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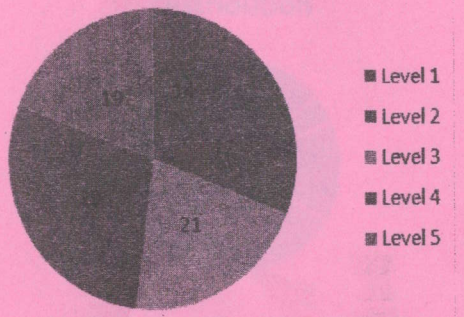
CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

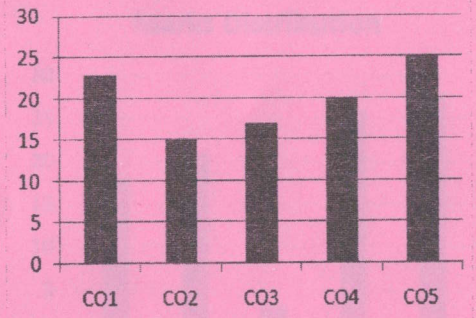
Course Outcomes	CO1	Maintain ocean thermal energy technologies
	CO2	Maintain the optimised working of solar PV and CS power plants.
	CO3	Maintain the optimised working of large wind power plants
	CO4	Maintain the optimised working of small wind turbines.
	CO5	Maintain the optimised working of biomass-based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

GRAFICAL REPRESENTATION

Bloom's Level Wise Mark Distribution



Course Outcome Wise Mark Distribution



ARKAJAIN University Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	**Mechanical Engineering**	**Program**	**Diploma**
Subject Name	**Renewable Energy Technology**	**Semester**	**V**
		Year	**Odd Nov/Dec 2023**

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 Q1-x) – 20 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	What do you mean by Biomass?	2	CO1	K1	PO1
ii	What is the function of inverter?	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 solar panel.	2	CO1	K4	PO2
vi	Define Renewable Energy.	2	CO1	K1	PO1
vii	Highlight the advantages of wind power	2	CO1	K4	PO5
viii	Define battery.	2	CO1	K1	PO1
ix	What is a solar collector?	2	CO1	K3	PO1
x	The storage of renewable energy sources is expensive. a) True b) False	2	CO1	K2	PO2

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What is difference between beam radiation and diffused radiation?	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	Differentiate between impulse and reaction turbine.	5	CO5	K1	PO5
7	Define Bio-fuel. Classify them briefly.	5	CO4	K2	PO4

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

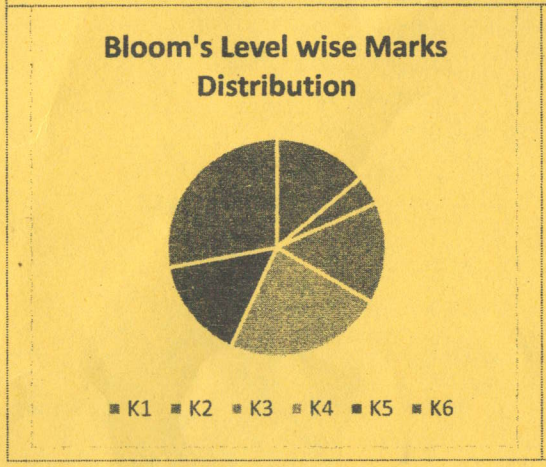
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Elaborate the Components & working of Tidal Power Plant with diagram.	10	CO1	K3	PO1
9	a) Differentiate between conventional and non-conventional sources of energy with detail examples. Discuss the advantages and dis advantages of renewable energy sources.	10	CO1	K4	PO1
10	Describe the factors for site selection for solar power plant.	10	CO2	K5	PO3
11	Explain solar water heating with neat sketch. Briefly describe its components.	10	CO2	K5	PO5
12	Explain the working principle, applications, advantages and disadvantages of solar dryers with neat diagram.	10	CO2	K1	PO3

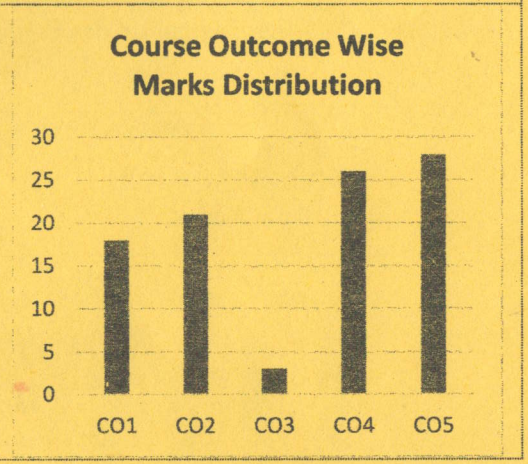
11/12/23

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

Course Outcomes	CO1	Maintain industrial energy technologies
	CO2	Maintain the Engineering & Management plants.
	CO3	Maintain the optimised working of large industries
	CO4	Maintain the optimised working of small industries
	CO5	Maintain the optimised working of Small scale industries .

