In Pursuit of Excellence	**Course and Faculty Details**	SESSION-2019-2020
		SEM- 8

Faculty Details

Name of the Faculty: Ganesh Kumar Sharma

Designation: Assistant Professor

Department: Mechanical Engg.

Course Details

Name of the Programme: B.Tech Batch: 2016-2020

1608240011	Amitesh Kushwaha	16	P	11
1608240013	Ankit Kumar	D	P	12
1608240014	Ankur Singh	18	P	13
1608240015	Anuj Panwar	D	P	14
1608240016	Arjun Singh	D	P	15
1608240019	Ayush Rajput	A	P	16
1608240022	Dhaneshwar Chauhan	D	P	17
1608240024	Dinesh Kumar	D	P	18
1608240025	Dishant Pratap	D	P	19
1608240026	Gajendra Singh	13	P	20
1608240030	Harsh Thakur	D	P	21
1608240037	Kovit Kumar	D	P	22
1608240041	Mohammad Faizi	D	P	23
1608240042	Mohammad Areeb Saifi	D	P	24
1608240043	Mohd Ahtesham	D	P	25
1608240045	Mohd Anas	D	P	26
1608240046	Mohd Athar	D	P	27
1608240047	Mohd Daniyal	D	P	28

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In Pursuit of Excellence	**Index**	SESSION-2019-2020 SEM-8th

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Course Outcome Attainment

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Vision of Institute

To develop industry ready professionals with values and ethics for global needs

Mission of Institute

M1: To impart education through outcome based pedagogic principles.

M2: To provide conducive environment for personality development, training and entrepreneurial skills.

M3: To induct high professional ethics and accountability towards society in students.

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Vision of Department

To develop competent and skilled Mechanical Engineers having moral values and ethics for the fulfilment of fast changing global needs.

Mission of the Department

- To nurture continuous enhancement in teaching learning process for imparting strong fundamental knowledge of core, engineering science, and interdisciplinary subjects to students.
- To provide state-of-the-art laboratories for providing hand-on experience of technology, and to provide platforms for leadership and overall personality development.
- To develop strong mentor-mentee relationship for the professional and personal growth of students and also to inculcate moral values and ethics for serving the society.

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Program Education Objectives

The objectives of the Department of Mechanical Engineering are to produce graduates who will have the:

- Employability skills for making career in industries, academia, government services and as an entrepreneur.
- Potential to apply fundamental concepts of mechanical engineering, engineering science and practical training in solving mechanical engineering problems and to contribute in development of technologies.
- Skills to apply leadership, managerial and administrative qualities to lead the projects professionally and ethically.

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In Pursuit of Excellence	**Program Outcomes**	SESSION-2019-2020
		SEM-8th

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, research literature, and analyses complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities, with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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In Pursuit of Excellence	**Program Specific Outcomes**	SESSION-2019-2020
		SEM- 8th

After completing their graduation, students of Mechanical Engineering will be able to –

PSO1: Identify and solve problems of thermal engineering, strength of materials, fluid mechanics, refrigeration & air conditioning, Design, dynamics of machines, mathematics and engineering science.

PSO2: Get fundamental knowledge and hand-on experience of different manufacturing processes, material testing techniques and CAD/CAM tooling to apply in various industries.

PSO 3 Learn quality and industrial management concepts, communication and soft skills along with other interdisciplinary subjects such as programming language, electrical engineering and basic electronics to enhance their employability.

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In Pursuit of Excellence	**Academic Calendar**	SESSION-2019-2020 SEM- 8th

