

Course Code: SOE-D-EE401

O P JINDAL UNIVERSITY

Mid-Semester Examination, April-2023

Diploma 4th Semester



ELECTRICAL ENGINEERING

POWER SYSTEM & PROTECTION

Time: 2 Hrs.

Max. Marks: 50

M	CO	KL
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Section A (10 marks)

All Questions are compulsory [05 x 02 marks=10 marks]

1	a.	Explain the short notes of the superheater in the boiler.	2	1	1
	b.	What is the working of an economizer?	2	1	1
	c.	What are the types of turbines?	2	1	2
	d.	Draw the layout of the transmission and distribution line.	2	1	6
	e.	Classify different types of underground cable on the basis of voltage level.	2	1	4

Section B (16 marks)

Answer any 4 questions [04 x 04 marks=16 marks]

2	a.	Write the advantage and disadvantages of the hydropower plant.	4	1	1
	b.	What is corona and what are the various factor affecting the corona and how to reduce this effect?	4	1	1
	c.	Briefly explain the criteria needed for site selection of a thermal power plant.	4	2	3
	d.	Explain the general construction of underground cables with a neat diagram.	4	2	6
	e.	Explain the main requirement of insulating material for cable.	4	1	4

Section C (24 marks)

Answer any 3 questions [03 x 08 marks=24 marks]

3	a.	Explain with a neat diagram, the essential part of the hydropower plant.	8	1	6
	b.	Draw the complete schematic diagram of a coal-fired thermal power plant, discuss briefly each component.	8	1	6
	c.	What are the various type of line support in overhead lines explain in detail with a diagram?.	8	1	6
	d.	What are the different types of distribution systems? Explain with the help of a neat sketch.	8	2	6
	e.	Write a short note on the different types of insulators used for overhead line and their application. show with the help of a neat sketch .	8	2	6



Course Code: SOE-D-EE402

OP JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 4th Semester

ELECTRICAL ENGINEERING

ELECTRICAL MACHINES II [01DE060]



Time: 2 Hrs.

Note:

Max. Marks: 50

Section A (20 marks)

M CO KL

Answer any 4 questions [05 x 04 marks=20 marks]

1	a.	Explain Faradays law of electromagnetic induction.	5	CO 1	KL 2
	b.	Define pitch factor and distribution factor.	5	CO 2	KL 2
	c.	Why armature winding is preferred to be placed on stator?	5	CO 1	KL 2
	d.	What is electromagnetic torque and how it is opposite to prime move torque. Explain?	5	CO 1	KL 2
	e.	Draw the relationship between voltage and current using phasor diagram for purely resistive, inductive, and capacitive load.	5	CO 1	KL 2

Section B (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	Derive expression for emf generation in a synchronous generator.	10	CO 2	KL 3
	b.	Describe the construction of alternator.	10	CO 2	KL 3
	c.	Describe the construction of three phase induction machine.	10	CO 3	KL 3
	d.	A 3-phase, 16-pole synchronous generator has a star-connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.04 Wb (sinusoidally distributed) and the speed is 375 rpm. Find the frequency and phase and line induced emf's. The total turns/phase may be assumed to be series connected.	10	CO 2	KL 3

Course Code: SOEDEE403

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma, 4th Semester

ELECTRICAL ENGINEERING

POWER ELECTRONICS [01DE060]



Time: 2 Hrs.

Max. Marks: 50

Note:

M CO KL

Unit-I (20 marks)

Answer any 4 questions [05 x 04 marks=20 marks]

1	a.	Write short notes on gate characteristic of SCR?	5	1	1
	b.	Explain the type of protection for SCR?	5	1	2
	c.	Define Thyristor and its applications. And also discuss its merits and demerits?	5	1	1
	d.	Discuss the merits and demerits of Power Electronics Devices?	5	1	1
	e.	Explain the V-I characteristic of SCR with suitable circuit diagram?	5	1	2