GRAFICAL REPRESENTATION





ARKAJAIN University Jharkhand

END SEM EXAMINATION
School of Engineering & IT

Branch	**Mechanical Engineering**	**Program**	**Diploma**
Subject Name	**Industrial Engineering & Management**	**Semester**	**V**
		Year	**Odd Nov/Dec 2023**

Time: 3 Hour
Max. Marks : 35

- 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 01 Marks from Q1-i to Q1-x) – 10 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	Define term of plant layout?	2	CO2	KL1	PO1
ii	What are principle good plant layout	2	CO3	KL5	PO3
iii	What is the fixed position layout	2	CO3	KL1	PO1
iv	Define scheduled maintenance.	2	CO5	KL1	PO1
v	What is the two handed process chart.	2	CO5	KL1	PO1
vi	What is leadership in industry?	2	CO3	KL5	PO2
vii	What is zero defect concepts?	2	CO3	KL1	PO3
viii	Define the term productivity?	2	CO1	KL1	PO1
ix	What is the concept of ISO 9001:2008	2	CO1	KL1	PO1
x	What is single sampling plan?	2	CO1	KL1	PO1

Section B (Answer any FIVE out of SIX) – 10 Marks
(Each question 2 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Write and explain the principle of production.	5	CO3	KL2	PO3
3	What are main objective of plant layout?	5	CO3	KL2	PO2
4	Define inspection and give its objectives.	5	CO4	KL4	PO4
5	What is scientific advantage of plant layout?	5	CO2	KL4	PO1
6	Explain the function of despatching?	5	CO4	KL2	PO2
7	Write and explain the principle of production.	5	CO3	KL2	PO2

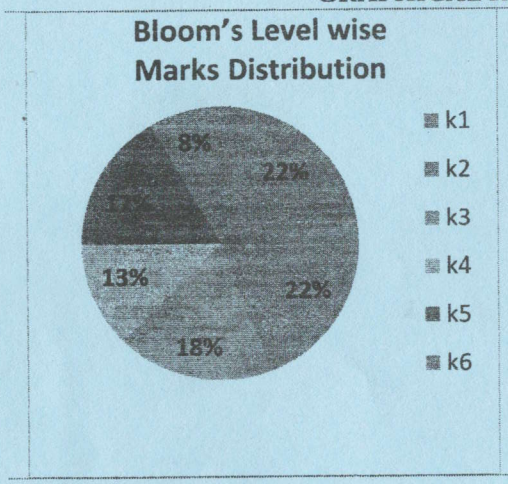
Section C (Answer any THREE out of FIVE) – 15 Marks-
(Each question Carry 5 Marks)

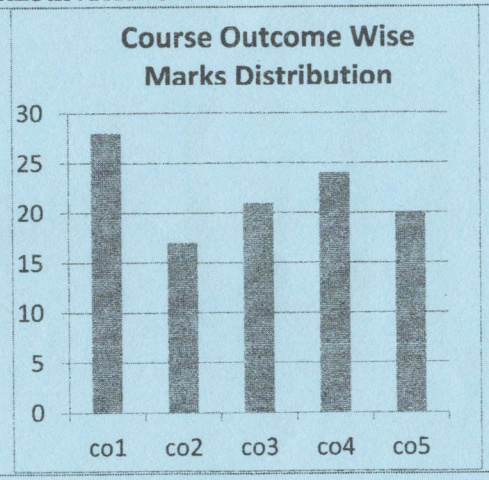
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	What are the factors that are considered for selecting a site for factory?	10	CO2	KL3	PO1
9	Write the short notes on a) Standard data b) Performance rating c) Productivity d) Fatigue allowance	10	CO1	KL2	PO1
10	Describe clearly the function of routing, scheduling and dispatching?	10	CO5	KL4	PO4
11	Explain product layout and process layout?	10	CO5	KL3	PO4
12	Explain the concept of Total quality management(TQM)	10	CO5	KL1	PO4

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

Course Outcomes	CO1	Know the Operation and control of different advanced machine tools and equipments.
	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.