Even Semester **Session: 2019 – 2020**

S. No.	Particulars	Date	Responsibility
1.	**Time Table** (a) Display on Notice Boards (b) Distribution to concerned Teachers	 18 Jan 2020 18 Jan 2020	O.C. Time Table
2.	Distribution of Students' lists to teachers	18 Jan 2020	Concerned HODs /O.C. Class
3.	Blow up submission to HODs	18 Jan 2020	Concerned Teachers
4.	**Registrations** (a) 2nd and 4th Semester (b) 6th and 8th Semester (b)List of unregistered students to various department (c) Notifying unregistered students for getting registered at the earliest (through class O.Cs, / Faculty)	 20 Jan 2020 21 Jan 2020 27 Jan 2020 29 Jan 2020	 Concerned Teachers OS Academic Concerned HODs
5.	**Commencement of Classes** (a) 2nd and 4th Semester (b) 6th and 8th Semester	 21 Jan 2020 22 Jan 2020	 HODs and Concerned Teachers
6.	Announcement of Test series dates	30 Jan 2020	Dean Academics
7.	Procurement of stationary & materials for Test Series for full semester (a) Requirement (b) Actual Procurement	 10 Feb 2020 15 Feb 2020	 Convener Test Series Committee O.S. Academics
8.	(a)Short attendance compilation before Class Test-1 (b) Information to parents (c)Undertaking form handed over to students (b)Collection of undertaking form	20 Feb 2020 21 Feb 2020 21 Feb 2020 22 Feb 2020	O.C. Class
9.	**1st Test Series**	**24, 25 and 26 Feb 2020**	
	Announcement of Test Series schedule, Invigilation Programme, Seating arrangement etc.	18 Feb 2020	Class Test Committee
	After completion of Test Series (a) Evaluation of test copies & showing of copies to students (b) Report of poor performance of students to class OCs (c)) Submission of test copies in Nodal Centre	 29 Feb 2020 29 Feb 2020 29 Feb 2020	 Concerned Teachers Concerned Teachers Concerned Teachers
10.	(a) Last date for submission of examination forms to office (b) Submission of forms to University	06 March 2020** 07 March 2020**	OS Academic to take timely action as per University directions.

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11.	Mid Semester break	09 March to 11 March 2020	
12.	Announcement of dues list and its last date for clearing dues (Current semester)	25 March 2020	Accounts/ OS Academic
13.	(a)Short attendance compilation before Class Test-2 (b) Information to parents (c)Undertaking form handed over to students (b)Collection of undertaking form	01 April 2020 03 April 2020 03 April 2020 04 April 2020	O.C. Class
14.	**2nd Test Series**	**07, 08 and 09 April 2020**	
	Announcement of Test Series schedule, Invigilation Programme, Seating arrangement etc.	03 April 2020	Class Test Committee
	After completion of Test Series (a) Evaluation of test copies & showing of copies to students (b) Report of poor performance of students to class OCs (c)) Submission of test copies in Nodal Centre	 13 April 2020 13 April 2020 13 April 2020	 Concerned Teachers Concerned Teachers Concerned Teachers
15.	Filling of student feedback forms for current semester	22 April 2020	Concerned HODs
16.	Requirement of additional Faculty (to be conveyed to Director) (for even semester)	30 April 2020	Concerned HODs
17.	(a) Floating the electives for even semester (b) Last date for students choice	22 April 2020 23 April 2020	Concerned HODs
18.	Date up to which final attendance is to be counted	26 April 2020	Concerned teachers
19.	Submission of consolidated list of shortage of attendance to Director and information to Parents	27 April 2020	Class O.Cs
20.	**3rd Test Series**	**28,29,30 April 2020**	
	Announcement of Test Series schedule, Invigilation Programme, Seating arrangement etc.	23 April 2020	Class Test Committee
	After completion of Test Series (a) Evaluation of test copies & showing of copies to students (b) Report of poor performance of students to class OCs (c)) Submission of test copies in Nodal Centre	 04 May 2020 04 May 2020 04 May 2020	Concerned Teacher Concerned Teachers Concerned Teachers
21.	**Submission of sessional marks:** (a) Meeting of Dean Academics, , all HODs and Director regarding attendance and performance of students.	05 May 2020	Dean Academics
	(b) Checking of Teachers' Records by HODs	06 May 2020	Concerned HODs
	(c) Finalization of sessional marks	08 May 2020	Concerned Teachers
	(d) Submission of Award list after final checking and uploading to OS Academics for further necessary action	As per date announced by AKTU	HODs Concerned Teachers
22.	**Theory Examinations:** (a) Collection of Admit Cards / Roll Nos. from University (b) Preparation of Roll lists (c) Collection of stationery such as copies, practical copies drawing sheets, graph paper etc. from University. (c) Procurement of stationery and other materials locally as necessary.	As per AKTU schedule	OS Academics to take appropriate actions as per University directions.