Unit-II (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	Discuss the classification, application and function of Phase controlled rectifier?	10	2	1
	b.	Explain the working principle of Full wave mid-point phase controlled rectifier with R-load with necessary circuit diagram and waveform?	10	2	2
	c.	Explain the working principle of half wave phase controlled rectifier with R-load with necessary circuit diagram and waveform?	10	2	2
	d.	Explain the working principle of Full wave diode bridge rectifier with R-load with necessary circuit diagram and waveform?	10	2	2
	e.	Explain the working principle of Full wave Phase controlled bridge rectifier with R-load with necessary circuit diagram and waveform?	10	2	2

Course Code: 01DE040

O P JINDAL UNIVERSITY**Mid Semester Examination, April-2023****Diploma - 4th Semester****Mechanical Engineering****Metrology and Instrumentation [Program code: SOE-D-ME403]****Time: 2 Hrs.****Max. Marks: 50**

Note:

M CO KL**Section A (10 marks)**

All Questions are compulsory [05 x 02 marks=10 marks]

1	a.	Define Threshold ?	2	CO4	I
	b.	Define Hysteresis effects ?	2	CO4	I
	c.	Define Range/span ?	2	CO4	I
	d.	Write short notes on Abbe's principle with diagram ?	2	CO1	I
	e.	Define Surface plate with diagram ?	2	CO1	I

Section B (16 marks)

Answer any 4 questions [04 x 04 marks=16 marks]

2	a.	Difference between Accuracy and Precision ?	4	CO1	I
	b.	Define error with neat sketch and also explain various types of error ?	4	CO1	I
	c.	Difference Between Systematic or Random Error ?	4	CO2	II
	d.	Difference between mechanical end Pneumatic Comparators ?	4	CO2	III
	e.	Build up the following dimension [29.758 or 46.635] with minimum number of slip gauge with set of Slip gauge M87	4	CO3	III
	Normal Set (M-87)				
Range (mm)	Steps	Pieces			
1.001 to 1.009	0.001	9			
1.01 to 1.49	0.01	49			
0.5 to 9.5	0.5	19			
10 to 90	10	9			
1.005	.	1			

Section C (24 marks)

Answer any 3 questions [03 x 08 marks=24 marks]

	a.	Explain working principle of Vernier calipers with neat sketch ?	8	CO1	II
	b.	Define following Zero error, positive error and negative error in Vernier calipers with diagram? and What are the Source of error ?	8	CO1	II
	c.	Explain working principle of Sine bar with neat sketch ?	8	CO2	II
3	d.	Define and Explain working principle Johansson "Mikrokator" is a mechanical comparator and Advantages and disadvantage of mechanical comparator ?	8	CO2	III
	e.	Define and Explain working principle Pneumatic Comparators and Advantages and disadvantage?	8	CO3	III

Course Code: 01DE040

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 4th Semester

Mechanical Engineering

Manufacturing Processes-II [SOE-D-ME401]

Time: 2 Hrs.

Max. Marks: 50



Note:

M CO KL

Unit-I (10 marks)

All Questions are compulsory [05 x 02 marks=10 marks]

1	a.	Define the term "milling machine".	2		
	b.	Define "CNC lathe".	2		
	c.	What is material removal rate (MRR)?	2		
	d.	What do you mean by part programming?	2		
	e.	What is machining time?	2		

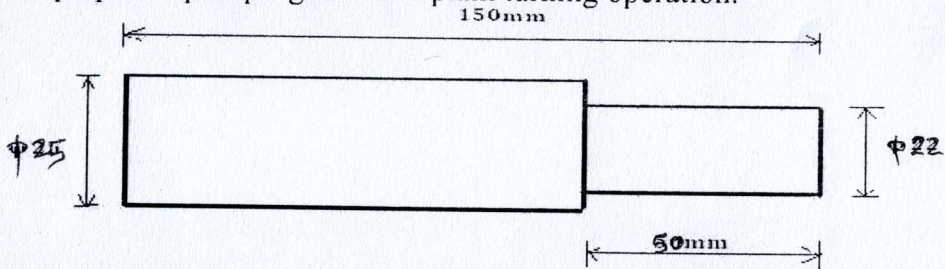
Unit-II (16 marks)

