



**ARKA JAIN  
University**  
Jharkhand



[14-05-2025]  
**END SEM EXAMINATION**  
\*School of Engineering & IT

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                 |                                  |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------|
| Program                           | ME & CSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Branch                          | Diploma                          |
| Subject Name                      | Indian Constitution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Session                         | Even, 2024-2025                  |
| Semester                          | VI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Year                            | May, 2025                        |
| Time: 1.5 Hour<br>Max. Marks : 35 | <ul style="list-style-type: none"> <li>Start writing from 2nd page onwards; <b>don't Write on the 1st Page Backside</b></li> <li>Answer all Questions of Section A (Compulsory)</li> <li>Answer Any <b>Five out of Six of Section B</b></li> <li>Answer Any <b>Two out of Four of Section C</b></li> <li>Possession of <b>Mobile Phones</b> or any kind of <b>Written Material, Arguments with the Invigilator or Discussing with Co-Student</b> will comes under <b>Unfair Means</b> and will <b>Result</b> in the <b>Cancellation of the Papers.</b></li> </ul> |                                 |                                  |
| Knowledge Level (KL)              | K1 : Remembering<br>K2 : Understanding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | K3 : Applying<br>K4 : Analysing | K5 : Evaluating<br>K6 : Creating |

**Section A (Each question Carry 01 Marks from Q1-i to v) - 05 Marks**

| Q. N<br>1 | QUESTIONS                                                                                        | Marks | COs | KL |
|-----------|--------------------------------------------------------------------------------------------------|-------|-----|----|
| i         | Who held the position of the first President of the Indian Constituent Assembly?                 | 01    | CO1 | K2 |
| ii        | What are the key aims of the Constitution of India?                                              | 01    | CO2 | K3 |
| iii       | Which part of the Constitution deals with Fundamental Rights?                                    | 01    | CO1 | K2 |
| iv        | What is the minimum age required to become the Prime Minister of India?                          | 01    | CO5 | K4 |
| v         | Which authority supervises the functioning of Panchayati Raj institutions at the district level? | 01    | CO4 | K3 |

**Section B (Answer any FIVE out of SIX) - 10 Marks**  
(Each question Carry 02 Marks)

| Q. No. | QUESTIONS                                                                                                                         | Marks | COs | KL |
|--------|-----------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|
| 2      | How is the role of a Mayor in a Municipal Corporation similar or different from that of a Sarpanch in a village Panchayat system? | 02    | CO4 | K2 |
| 3      | Which authority is in charge of holding elections for Panchayats and Municipalities in India?                                     | 02    | CO5 | K2 |
| 4      | How do fundamental duties help in safeguarding the rights of citizens as per the Constitution?                                    | 02    | CO3 | K4 |



| 5                                                                                          | What is the structure of the Indian Parliament in terms of its composition?                                    | 02    | CO3  | K1 |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------|------|----|
| 6                                                                                          | How are the responsibilities of the Lok Sabha different from those of the Rajya Sabha? *                       | 02    | CO5  | K6 |
| 7                                                                                          | How is grassroots democracy implemented in village-level governance?                                           | 02    | CO4  | K4 |
| <b>Section C (Answer any TWO out of FOUR) - 20 Marks</b><br>(Each question Carry 10 Marks) |                                                                                                                |       |      |    |
| Q. No.                                                                                     | QUESTIONS                                                                                                      | Marks | COs  | KL |
| 8                                                                                          | Explain the role along with challenges of the Drafting Committee while drafting the Indian Constitution        | 10    | CO1  | K6 |
| 9                                                                                          | Highlight the role and importance of the District Administration head in the overall governance of a district. | 10    | CO4  | K3 |
| 10                                                                                         | Describe how Fundamental Rights uphold democratic principles and mention their main categories.                | 10    | CO 3 | K5 |
| 11                                                                                         | Discuss on the Salient features of Constitution of India and compare with any other worlds constitution.       | 10    | CO 2 | K3 |

CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

|                 |     |                                                                                                                        |
|-----------------|-----|------------------------------------------------------------------------------------------------------------------------|
| Course Outcomes | CO1 | Understand the emergence and evolution of Indian Constitution. Understand and analyse federalism in the Indian context |
|                 | CO2 | Understand and explain the significance of Indian Constitution as the fundamental law of the land                      |
|                 | CO3 | Exercise his fundamental rights in proper sense at the same time identifies his responsibilities in national building. |
|                 | CO4 | Analyse the Indian political system, the powers and functions of the Union, State and Local Governments in detail      |
|                 | CO5 | Understand Electoral Process, Emergency provisions and Amendment procedure                                             |

