10 | 6 | 7 | 11 | | M2 | 5 | 6 | 2 | 3 | 4 | | M3 | 4 | 9 | 8 | 6 | 5 | | (CO 3) | [Application] |
|  | | | |
| 15 | A scheduler has four jobs that can be done on any of four machines with respective times (minutes) as shown below. Determine the allocation of jobs to machines that will result in minimum time.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Job | Machine | | | | | 1 | 2 | 3 | 4 | | A | 5 | 6 | 8 | 7 | | B | 10 | 12 | 11 | 7 | | C | 10 | 8 | 13 | 6 | | D | 8 | 7 | 4 | 3 | | (CO 3) | [Application] |
|  | | | |
| 16 | Consider a 3 machine and 5 job flow shop scheduling problem. Solve by using CDS heuristics.   |  |  |  |  | | --- | --- | --- | --- | | Job | M1 | M2 | M3 | | J1 | 16 | 18 | 12 | | J2 | 14 | 10 | 11 | | J3 | 13 | 20 | 15 | | J4 | 19 | 15 | 19 | | J5 | 15 | 16 | 16 | | (CO 3) | [Application] |
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