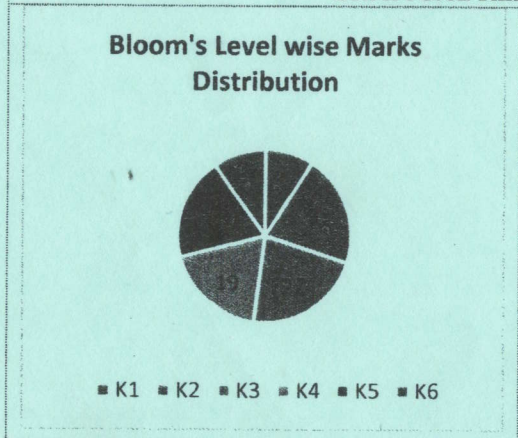
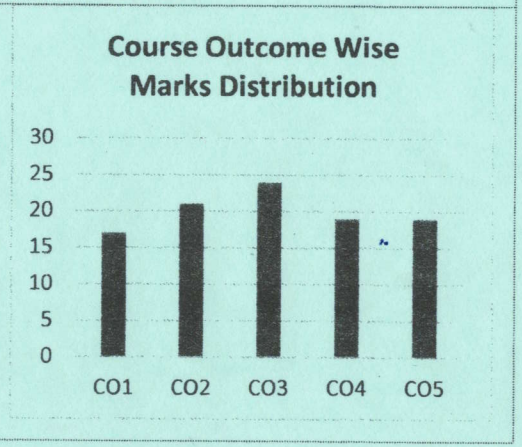
**CO**- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

| | | |
|---|---|---|
| Course Outcomes | [CO1] | Know different machine elements and mechanisms. |
| | [CO2] | Understand Kinematics and Dynamics of different machines and mechanisms. |
| | [CO3] | Select Suitable Drives and Mechanisms for a particular application. |
| | [CO4] | Appreciate concept of balancing and Vibration. |
| | [CO5] | Develop ability to come up with innovative ideas. |

**GRAFICAL REPRESENTATION**




**ARKA JAIN University**
Jharkhand
NAAC GRADE A

**[18-11-2025]**
**END SEM EXAMINATION**
**School of Engineering & IT**

| | | | |
|---|---|---|---|
| **Program** | **Mechanical Engineering** | **Branch** | **Diploma** |
| **Subject Name** | **Theory of Machine & Mechanisms** | **Session** | **Odd, 2025-26** |
| **Semester** | **V** | **Year** | **Nov, 2025** |

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
- **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 Phones** or any kind of **Written Material, Arguments with the Invigilator or Discussing with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Papers**.

| | | | |
|---|---|---|---|
| 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 | COs | KL | PO |
|---|---|---|---|---|---|
| i | Define kinematic link with one example. | 2 | CO1 | K1 | PO2 |
| ii | Define cam and follower. | 2 | CO2 | K2 | PO1 |
| iii | State the function of Flywheel? | 2 | CO2 | K1 | PO2 |
| iv | What are different types of gear train. | 2 | CO2 | K3 | PO3 |
| v | What is the function of a dynamometer? | 2 | CO3 | K2 | PO1 |
| vi | Differentiate between a machine and a structure. | 2 | CO3 | K4 | PO2 |
| vii | What is Function of Governor in Automobile? | 2 | CO4 | K2 | PO2 |
| viii | Give one-one example of Sliding Pair and Turning Pair of Kinematic Pair. | 2 | CO4 | K4 | PO3 |
| ix | Classify different types of Brakes used in Automobile. | 2 | CO5 | K5 | PO2 |
| x | What are the advantages of 'V' belt drive over flat belt drive? | 2 | CO5 | K5 | PO1 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 2 | What are types of kinematic pair? Give its example. | 5 | CO1 | K4 | PO2 |
| 3 | What are different types of follower used in CAM-follower. Explain with neat diagram. | 5 | CO4 | K3 | PO3 |
| 4 | Differentiate between cross belt drive and open belt drive. Also Draw Schematic diagram. | 5 | CO2 | K6 | PO1 |
| 5 | Explain the working of internal expanding shoe brake with the help of neat sketch. | 5 | CO3 | K1 | PO3 |
| 6 | Explain the working of Whitworth quick return mechanism. | 5 | CO3 | K2 | PO1 |
| 7 | What is the role of Clutch? Write difference between Uniform pressure and Uniform wear concept of clutch. | 5 | CO5 | K3 | PO3 |

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

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 8 | Explain the working of Watt governor with neat diagram. | 10 | CO4 | K4 | PO1 |
| 9 | What is CAM and Follower mechanism? Draw displacement diagram for a follower subjected to uniform velocity during rise and SHM during return with following details:<br>Stroke length = 60 mm<br>Angle of rise = 90°<br>Angle of return = 90°<br>Angle of dwell after return = 180°<br>(Assume Suitable data if needed) | 10 | CO5 | K5 | PO3 |
| 10 | Explain sliding pair, turning pair, rolling pair and spherical pair with one example each. | 10 | CO1 | K3 | PO2 |
| 11 | Explain the compound gear train with neat sketch and write down the velocity ratio's equation. | 10 | CO2 | K2 | PO2 |
| 12 | What is belt drive? Drive the formula of length of open belt drive open with diagram.<br>Two pulleys, one 450 mm diameter and the other 200 mm diameter are on parallel shafts 1.95 m apart and are connected by an open belt. Find the length of the belt required and the angle of contact between the belt and each pulley. | 10 | CO3 | K4 | PO1 |

