JGI	ARKA JAIN University, Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[30-04-2026] END SEM EXAMINATION School of Engineering & IT

Program	**Mechanical Engineering**	**Branch**	**B. Tech**
Subject Name	**Manufacturing Process-II**	**Session**	**Even, 2025-26**
Semester	**VI**	**Year**	**April, 2026**

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	Define machinability.	02	CO1	K1
ii	Define orthogonal cutting.	02	CO1	K2
iii	What is the function of cutting fluid?	02	CO1	K2
iv	What is a turret lathe?	02	CO2	K1
v	Explain the uses of a shaper machine?	02	CO3	K2
vi	What is the difference between drilling and boring?	02	CO3	K2
vii	Explain gear hobbing?	02	CO3	K2
viii	How is a grinding wheel specify?	02	CO4	K2
ix	Define broaching operation.	02	CO4	K1
x	Define the term surface finish?	02	CO5	K2

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Describe tool wear mechanisms.	05	CO1	K2
3	Explain tool life and factors affecting it.	05	CO5	K3
4	Compare capstan and turret lathes.	05	CO4	K4
5	Explain gear generating methods.	05	CO3	K3
6	Explain centreless grinding with diagram.	05	CO4	K3
7	Explain advantages of CNC machines over conventional machines.	05	CO4	K4

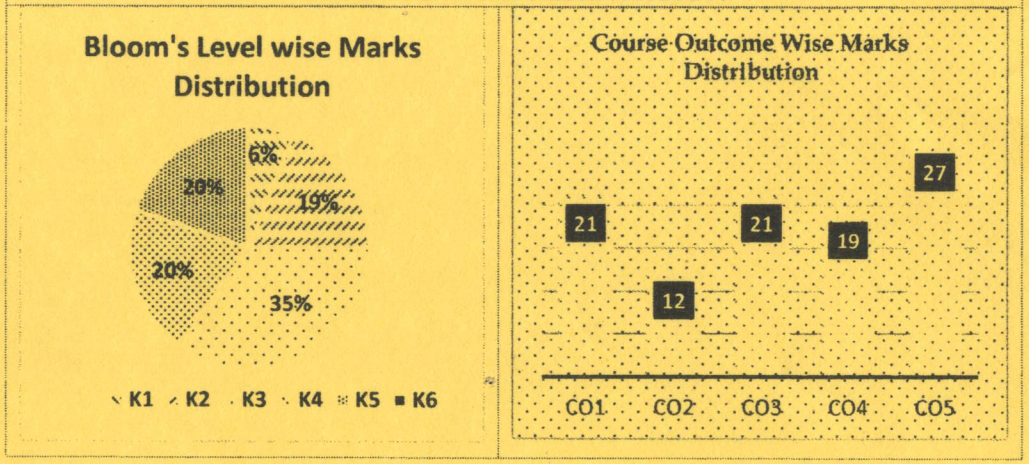
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Explain mechanics of chip formation with force analysis in orthogonal cutting.	10	CO1	K4
9	Derive the expression for tool life equation and discuss its practical significance.	10	CO5	K5
10	Explain milling machine operations and classify different types of milling cutters.	10	CO3	K3
11	Explain grinding processes and analyze factors affecting surface integrity.	10	CO2	K5
12	A cylindrical workpiece of diameter 50 mm and length 200 mm is turned on a lathe at a cutting speed of 60 m/min. The feed is 0.3 mm/rev and depth of cut is 2 mm. Calculate: (a) Spindle speed (N) (b) Machining time (c) Material Removal Rate (MRR)	10	CO5	K3

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

Course Outcomes	CO1	Understand the basic theories of machining and selection of machine tool.
	CO2	Understand the principles behind working of each machine tools
	CO3	Apply the knowledge of kinematics in the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines.
	CO4	Analyse the basic functions of different machine tools.
	CO5	Evaluate the different formulas used in analysis of machining operations.

GRAPHICAL REPRESENTATION

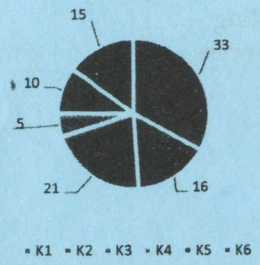


CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

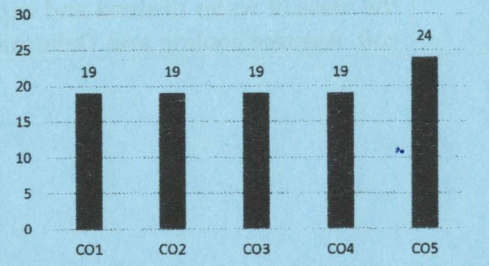
Course Outcomes	CO1	Understanding the various thermodynamic cycles used in refrigeration and air conditioning.
	CO2	Applying the knowledge of basic science in refrigeration.
	CO3	Analyzing various theories and their mathematical equations by real data.
	CO4	Evaluating performance of different refrigeration system.
	CO5	Creating curiosity to learn about new development in field of refrigeration and A.C.