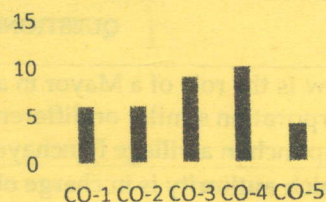
#### GRAPHICAL REPRESENTATION

**Bloom's level wise Marks Distribution**



\* K1 \* K2 \* K3 \* K4 \* K5 \* K6

**Course Outcome wise Marks Distribution**





|                                                                                                                                                                                                                                                                                                                                                                                     |                            |                                                                       |                 |                                                                          |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------|--|
|  <b>ARKA JAIN University</b><br>Jharkhand                                                                                                                                                                                                                                                          |                            | <b>NAAC</b><br>GRADE <b>A</b><br><small>ACCREDITED UNIVERSITY</small> |                 | [07-05-2025]<br><b>END SEM EXAMINATION</b><br>School of Engineering & IT |  |
| Program                                                                                                                                                                                                                                                                                                                                                                             | Mechanical Engineering     |                                                                       | Branch          | Diploma                                                                  |  |
| Subject Name                                                                                                                                                                                                                                                                                                                                                                        | Design Of Machine Elements |                                                                       | Session         | Even, 2024-2025                                                          |  |
| Semester                                                                                                                                                                                                                                                                                                                                                                            | VI                         |                                                                       | Year            | May, 2025                                                                |  |
| Time: 3 Hour<br>Max. Marks : 70                                                                                                                                                                                                                                                                                                                                                     |                            |                                                                       |                 |                                                                          |  |
| • Start writing from 2nd page onwards; don't Write on the 1st Page.<br>Backside                                                                                                                                                                                                                                                                                                     |                            |                                                                       |                 |                                                                          |  |
| • Answer all Questions of Section A (Compulsory)<br>• Answer Any Four out of Six of Section B<br>• Answer Any Three out of Five of Section C<br>• Possession of Mobile Phone or any kind of <u>Written Material, Arguments</u> with the Invigilator or Discussion with Co-Student will comes under <u>Unfair Means</u> and will Result in the <u>Cancellation of the Paper(s)</u> . |                            |                                                                       |                 |                                                                          |  |
| Knowledge Level (KL)                                                                                                                                                                                                                                                                                                                                                                | K1 : Remembering           | K3 : Applying                                                         | K5 : Evaluating |                                                                          |  |
|                                                                                                                                                                                                                                                                                                                                                                                     | K2 : Understanding         | K4 : Analysing                                                        | K6 : Creating   |                                                                          |  |

| Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks) |                                                                            |       |     |    |  |
|--------------------------------------------------------------------|----------------------------------------------------------------------------|-------|-----|----|--|
| Q. N                                                               | QUESTIONS                                                                  | Marks | COs | KL |  |
| 1                                                                  |                                                                            |       |     |    |  |
| i                                                                  | Define stress concentration? What are the reason for stress concentration? | 2     | CO4 | K2 |  |
| ii                                                                 | Define yield strength and allowable/working strength.                      | 2     | CO1 | K2 |  |
| iii                                                                | How friction can be reduced in machines?                                   | 2     | CO3 | K1 |  |
| iv                                                                 | What is shafts? What properties must have in a shaft?                      | 2     | CO1 | K2 |  |
| v                                                                  | List out the various phases of design process.                             | 2     | CO5 | K2 |  |
| vi                                                                 | What is maximum principle stress theory of failure?                        | 2     | CO4 | K1 |  |
| vii                                                                | Which theory of failure is suitable for the design of brittle materials?   | 2     | CO4 | K2 |  |
| viii                                                               | What if fatigue?                                                           | 2     | CO3 | K2 |  |
| ix                                                                 | What are different types of keys used in shaft?                            | 2     | CO4 | K2 |  |
| x                                                                  | What type of stress induced in shafts?                                     | 2     | CO5 | K2 |  |

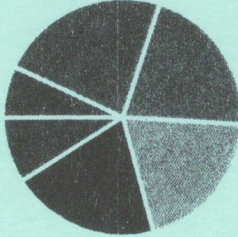
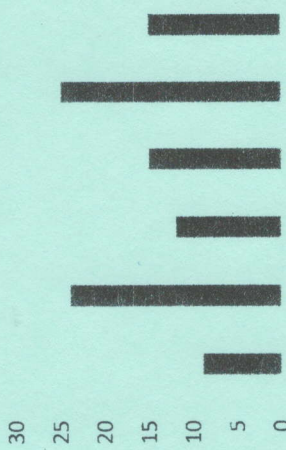