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

| | | |
|---|---|---|
| Course Outcomes | [CO1] | Know different machine elements and mechanisms. |
| | [CO2] | Understand Kinematics and Dynamics of different machines and mechanisms. |
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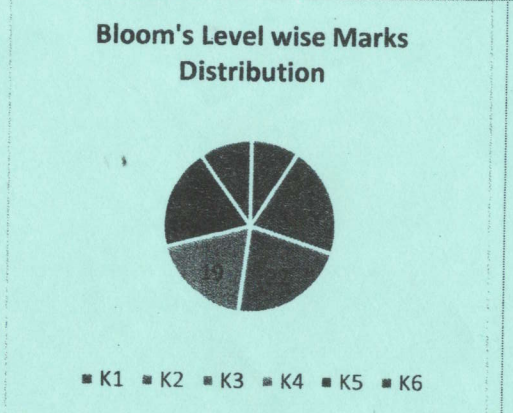
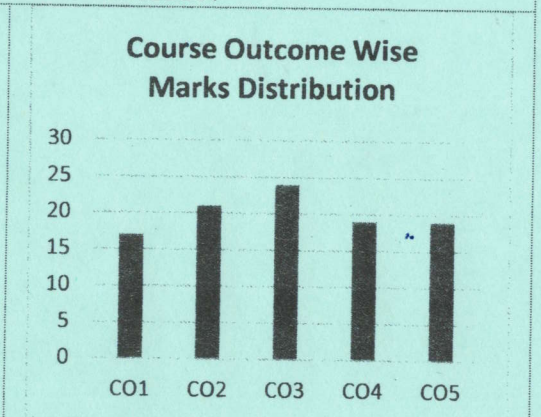
**GRAFICAL REPRESENTATION**




**ARKA JAIN University**
Jharkhand

NAAC GRADE A ACCREDITED UNIVERSITY

**[18-11-2025]**
**END SEM EXAMINATION**
**School of Engineering & IT**

| | | | |
|---|---|---|---|
| **Program** | **Mechanical Engineering** | **Branch** | **Diploma** |
| **Subject Name** | **Theory of Machine & Mechanisms** | **Session** | **Odd, 2025-26** |
| **Semester** | **V** | **Year** | **Nov, 2025** |

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; don't Write on the 1st Page Backside
- **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**
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| | | | |
|---|---|---|---|
| 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 | COs | KL | PO |
|---|---|---|---|---|---|
| i | Define kinematic link with one example. | 2 | CO1 | K1 | PO2 |
| ii | Define cam and follower. | 2 | CO2 | K2 | PO1 |
| iii | State the function of Flywheel? | 2 | CO2 | K1 | PO2 |
| iv | What are different types of gear train. | 2 | CO2 | K3 | PO3 |
| v | What is the function of a dynamometer? | 2 | CO3 | K2 | PO1 |
| vi | Differentiate between a machine and a structure. | 2 | CO3 | K4 | PO2 |
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| ix | Classify different types of Brakes used in Automobile. | 2 | CO5 | K5 | PO2 |
| x | What are the advantages of 'V' belt drive over flat belt drive? | 2 | CO5 | K5 | PO1 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 2 | What are types of kinematic pair? Give its example. | 5 | CO1 | K4 | PO2 |
| 3 | What are different types of follower used in CAM-follower. Explain with neat diagram. | 5 | CO4 | K3 | PO3 |
| 4 | Differentiate between cross belt drive and open belt drive. Also Draw Schematic diagram. | 5 | CO2 | K6 | PO1 |
| 5 | Explain the working of internal expanding shoe brake with the help of neat sketch. | 5 | CO3 | K1 | PO3 |
| 6 | Explain the working of Whitworth quick return mechanism. | 5 | CO3 | K2 | PO1 |
| 7 | What is the role of Clutch? Write difference between Uniform pressure and Uniform wear concept of clutch. | 5 | CO5 | K3 | PO3 |

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

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 8 | Explain the working of Watt governor with neat diagram. | 10 | CO4 | K4 | PO1 |
| 9 | What is CAM and Follower mechanism? Draw displacement diagram for a follower subjected to uniform velocity during rise and SHM during return with following details:<br>Stroke length = 60 mm<br>Angle of rise = 90°<br>Angle of return = 90°<br>Angle of dwell after return = 180°<br>(Assume Suitable data if needed) | 10 | CO5 | K5 | PO3 |
| 10 | Explain sliding pair, turning pair, rolling pair and spherical pair with one example each. | 10 | CO1 | K3 | PO2 |
| 11 | Explain the compound gear train with neat sketch and write down the velocity ratio's equation. | 10 | CO2 | K2 | PO2 |
| 12 | What is belt drive? Drive the formula of length of open belt drive open with diagram.<br>Two pulleys, one 450 mm diameter and the other 200 mm diameter are on parallel shafts 1.95 m apart and are connected by an open belt. Find the length of the belt required and the angle of contact between the belt and each pulley. | 10 | CO3 | K4 | PO1 |

| ARKA JAIN University, Jharkhand | NAAC GRADE A | [29-11-2025] END SEM EXAMINATION School of Engineering & IT |
|---|---|---|

| | | | |
|---|---|---|---|
| Program | Mechanical Engineering | Branch | Diploma |
| Subject Name | Renewable Energy Technology | Session | Odd, 2025-26 |
| Semester | V | Year | Nov, 2025 |

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
- **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**
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| 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 | COs | KL | PO |
|---|---|---|---|---|---|
| i | What is Energy? | 2 | CO1 | K1 | PO1 |
| ii | What is a solar collector? | 2 | CO5 | K2 | PO3 |
| iii | What are the different types of current? | 2 | CO5 | K3 | PO5 |
| iv | Define Geothermal Energy? | 2 | CO4 | K1 | PO1 |
| v | List the types of wind turbines. | 2 | CO1 | K4 | PO2 |
| vi | Define Energy. | 2 | CO1 | K1 | PO1 |
| vii | Highlight the advantages of wind power. | 2 | CO1 | K4 | PO5 |
| viii | What is the function of inverter? | 2 | CO1 | K1 | PO1 |
| ix | What is a solar radiation? | 2 | CO1 | K3 | PO1 |
| x | Coal is the example of .....sources of energy. | 2 | CO1 | K2 | PO2 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question Carry 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 2 | Differentiate between impulse and reaction turbine. | 5 | CO4 | K3 | PO1 |
| 3 | Explain the setup for wind mills with neat sketch. | 5 | CO2 | K1 | PO2 |
| 4 | Elaborate the future prospects of solar energy in Indian market. | 5 | CO1 | K2 | PO3 |
| 5 | Explain solar pond with diagram. | 5 | CO3 | K1 | PO2 |
| 6 | What is difference between beam radiation and diffused radiation? | 5 | CO5 | K1 | PO5 |
| 7 | Define Solar Panel. Classify them briefly | 5 | CO4 | K2 | PO4 |