Answer any 4 questions [04 x 04 marks=16 marks]

2	a.	What is G & M codes? Write the uses of G and M codes.	4		
	b.	What is automatic tool changer and tool magazine? Explain it	4		
	c.	Give five names of work holding devices of a mill.	4		
	d.	What is dividing head? Classify it.	4		
	e.	What is Computer Assisted Part Programming? Explain it.	4		

Unit-III (24 marks)

Answer any 3 questions [03 x 08 marks=24 marks]

3	a.	Explain the various parts of horizontal milling machine with neat sketch.	8		
	b.	To prepare a part program for a plain turning operation. 	8		
	c.	Describe the following milling operations with neat sketch: (a) Slab milling (b) End milling (c) Face milling (d) T-slot milling	8		
	d.	With neat sketch explain briefly the upmilling machine and downmilling machine.	8		
	e.	Write the function of following G and M codes: (a) G00 (b) G01 (c) G02 (c) G03 and (a) M00 (b) M01 (c) M02 (d) M03	8		

1. The first part of the document is a letter from the Secretary of the State to the Governor, dated 18th March 1871. It contains a report on the state of the country and the progress of the various departments of the Government.


2. The second part of the document is a report on the state of the country and the progress of the various departments of the Government, dated 18th March 1871. It contains a detailed account of the various departments of the Government and the progress of their work.

3. The third part of the document is a report on the state of the country and the progress of the various departments of the Government, dated 18th March 1871. It contains a detailed account of the various departments of the Government and the progress of their work.

4. The fourth part of the document is a report on the state of the country and the progress of the various departments of the Government, dated 18th March 1871. It contains a detailed account of the various departments of the Government and the progress of their work.

5. The fifth part of the document is a report on the state of the country and the progress of the various departments of the Government, dated 18th March 1871. It contains a detailed account of the various departments of the Government and the progress of their work.

6. The sixth part of the document is a report on the state of the country and the progress of the various departments of the Government, dated 18th March 1871. It contains a detailed account of the various departments of the Government and the progress of their work.

		Course Code:			
O P JINDAL UNIVERSITY		 OPJU <small>UNIVERSITY OF SCIENCE TECHNOLOGY AND MANAGEMENT</small>			
Mid Semester Examination, April-2023					
Diploma 4 th Semester					
MECHANICAL ENGINEERING					
THEORY OF MACHINE [SOE-D-ME402]					
Time: 2 Hrs.		Max. Marks: 50			
Note: Attempt All questions are compulsory.					
		M	CO	KL	
Section A (20 marks)					
Answer any 4 questions [05 x 04 marks=20 marks]					
1	a.	Define Kinematic Link and its types with example?	4		
	b.	Differentiate between a Machine and a structure ?	4		
	c.	Explain Types of Kinematic Chain With sketch.	4		
	d.	List different types of Kinematic Pair ?	4		
	e.	What are the working principle of a Mechanical Brake?	4		
Section B (30 marks)					
Answer any 3 questions [03 x 10 marks=30 marks]					
2	a.	With a neat sketch Explain the Multi-plate clutch, its Functions, and their working Mechanism?	10		
	b.	PQRS is a four-bar chain with link PS fixed. The lengths of the link are PQ=62.5mm, QR=175mm, RS=112.5mm & PS=200mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity & acceleration diagram when angle QPS=60° & Q and R lie on the same side of PS. Find the angular velocity & angular acceleration of the link QR & PS.	10		
	c.	What are the functions of a dynamometer? In a laboratory experiment the following data were recorded with a rope brake. Diameter of the flywheel 1.2 m, Diameter of rope 12.5 mm, speed of Engine 200 rpm, Dead weight on the brake 600N, Spring balance reading 150N. Calculate the brake power of the Engine.	10		
	d.	Draw the profile of a cam operating a knife-edge follower from the following data: A follower moves outward through a distance of 40 mm during 120° A follower to dwell for the next 60° A follower to return to its initial position during 90° A follower to dwell for the remaining 90° of cam rotation.	10		

UNIVERSITY OF TORONTO

Faculty of Engineering

Department of Mechanical Engineering

MECHANICAL ENGINEERING
THEORY OF MACHINES (MECH 404)

May 1998

Time Allowed: 120 minutes

MECH 404

Section A (30 marks)

Answer any 4 questions (15 marks each)

1. Define the term "mechanical advantage" and explain its significance in the design of a mechanism.

2. Explain the concept of "instantaneous center" and how it is used to determine the velocity of a point on a rigid body.