**Section B (Answer any FOUR out of SIX) – 20 Marks**  
(Each question Carry 05 Marks)

| Q. No. | QUESTIONS                                                                                                                                | Marks | COs | KL |
|--------|------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|
| 2      | What are the steps involved in general design procedure? Explain.                                                                        | 05    | CO5 | K2 |
| 3      | Elaborate Design philosophy and Procedures with flow chart                                                                               | 05    | CO3 | K2 |
| 4      | What is meant by working stress and how it is calculated from the ultimate stress or yield stress of material?                           | 05    | CO4 | K2 |
| 5      | Write difference between axle and shaft. Also draw their diagrams.                                                                       | 05    | CO5 | K1 |
| 6      | Explain stress strain diagram for Ductile and Brittle Materials.                                                                         | 05    | CO5 | K2 |
| 7      | A shaft running at 600 r.p.m. transmits 12 kW Power. Assuming allowable shear stress in shaft as 45 MPa, find the diameter of the shaft. | 05    | CO3 | K2 |

**Section C (Answer any THREE out of FIVE) – 30 Marks**  
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS                                                                                                                                                                                                                                                                                                                                                                                | Marks | COs | KL  |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-----|
| 8      | Elaborate the steps and Procedure used in designing Knuckle Joint                                                                                                                                                                                                                                                                                                                        | 10    | CO2 | KL3 |
| 9      | How are the keys classified? Draw neat sketches of different types of keys and state their applications.                                                                                                                                                                                                                                                                                 | 10    | CO1 | KL2 |
| 10     | Design a cotter joint to connect two mild steel rods for a pull of 30 kN. The maximum permissible stresses are 60 MPa in tension ; 40 MPa in shear and 70 MPa in crushing. Draw a neat sketch of the joint designed.                                                                                                                                                                     | 10    | CO5 | KL4 |
| 11     | Explain stress strain diagram for Ductile and Brittle Materials. Also show salient points in diagram.                                                                                                                                                                                                                                                                                    | 10    | CO5 | KL3 |
| 12     | Elaborate the steps and Procedure used in designing Cotter Joint. Design a cotter joint to support a load varying from 40 KN in compression to 40 KN in tensions. The material used is carbon steel for which the following allowable stresses may be used . the load is applied statically. Tensile stress =compressive stress = 60MPa; shear stress=50 MPa and crushing stress = 80MPa | 10    | CO5 | KL1 |

| Course Outcomes                                                                   | CO1 | CO2 | CO3 | CO4 | CO5 | Analyze the various modes of failure of machine components under different load patterns. | Design and prepare part and assembly drawings. | Use design data books and different codes of design. | Select standard components with their specifications from manufacturer's catalogue. | Develop drawings on CAD software. |
|-----------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------|
|                                                                                   |     |     |     |     |     |                                                                                           |                                                |                                                      |                                                                                     |                                   |
| <b>GRAPHICAL REPRESENTATION</b>                                                   |     |     |     |     |     |                                                                                           |                                                |                                                      |                                                                                     |                                   |
| <b>Bloom's level wise Marks Distribution</b>                                      |     |     |     |     |     | <b>Course Outcome wise Marks Distribution</b>                                             |                                                |                                                      |                                                                                     |                                   |
|  |     |     |     |     |     |          |                                                |                                                      |                                                                                     |                                   |
| ■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6                                                     |     |     |     |     |     | CO-1 CO-2 CO-3 CO-4 CO-5 CO-6                                                             |                                                |                                                      |                                                                                     |                                   |





**ARKA JAIN**  
**University**  
Jharkhand



[09-05-2025]

**END SEM EXAMINATION**  
**School of Engineering & IT**

|                                                                                                                                                                                                                                                            |                                 |                |                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------|-----------------|
| Program                                                                                                                                                                                                                                                    | Mechanical Engineering          | Branch         | Diploma         |
| Subject Name                                                                                                                                                                                                                                               | Open Elective-III- 3-D Printing | Session        | Even, 2024-2025 |
| Semester                                                                                                                                                                                                                                                   | VI                              | Year           | May, 2025       |
| Time: 3 Hour<br>Max. Marks : 70                                                                                                                                                                                                                            |                                 |                |                 |
| • Start writing from 2nd page onwards; don't Write on the 1st Page<br><u>Backside</u>                                                                                                                                                                      |                                 |                |                 |
| • Answer all Questions of Section A (Compulsory)                                                                                                                                                                                                           |                                 |                |                 |
| • Answer Any Four out of Six of Section B                                                                                                                                                                                                                  |                                 |                |                 |
| • Answer Any Three out of Five of Section C                                                                                                                                                                                                                |                                 |                |                 |
| • Possession of Mobile Phone or any kind of <u>Written Material</u> ,<br><u>Arguments with the Invigilator or Discussion with Co-Student</u> will<br>comes under <u>Unfair Means</u> and will <u>Result in the Cancellation of the</u><br><u>Paper(s).</u> |                                 |                |                 |
| Knowledge Level<br>(KL)                                                                                                                                                                                                                                    | K1 : Remembering                |                | K5 : Evaluating |
|                                                                                                                                                                                                                                                            | K2 : Understanding              |                | K6 : Creating   |
|                                                                                                                                                                                                                                                            |                                 | K3 : Applying  |                 |
|                                                                                                                                                                                                                                                            |                                 | K4 : Analysing |                 |

**Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)**

| Q.N  | QUESTIONS                                                           | Marks | COs | KL |
|------|---------------------------------------------------------------------|-------|-----|----|
| 1    |                                                                     |       |     |    |
| i    | Define 3D printing.                                                 | 2     | CO1 | K1 |
| ii   | Name one software used for 3D design.                               | 2     | CO1 | K1 |
| iii  | What file format is commonly used to export 3D models for printing? | 2     | CO2 | K2 |
| iv   | How does Tinkercad help students?                                   | 2     | CO1 | K5 |
| v    | Define the term prototype.                                          | 2     | CO3 | K6 |
| vi   | What is the purpose of a 3D printer nozzle?                         | 2     | CO4 | K4 |
| vii  | Name one website where you can find ready-to-print 3D models.       | 2     | CO1 | K1 |
| viii | What do you mean by Binder Jetting?                                 | 2     | CO4 | K1 |
| ix   | List one material commonly used in 3D printing.                     | 2     | CO2 | K5 |
| x    | What is a diorama?                                                  | 2     | CO3 | K6 |



**Section B (Answer any FOUR out of SIX) – 20 Marks**  
(Each question Carry 05 Marks)

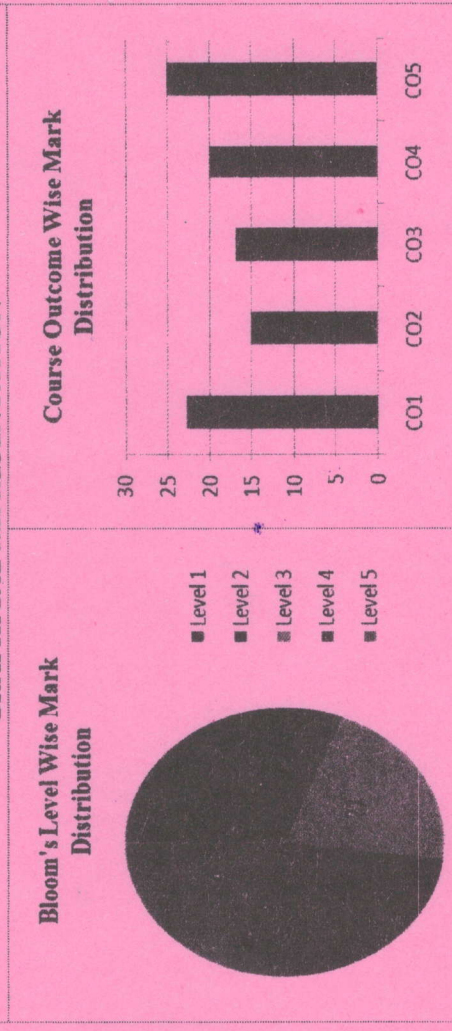
| Q. No. | QUESTIONS                                                                                                                                        | Marks | COs | KL |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|
| 2      | Compare and contrast additive manufacturing with subtractive manufacturing.                                                                      | 05    | CO1 | K1 |
| 3      | Analyze the advantages and limitations of Fused Deposition Modeling (FDM).                                                                       | 05    | CO2 | K2 |
| 4      | List the additive manufacturing process with its major stages.                                                                                   | 05    | CO1 | K5 |
| 5      | Evaluate the role of support structures in 3D printing. In which situations are they critical, and how do they affect the post-processing stage? | 05    | CO3 | K6 |
| 6      | Explain the importance of scanning objects in 3D printing.                                                                                       | 05    | CO4 | K4 |
| 7      | What challenges and benefits would you anticipate while using 3D printing?                                                                       | 05    | CO1 | K1 |