GRAPHICAL REPRESENTATION





ARKAJAIN University Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	Mechanical Engineering	Program	Diploma
Subject Name	Advance Manufacturing Process	Semester	V
		Year	Odd Nov/Dec2023

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 Q1-x) – 20 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	Explain the use of Jigs and Fixture in Machining.	2	CO1	K1	PO1
ii	List out the types of Jigs used in machining.	2	CO2	K2	PO2
iii	What are the advantages of using jigs and fixture in manufacturing?	2	CO3	K1	PO3
iv	Explain the function of CNC machine	2	CO3	K2	PO3
v	What are the differences between absolute and relative coordinate system in CNC programming?	2	CO1	K1	PO1
vi	List out the name of Primary and Secondary plastic processing technology	2	CO3	K1	PO1
vii	Draw the Block diagram of PLC.	2	CO4	K1	PO2
viii	Why does Non-Traditional machining needed.	2	CO1	K4	PO1
ix	Write working principle of Abrasive Jet Machining.	2	CO1	K2	PO3
x	List out the different types of fixtures or clamps used in machining.	2	CO4	K1	PO1

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Write the advantages, limitation and application of Ultrasonic Machining.	5	CO1	K1	PO1
3	Explain any five types of jigs used in drilling with neat sketch.	5	CO5	K5	PO2
4	Explain Blow moulding processes with suitable diagram	5	CO5	K5	PO5
5	Explain Total Productive Maintenance (TPM).	5	CO1	K2	PO1
6	Explain Injection moulding processes with suitable diagram	5	CO3	K2	PO5
7	Write the comparison between traditional and Non-Traditional Machining.	5	CO2	K4	PO5

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Explain plastic processing technique with flow chart, Also Explain Injection Moulding or Blow Moulding with schematic diagram.	10	CO1	K4	PO1
9	Explain the function of any five types of Jigs & fixture with suitable diagram.	10	CO5	K5	PO3
10	Explain any one types of plastic moulding technique with suitable diagram.	10	CO3	K3	PO5
11	Explain the Basic G & M Codes used in CNC Programming.	10	CO4	K6	PO5
12	Explain working Principle of Laser Beam Machining with Suitable diagram.	10	CO4	K1	PO5

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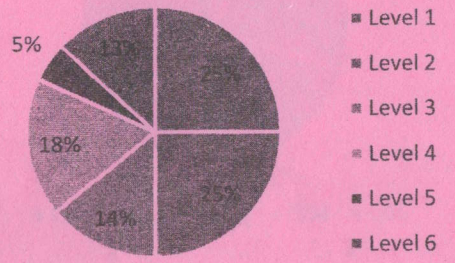
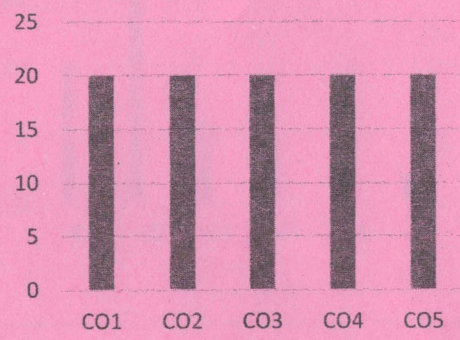
CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

Course Outcomes	CO1	Know different machine elements and mechanisms. Understand Kinematics and Dynamics of different machines and mechanisms.
	CO2	Select Suitable Drives and Mechanisms for a particular application.
	CO3	Appreciate concept of balancing and Vibration.
	CO4	Develop ability to come up with innovative ideas.
	CO5	Understand different types of cams and their motions and also draw cam profiles for various Motions

GRAFICAL REPRESENTATION





ARKAJAIN University Jharkhand

END SEM EXAMINATION
School of Engineering & IT

Branch	Mechanical Engineering	Program	Diploma
Subject Name	Theory of Machine And Mechanisms	Semester	V
		Year	Odd Nov/Dec 2023

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)
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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 Q1-x) – 20 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	Differentiate between cross belt drive and open belt drive.	2	CO1	KL1	PO2
ii	How are drives classified?	2	CO1	KL2	PO1
iii	State the types of gear & gear train?	2	CO2	KL1	PO3
iv	State the function of Flywheel?	2	CO2	KL1	PO4
v	Define Coefficient of fluctuation of speed Coefficient of fluctuation of energy	2	CO2	KL2	PO3
vi	State the function of governor in an I C Engine.	2	CO4	KL2	PO2
vii	Write the classification of followers.	2	CO3	KL3	PO4
viii	State types of brake and write the function of brake.	2	CO3	KL1	PO2
ix	State the application of disc brake.	2	CO4	KL2	PO2
x	What is the function of a dynamometer?	2	CO2	KL2	PO2