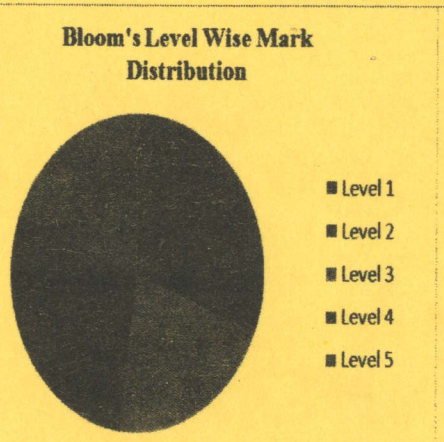
**Section C (Answer any THREE out of FIVE) – 30 Marks**
**(Each question Carry 10 Marks)**

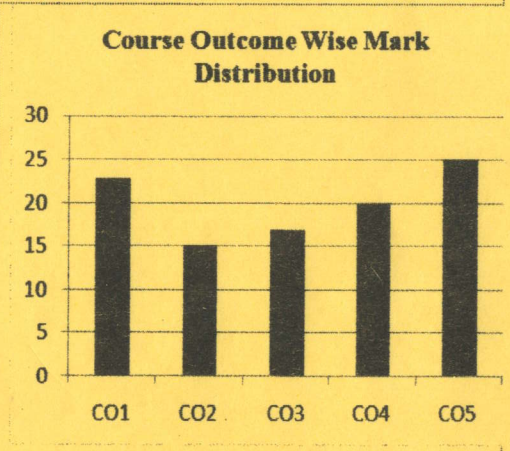
| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 8 | Differentiate between conventional and non-conventional sources of energy. Discuss the advantages and dis advantages of renewable energy sources | 10 | CO1 | K3 | PO1 |
| 9 | Explain the working principle, applications, advantages and disadvantages of solar dryers with neat diagram. | 10 | CO1 | K4 | PO1 |
| 10 | Explain the process of generating power from Biomass. Draw the schematic diagram.. | 10 | CO2 | K5 | PO3 |
| 11 | Explain the different types of instruments used for solar radiation measurement. | 10 | CO2 | K5 | PO5 |
| 12 | Describe the factors for site selection for wind power plant | 10 | CO2 | K1 | PO3 |

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

| | | |
|---|---|---|
| Course Outcomes | CO1 | Maintain ocean thermal energy technologies |
| | CO2 | Maintain the optimised working of solar PV and CS power plants. |
| | CO3 | Maintain the optimised working of large wind power plants |
| | CO4 | Maintain the optimised working of small wind turbines. |
| | CO5 | Maintain the optimised working of biomass-based power plants. |

**GRAFICAL REPRESENTATION**



| JGI ARKA JAIN University Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY | [29-11-2025] END SEM EXAMINATION School of Engineering & IT | |
|---|---|---|---|
| **Program** | **Mechanical Engineering** | **Branch** | **Diploma** |
| **Subject Name** | **Renewable Energy Technology** | **Session** | **Odd, 2025-26** |
| **Semester** | **V** | **Year** | **Nov, 2025** |
| Time: 3 Hour<br>Max. Marks : 70 | • Start writing from 2nd page onwards; **don't Write on the 1st Page 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 **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s).** | | |
| Knowledge Level (KL) | **K1** : Remembering | **K3** : Applying | **K5** : Evaluating |
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**Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)**

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|---|---|---|---|---|---|
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| viii | What is the function of inverter? | 2 | CO1 | K1 | PO1 |
| ix | What is a solar radiation? | 2 | CO1 | K3 | PO1 |
| x | Coal is the example of .....sources of energy. | 2 | CO1 | K2 | PO2 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question Carry 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
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| 3 | Explain the setup for wind mills with neat sketch. | 5 | CO2 | K1 | PO2 |
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| 6 | What is difference between beam radiation and diffused radiation? | 5 | CO5 | K1 | PO5 |
| 7 | Define Solar Panel. Classify them briefly | 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 |
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| | CO5 | Maintain the optimised working of biomass-based power plants. |

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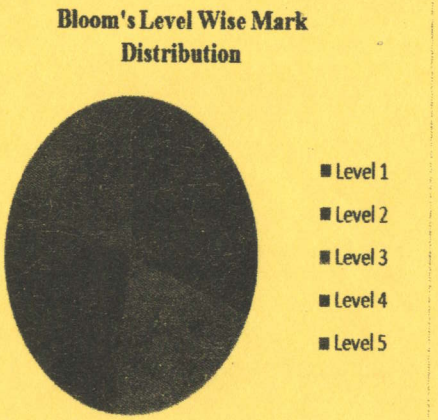


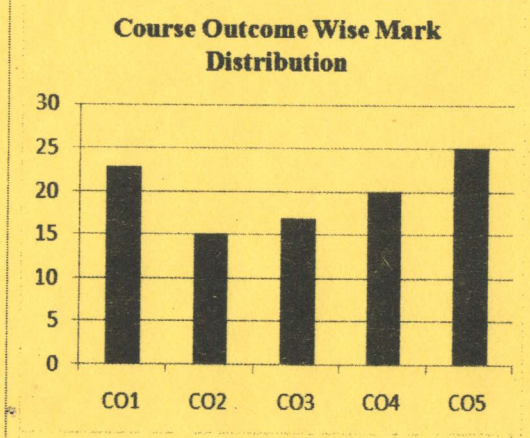

| JGI | ARKA JAIN University, Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY | [27-11-2025] END SEM EXAMINATION School of Engineering & IT |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Program** | **Mechanical Engineering** | **Branch** | **Diploma** |
| **Subject Name** | **Industrial Engineering & Management** | **Session** | **Odd, 2025-26** |
| **Semester** | **V** | **Year** | **Nov, 2025** |