**Section C (Answer any THREE out of FIVE) – 30 Marks**  
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS                                                                                                                                                              | Marks | COs | KL |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|
| 8      | Differentiate between various types of additive manufacturing materials (plastics, metals, composites) based on their mechanical properties and suitable applications. | 10    | CO1 | K1 |
| 9      | Identify and describe the role of CAD (Computer-Aided Design) in the additive manufacturing workflow.                                                                  | 10    | CO2 | K2 |
| 10     | List the industries where additive manufacturing is most widely used and explain two examples                                                                          | 10    | CO1 | K5 |
| 11     | Describe the general process steps involved in additive manufacturing from digital design to final product.                                                            | 10    | CO3 | K6 |
| 12     | Explain different types of 3D printing process with suitable diagram.                                                                                                  | 10    | CO4 | K4 |

| CO- Course Outcomes, | KL- Knowledge Level,                                                                                                       | PO – Program Outcome |
|----------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------|
| CO1                  | Students able to makes 3D printing special, and when to use 3D printing vs Alternative options.                            |                      |
| CO2                  | Students able to understand familiarize themselves with the 3D printing process and how it works                           |                      |
| CO3                  | Students learn how to visualize and plan projects before getting started, so they can be more efficient                    |                      |
| CO4                  | Students spend several days familiarizing themselves with several software programs and combining them to accomplish tasks |                      |
| CO5                  | Students put all their knowledge together to design and 3D print prototypes                                                |                      |

**GRAPHICAL REPRESENTATION**





|                                                                                                                                           |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                                                                                            |  |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------|--|
|  <b>ARKA JAIN University</b><br><small>Jharkhand</small> |                                | <b>NAAC</b><br><b>GRADE A</b><br><small>ACCREDITED UNIVERSITY</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         | <b>[12-05-2025]</b><br><b>END SEM EXAMINATION</b><br><b>School of Engineering &amp; IT</b> |  |
| Program                                                                                                                                   | ME & CSE                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Branch  | Diploma                                                                                    |  |
| Subject Name                                                                                                                              | Entrepreneurship and Start-ups |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Session | Even, 2024-2025                                                                            |  |
| Semester                                                                                                                                  | VI                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Year    | May, 2025                                                                                  |  |
| Time: 3 Hour<br>Max. Marks : 70                                                                                                           |                                | • Start writing from 2nd page onwards; <u>don't Write on the 1st Page</u><br><u>Backside</u><br>• Answer all Questions of Section A (Compulsory)<br>• Answer Any Four out of Six of Section B<br>• Answer Any Three out of Five of Section C<br>• Possession of Mobile Phone or any kind of <u>Written Material</u> , <u>Arguments with the Invigilator or Discussion with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Paper(s)</u> .<br>K1 : Remembering      K3 : Applying      K5 : Evaluating<br>K2 : Understanding      K4 : Analysing      K6 : Creating |         |                                                                                            |  |

| Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks) |                                                       |       |     |    |     |
|--------------------------------------------------------------------|-------------------------------------------------------|-------|-----|----|-----|
| Q.N                                                                | QUESTIONS                                             | Marks | COs | KL | PO  |
| 1                                                                  |                                                       |       |     |    |     |
| i                                                                  | What do you mean by Entrepreneurship?                 | 2     | CO1 | K1 | PO1 |
| ii                                                                 | Define start-up.                                      | 2     | CO5 | K2 | PO3 |
| iii                                                                | How to identify the target market?                    | 2     | CO5 | K3 | PO5 |
| iv                                                                 | Define motivation?                                    | 2     | CO4 | K1 | PO1 |
| v                                                                  | Why is competition evaluation is needed?              | 2     | CO1 | K4 | PO2 |
| vi                                                                 | List two bankruptcy in Indian economy.                | 2     | CO1 | K1 | PO1 |
| vii                                                                | Highlight the advantages of License for any business. | 2     | CO1 | K4 | PO5 |
| viii                                                               | Analyse the function of MUDRA project?                | 2     | CO1 | K1 | PO1 |
| ix                                                                 | What is a risk analysis?                              | 2     | CO1 | K3 | PO1 |
| x                                                                  | Write the full form of PMEGP                          | 2     | CO1 | K2 | PO2 |



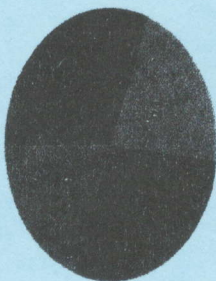
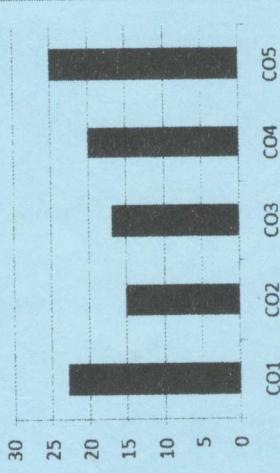
**Section B (Answer any FOUR out of SIX) - 20 Marks**  
(Each question Carry 05 Marks)

| Q. No. | QUESTIONS                                                   | Marks | COs | KL | PO  |
|--------|-------------------------------------------------------------|-------|-----|----|-----|
| 2      | What are the methods and sources of Idea generation?        | 5     | CO4 | K3 | PO1 |
| 3      | Explain the organization structure with flow chart.         | 5     | CO2 | K1 | PO2 |
| 4      | Explain the Contents and guidelines for report preparation. | 5     | CO1 | K2 | PO3 |
| 5      | Draw a flow chart for any Business Plan. Elaborate briefly. | 5     | CO3 | K1 | PO2 |
| 6      | Discuss the role of online education in economy.            | 5     | CO5 | K1 | PO5 |
| 7      | Explain the Classification of Entrepreneurs with example.   | 5     | CO4 | K2 | PO4 |

