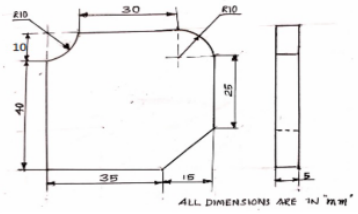
S6 - MECHANICAL QUESTION BANK 2023

Questions compiled by

DEPARTMENT OF MECHANICAL ENGINEERING

VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY TECHNICAL CAMPUS, KILIMANOOR, THIRUVANATHAPURAM

CODE: MET306	COURSE NAME: ADVANCED MANUFACTURING ENGINEERING		Credit:
Q.No	**Module I**	**Month & Year**	**Marks**
1	Explain Powder metallurgy method in production and the steps involved in it with figures.		
2	What are the advantages of HVF methods over conventional method of forming?		
3	What are the different methods of atomization for making metal powders in Powder metallurgy?		
4	Differentiate the impregnation and infiltration process in Powder metallurgy		
5	With neat sketches explain the principal methods used to produce metallic powders in powder metallurgy		
6	Explain the properties of cutting fluids		
7	Differentiate betwween orthogonal and oblique cutting		
8	Differentiate between Cold isostatic pressing and Hot Isoststic pressing		
9	What is the use of chip breakers in metal cutting process		
10	Explain Sintering		
11	Explain atomization process and classify it		
Q.No	**Module II**	**Month & Year**	
1	What are the different word address formats used in part programming?		**Marks**
2	What is meant by interpolation in NC systems? Explain different types of interpolations.		
3	Write any Five preparatory function code in manual part programming and its explanation		
4	Write any two methods of specifying a line in an APT language.		
5	What is DDA? Explain its functions and importance in manufacturing.		
6	 Write the part programming for the given specimen		
7	Write a PLC ladder logic diagram to get continuous reciprocating movement of a punch, after designing the system using two limit switches, two motors and other necessary devices. Draw input and output diagrams also.		
8	Mention the purpose of miscellaneous functions in part programming. Write any 2 M – codes with their applications.		
Q.No	**Module III**	**Month & Year**	
1	What are the functions of dielectric fluid and electrode in EDM? Write the desirable properties of dielectric materia		**Marks**
2	Explain the working of Electro Chemical Machining with a neat sketch and example.		
3	Explain the working of AWJM with a neat sketch		
4	Compare the advantages and limitations of LBM and EBM		
5	What are the process parameters in Abrasive Water Jet Machining?		
6	Write the applications of Wire Cut Electro Discharge Machining.		
7	What are the process parameters in Abrasive Water Jet Machining?		
8	What are the characteristics of Electro Discharge Machining (EDM)		
9	Explain Ultra Sonic Machining with a neat figure		
10	How the amplitude and frequency of vibration effects on material removal rate in Ultra Sonic Machining.		
11	Explain the mechanism of material removal in Plasma arc machining		
12	Explain solid state Laser Beam Machining Process with neat figure		
13	Describe advantages and limitations of Ion beam machining.		
14	Describe the mechanism of material removal in Ion beam machining		
Q.No	**Module IV**	**Month & Year**	
1	Explain the two Techniques in Explosive forming process.		**Marks**
2	Explain the Electro hydraulic forming process.		

3	What are the advantages of HVF methods over conventional method of forming?		
4	Explain the types of elastic body waves		
5	Explain in detail about electro magnetic forming		
6	Explain the effect of high speed on stress strain relationship of mild steel and aluminium with graphs		
7	Explain different types of explosive forming techniques with sketch		
8	Differentiate P Wave and S wave in High Velocity Forming		
Q.No	**Module V**	**Month & Year**	
1	What is Laminated Object Manufacturing? Explain the process with sketches		**Marks**
2	What is LIGA process? Explain it with neat sketches		
3	With a neat sketch explain Diamond turn machining process.		
4	With a neat sketch explain Selective Laser Sintering.		
5	Explain the working of laser engineered net shaping with sketch.		
6	Explain magnetic float polishing with sketch. Write its advantages and applications		
7	Name various material addition processes. Explain any One type with sketch		
8	Write any six material addition process in Additive Manufacturing		