3. Describe the function of a flywheel in a reciprocating engine and how its moment of inertia affects its performance.

4. Illustrate the working principle of a mechanical linkage and provide a schematic diagram.

Section B (30 marks)

Answer any 2 questions (15 marks each)

1. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the angular velocity of the output link.

2. A cam-follower mechanism is shown in the figure below. The cam is rotating with an angular velocity of ω_c . Determine the velocity of the follower.

3. A slider block is constrained to move along a horizontal guide. The block is connected to a rotating link. Determine the acceleration of the block.

4. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

5. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

6. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

7. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

8. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

9. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

10. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

11. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

12. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

13. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

14. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

15. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

16. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

17. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

18. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

19. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

20. A mechanism is shown in the figure below. The input link is rotating with an angular velocity of ω_2 . Determine the velocity of the slider block.

Program Code: 01DE05

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 4th Semester



METALLURGICAL ENGINEERING

Iron and Steel Making (Course Code: SOE-D-MT401)

Time: 2 Hrs.

Max. Marks: 50

Note: Giving proper explanations with a labelled diagram wherever required will lead to good marks.

M	CO	KL
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Section A (20 marks)

Answer any 4 questions [05 x 04 marks=20 marks]

1	a.	What are the basic raw materials required for pig iron production in a BF?	04	—	1
	b.	What is slag? Write the reactions involved in slag forming?	04	—	2
	c.	Explain different fluxes for iron making? Give their chemical compositions.	04	—	1
	d.	What are the functions of coke in iron making?	04	—	1
	e.	What is sintering and pelletization?	04	—	1

Section B (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	Draw and explain the schematic of iron ore beneficiation process.	10	—	2
	b.	Write brief about history of iron making in India. Explain about the pig iron making process at JSP Raigarh. Draw the layout.	10	—	3
	c.	What are the various reactions involved inside the blast furnace during the production of pig iron? Explain the temperature profile of a BF.	10	—	2
	d.	What are the alternative routes of iron making? Explain anyone.	10	—	2

Course Code: SOE-D-MT403

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 4th Semester**METALLURGICAL ENGINEERING****POWDER METALLURGY | 01UG050|****Time: 2 Hrs.****Max. Marks: 50**

Note: Answer ALL questions from UNIT-I and answer any FOUR questions from UNIT-II and also answer any THREE questions from UNIT-III. Mark your answers with VALID QUESTION NUMBER.

M

CO

KL

Unit-I (10 marks)

All Questions are compulsory [05 x 02 marks = 10 marks]

1	a.	Explain the meaning of 'blending of powders' and its advantages.	2		
	b.	Provide two advantages of powder metallurgy process.	2		
	c.	Mention two applications of powder metallurgy process.	2		
	d.	What are the steps to be followed in powder metallurgy?	2		
	e.	Provide two examples of powder lubricants.	2		

Unit-II (16 marks)

Answer any 4 questions [04 x 04 marks = 16 marks]

2	a.	Explain some limitations of powder metallurgy.	4		
	b.	How do you differ powder metallurgy from casting process?	4		
	c.	Summarize the objectives of powder milling process.	4		
	d.	How do mechanical forces interfere in powder milling process?	4		
	e.	State two milling equipment and discuss their functions in grinding/milling.	4		

Unit-III (24 marks)

Answer any 3 questions [03 x 08 marks = 24 marks]

3	a.	With a neat flowsheet discuss the powder preparation method.	8		
	b.	Identify various classified ceramic materials.	8		
	c.	Why do heat treatment is generally carried out before mixing or blending of metal powders	8		
	d.	Classify different powder compaction techniques and discuss any two of them.	8		
	e.	State the following terms: Green density, Green strength, Apparent density, Tap density.	8		

Course Code: SOE-D-MT402

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 4th Semester



METALLURGICAL AND MATERIALS ENGINEERING

Foundry Technology [01DE050]

Time: 2 Hrs.