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23.	**Practical Examinations:**	As per AKTU schedule	Concerned HODs
	(a) Appointment of Internal Examiners	3 days before the practical exam schedule	Concerned HODs
	(b) Obtaining list of panel of External Examiners from AKTU & preparation of schedule of practical examination.	As per AKTU schedule	OS Academics
	(d) Dispatch of letters/contacting the external examiners	Within 2 days of list obtained from AKTU	HODs and concerned teachers
24.	**Preparation for Even Semester** (a) Load Distribution by Department (b) Submission to O.C. Time Table	 15 May 2020 16 May 2020	 Concerned Coordinators O.C. Time Table
25.	Registration for odd semester (2020 – 21)	To be announced**	OS Academic

****May be revised as per AKTU Schedule.**

Nitin Ahl 16-01-2020
Dean Academics

Director

Copy to:

1. Chairman
2. Secretary
3. P.A. to Director for Director's folder
4. All HODs
5. DOSW
6. Controller of Examination
7. O.C. Time Table
8. Registrar
9. All Faculty Members through HODs
10. O.S. Academics
11. A.S. Examinations
12. Account Section
13. T & P Cell
14. Librarian
15. Convener Test Series

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In Pursuit of Excellence	**Course Evaluation Scheme**	SESSION-2019-2020 SEM-8th

EIGHT SEMESTER									
Sl.No.	Subject Code	Subject Name	Department	L-T-P	Th/Lab Marks	Sessional		Total	Credit
					ESE	CT	TA		
1		OPEN ELECTIVE COURSE-2	Other Deptt.	3-0-0	70	20	10	100	3
2		DEPTT ELECTIVE COURSE-5	Core Deptt.	3-1-0	70	20	10	100	4
3		DEPTT ELECTIVE COURSE-6	Core Deptt.	3-0-0	70	20	10	100	3
4	RME851	SEMINAR	Core Deptt.	0-0-3			100	100	2
5	RME852	PROJECT-2	Core Deptt.	0-0-12	350		250	600	12
	TOTAL				**560**	**60**	**380**	**1000**	**24**

DEPARTMENTAL ELECTIVE-5	
Sub.Code	**Subject Name**
RME080	Non-Destructive Testing
RME081	Advance Welding
RME082	Thermal Turbo Machine
RME083	Energy Conservation &Management

S.Code **MOOC Subject Name**
RME084 Industrial Safety Engineering.

DEPARTMENTAL ELECTIVE-6	
S.Code	**Subject Name**
RME085	Total Quality Management
RME086	Gas Dynamics & Jet Propulsion
RME087	Design & Transmission System
RME088	Theory of Elasticity.

S.Code **MOOC Subject Name**
RME089 Manufacturing of Composites.

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ADVANCED WELDING

L-T-P
3-1-0

UNIT-I:

Introduction: Welding as compared with other fabrication processes, Importance andapplication of welding, classification of welding processes, Health & safety measures inwelding.

Welding Power Sources: Physics of welding Arc, Basic characteristics of power sources forvarious arc welding processes, Transformer, rectifier and generators.

Physics of Welding Arc: Welding arc, arc initiation, voltage distribution along the arc, arccharacteristics, arc efficiency, heat generation at cathode and anode, Effect of shielding gas onarc, isotherms of arcs and arc blow.

Metal Transfer: Mechanism and types of metal transfer in various arc welding processes.

UNIT-II:

Welding Processes:

Manual Metal Arc Welding (MMAW), TIG, MIG, Plasma Arc,Submerged Arc Welding, Electro gas and Electroslag, Flux Cored Arc Welding, Resistancewelding, Friction welding, Brazing, Soldering and Braze welding processes, Laser beamwelding, Electron beam welding, Ultrasonic welding, Explosive welding, Friction Stir Welding,Underwater welding & Microwave welding.

UNIT-III:

Heat Flow Welding:

Calculation of peak temperature; Width of Heat Affected Zone (HAZ);cooling rate and solidification rates; weld thermal cycles; residual stresses and theirmeasurement; weld distortion and its prevention.

UNIT-IV:

Repair & Maintenance Welding:

Hardfacing, Cladding, Surfacing, Metallizing processes andReclamation welding.

Weldability: Effects of alloying elements on weld ability, welding of plain carbon steel, Castfron and aluminium. Micro & Macro structures in welding.

UNIT-V:

Weld Design:

Types of welds & joints, Joint Design, Welding Symbols, weld defects,Inspection/testing of welds, Introduction to Welding Procedure Specification & ProcedureQualification Record.