CODE: MET 372	COURSE NAME: ADVANCED METAL JOINING TECHNIQUES		Credit:
Q.No	**Module I**	**Month & Year**	**Marks**
1	Explain the working principle of Electron Beam Welding with neat diagram	June 2022	10
2	Write four applications of Electron Beam Welding	June 2022	4
3	Explain the process variables and characteristics of Laser Beam Welding	June 2022	10
4	Write a short note on weld joint design of Laser Beam Welding	June 2022	4
5	What are the safety measures associated with Laser Beam Welding?	September 2020	4
6	Explain the different process parameters affecting Laser Beam Welding	September 2020	4
7	What are the different types of lasers used in LBW?	September 2020	2
8	What are the classifications of Electron Beam gun?	September 2020	3
Q.No	**Module II**	**Month & Year**	**Marks**
1	Explain the cold pressure welding process	June 2022	8
2	Explain any two welding parameters in diffusion welding	June 2022	6
3	Explain the working of adhesive welding with neat diagram	June 2022	10
4	Write any four applications of adhesive welding	June 2022	4
5	Explain the different components involved in Explosive welding process?	September 2020	6
6	Explain the Diffusion welding process with neat sketches	September 2020	6
7	What are the different materials that can be joined by Diffusion welding process?	September 2020	2
8	What is the role of dies in Cold Pressure welding?	September 2020	4
9	List the advantages and disadvantages of Cold Pressure welding	September 2020	5
10	Explain the major Adhesive bonding theories.	September 2020	5
Q.No	**Module III**	**Month & Year**	**Marks**
1	Explain the principle of operation of explosive welding with neat sketch	June 2022	10
2	Write two advantages and two limitations of explosive welding	June 2022	4
3	Explain the metal flow phenomena in friction stir welding	June 2022	8
4	What are the different stages in friction welding	June 2022	6
5	Explain the different components involved in Explosive welding process?	September 2020	5
6	Explain the different tests performed to assess the quality of weld in Explosive welding?	September 2020	4
7	List any two applications of Friction welding.	September 2020	2
8	Discuss the process variants of Friction Resistance welding	September 2020	6
9	What are the advantages and disadvantages of Friction welding?	September 2020	6
Q.No	**Module IV**	**Month & Year**	**Marks**
1	Explain the process variables and equipment in ultrasonic welding	June 2022	8
2	Write six applications of ultrasonic welding	June 2022	6
3	Explain the working of brazing operation	June 2022	10
4	Write four applications of brazing operation	June 2022	4

5	With the help of neat diagram, explain Ultrasonic welding process.	September 2020	6
6	Explain Vacuum brazing process with the help of neat sketch	September 2020	6
7	What are the advantages and disadvantages of Vacuum brazing?	September 2020	4
Q.No	**Module V**	**Month & Year**	**Marks**
1	Explain the principle of operation of MIAB	June 2022	10
2	Write two advantages and two limitations of plasma arc welding	June 2022	4
3	Explain the working principle of wet under water welding	June 2022	8
4	Draw neat diagrams of transferred arc and non-transferred plasma arc welding	June 2022	6
5	List the disadvantages and risk of Underwater welding.	September 2020	5
6	Explain the process of dry and wet underwater welding	September 2020	5
7	Explain the principle of operation of Needle Arc Micro Plasma welding with the help of neat diagram.	September 2020	5

CODE: HUT 310	COURSE NAME: MANAGEMENT FOR ENGINEERS		Credit:
Q.No	**Module I**	**Month & Year**	**Marks**
1	Explain Management as an 'Art' and 'Profession'	June 2022	
2	Explain the different types of roles of a manager		
3	What are the different levels of management	June 2022	
4	Explain the different theories of management		
5	Explain the different functions and objectives of management	June 2022	
6	What are the qualities and responsibilities of a manager		
7	Explain system approach and Contingency approach of modern organization theory	June 2022	
Q.No	**Module II**	**Month & Year**	**Marks**
1	Explain the features, steps and types of a planning process	June 2022	
2	Explain the terms mission, objective, goal, policies, and organizing with respect to management		
3	Explain in detail about Principles of Organization		
4	Explain the different types of organization structures	June 2022	
5	Explain the term leadership. What are its different types and functions?		
6	What is Maslow's Need hierarchy theory?		
7	What are managerial grid styles?		
Q.No	**Module III**	**Month & Year**	**Marks**
1	What is productivity? What are the factors affecting productivity?		
2	Problems on types of productivity	June 2022	
3	Explain in detail about decision making process		
4	What are the different decision making models?		
5	Problems on decision making under different conditions	June 2022	
6	Decision trees and analysis of decision tree	June 2022	
Q.No	**Module IV**	**Month & Year**	**Marks**
1	What is Project management? What is its necessary?		
2	Network diagram drawing and network analysis	June 2022	
3	Critical Path method and problems using it	June 2022	
4	Program Evaluation and Review Technique and problems using it	June 2022	
5	Problems on probability of completion of project	June 2022	
6	Time Cost Trade Off Analysis		
Q.No	**Module V**	**Month & Year**	**Marks**
1	What are the functions of Operations Management?		
2	What is Human Resource Management? What are its functions?	June 2022	
3	What is marketing? What are the major concepts and objectives of marketing?		
4	Explain in detail about Financial Management		
5	What is Budget? What are the types of Budgets?		
6	Explain in detail about entrepreneurship and its classifications	June 2022	
7	What is a business plan? What are the steps in writing a business plan?	June 2022	
8	What is Forecasting? Explain in detail about types and methods of forecasting	June 2022	