Max. Marks: 50

Note:

Section A (20 marks)

Answer any 4 questions [05 x 04 marks=20 marks]

1	a.	Discuss in detail the shrinkage allowance.
	b.	Why the molding sand should contain 2- 5 % moisture? Discuss the method to measure the moisture content in sand.
	c.	Determine the permeability of a AFS standard sand specimen of 5.08 cm diameter and 5.08 cm in height. The air drum was raised to take 2000 cm ³ of air into it. The whole air was then allowed to escape through the sand specimen at a pressure of 10 g/cm ³ in a span of 15 seconds.
	d.	How draft allowance is different from shake allowance?
	e.	Write the applications of the Solid pattern, Two- piece split pattern, Sweep pattern, Segmental pattern, Skeleton pattern

Section B (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	Determine the dimension of the pattern for casting having length, width and height of 150 m, 100m and 50 m respectively. Shrinkage allowance is 15 mm/m and machining allowance on all surfaces is 3 mm and 1.5 ° draft allowance for external dimensions respectively.
	b.	A steel casting has to be produced having length, width and height of 60 mm, 90 mm and 30 mm. The mold for this job is made from a wooden pattern. Determine the dimensions of the wooden pattern. Assume machining allowance of 5 mm on each side, shrinkage allowance of 3 % and taper allowance of 2 %.
	c.	Why grey cast iron expands during solidification. A grey cast iron block of dimensions 300 X 150 X 25 mm is produced by sand casting process. Pattern making allowance is 2 %. What is the ratio of volume of pattern to casting?
	d.	A cubical casting of 50 mm size undergoes volume solidification of 5 % and volume solid contraction of 2 %. There is no riser used and pattern making allowance is not considered. What is the final size of the casting.

Course Code: SOE-D-EE602

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

DIPLOMA- 6th Semester



ELECTRICAL ENGINEERING

RENEWABLE ENERGY SOURCES AND SYSTEMS

Time: 2 Hrs.

Max. Marks: 50

Note:

M	CO	KL
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Unit-I (20 marks)

Answer any 4 questions [05 x 04 marks=20 marks]

			M	CO	KL
1	a.	What is the importance of renewable energy sources?	5	1	2
	b.	Brief the impact on the atmosphere with conventional sources.	5	1	2
	c.	What are the various consequences of energy consumption?	5	1	3
	d.	Define solar radiation and discuss briefly.	5	2	2
	e.	what is the basic operation principle of solar flat plate collector	5	2	2

Unit-II (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	Comparison between renewable and non-renewable energy sources	10	1	2
	b.	Classification of various energy sources	10	1	3
	c.	Explain various solar collectors.	10	2	4
	d.	Elaborate the photovoltaic systems working and operation.	10	2	4
	e.	Explore various parameters involved in PV array design.	10	2	4

03/04/23
12

Course Code: SOE-D-EE601

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

DIPLOMA, 6th Semester

ELECTRICAL ENGINEERING

ICMT&REE [01DE060]



Time: 2 Hrs.

Max. Marks: 50

M	CO	KL
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Section A (20 marks)

Answer any 4 questions [05 x 04 marks=20 marks]

1	a.	State the definition of terminology used in safety of the following (1) Accident (2) (3) Risk (4) sign Board	4	1	
	b.	Why Testing and commissioning is required for also give some reason on point form.	4	3	
	c.	What "I.E. Act" is about? How many no. of Acts. in Indian Electricity Act? give some examples of Acts / Rules.	4	2	
	d.	What is touch potential and step potential?	4	1	
	e.	What is the difference between type tests, routine tests and commissioning tests?	4	2	

Section B (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	What is "Earthing" What is purpose of Earthing	10	1	
	b.	What are the types and Scope of Maintenance?	10	3	
	c.	What are the principles of safety management? And For sub-station operator what are the Do's and don'ts?	10	2	
	d.	What do you mean by electric shock? Discus the any method of providing artificial respiration to a person who got electric shock	10	1	

Course Code: 01DE040

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 6th Semester

Mechanical Engineering

Energy Conversion-II [SOE-D-ME601]



Time: 2 Hrs.