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
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| **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 | COs | KL | PO |
|---|---|---|---|---|---|
| i | Discuss briefly the role of work study in increasing industrial productivity. | 2 | CO1 | K1 | PO2 |
| ii | Define productivity. Distinguish between production and productivity. | 2 | CO1 | K2 | PO1 |
| iii | Why management is necessary and what is its function? | 2 | CO2 | K1 | PO2 |
| iv | How work study is useful for management, labour, society and industrial productivity. | 2 | CO2 | K2 | PO3 |
| v | Define indirect cost in the factory. | 2 | CO3 | K3 | PO1 |
| vi | Discuss about just in time in production system. | 2 | CO3 | K1 | PO2 |
| vii | Enlist types of organizations. | 2 | CO4 | K3 | PO2 |
| viii | Discuss the scope and purpose of work study. | 2 | CO4 | K1 | PO3 |
| ix | Explain the concept of 5 "S" | 2 | CO5 | K2 | PO2 |
| x | What is concept of "Just In Time" in production? | 2 | CO5 | K3 | PO1 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question Carry 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 2 | Write the short notes on Wages and Salary also discuss about Administration Components of Wage Fixation | 5 | CO1 | K4 | PO2 |
| 3 | Make a left-right hand operation chart for filling a fountain pen. | 5 | CO2 | K3 | PO3 |
| 4 | Write short notes on the following<br>a) Two hand chart<br>b) Symbol of | 5 | CO3 | K6 | PO1 |
| 5 | Explain types of organizations in details. | 5 | CO4 | K1 | PO3 |
| 6 | Explain the function of despatching. | 5 | CO4 | K1 | PO1 |
| 7 | Define production. Enlist the types of production, Explain their advantage and disadvantages. | 5 | CO5 | K4 | PO3 |

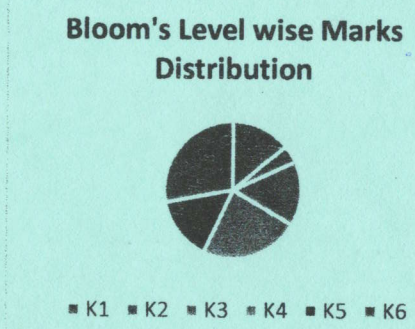
**Section C (Answer any THREE out of FIVE) – 30 Marks**
**(Each question Carry 10 Marks)**

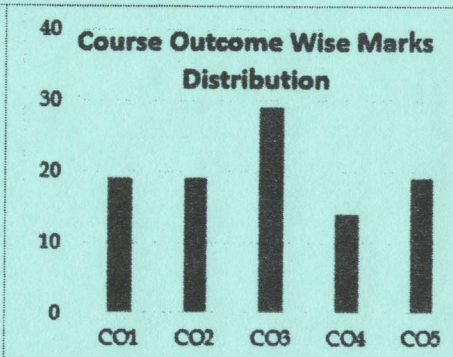
| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 8 | Discuss a procedure for selection and training of skilled and semi-skilled workers in factory. | 10 | CO1 | K5 | PO1 |
| 9 | Describe the objective and functions of production planning. | 10 | CO2 | K6 | PO3 |
| 10 | Explain the concept of Total quality management (TQM) | 10 | CO3 | K2 | PO2 |
| 11 | Describe clearly the function of routing, scheduling and dispatching. | 10 | CO3 | K3 | PO2 |
| 12 | Explain product layout and process layout with flow chart. | 10 | CO5 | K1 | PO1 |

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

| | | |
|---|---|---|
| Course Outcomes | [CO1] | Know different concept of plant layout and industry mechanism |
| | [CO2] | Understand the personnel development in industry. |
| | [CO3] | Explain the concept the best plant layout. |
| | [CO4] | Develop ability to come up with plant cost reducing. |
| | [CO5] | Understand different types of concept of industrialist in production revolution. |

**GRAFICAL REPRESENTATION**



| JGI | ARKA JAIN University, Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY | [27-11-2025] END SEM EXAMINATION School of Engineering & IT |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Program | Mechanical Engineering | Branch | Diploma |
| Subject Name | Industrial Engineering & Management | Session | Odd, 2025-26 |
| Semester | V | Year | Nov, 2025 |

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
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| 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 | COs | KL | PO |
|---|---|---|---|---|---|
| i | Discuss briefly the role of work study in increasing industrial productivity. | 2 | CO1 | K1 | PO2 |
| ii | Define productivity. Distinguish between production and productivity. | 2 | CO1 | K2 | PO1 |
| iii | Why management is necessary and what is its function? | 2 | CO2 | K1 | PO2 |
| iv | How work study is useful for management, labour, society and industrial productivity. | 2 | CO2 | K2 | PO3 |
| v | Define indirect cost in the factory. | 2 | CO3 | K3 | PO1 |
| vi | Discuss about just in time in production system. | 2 | CO3 | K1 | PO2 |
| vii | Enlist types of organizations. | 2 | CO4 | K3 | PO2 |
| viii | Discuss the scope and purpose of work study. | 2 | CO4 | K1 | PO3 |
| ix | Explain the concept of 5 "S" | 2 | CO5 | K2 | PO2 |
| x | What is concept of "Just In Time" in production? | 2 | CO5 | K3 | PO1 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question Carry 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 2 | Write the short notes on Wages and Salary also discuss about Administration Components of Wage Fixation | 5 | CO1 | K4 | PO2 |
| 3 | Make a left-right hand operation chart for filling a fountain pen. | 5 | CO2 | K3 | PO3 |
| 4 | Write short notes on the following<br>a) Two hand chart<br>b) Symbol of | 5 | CO3 | K6 | PO1 |
| 5 | Explain types of organizations in details. | 5 | CO4 | K1 | PO3 |
| 6 | Explain the function of despatching. | 5 | CO4 | K1 | PO1 |
| 7 | Define production. Enlist the types of production, Explain their advantage and disadvantages. | 5 | CO5 | K1 | PO3 |