GRAPHICAL REPRESENTATION

Bloom's Level wise Marks Distribution



Course Outcome Wise Marks Distribution



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[04-05-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Mechanical Engineering**	**Branch**	**B. Tech**
Subject Name	**Refrigeration and Air Conditioning**	**Session**	**Even, 2025-26**
Semester	**VI**	**Year**	**April, 2026**

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**
- **Use of refrigeration table is allowed**
- **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 the following terms. i) Refrigeration ii) Heat Engine	02	CO1	K1
ii	Define Unit of Refrigeration.	02	CO1	K2
iii	What are the advantages of vapour compression refrigeration system over air refrigeration system?	02	CO2	K1
iv	Construct Pressure – Enthalpy (p-h) chart of Vapor compression cycle.	02	CO2	K2
v	State the advantages and limitations of VAR.	02	CO3	K3
vi	Write down properties of refrigerant-absorbent combination in vapour absorption refrigeration cycle.	02	CO3	K1
vii	What are the chemical formula of refrigerant R-11, R-12, R-22, R114	02	CO4	K3
viii	What is the function of refrigerant	02	CO4	K1
ix	Define humidity ratio	02	CO5	K2
x	Define DBT, DPT, WBT	02	CO5	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
2	In a refrigeration plant working on Bell Coleman cycle, air is compressed to 5 bar from 1 bar. Its initial temperature is 10°C. After compression, the air is cooled up to 20°C in a cooler before expanding to a pressure of 1 bar. Determine the theoretical C.O.P of the plant and net refrigerating effect. Take C_p = 1.005 KJ/Kg K and C_v = 0718 KJ/Kg K.	05	CO1	K4
3	With a neat sketch, explain the working principle of vapour compression refrigeration system	05	CO2	K3
4	In a vapour absorption refrigeration system, heating, cooling and refrigeration takes place at the temperature of 100°C, 20°C and -5°C respectively. Find COP of refrigeration system.	05	CO3	K6
5	State the desirable properties of refrigerants and name the different refrigerants generally used.	05	CO4	K1
6	Write a short note on factors affecting comfort air conditioning.	05	CO5	K1
7	The atmospheric condition of air are 25°C DBT and specific humidity of 0.01 kg per kg of dry air. Find Partial pressure of vapour, relative humidity and DPT	05	CO5	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Atmospheric air at pressure 1 bar and temperature 10°C is drawn in compressor of Bell-Coleman cycle. The air is then compressed to 5 bar. The compressed air is cooled to 25°C before entering to the expansion valve. Considering for the compression and expansion, find COP of the cycle.	10	CO1	K5
9	A Vapour compression refrigerator works between the pressure limits of 60 bar and 25 bar. The working fluid is just dry at the end of compression and there is no under cooling of the liquid before the expansion valve. **Determine** (i) C.O.P of the cycle (ii) Capacity of the refrigerator if the fluid flow is at the rate of 5 kg/min.	10	CO2	K6
10	A vapour compression refrigerator uses ammonia and operates between temperature limits of -10°C and 25°C. At the end of compression, the refrigerant is dry-saturated. Find the COP of the refrigerator assuming no under-cooling.	10	CO3	K2
11	Describe the working principles and types of major refrigeration system components-compressors, condensers, expansion devices, and evaporators.	10	CO4	K3
12	An air conditioning plant is required to supply 60 m3 of air per minute at a DBT of 21°C and 55% RH. The outside air is at DBT of 28°C and 60% RH. Determine the mass of water drained and capacity of cooling coil. Assume cooling and Dehumidification process.	10	CO5	K1

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Program	**Mechanical Engineering**	**Branch**	**B. Tech**
Subject Name	**Total Quality Management**	**Session**	**Even, 2025-26**
Semester	**VI**	**Year**	**April, 2026**
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 carries 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	Define product quality.	02	CO1	K1
ii	What is supplier rating?	02	CO2	K2
iii	Define Six Sigma.	02	CO3	K1
iv	What are control charts?	02	CO2	K2
v	What is meant by TQM in service sector?	02	CO4	K2
vi	List any two benefits of Six Sigma.	02	CO3	K1
vii	What is FMEA?	02	CO3	K1
viii	What are the benefits of ISO 14000??	02	CO4	K2
ix	What is the importance of customer satisfaction in TQM?	02	CO1	K2
x	What is PDCA cycle?	02	CO2	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Define quality, product quality, and service quality with suitable examples.	05	CO1	K2
3	Discuss customer focus, customer satisfaction, and customer retention.	05	CO1	K3
4	Discuss the barriers to TQM implementation and suggest remedies.	05	CO4	K3
5	Explain ISO 9000, ISO 14000, and quality auditing with their benefits.	05	CO2	K2
6	Explain the stages and types of FMEA with suitable examples.	05	CO3	K3
7	Discuss the importance of continuous improvement in TQM with examples.	05	CO4	K3