CODE: MET 312	COURSE NAME: NON DESTRUCTIVE TESTING		Credit:
Q.No	**Module I**	**Month & Year**	**Marks**
1	Differentiate between Destructive and Non- Destructive testing	Dec 2017	4
2	Explain the future scope of NDT methods	Dec 2017	2
3	Explain the scope of NDT	Dec 2018	5
4	What is the significance of NDT in engineering applications?	Dec 2019	2
5	What are the objectives of NDT	Dec 2019	4
6	What are the various applications of NDT?	Sep 2020	5
7	Define Non-destructive testing?	Jun 2022	3
8	Mention any two limitations of NDT	Jan 2023	3
9	What are the different visual aids used in Visual inspection? Explain any 3 in detail.	Dec 2017	6
10	How visual inspection helps in Non- Destructive Testing?	Dec 2017	2
11	Explain computer enhanced visual system for Visual inspection	Dec 2017	6
12	List the applications and Limitations of Visual inspection technique in NDT	Dec 2017	5
13	What are the different types of light sources used in Visual Inspection?	Dec 2017	5
14	Explain In detail the material attributes and environmental factors that affect Visual inspection.	Jun 2022	8
15	Describe any five special lighting techniques used in visual inspection.	Jan 2023	5
Q.No	**Module II**	**Month & Year**	**Marks**
1	Explain the principle of Liquid Penetrant Inspection	Dec 2017	4
2	Explain various methods of Liquid Penetrant Inspection.	Dec 2017	6
3	What are the properties required for a good penetrant?	Dec 2017	4
4	With neat sketches explain the steps involved in conducting the LPI.	Dec 2017	4
5	What are the limitations of LPI?	Dec 2017	2
6	What are the different types of developers? How it can be applied?	Dec 2018	5
7	Differentiate between ordinary penetrant testing and fluorescent penetrant testing	Dec 2018	5
8	Clearly mention the advantages, disadvantages and applications of DPT	Dec 2018	5
9	How are penetrants classified based on a. Physical properties b. Removal techniques c. Strength of indication	Dec 2018	8
10	What are the methods used to remove excess penetrants during LPI	Dec 2018	6
11	List any 4 defects that can be detected using LPI.	Dec 2018	2
12	Define the terms dwell time and development time.	Sep 2020	2
13	What are the points to be remembered while interpreting the results in Liquid penetrant inspection?	Jun 2022	6
14	You are about to carry out a Liquid Penetrant Inspection. What are the safety precautions required to conduct the test?	Jan 2023	5
Q.No	**Module III**	**Month & Year**	**Marks**
1	With neat sketch explain any four magnetization techniques used in Magnetic Particle Inspection.	Dec 2017	6
2	What is the use of field indicators in MPI? Explain any one type of field indicator used in MPI	Dec 2017	4
3	Explain procedure used for testing a component using Magnetic particle inspection (MPI).	Dec 2017	6