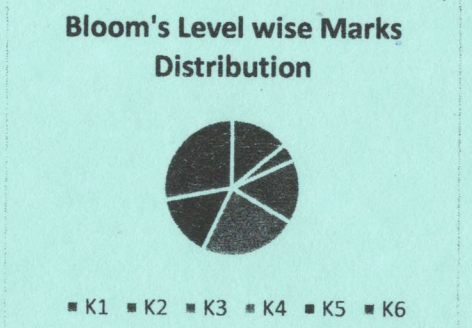
**Section C (Answer any THREE out of FIVE) – 30 Marks**
**(Each question Carry 10 Marks)**

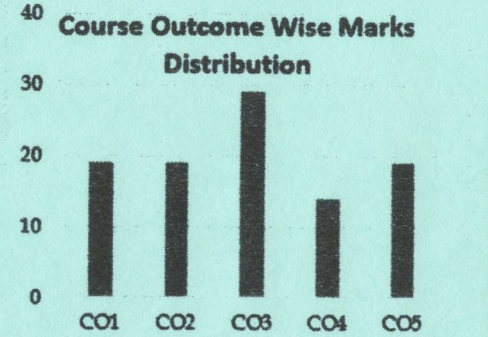
| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 8 | Discuss a procedure for selection and training of skilled and semi-skilled workers in factory. | 10 | CO1 | K5 | PO1 |
| 9 | Describe the objective and functions of production planning. | 10 | CO2 | K6 | PO3 |
| 10 | Explain the concept of Total quality management (TQM) | 10 | CO3 | K2 | PO2 |
| 11 | Describe clearly the function of routing, scheduling and dispatching. | 10 | CO3 | K3 | PO2 |
| 12 | Explain product layout and process layout with flow chart. | 10 | CO5 | K1 | PO1 |

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

| | | |
|---|---|---|
| Course Outcomes | [CO1] | Know different concept of plant layout and industry mechanism |
| | [CO2] | Understand the personnel development in industry. |
| | [CO3] | Explain the concept the best plant layout. |
| | [CO4] | Develop ability to come up with plant cost reducing. |
| | [CO5] | Understand different types of concept of industrialist in production revolution. |

**GRAFICAL REPRESENTATION**



| ARKA JAIN University, Jharkhand — NAAC GRADE A | | | [25-11-2025] END SEM EXAMINATION School of Engineering & IT |
|---|---|---|---|
| Program | Mechanical Engineering | Branch | Diploma |
| Subject Name | Power Plant Engineering | Session | Odd, 2025-26 |
| Semester | V | Year | Nov, 2025 |
| Time: 3 Hour<br>Max. Marks : 70 | • Start writing from 2nd page onwards; **don't Write on the 1st Page 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 **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** 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 1 | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| i | Define nozzle efficiency? | 2 | CO4 | K2 |
| ii | What is the function of a Preheater? | 2 | CO3 | K3 |
| iii | What is the function of an Economiser? | 2 | CO2 | K1 |
| iv | State the function of a prime mover in a thermal power plant? | 2 | CO4 | K2 |
| v | What is the function of a super heater? | 2 | CO3 | K1 |
| vi | What are the two methods of turbine compounding? | 2 | CO2 | K2 |
| vii | What is a captive power station? | 2 | CO3 | K2 |
| viii | List any two types of power stations? | 2 | CO1 | K3 |
| ix | Mention two types of losses in steam turbines? | 2 | CO2 | K4 |
| x | Define critical pressure ratio of a steam nozzle. | 2 | CO1 | K3 |

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

| Q. No. | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| 2 | Write a short note on high pressure boilers used in modern steam power plants? | 05 | CO3 | K3 |
| 3 | Differentiate between Velox boiler and La-Mont boiler? | 05 | CO4 | K2 |
| 4 | Describe different methods of superheat control in boilers? | 05 | CO2 | K3 |
| 5 | Explain the function of economizer and air-preheater in a steam generator? | 05 | CO3 | K2 |
| 6 | Write a short note on high pressure boilers used in modern steam power plants La-Mont? | 05 | CO1 | K1 |
| 7 | Explain governing methods of steam turbines. | 05 | CO2 | K2 |

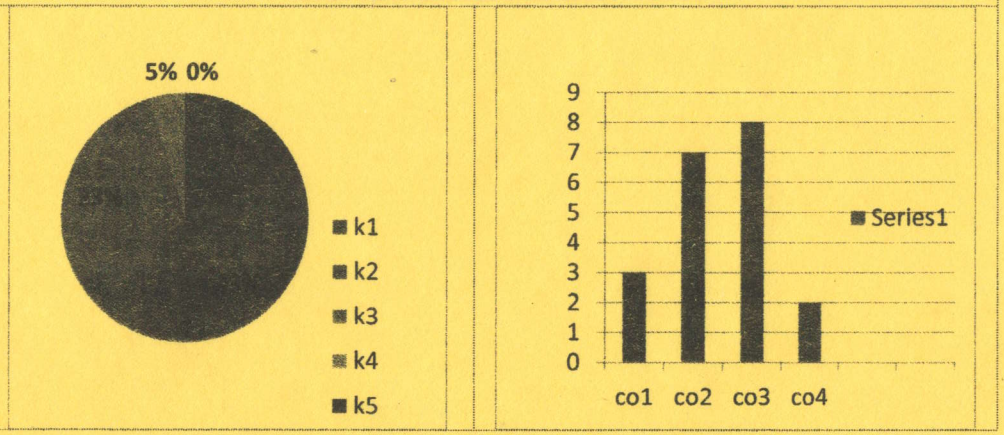
**Section C (Answer any THREE out of FIVE) – 30 Marks**
**(Each question Carry 10 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| 8 | Explain the process of energy conversion in a thermal power station, highlighting the limitations of converting heat into work? | 10 | CO2 | K1 |
| 9 | Explain the function of a steam condenser and distinguish between jet and surface condensers in terms of their operation? | 10 | CO3 | K3 |
| 10 | Discuss two methods to improve the thermal efficiency of a gas turbine power plant and explain their impact on performance? | 10 | C03 | K2 |
| 11 | Explain the differences between low, medium, and high head hydroelectric plants, including one advantage of each type? | 10 | CO2 | K3 |
| 12 | Define load factor and demand factor in the context of power plant economics and explain their significance in plant operation? | 10 | CO3 | K2 |