**Section C (Answer any THREE out of FIVE) - 30 Marks**  
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS                                                                                                                                | Marks | COs | KL | PO  |
|--------|------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|-----|
| 8      | Differentiate between entrepreneurs and managers.                                                                                        | 10    | CO1 | K3 | PO1 |
| 9      | Identify and apply key entrepreneurial traits to a case study of a well-known entrepreneur (e.g., Elon Musk, Oprah Winfrey, Steve Jobs). | 10    | CO1 | K4 | PO1 |
| 10     | Identify any industrial sickness and explain the various causes.                                                                         | 10    | CO2 | K5 | PO3 |
| 11     | Analyze the role of market research in discovering and validating a business idea. Give examples.                                        | 10    | CO2 | K5 | PO5 |
| 12     | Choose a real-world business idea and develop a basic activity map outlining its key components.                                         | 10    | CO2 | K1 | PO3 |

CO- Course Outcomes, KL- Knowledge Level, PO - Program Outcome

|                                                                                                                               |     |                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------|
| Course Outcomes                                                                                                               | CO1 | Understanding the dynamic role of entrepreneurship and small businesses.         |
|                                                                                                                               | CO2 | Organizing and Managing a Small Business                                         |
|                                                                                                                               | CO3 | Financial Planning and Control                                                   |
|                                                                                                                               | CO4 | Forms of Ownership for Small Business                                            |
|                                                                                                                               | CO5 | Strategic Marketing Planning                                                     |
| <b>GRAPHICAL REPRESENTATION</b>                                                                                               |     |                                                                                  |
| <b>Bloom's Level Wise Mark Distribution</b>                                                                                   |     | <b>Course Outcome Wise Mark Distribution</b>                                     |
|                                             |     |  |
| <ul style="list-style-type: none"> <li>Level 1</li> <li>Level 2</li> <li>Level 3</li> <li>Level 4</li> <li>Level 5</li> </ul> |     |                                                                                  |



|                                                                                                                              |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |                                                                          |  |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------|--|
|  <b>ARKA JAIN University</b><br>Jharkhand |                             |                                                                                                                                                                                                                                                                                                                                                                                                                    |                 | [16-05-2025]<br><b>END SEM EXAMINATION</b><br>School of Engineering & IT |  |
| Program                                                                                                                      | Mechanical Engineering      | Branch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Diploma         |                                                                          |  |
| Subject Name                                                                                                                 | Open Elective-II - Robotics | Session                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Even, 2024-2025 |                                                                          |  |
| Semester                                                                                                                     | VI                          | Year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | May, 2025       |                                                                          |  |
| Time: 3 Hour<br>Max. Marks : 70                                                                                              |                             | • Start writing from 2nd page onwards; don't Write on the 1st Page<br>Backside<br>• Answer all Questions of Section A (Compulsory)<br>• Answer Any Four out of Six of Section B<br>• Answer Any Three out of Five of Section C<br>• Possession of Mobile Phone or any kind of <u>Written Material</u> ,<br><u>Arguments with the Invigilator or Discussion with Co-Student</u> will<br>comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the</u><br><u>Paper(s).</u> |                 |                                                                          |  |
| Knowledge Level (KL)                                                                                                         | K1 : Remembering            | K3 : Applying                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | K5 : Evaluating |                                                                          |  |
|                                                                                                                              | K2 : Understanding          | K4 : Analysing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | K6 : Creating   |                                                                          |  |

| Section A (Each question Carry 02 Marks from Q1-i to x) – 20 Marks |                                                                  |  |       |    |     |
|--------------------------------------------------------------------|------------------------------------------------------------------|--|-------|----|-----|
| Q. N 1                                                             | QUESTIONS                                                        |  | Marks |    | PO  |
|                                                                    |                                                                  |  | COs   | KL |     |
| i                                                                  | Define the term 'Robot'. How robots are different from human?    |  | CO1   | K1 | PO1 |
| ii                                                                 | Write some applications of Industrial Robot.                     |  | CO2   | K1 | PO2 |
| iii                                                                | What is the function of joints?                                  |  | CO2   | K1 | PO2 |
| iv                                                                 | What is an actuator in Robotics?                                 |  | CO2   | K1 | PO2 |
| v                                                                  | Write the name of the parts of a general Industrial Robot.       |  | CO2   | K1 | PO2 |
| vi                                                                 | Enlist the name of the drive system used in Robotics.            |  | CO2   | K1 | PO2 |
| vii                                                                | Write the name of different coordinate system used in Robotics.  |  | CO2   | K1 | PO2 |
| viii                                                               | Enlist name of different types of sensor used Industrial Robots. |  | CO2   | K1 | PO2 |
| ix                                                                 | What does a sensor do in a Robot?                                |  | CO3   | K1 | PO3 |
| x                                                                  | What is a Robotic arm used for?                                  |  | CO3   | K1 | PO3 |