Books and References:

1. Welding and Welding Technology, by- Richard L. Little, McGraw Hill Education.
2. Welding Principals and Practices, by- Edwars R. Bohnart, McGraw Hill Education.
3. Welding Engineering and Technology, by- R. S. Parmar, Khanna Publishsers.
4. Welding Technology Fundamentals by William. A. Bowditch.
5. Welding Technology by N K Srinivasan.

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UNIT-I:

Introduction:

Welding as compared with other fabrication processes, Importance and application of welding, classification of welding processes, Health & safety measures in welding.

Welding Power Sources: Physics of welding Arc, Basic characteristics of power sources for various arc welding processes, Transformer, rectifier and generators.

Physics of Welding Arc: Welding arc, arc initiation, voltage distribution along the arc, arc characteristics, arc efficiency, heat generation at cathode and anode, Effect of shielding gas onarc, isotherms of arcs and arc blow.

Metal Transfer: Mechanism and types of metal transfer in various arc welding processes.

UNIT-II:

Welding Processes: Manual Metal Arc Welding (MMAW), TIG, MIG, Plasma Arc,Submerged Arc Welding, Electro gas and Electroslag, Flux Cored Arc Welding, Resistancewelding, Friction welding, Brazing, Soldering and Braze welding processes, Laser beamwelding, Electron beam welding, Ultrasonic welding, Explosive welding, Friction Stir Welding,Underwater welding & Microwave welding.

UNIT-III:

Heat Flow Welding: Calculation of peak temperature; Width of Heat Affected Zone (HAZ);cooling rate and solidification rates; weld thermal cycles; residual stresses and their measurement; weld distortion and its prevention.

UNIT-IV:

Repair & Maintenance Welding: Hardfacing, Cladding, Surfacing, Metallizing processes and Reclamation welding. Weldability: Effects of alloying elements on weld ability, welding of plain carbon steel, Cast Iron and aluminium. Micro & Macro structures in welding.

UNIT-V:

Weld Design: Types of welds & joints, Joint Design, Welding Symbols, weld defects, Inspection/testing of welds, Introduction to Welding Procedure Specification & ProcedureQualification Record.

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References:

1. Welding and Welding Technology, by- Richard L. Little, McGraw Hill Education.

2. Welding Principals and Practices, by- Edwars R. Bohnart, McGraw Hill Education.

3. Welding Technology Fundamentals by William. A. Bowditch.

4. Welding Technology by N K Srinivasan.

5. Modern Welding Technology by Howard B Cary and Scott Helzer.

6. Welding Handbooks (Vol. I & II).

Additional References:

1. Welding Engineering and Technology, by- R. S. Parmar, Khanna Publishsers.
2. Welding Engineering and Technology by R S Parmar

Text Books:

1. Welding technology by O.P. Khanna

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COURSE OUTCOMES

Once the student has successfully completed this course, he/she will be able:

RME081.1	Understand various parameters and requirements for welding processes
RME081.2	Understand comparative merits and demerits of various welding processes along with their procedures
RME081.3	Study the thermal and metallurgical considerations in welding
RME081.4	Understand repair & Maintance welding process, Weldability & their structures.
RME081.5	Studying about weld design & classification of weld defects and testing of welds

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In Pursuit of Excellence	**Course Delivery Method**	SESSION-2019-2020
		SEM-8th

Name of Subject: Advance Welding

Subject Code: RME-081

Branch: Mechanical Engineering

Course Plan

Delivery Methods: Chalk & Talk, Power Point Presentation, Tutorials, Video Lectures, Analogy, solving Numerical /Design exercises, assignments, seminar, Brainstorming, Group Discussion/Interactive session, Delivery through Simulation Software/CAD Tools, Mini Project, Quiz

Coverage of

Unit 1 by: - Chalk & Talk, Power Point Presentation, Tutorials, Video Lectures, solving numerical, assignments, seminar.

Unit 2 by: - Chalk & Talk, Power Point Presentation, Tutorials, Video Lectures, solving Numerical /Design exercises, assignments.

Unit 3 by: - Chalk & Talk, Power Point Presentation, Tutorials, Video Lectures, solving Numerical/Design exercises, assignments.

Unit 4 by: - Power Point Presentation, Tutorials, Video Lectures, solving Numerical/Design exercises, mini project (simulation based), assignments, group discussion/Interactive session.

Unit 5 by: -Power Point Presentation, Tutorials, Video Lectures, solving Numerical /Design exercises; brain storming question, assignments, quiz.