Max. Marks: 50

Note:

M CO KL

Unit-I (10 marks)

All Questions are compulsory [05 x 02 marks=10 marks]

1	a.	Define the term "energy sources".	2		
	b.	What is "solar energy"?	2		
	c.	What do you mean "fossil fuels"?	2		
	d.	What is Hour angle. Define it	2		
	e.	Define the term "energy storage"	2		

Unit-II (16 marks)

Answer any 4 questions [04 x 04 marks=16 marks]

2	a.	Differentiate in-between conventional and non-conventional energy sources.	4		
	b.	Write short notes on energy distribution between developed and developing country.	4		
	c.	Describe in detail a solar flat plate collector with neat sketch.	4		
	d.	What is direct, diffuse and total radiation? Define it.	4		
	e.	What are renewable energy sources? Classify and explain it.	4		

Unit-III (24 marks)

Answer any 3 questions [03 x 08 marks=24 marks]

3	a.	Write short notes on Indian energy scenario.	8		
	b.	With neat sketch explain the pumped hydroelectric storage (PHES) system.	8		
	c.	Define the term conventional non-conventional energy sources? List the various conventional and non-conventional energy sources.	8		
	d.	Explain solar photovoltaic system with neat sketch.	8		
	e.	Explain the photovoltaic cell with schematic diagram.	8		

Course Code: B20CSOE02

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 6th Semester

MECHANICAL ENGINEERING

Computer Aided Design & Manufacturing [Program code: SOE-D-ME602]

Time: 2 Hrs.

Max. Marks: 50



Note:

M CO KL

Section A (10 marks)

All Questions are compulsory [05 x 02 marks=10 marks]

1	a.	Define CAD and what are the CAD Software ?	2	CO1	I
	b.	Advantage and disadvantages of CAD ?	2	CO1	I
	c.	Define Types of Cathode Ray Tube (CRT) ?	2	CO1	I
	d.	Define Parametric Modeling and its Advantages ?	2	CO2	I
	e.	What are Constraint of Geometric Modelling ?	2	CO2	I

Section B (16 marks)

Answer any 4 questions [04 x 04 marks=16 marks]

2	a.	Difference between Computer aided drafting and Design ?	4	CO1	I
	b.	Differentiate between Random and Raster Scan Display ?	4	CO1	I
	c.	What are the Benefits of product lifecycle management (MLM) ?	4	CO1	II
	d.	Describe various types of geometric models with neat sketch ?	4	CO2	II
	e.	Describe various type Translation tool in 2D with diagram .	4	CO2	II

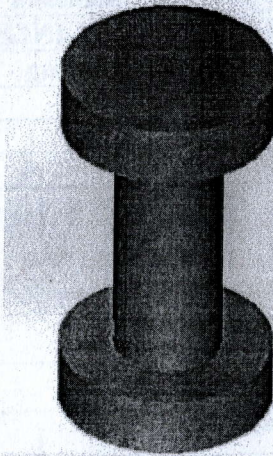
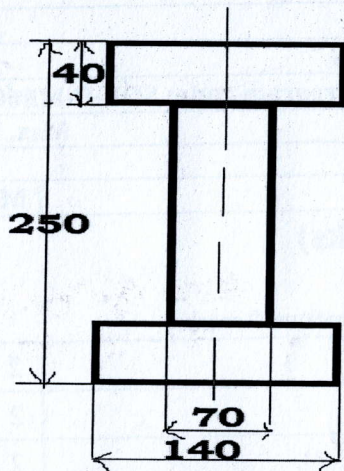
Section C (24 marks)

Answer any 3 questions [03 x 08 marks=24 marks]

3	a.	Write short notes on CRT Monitor and explain working principle with suitable diagram?	8	CO1	II
	b.	Write short on Vector Scan Display and explain working principle with suitable diagram with advantages and disadvantages?	8	CO1	II
	c.	Write short on Raster Scan Display and explain working principle with suitable diagram with advantages and disadvantages?	8	CO1	II

Describe the process to Create the below geometric models using any of the modeling package available with extrude and revolve both command.

d.