4	What is sensitivity in MPI?	Dec 2017	4
5	An 8 mm thick MS plate of size 300 mm X 250 mm has to be tested for internal defects. Explain the inspection procedure with sketches using magnetic prod	Dec 2018	10
6	Is it essential to demagnetise the specimen before and after the magnetic particle testing? Substantiate your answer.	Dec 2018	5
7	A 6 mm carbon steel plate is brought to the testing lab. A magnetic yoke with Ac and DC mode is available. What mode you prefer to reveal internal defects? Why	Dec 2018	5
8	What are the various reasons for false indications, Non-relevant indications and Relevant indications during MPI?	Dec 2019	5
9	Explain with suitable sketch about following a. Circular magnetization b. Longitudinal magnetization	Dec 2019	3
10	What is continuous testing and residual technique of MPI	Dec 2019	7
11	Explain the following magnetization techniques used in Magnetic Particle Inspection with neat sketches: (i) Head shot technique (ii) Magnetization using prods (iii) Coil shot technique (iv) Central conductor technique.	Sep 2020	8
12	Explain the use of Pie gauge in Magnetic Particle Inspection.	Sep 2020	5
13	List the advantages and disadvantages of Magnetic Particle Inspection	Sep 2020	5
14	Classify the continuous testing of MPI?	Jan 2022	4
15	Explain in detail, the continuous testing of MPI and residual technique of MPI	Jun 2022	8
Q.No	**Module IV**	**Month & Year**	**Marks**
1	What is the principle of Ultrasonic Testing (UT)?	Dec 2017	4
2	With sketches, explain different modes of display in Ultrasonic Testing.	Dec 2017	6
3	Explain TOFD in ultrasonic testing	Dec 2017	4
4	Explain straight beam and angle beam testing techniques used in UT	Dec 2017	6
5	What are the different wave forms used in ultrasonic testing?	Dec 2018	10
6	What are the different types of probes used in ultrasonic testing?	Dec 2018	5
7	A 10 mm MS plate has to be tested for delamination. Explain the procedure using ultrasonic equipment	Dec 2018	5
8	With neat sketches explain the procedures followed in transmission method and Pulseecho method of UT.	Dec 2019	10
9	What are the Limitations and applications of UT	Dec 2019	7
10	What is the need for Calibration of Equipments in UT	Dec 2019	3
11	Explain immersion testing technique and dual crystal probe testing technique used in Ultrasonic Testing	Sep 2020	5
12	Explain the working of piezoelectric transducer with a neat sketch. Write its advantages and disadvantages	Sep 2020	5
13	Differentiate between contact testing technique and immersion technique used in UT with neat sketches?	Jan 2022	5
14	Explain straight beam testing technique and angle beam testing technique with neat sketch?	Jan 2022	6
15	Explain the use of Transducers in UT and also classify the ultrasonic transducers?	Jan 2022	4
16	Explain the significance of the use of couplant in UT with examples	Jun 2022	3
17	What is Snell's Law and its significance in Ultrasonic Testing?	Jun 2022	3
Q.No	**Module V**	**Month & Year**	**Marks**
1	What is real time radiography? What are the advantages and disadvantages of real time radiography?	Dec 2017	5

2	Explain the production of X- Ray.	Dec 2017	5
3	Explain SWSI, DWSI and DWDI inspection techniques in radiographic testi	Dec 2017	8
4	What are the properties of X- and Gamma Rays	Dec 2017	2
5	How the quality of a good radiograph is accessed.	Dec 2017	3
6	Explain any two types of screens used in radiographic testing	Dec 2017	3
7	What are the safety precautions to be taken during Radiographic testing?	Dec 2017	4
8	Explain the process of film processing in radiography testing.	Dec 2018	5
9	Write short note on image quality indicators.	Dec 2018	5
10	With suitable diagram explain the process of radiography testing using Coba isotope.	Dec 2018	5
11	Compare and contrast between X-ray and Gamma ray.	Dec 2018	5
12	How is evaluation of Test results carried out in RT	Dec 2019	3
13	With a neat sketch explain the working of Real time Radiography.	Dec 2019	6
14	What you mean by high energy X-ray source. List its any 2 benefits.	Dec 2019	4
15	What are the advantages, limitations and applications of RT.	Dec 2019	10
16	What are the functions of screens in Radiography Testing? Compare metal foil screen and fluorescent salt screen.	Sep 2020	5
17	Differentiate between high speed film and low speed film used in Radiograp Testing.	Sep 2020	5
18	What is the principle of Eddy current testing?	Dec 2017	5
19	What is sensitivity in Eddy current Testing?	Dec 2017	5
20	Define ‘lift off effect’, ‘edge effect’ and ‘end effect’ in ECT	Dec 2017	5
21	Explain constant current drive and scanning probe ECT techniques	Dec 2017	5
22	Explain any three applications of Eddy current testing	Dec 2017	6
23	What are the advantages and limitations of ECT?	Dec 2017	4
24	What are the different types of eddy current testing probes?	Dec 2018	5
25	Design a suitable test set up used for the evaluation of weldment in stainless steel using Eddy Current Testing	Dec 2019	10
26	With neat sketches explain the following terms associated with ECT a. Inductive reactance b. Impedance c. Permeability	Dec 2019	5
27	With the help of neat sketches explain how the thickness measurement is carried out using ECT?	Dec 2019	5
28	With neat sketches explain the construction and working of Reflection Probe and Differential Probe used in ECT.	Dec 2019	5
29	What is the relation between frequency and depth of penetration in Eddy Current Testing?	Sep 2020	5
30	Compare absolute probes and differential probes used in Eddy Current Testi	Sep 2020	5
31	List any six physics aspect of Eddy current testing?	Jan 2022	6
32	How material conductivity and magnetic permeability affect ECT?	Jan 2023	4