| Course Outcomes                              | CO1                                                                    | CO2                                                  | CO3                                                                     | CO4                                                                  | CO5                                                                |
|----------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------|
|                                              | Understand the Operation and control of Industrial Robot in Automation | Apply the function of Industrial Robot in Automation | Develop the mind set for modern trends in manufacturing and automation. | Identify the different application of Industrial Robot in Automation | Know different working operation of Industrial Robot in Automation |
| <b>GRAPHICAL REPRESENTATION</b>              |                                                                        |                                                      |                                                                         |                                                                      |                                                                    |
| <b>Bloom's Level wise Marks Distribution</b> |                                                                        |                                                      | <b>Course Outcome Wise Marks Distribution</b>                           |                                                                      |                                                                    |
| <p>■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6</p>         |                                                                        |                                                      | <p>CO1 CO2 CO3 CO4 CO5</p>                                              |                                                                      |                                                                    |

| <b>Section B (Answer any FOUR out of SIX) – 20 Marks</b><br>(Each question 5 Marks)          |                                                                                                                                              |       |     |    |     |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|-----|
| Q. No.                                                                                       | QUESTIONS                                                                                                                                    | Marks | COs | KL | PO  |
| 2                                                                                            | Elaborate the importance of using industrial robot in manufacturing industries?                                                              | 5     | CO1 | K2 | PO1 |
| 3                                                                                            | Why Automation is important? justifies with examples and also Explain Types of Automation in terms of product volume and variety with graph. | 5     | CO2 | K4 | PO2 |
| 4                                                                                            | Which factors should be considered for implementation of automation in manufacture industries?                                               | 5     | CO2 | K4 | PO2 |
| 5                                                                                            | Explain role of sensors in Robotics? Make a list of sensors and their use.                                                                   | 5     | CO2 | K2 | PO2 |
| 6                                                                                            | Briefly discuss the function of different types of Robotic Sensors used for Vision System.                                                   | 5     | CO4 | K2 | PO4 |
| 7                                                                                            | What are different types of drive system in robots? Explain any two with example.                                                            | 5     | CO4 | K2 | PO4 |
| <b>Section C (Answer any THREE out of FIVE) – 30 Marks</b><br>(Each question Carry 10 Marks) |                                                                                                                                              |       |     |    |     |
| Q. No.                                                                                       | QUESTIONS                                                                                                                                    | Marks | COs | KL | PO  |
| 8                                                                                            | Explain different types of industrial robot based on level of automation used in manufacturing with the help of neat sketch.                 | 10    | CO1 | K2 | PO1 |
| 9                                                                                            | Explain proximity or displacement sensors used in Industrial Robot with example.                                                             | 10    | CO1 | K2 | PO1 |
| 10                                                                                           | Explain different types of robots as per coordinate system and movement of manipulator.                                                      | 10    | CO2 | K2 | PO2 |
| 11                                                                                           | Explain hydraulic or electrical drive system in robot with suitable example.                                                                 | 10    | CO5 | K6 | PO5 |
| 12                                                                                           | Elaborate different Types of Automation used in manufacturing industry with suitable graphs.                                                 | 10    | CO5 | K5 | PO5 |





**ARKA JAIN**  
**University**  
Jharkhand



[19-05-2025]

**END SEM EXAMINATION**  
**School of Engineering & IT**

| Program                         | Mechanical Engineering                                                                                                                                                                                                                    | Branch         | Diploma         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
| Subject Name                    | Production & Operations Management                                                                                                                                                                                                        | Session        | Even, 2024-2025 |
| Semester                        | VI                                                                                                                                                                                                                                        | Year           | May, 2025       |
| Time: 3 Hour<br>Max. Marks : 70 | • Start writing from 2nd page onwards; <u>don't Write on the 1st Page Backside</u>                                                                                                                                                        |                |                 |
|                                 | • Answer all Questions of Section A (Compulsory)                                                                                                                                                                                          |                |                 |
|                                 | • Answer Any Four out of Six of Section B                                                                                                                                                                                                 |                |                 |
|                                 | • Answer Any Three out of Five of Section C                                                                                                                                                                                               |                |                 |
|                                 | • Possession of <u>Mobile Phone</u> or any kind of Written Material, Arguments with the <u>Invigilator</u> or <u>Discussion</u> with Co-Student will comes under <u>Unfair Means</u> and will Result in the Cancellation of the Paper(s). |                |                 |
| Knowledge Level (KL)            | K1 : Remembering                                                                                                                                                                                                                          | K3 : Applying  | K5 : Evaluating |
|                                 | K2 : Understanding                                                                                                                                                                                                                        | K4 : Analysing | K6 : Creating   |