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In Pursuit of Excellence	Mapping	SESSION-2019-2020
		SEM-8th

Mapping of Course Outcomes with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
RME081.1	3	1	2	-	1	3	2	-	1	1	-	3
RME081.2	2	-	3	-	2	2	3	-	-	1	1	3
RME081.3	3	2	3	3	1	-	-	-	-	1	1	3
RME081.4	2	-	2	2	1	-	-	-	-	1	1	3
RME081.5	3	-	3	1	-	-	-	-	-	1	2	3
RME081	2.6	1.5	2.6	2	1.25	2.5	2.5	-	1	1	1.25	3

CO	PSO1	PSO2	PSO3
RME081.1	3	2	2
RME081.2	3	2	2
RME081.3	3	3	2
RME081.4	2	2	3
RME081.5	3	1	2
RME081	3	2	2.2

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In Pursuit of Excellence	**Time Table**	SESSION-2019-2020
		SEM-

TER)

w.e.f. – 21/01/2020

FACULTY NAME – MR. GANESH SHARMA (GKS)

L T P

7 4 3 = 14 HRS

TIME / DAY	9.00-10.00 am	10.00-11.00am	11.00 - 12.00 Noon	12.00-01.00pm	01.00-2.00pm	2.00-3.00pm	3.00-4.00pm	4.00-5.00pm
MON					L			
TUE	RME-081 (T), 8TH A.W.-1 D-307			RME-081 (L), 8TH A.W. D-307	U			
WED	RME-081 (T), 8TH A.W.-2 D-307	5.GV.06 (L) 2ND B.VOC. A B-303		RME-081 (L), 8TH A.W. D-307	N			
THU	RME-081 (T), 8TH A.W.-3 D-307		5.GV.06 (L) 2ND B.VOC. A B-303	RME-081 (L), 8TH A.W. D-307	C			KWS-201 (T) 2ND, E2 A-302
FRI	5.GV.06 (L) 2ND B.VOC. A B-303				H	KWS-201(P) 2ND, E2, WORKSHOP LAB, G-102		
SAT			5.GV.06 (L) 2ND B.VOC. A B-303					

Subject Code	Subject Name
RME-081	Advance Welding
KWS-201(P)	WORKSHOP
5.GV.06	Motor Vehicle Technology –II

(Atul Sharma) 18/1/2020
(Deptt. Coordinator Time-Table)

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18/1/20

(Rakesh Kumar Gangwar)
(O.C.Time-Table)

In Pursuit of Excellence	**Lecture Plan & Course Coverage**	SESSION-2019-2020 SEM-8th

Total Period: 48

Sr. No.	No. of Periods	Topics/Sub Topics	Reference Books	CO Covered	Planned Date	Coverage Date	Sign
1.	1	Introduction to Course Educational Objective, Course Outcomes, Scheme, Adopted Syllabus, PEOs, POs, PSOs Pre-requisite, Vision & Mission of Institute and Department			22/1/20	22/1/20	
2.	1	**Introduction:** Welding as compared with other fabrication processes	[1,4]	CO1	28/1/20	28/1/20	
3.	1	Importance and application of welding	[1,3]	CO1	29/1/20	29/1/20	
4.	1	Classification of welding processes	[1,6]	CO1	30/1/20	30/1/20	
5.	1	Health & safety measures in welding	[1,4]	CO1	31/1/20	31/1/20	
6.	1	**Welding Power Sources:** Physics of welding Arc	[1,2]	CO1	4/2/20	4/2/20	
7.	2	Basic characteristics of power sources for various arc welding processes	[1,3]	CO1	5/2/20	5/2/20 & 6/2/20	
8.	2	Transformer, rectifier and generators	[1,2]	CO1	6/2/20	7/2/20	
9.	1	Welding arc, arc initiation	[2,3]	CO1	11/2/20	11/2/20	
10.	1	Voltage distribution along the arc, arc characteristics	[3]	CO1	12/2/20	12/2/20	