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Elaborate function of cam and follower with net sketch.	5	CO1	KL1	PO1
3	What is a machine? Differentiate between a machine and a structure.	5	CO4	KL4	PO3
4	Define flywheel and explain the function of flywheel in automobile.	5	CO1	KL2	PO1
5	Give the classification of dynamometer. State the function of it.	5	CO4	KL4	PO4
6	Explain the function and types gear train with neat sketch and write down the velocity ratio's equation.	5	CO4	KL1	PO4
7	Explain function and working of brake & dynamometer	5	CO3	KL4	PO4

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Draw the profile of a cam imparting motion to a roller follower with following details Stroke length= 42mm Roller diameter = 14mm Base circle diameter = 60mm Angle of Rise = 120° Dwell after rise = 60° Angle of return = 180° The follower rises with S.H.M and returns with uniform velocity.	10	CO1	KL2	PO1
9	Explain construction and working of any one type of dynamometer with net sketch.	10	CO1	KL1	PO4
10	Explain with sketch, working of any one type of Governor.	10	CO2	KL5	PO1
11	Drive the formula of length of open belt drive with diagram	10	CO2	KL6	PO4
12	Explain construction and working of any one type of brake with net sketch.	10	CO3	KL3	PO1

ARKAJAIN University Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	Mechanical Engineering	Program	Diploma
Subject Name	Power Plant Engenieering	Semester	V
		Year	Odd Nov/Dec2023

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**
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Knowledge Level (KL)			
	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

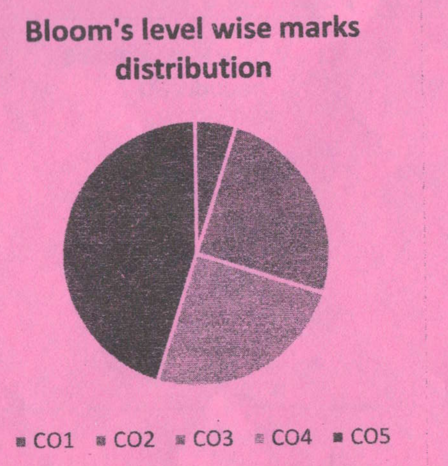
Section A (Each question Carry 02 Marks from Q1-i to Q1-xx) – 20 Marks

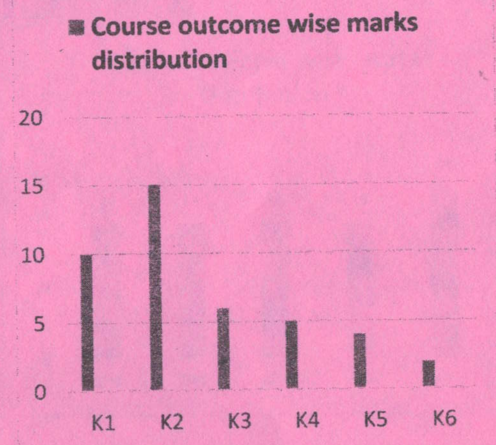
Q. N 1	QUESTIONS	Marks	CO	KL	PO
i	What is power plant? The pick load of power plant is 70mw the load of power plant with maximum demand of 40,70,60,74 are connected to power plant determine the demand factor	2	Co4	K2	PO1
ii	What are the types of power plant?	2	Co1	K2	PO3
iii	Name four conventional power plant.	2	Co3	K1	PO1
iv	What are the essential component of diesel power plant?	2	Co5	K2	PO1
v	Write the factors which are considered in selecting power plant site.	2	Co5	K2	PO1
vi	What is geo thermal power plant?	2	Co4	K1	PO2
vii	What is hydrograph?	2	Co4	K2	PO3
viii	What is combined cycle power generation?	2	Co3	K2	PO1
ix	How average load are define in power plant	2	Co4	K2	PO1
x	A consumer consume 400kwh per day at a load factor of 50% without increasing the maximum demand if the consumer increase the load factor to 80% what will be the consumption of energy in kwh.	2	Co5	K2	PO1

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

Course Outcomes	CO1	Familiarised with the present and future power scenario of India.
	CO2	Enlist vasrious 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.