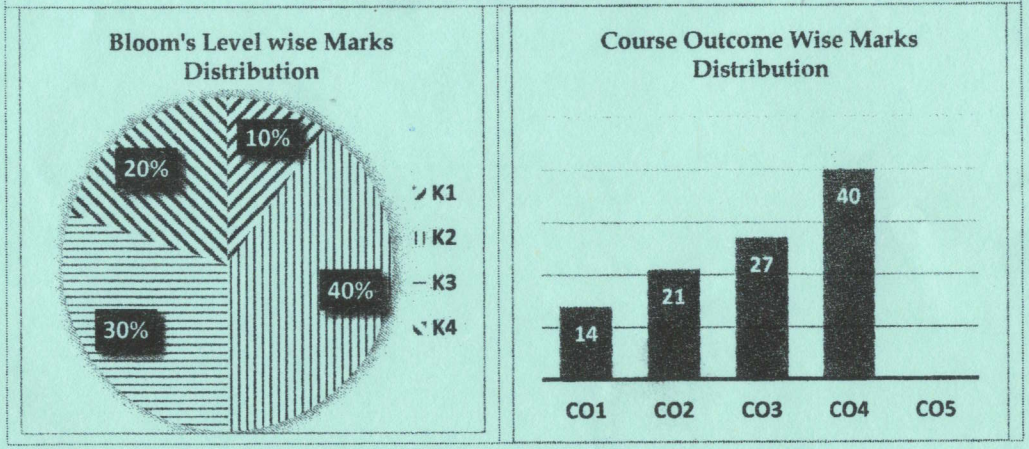
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question carries 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Describe continuous process improvement techniques such as PDCA cycle, 5S, and Kaizen with suitable examples.	10	CO3	K3
9	Explain the importance of control charts in process monitoring and improvement.	10	CO2	K2
10	Describe the process of quality auditing and explain how it is applied in organizations.	10	CO4	K2
11	Evaluate the effectiveness of quality auditing in maintaining organizational standards.	10	CO4	K4
12	Analyze the role of performance appraisal systems in supporting Total Quality Management initiatives.	10	CO4	K4

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

Course Outcomes	CO1	Remembering the different principles of quality control.
	CO2	Understanding the role and responsibilities of a quality engineer.
	CO3	Analyzing different tools used for quality checkup.
	CO4	Evaluating the tools used in quality control using numerical problems.
	CO5	Creating curiosity to learn newly adopted quality control tools.

GRAPHICAL REPRESENTATION



JGI	ARKA JAIN University, Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[08-05-2026] END SEM EXAMINATION School of Engineering & IT

Program	Mechanical Engineering	Branch	B. Tech
Subject Name	Humanities II - Organizational Behavior	Session	Even, 2025-26
Semester	VI	Year	April, 2026

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	Define Organizational Behaviour.	02	CO1	KL1
ii	List any two elements of Organizational Behaviour.	02	CO2	KL2
iii	Define motivation.	02	CO2	KL1
iv	Name the levels of Organizational Behaviour.	02	CO3	KL1
v	What is group behaviour?	02	CO4	KL3
vi	Explain the meaning of teamwork.	02	CO3	KL4
vii	Explain the role of leadership in an organization.	02	CO2	KL2
viii	How can motivation improve employee performance?	02	CO3	KL1
ix	Describe organizational conflict.	02	CO2	KL1
x	Explain formal and informal ss	02	CO4	KL2

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain the nature and scope of Organizational Behaviour.	05	CO3	KL6
3	Describe the importance of Organizational Behaviour in modern organizations.	05	CO4	KL3
4	Explain the key elements of Organizational Behaviour.	05	CO2	KL2
5	Discuss the concept of personality and its importance in the workplace.	05	CO3	KL4
6	Explain the role of perception in influencing employee behaviour.	05	CO2	KL3
7	Explain the nature and scope of Organizational Behaviour.	05	CO2	KL2

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

Q. No.	QUESTIONS	Marks	COs	KL
8	How can effective communication improve organizational efficiency?	10	CO3	KL2
9	Explain how leadership influences group behaviour in an organization.	10	CO3	KL3
10	Discuss how teamwork contributes to organizational success.	10	CO1	KL4
11	Explain how managers can handle workplace conflict effectively.	10	CO3	KL6
12	Compare Herzberg's two factor theory with Alderfer's ERG theory in brief.	10	CO3	KL2

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

Course Outcomes	CO1	Understand the dynamics of human behavior in work context.
	CO2	Understand the determinants of work behaviour from different levels.
	CO3	Develop competencies of analysing behavioural issues in the work environment.
	CO4	Expose students to key ideas and issues in OB that influence the way people behave in organizational setting.

GRAPHICAL REPRESENTATION