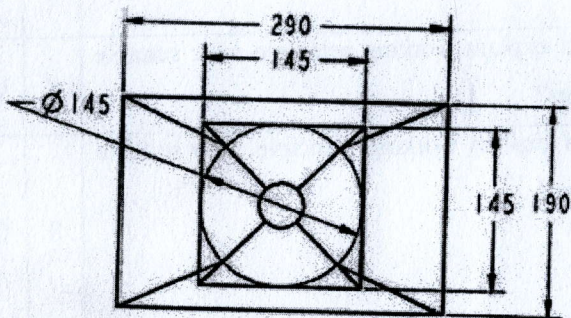
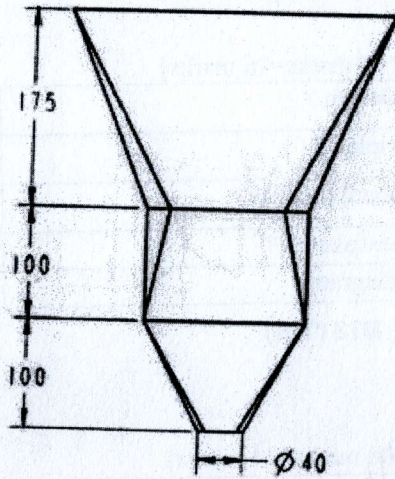
8

CO2

III

Describe the process to Create the below geometric models using any of the modeling package available.

e.



8

CO2

III

Course Code:

O P JINDAL UNIVERSITY

Mid Semester Examination, April-2023

Diploma 6th Semester



MECHANICAL ENGINEERING

Internal Combustion Engine and Automobile Engineering [SOE-D-ME 603 (3)]

Time: 2 Hrs.

Max. Marks: 50

Note: Attempt all questions are compulsory.

M CO KL

Section A (20 marks)

Answer any 4 questions [05 x 04 marks=20 marks]

1	a.	Draw the Layout of the chassis and frames. What are the Functions of chassis?	4		
	b.	Explain in short Petrol Engine, Diesel Engine, Gas Turbine, Solar Vehicles, Electric Vehicles?	4		
	c.	Draw the port timing diagram on 4-stroke and 2-stroke engine?	4		
	d.	Write in short on:- 1) Caster 2) Camber 3) Toe 4) Axle	4		
	e.	Explain about Steering mechanism and Function of the steering system.	4		

Section B (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	What are the major components of Automobile and their Functions?	10		
	b.	What are the Function & need of differential? Explain with neat sketch?	10		
	c.	Define Engines? List of Engine components and working with suitable diagram?	10		
	d.	Explain braking system and types of brakes with suitable diagram.	10		

Program code: 01DE050

Course Code: SOE-D-MT601

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Mid Semester Examination, April-2023

DIPLOMA 6th Semester



METALLURGICAL ENGINEERING

ALLOYS, THEIR PROPERTIES AND SELECTION

Time: 2 Hrs.

Max. Marks: 50

Note:

M CO KL

Section-A (20 marks)


Answer any 4 questions [04 x 05 marks=20 marks]

			M	CO	KL
1	a.	What do you understand by Red hardness? How is it achieved in high speed steels?	5		
	b.	Define alloy steels? Why alloying elements are added to steel?	5		
	c.	What is ball bearing steel? Explain its heat treatment process.	5		
	d.	What is secondary hardening?	5		
	e.	Write short note on Temper brittleness.	5		