| Section A (Each question Carry 02 Marks from Q1-i to x) - 20 Marks |                                               |       |     |    |
|--------------------------------------------------------------------|-----------------------------------------------|-------|-----|----|
| Q.N                                                                | QUESTIONS                                     | Marks | COs | KL |
| 1                                                                  |                                               |       |     |    |
| i                                                                  | Define the term process engineering.          | 2     | CO1 | K1 |
| ii                                                                 | Explain the Choice of Plant Layout.           | 2     | CO1 | K1 |
| iii                                                                | Define Cycle Time.                            | 2     | CO2 | K2 |
| iv                                                                 | What is Production Forecasting?               | 2     | CO2 | K2 |
| v                                                                  | What is Theory of Constraints?                | 2     | CO2 | K2 |
| vi                                                                 | Explain functional surface of the work piece. | 2     | CO1 | K1 |
| vii                                                                | What is the objectives in Scheduling?         | 2     | CO3 | K2 |
| viii                                                               | What is Time frame & Demand Behaviour?        | 2     | CO3 | K3 |
| ix                                                                 | Explain Assembly Line Balancing.              | 2     | CO3 | K3 |
| x                                                                  | Write Importance of Material Management.      | 2     | CO4 | K4 |



### Section B (Answer any FOUR out of SIX) – 20 Marks

(Each question 5 Marks)

| Q. No. | QUESTIONS                                                                       | Marks | COs | KL |
|--------|---------------------------------------------------------------------------------|-------|-----|----|
| 2      | Name and explain the factors which affect Make -Buy Policy for a new component. | 5     | CO1 | K1 |
| 3      | What are Quantitative and Qualitative Forecasting Techniques?                   | 5     | CO2 | K2 |
| 4      | What is scheduling in job? Explain the concept underlying its importance.       | 5     | CO3 | K3 |
| 5      | What is difference between Aggressive Planning and Forecasting?                 | 5     | CO4 | K4 |
| 6      | Discuss about TQM management techniques.                                        | 5     | CO5 | K5 |
| 7      | Write short notes on Vendor Development.                                        | 5     | CO3 | K3 |

### Section C (Answer any THREE out of FIVE) – 30 Marks

(Each question Carry 10 Marks)

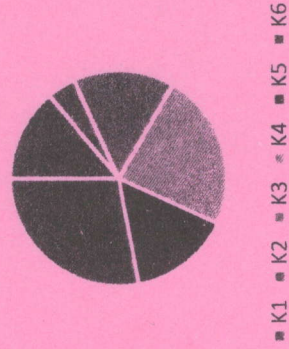
| Q. No. | QUESTIONS                                                                                                                                                                                           | Marks | COs | KL |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|
| 8      | Define and differentiate the following terms:<br>(i) Machine Capacity<br>(ii) Plant Capacity<br>(iii) Machine Selection                                                                             | 10    | CO1 | K1 |
| 9      | State the pre-requisites of process planning and explain why each is important in the context of efficient manufacturing operations                                                                 | 10    | CO1 | K1 |
| 10     | Explain the concept of Computerized Assembly Line Balancing (CALB). Discuss current trends and technologies in assembly line systems that enhance productivity and flexibility in manufacturing.    | 10    | CO3 | K3 |
| 11     | Describe the break-even analysis approach used for process and equipment selection. How can this analysis support managerial decision-making in choosing between alternative processes or machines? | 10    | CO5 | K5 |
| 12     | Explain about various method in measuring Total productivity.                                                                                                                                       | 10    | CO5 | K5 |

CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

|     |                                                                                                                                   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Define operations management and explain its relationship to productivity. And understand tools and techniques.                   |
| CO2 | Describe the importance of forecasting and explain the effective application of the different forecasting approaches and methods. |
| CO3 | Explain layout strategy and how operations managers determine facility arrangements and size.                                     |
| CO4 | Describe how operations managers achieve a reasonable work environment and set expectations related to employee productivity.     |
| CO5 | Understand make-or-buy decisions, and the selection and integration of suppliers. And how much to order and when to order.        |

### GRAFICAL REPRESENTATION

**Bloom's Level wise Marks Distribution**



**Course Outcome Wise Marks Distribution**