GRAFICAL REPRESENTATION





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

Q.-No.	QUESTIONS	Marks	COs	KL	PO
2	Write the classification of power plant how power plant are contribute in economic growth of a country.	5	Co5	K2	PO2
3	The load on the power plant with respect to time for 24 hour are given as follow. TIME: 6-8 | 8-12 | 12-14 | 14-16 | 16-20 | 20-21 | 21-23 | 23-24 LOAD: 50 | 70 | 40 | 80 | 100 | 60 | 90 | 30 Draw the load graph and find the total energy generated and age load.	5	Co3	K2	PO4
4	What is combined power generation explain? What are the advantage of combined power generation?	5	Co4	K2	PO1
5	A power plant maximum demand 15000kw.the annual load factor is 70% and capacity of power plant is 19750kw determine the plant capacity factor.	5	Co5	K1	PO2
6	What is greenhouse effect how power plant are responsible for sustainable development of any country?	5	Co5	K2	PO2
7	Explain working of a diesel power plant. Write the component of a diesel power plant.	5	Co3	K2	PO2

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	What are the consideration to be made while selecting the suitable site for a thermal and nuclear power plant?	10	Co3	K3	PO1
9	Determine the generating cost per unit of 80MW power station with the following data: Capital cost =Rs 160x107 Annual cost of fuel = Rs 32x106 Annual wages and taxes= Rs 36x106 Interest and depreciation=10% of capital cost Annual load factor=45%	10	Co4	K3	PO1
10	Write the difference between conventional and non-conventional source of energy.	10	Co5	K2	PO4
11	the pick load in power plant is 70mw the load having maximum demand of 40,30,20,16mw are connected to the power plant the capacity of power plant is 90mw and the annual load factor is 0.50 estimate the:- (i)THE AVERAGE LOAD ON POWER PLANT (ii)THE ENERGY SUPPLY FOR YEAR	10	Co4	K3	PO4
12	Draw the Schematic diagram of diesel power plant layout	10	Co4	K3	PO1

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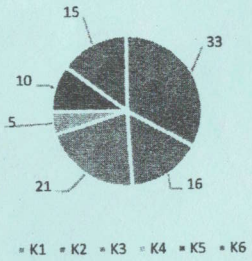
CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

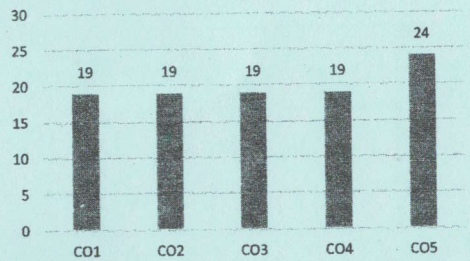
Course Outcomes	[CO1]	Identify the components of an automobile with their working
	[CO2]	Explain the concepts of cooling and lubricating systems.
	[CO3]	Identify different suspension systems and their applications.
	[CO4]	Explain the concepts of Ignition and Transmission and steering systems.
	[CO5]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

GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



Course Outcome Wise Marks Distribution



ARKAJAIN University Jharkhand

END TERM EXAMINATION
School of Engineering & IT

Branch	**Mechanical Engineering**	**Program**	**Diploma**
Subject Name	**Automobile Engineering**	**Semester**	**V**
		Year	**Odd Nov/Dec 2023**

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)**
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- **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 Q1-x) – 20 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	What is chassis? How its design is related to vehicle aerodynamics?	2	CO1	K1	PO2
ii	State the advantage of Uni-body construction over Body on frame	2	CO1	K2	PO1
iii	What is main purpose of fuel injection system in CI engine.	2	CO2	K1	PO2
iv	State the advantage of electronic ignition system	2	CO2	K2	PO3
v	What is a fluid coupling?	2	CO3	K3	PO1
vi	Explain the working of a cone clutch	2	CO3	K1	PO2
vii	Distinguish between disc brake with drum brake.	2	CO4	K3	PO2
viii	Define king pin inclination.	2	CO4	K1	PO3
ix	What are the advantages of hybrid vehicle system?	2	CO5	K2	PO2
x	What is a fuel cell?	2	CO5	K3	PO1

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Draw a simple sketch of a solid frame with front engine and rear drive. Locate major components of the engine on the frame.	5	CO1	K4	PO2
3	State the working principle of magneto coil ignition system with neat sketch.	5	CO2	K3	PO3
4	Explain the purpose and working of differential unit	5	CO3	K6	PO1
5	Explain a typical power steering system.	5	CO4	K1	PO3
6	State the advantages and disadvantage of use of renewable source of energy.	5	CO5	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	Briefly explain the different layouts of vehicle construction.	10	CO1	K5	PO1
9	Describe CRDi system in detail.	10	CO2	K6	PO3
10	Explain the gear shift mechanism of a typical gear box with neat skectch.	10	CO3	K2	PO2
11	Write short note on ABS and Traction control.	10	CO4	K3	PO2
12	Explain the construction and lay out of Hybrid Vehicles.	10	CO5	K1	PO1