Section-B (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

			M	CO	KL
2	a.	Define Steel. Classify the steels according to i) Amount of carbon ii) Amount of deoxidation iii) Depth of hardening iv) Basis of use/application	10		
	b.	Explain the properties and uses of the following alloying elements: i) Silicon ii) Manganese iii) Chromium iv) Nickel v) Tungsten	10		
	c.	Write short notes on: i) Free Cutting steels ii) High Strength Low Alloy steels	10		
	d.	Distinguish between Austenite stabilizers and Ferrite stabilizers.	10		
	e.	Explain the effect of alloying elements on i) position of S curve ii) Shape of S curve	10		

				Course Code:		
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Mid-Semester Examination, April-2023						
Diploma. 6th Semester						
METALLURGICAL ENGINEERING						
Corrosion and Protection Methods [SOE-D-MT602]						
Time: 2 Hrs.				Max.		
Marks: 50						
Note:						
				M	CO	KL
Section A (20 marks)						
Answer any 4 questions [04 x 05 marks=20 marks]						
1	a.	What is corrosion? Discuss the corrosion of zinc metal in the hydrochloric acid solution.	5	-	-	
	b.	Which metal will degrade faster in terms of corrosion if two metals, such as Au (Gold) and Iron (Fe), are exposed to the same environment?	5	-	-	
	c.	Explain the cost of corrosion in the context of Indian GDP.	5	-	-	
	d.	What is the galvanic series? Explain briefly.	5	-	-	
	e.	Describe cathodic reactions in metallic materials.	5	-	-	
Section B (30 marks)						
Answer any 3 questions [03 x 10 marks=30 marks]						
2	a.	Explain real-life examples of corrosion problems in the steel industry.	10			
	b.	Explain how corrosion affects the mechanical properties of metallic samples. Also discuss with suitable examples.	10	-	-	
	c.	What is underground corrosion? Explain their influences on environments with a schematic diagram.	10	-	-	
	d.	Discuss the reactivity of metals/alloys (at least 8) and a way to calculate the corrosion rate.	10	-	-	



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DEPARTMENT OF MECHANICAL ENGINEERING
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MECH 601

Question A (10 marks)

Answer any 4 questions (4 x 10 marks)

1. What is the difference between the concepts of stress and strain? Illustrate with a diagram.
2. Define the term 'modulus of elasticity' and state its units.
3. Explain the concept of Poisson's ratio and its significance.
4. What is the difference between ductile and brittle materials?
5. Describe the various types of stress-strain curves.

Question B (10 marks)

Answer any 4 questions (4 x 10 marks)

1. Explain the concept of shear stress and shear strain. Illustrate with a diagram.
2. Define the term 'shear modulus' and state its units.
3. Explain the concept of volumetric strain and its significance.
4. What is the difference between tensile and compressive stresses?
5. Describe the various types of failure modes in materials.

Course Code: SOE-D-MT303 (1)

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Mid Semester Examination, April-2023

Diploma 6th Semester

METALLURGICAL ENGINEERING

ENERGY AND ENVIRONMENT CONTROL



Time: 2 Hrs.

Max. Marks: 50

Note:

M CO KL

Unit-I (20 marks)

Answer any 4 questions [05 x 04 marks=20 marks]

1	a.	List the raw materials that can be used for generating heat in a thermal power plant? Explain working of a gas turbine?	4	1	1
	b.	What are the raw materials required for generating electricity in a nuclear power plant?	4	1	2
	c.	List 4 ways by which one can generate electricity?	4	2	5
	d.	What are the advantages and disadvantages of nuclear power plant?	4	4	4
	e.	Explain the impact of installing a power plant on the environment?	4	3	6

Unit-II (30 marks)

Answer any 3 questions [03 x 10 marks=30 marks]

2	a.	What are the renewable sources of generating electricity? Explain any one of them in detail.	10	1	1
	b.	What are the advantages and limitations of solar energy?	10	1	2
	c.	What are the requirements of installing a windmill for generating electricity?	10	3	5
	d.	Explain the working of a fuel cell? What are the raw materials required in the fuel cell? What are the environmental impact of mining materials used in the fuel cell?	10	4	4, 6
	e.	What is biogas and how is it generated? Explain ways of utilizing waste in form of biomass and biogas in generating electricity?	10	2	2, 5