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

| | | |
|---|---|---|
| Course Outcomes | CO1 | Familiarised with the present and future power scenario of India. |
| | CO2 | Enlist various load terminologies in power plants. |
| | CO3 | Working and classifications in hydro power plant. |
| | CO4 | Working principles of Diesel, Gas and Nuclear power plants. |
| | CO5 | Understand the issues and necessity of safety concepts of power plants |

**GRAPHICAL REPRESENTATION**



| JGI ARKA JAIN University Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY | [25-11-2025] END SEM EXAMINATION School of Engineering & IT | |
|---|---|---|---|
| Program | Mechanical Engineering | Branch | Diploma |
| Subject Name | Power Plant Engineering | Session | Odd, 2025-26 |
| Semester | V | Year | Nov, 2025 |
| Time: 3 Hour<br>Max. Marks : 70 | • Start writing from 2nd page onwards; don't Write on the 1st Page 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 Written Material, Arguments with the Invigilator or Discussion with Co-Student will comes under Unfair Means 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 1 | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| i | Define nozzle efficiency? | 2 | CO4 | K2 |
| ii | What is the function of a Preheater? | 2 | CO3 | K3 |
| iii | What is the function of an Economiser? | 2 | CO2 | K1 |
| iv | State the function of a prime mover in a thermal power plant? | 2 | CO4 | K2 |
| v | What is the function of a super heater? | 2 | CO3 | K1 |
| vi | What are the two methods of turbine compounding? | 2 | CO2 | K2 |
| vii | What is a captive power station? | 2 | CO3 | K2 |
| viii | List any two types of power stations? | 2 | CO1 | K3 |
| ix | Mention two types of losses in steam turbines? | 2 | CO2 | K4 |
| x | Define critical pressure ratio of a steam nozzle. | 2 | CO1 | K3 |

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

| Q. No. | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| 2 | Write a short note on high pressure boilers used in modern steam power plants? | 05 | CO3 | K3 |
| 3 | Differentiate between Velox boiler and La-Mont boiler? | 05 | CO4 | K2 |
| 4 | Describe different methods of superheat control in boilers? | 05 | CO2 | K3 |
| 5 | Explain the function of economizer and air-preheater in a steam generator? | 05 | CO3 | K2 |
| 6 | Write a short note on high pressure boilers used in modern steam power plants La-Mont? | 05 | CO1 | K1 |
| 7 | Explain governing methods of steam turbines. | 05 | CO2 | K2 |

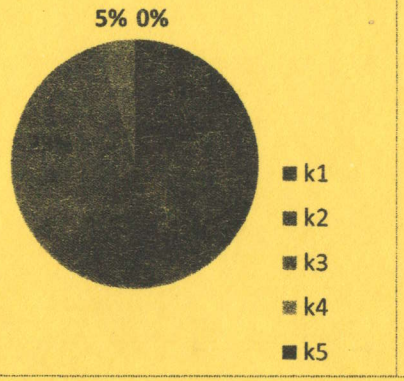
**Section C (Answer any THREE out of FIVE) – 30 Marks**
**(Each question Carry 10 Marks)**

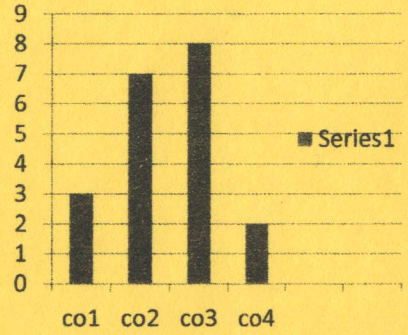
| Q. No. | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| 8 | Explain the process of energy conversion in a thermal power station, highlighting the limitations of converting heat into work? | 10 | CO2 | K1 |
| 9 | Explain the function of a steam condenser and distinguish between jet and surface condensers in terms of their operation? | 10 | CO3 | K3 |
| 10 | Discuss two methods to improve the thermal efficiency of a gas turbine power plant and explain their impact on performance? | 10 | C03 | K2 |
| 11 | Explain the differences between low, medium, and high head hydroelectric plants, including one advantage of each type? | 10 | CO2 | K3 |
| 12 | Define load factor and demand factor in the context of power plant economics and explain their significance in plant operation? | 10 | CO3 | K2 |

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

| | | |
|---|---|---|
| Course Outcomes | CO1 | Familiarised with the present and future power scenario of India. |
| | CO2 | Enlist various load terminologies in power plants. |
| | CO3 | Working and classifications in hydro power plant. |
| | CO4 | Working principles of Diesel, Gas and Nuclear power plants. |
| | CO5 | Understand the issues and necessity of safety concepts of power plants |

**GRAPHICAL REPRESENTATION**



| | | | |
|---|---|---|---|
| JGI | **ARKA JAIN University** Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY | **[22-11-2025] END SEM EXAMINATION School of Engineering & IT** |

| | | | |
|---|---|---|---|
| **Branch** | **Mechanical Engineering** | **Program** | **Diploma** |
| **Subject Name** | **Automobile Engineering** | **Session** | **Odd,2025-26** |
| **Semester** | **V** | **Year** | **Nov,2025** |
| Time: 3 Hour<br>Max. Marks : 70 | • Start writing from 2nd page onwards; **don't Write on the 1st Page 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 Phones** or any kind of **Written Material, Arguments with the Invigilator or Discussing with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Papers**. | | |
| 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 | COs | KL | PO |
|---|---|---|---|---|---|
| i | State the function of flywheel. | 2 | CO1 | K1 | PO2 |
| ii | Sate the difference between carburetor and fuel injector. | 2 | CO1 | K2 | PO1 |
| iii | What are the advantages of CRDI system? | 2 | CO2 | K1 | PO2 |
| iv | State the advantage of electronic ignition system. | 2 | CO2 | K2 | PO3 |
| v | What is the use of torque convertor? | 2 | CO3 | K3 | PO1 |
| vi | State the forces act on the rear axle. | 2 | CO3 | K1 | PO2 |
| vii | Define caster and camber. | 2 | CO4 | K3 | PO2 |
| viii | What are the benefits of anti -lock brake system? | 2 | CO4 | K1 | PO3 |
| ix | What are the advantages of hybrid system? | 2 | CO5 | K2 | PO2 |
| x | State the advantages of fuel cell. | 2 | CO5 | K3 | PO1 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question Carry 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 2 | State any Five engine component's function, material and method of its manufacturing. | 5 | CO1 | K4 | PO2 |
| 3 | Discuss the merits and demerits of electronic ignition system. | 5 | CO2 | K3 | PO3 |
| 4 | Explain the working of universal joint with neat sketch. | 5 | CO3 | K6 | PO1 |
| 5 | Explain the working of torsion bar with neat sketch. | 5 | CO4 | K1 | PO3 |
| 6 | Explain the wheel alignment system. | 5 | CO4 | K1 | PO1 |
| 7 | Explain the working of an electric car. | 5 | CO5 | K1 | PO3 |

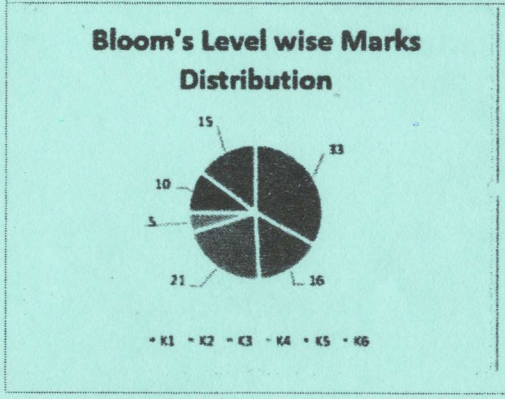
**Section C (Answer any THREE out of FIVE) – 30 Marks**
**(Each question Carry 10 Marks)**

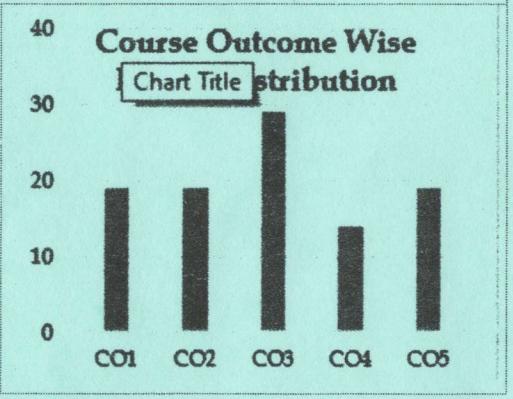
| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 8 | List the engine parts with their functions, materials and method of its manufacture with neat sketch. | 10 | CO1 | K5 | PO1 |
| 9 | Explain engine emission control by three-way catalytic converter system. | 10 | CO2 | K6 | PO3 |
| 10 | Explain the working principle of hotchkiss drive with neat sketch. | 10 | CO3 | K2 | PO2 |
| 11 | Explain the working of power steering with neat sketch. | 10 | CO3 | K3 | PO2 |
| 12 | Explain the Performance, Combustion and Emission Characteristics of CI engines with these alternate fuels. | 10 | CO5 | K1 | PO1 |

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

| | | |
|---|---|---|
| Course Outcomes | [CO1] | Identify the components of an automobile with their working |
| | [CO2] | Explain the concepts of cooling and lubricating systems. |
| | [CO3] | Identify different suspension systems and their applications. |
| | [CO4] | Explain the concepts of Ignition and Transmission and steering systems. |
| | [CO5] | Differentiate the special vehicles according to the usage. |

**GRAFICAL REPRESENTATION**



| | | | |
|---|---|---|---|
| JGI **ARKA JAIN University** Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY | | | **[22-11-2025] END SEM EXAMINATION School of Engineering & IT** |
| **Branch** | **Mechanical Engineering** | **Program** | **Diploma** |
| **Subject Name** | **Automobile Engineering** | **Session** | **Odd,2025-26** |
| **Semester** | **V** | **Year** | **Nov,2025** |
| Time: 3 Hour<br>Max. Marks : 70 | • Start writing from 2nd page onwards; **don't Write on the 1st Page 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 Phones** or any kind of **Written Material, Arguments with the Invigilator or Discussing with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Papers.** | | |
| 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 | COs | KL | PO |
|---|---|---|---|---|---|
| i | State the function of flywheel. | 2 | CO1 | K1 | PO2 |
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| vi | State the forces act on the rear axle. | 2 | CO3 | K1 | PO2 |
| vii | Define caster and camber. | 2 | CO4 | K3 | PO2 |
| viii | What are the benefits of anti -lock brake system? | 2 | CO4 | K1 | PO3 |
| ix | What are the advantages of hybrid system? | 2 | CO5 | K2 | PO2 |
| x | State the advantages of fuel cell. | 2 | CO5 | K3 | PO1 |

**Section B (Answer any FOUR out of SIX) – 20 Marks**
**(Each question Carry 5 Marks)**

| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 2 | State any Five engine component's function, material and method of its manufacturing. | 5 | CO1 | K4 | PO2 |
| 3 | Discuss the merits and demerits of electronic ignition system. | 5 | CO2 | K3 | PO3 |
| 4 | Explain the working of universal joint with neat sketch. | 5 | CO3 | K6 | PO1 |
| 5 | Explain the working of torsion bar with neat sketch. | 5 | CO4 | K1 | PO3 |
| 6 | Explain the wheel alignment system. | 5 | CO4 | K1 | PO1 |
| 7 | Explain the working of an electric car. | 5 | CO5 | K1 | PO3 |

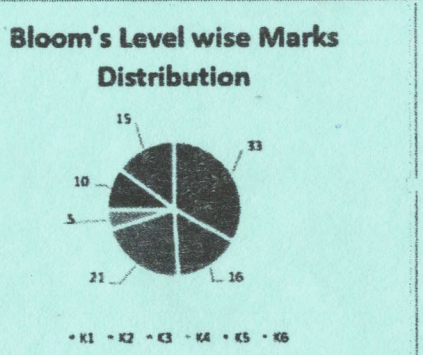
**Section C (Answer any THREE out of FIVE) – 30 Marks**
**(Each question Carry 10 Marks)**

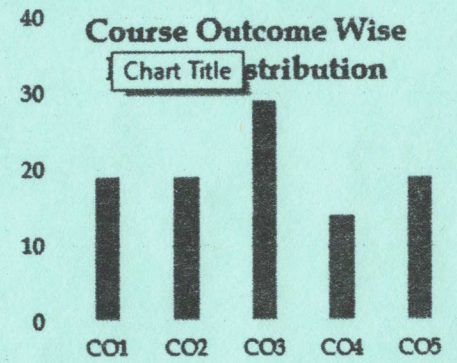
| Q. No. | QUESTIONS | Marks | COs | KL | PO |
|---|---|---|---|---|---|
| 8 | List the engine parts with their functions, materials and method of its manufacture with neat sketch. | 10 | CO1 | K5 | PO1 |
| 9 | Explain engine emission control by three-way catalytic converter system. | 10 | CO2 | K6 | PO3 |
| 10 | Explain the working principle of hotchkiss drive with neat sketch. | 10 | CO3 | K2 | PO2 |
| 11 | Explain the working of power steering with neat sketch. | 10 | CO3 | K3 | PO2 |
| 12 | Explain the Performance, Combustion and Emission Characteristics of CI engines with these alternate fuels. | 10 | CO5 | K1 | PO1 |

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

| | | |
|---|---|---|
| Course Outcomes | [CO1] | Identify the components of an automobile with their working |
| | [CO2] | Explain the concepts of cooling and lubricating systems. |
| | [CO3] | Identify different suspension systems and their applications. |
| | [CO4] | Explain the concepts of Ignition and Transmission and steering systems. |
| | [CO5] | Differentiate the special vehicles according to the usage. |

**GRAFICAL REPRESENTATION**



| JGI | ARKA JAIN University, Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY | [20-11-2025] END SEM EXAMINATION School of Engineering & IT |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Program | Mechanical Engineering | Branch | Diploma |
| Subject Name | Advanced Manufacturing Processes | Session | Odd, 2025-26 |
| Semester | V | Year | Nov, 2025 |

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
- **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 **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** 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 1 | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| i | List out the types of Jigs used in machining | 2 | CO1 | K1 |
| ii | What is the principle of location? | 2 | CO1 | K2 |
| iii | Define Injection Moulding Process | 2 | CO2 | K1 |
| iv | What are the needs of Non-Traditional Machining Process? | 2 | CO2 | K2 |
| v | Explain the function of Dielectric fluid used in EDM | 2 | CO3 | K4 |
| vi | Write the application of Electrochemical Machining. | 2 | CO3 | K3 |
| vii | List out the name of Primary and Secondary plastic processing technology | 2 | CO4 | K1 |
| viii | Draw the Block diagram of PLC. | 2 | CO5 | K2 |
| ix | Explain the general elements of SPM | 2 | CO5 | K1 |
| x | What are the different types of maintenance? | 2 | CO6 | K2 |

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

| Q. No. | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| 2 | List out the different types of fixtures or clamps used in machining. | 05 | CO1 | K5 |
| 3 | Differentiate between the jigs and fixtures in manufacturing? | 05 | CO1 | K4 |
| 4 | Write the comparison between traditional and Non-Traditional Machining | 05 | CO2 | K3 |
| 5 | Explain in brief about Abrasive Jet Machining. | 05 | CO3 | K1 |
| 6 | Explain the basic components of a CNC machine. | 05 | CO5 | K2 |
| 7 | Explain Total Productive Maintenance (TPM) in brief. | 05 | CO6 | K1 |

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

| Q. No. | QUESTIONS | Marks | COs | KL |
|---|---|---|---|---|
| 8 | Explain the function of any five types of Jigs & Fixtures with a suitable diagram. | 10 | CO1 | K3 |
| 9 | Explain the plastic processing technique using a flow chart. Also, explain Blow Moulding with schematic diagrams. | 10 | CO2 | K4 |
| 10 | Explain the working principle, components, advantages, limitations, and application of EDM and Wire EDM processes with a suitable diagram | 10 | CO3 | K2 |
| 11 | a) Explain the Basic G & M Codes used in CNC Programming.<br>b) Explain the servo control system. | 10 | CO5 | K3 |
| 12 | Explain any two types of special-purpose machines with a suitable diagram. | 10 | CO5 | K2 |

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

| | | |
|---|---|---|
| Course Outcomes | CO1 | Know the Operation and control of different advanced machine tools and equipment's. |
| | CO2 | Produce jobs as per specified requirements by selecting the specific machining process. |
| | CO3 | Develop the mind set for modern trends in manufacturing and automation. |
| | CO4 | Identify the different fabrication methods viz., sheet forming, blow moulding, laminating and reinforcing of plastics. |
| | CO5 | Know different non-traditional machining processes, CNC milling machines, special purpose machines. |
| | CO6 | Work as maintenance engineer. |

**GRAPHICAL REPRESENTATION**