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11.	1	Arc efficiency, heat generation at cathode and anode	[6]	CO1	13/2/20	13/2/20	
12.	1	Effect of shielding gas on arc, isotherms of arcs and arc blow	[1,4]	CO1	14/2/20	14/2/20	
13.	1	**Metal Transfer:** Mechanism and types of metal transfer in various arc welding processes	[1,2]	CO1	18/2/20	18/2/20	
14.	1	**Beyond the syllabus: Introduction to Manufacturing Processes**	[1,3]	CO1	19/2/20	19/2/20	
15.	1	**Welding Processes:** Manual Metal Arc Welding (MMAW)	[1,4]	CO2	20/2/20	20/2/20	
16.	1	TIG, MIG	[4,5]	CO2	22/2/20	24/2/20	
17.	1	Plasma Arc, Submerged Arc Welding	[1,6]	CO2	25/2/20	25/2/20	
18.	1	Electro gas and Electroslag Welding	[3,4]	CO2	26/2/20	26/2/20	
19.	1	Flux Cored Arc Welding	[4,6]	CO2	27/2/20	27/2/20	
20.	1	Resistance welding, Friction welding	[1,4]	CO2	3/3/20	3/3/20	
21.	1	Brazing, Soldering and Braze welding processes	[1,2]	CO2	4/3/20	4/3/20	
22.	1	Laser beam welding, Electron beam welding	[1,4]	CO2	21/3/20	21/3/20	
23.	1	Ultrasonic welding, Explosive welding	[1,2]	CO2	24/3/20	24/3/20	
24.	1	Friction Stir Welding	[1,3]	CO2	26/3/20	26/3/20	
25.	1	Underwater welding & Microwave welding	[1,5]	CO2	27/3/20	27/3/20	
26.	1	**Beyond the syllabus: Gas Metal Arc Welding**	[1,2]	CO2	30/3/20	30/3/20	
27.	1	**Heat Flow Welding:** Calculation of peak temperature	[1,4]	CO3	31/3/20	31/3/20 & 1/4/20	

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28.	1	Width of Heat Affected Zone (HAZ)	[1,6]	CO3	3/4/20	4/4/20	
29.	1	Cooling rate and solidification rates	[1,3]	CO3	7/4/20	7/4/20	
30.	1	Weld thermal cycles		CO3	8/4/20	8/4/20	
31.	1	Residual stresses and their measurement	[1,4]	CO3	13/4/20	13/4/20	
32.	2	Weld distortion and its prevention	[1,2]	CO3	15/4/20	15/4/20 & 16/4/20	
33.	1	**Beyond the syllabus: Methods of preheating***	[1,3]	CO3	17/4/20	17/4/20	
34.	2	**Repair & Maintenance Welding:** Hard facing, Cladding, Surfacing	[1,2]	CO4	18/4/20	18/4/20 & 20/4/20	
35.	1	Metallizing processes and Reclamation welding	[1,4]	CO4	21/4/20	21/4/20	
36.	1	**Weldability:** Effects of alloying elements on weld ability	[3,4]	CO4	22/4/20	22/4/20	
37.	1	Welding of plain carbon steel	[4,5]	CO4	23/4/20	23/4/20	
38.	1	Welding of Cast Iron and aluminum	[1,6]	CO4	24/4/20	24/4/20	
39.	2	Micro & Macro structures in welding	[2,4]	CO4	27/4/20	27/4/20 & 28/4/20	
40.	2	**Beyond the syllabus: Welding of low, medium and high carbon steels***	[5,6]	CO4	4/5/20	4/5/20 & 5/5/20	
41.	1	**Weld Design:** Types of welds & joints	[2,5]	CO5	5/5/20	6/5/20	
42.	2	Joint Design, Welding Symbols	[4,6]	CO5	11/5/20	11/5/20 & 12/5/20	
43.	1	Weld defects	[2,4]	CO5	12/5/20	14/5/20	
44.	1	Inspection/testing of welds	[4,5]	CO5	15/5/20	15/5/20	
45.	2	Introduction to Welding Procedure Specification & Procedure Qualification Record	[1,5]	CO5	18/5/20	18/5/20 & 19/5/20	
46.	1	**Beyond the syllabus: Heavy welded**	[2,6]	CO5	19/5/20	20/5/20	

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		fabrications					

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2. Welding Principals and Practices, by- Edwars R. Bohnart, McGraw Hill Education.
3. Welding Technology Fundamentals by William. A. Bowditch.
4. Welding Technology by N K Srinivasan.
5. Modern Welding Technology by Howard B Cary and Scott Helzer.
6. Welding Handbooks (Vol. I & II).

Additional References:

1. Welding Engineering and Technology, by- R. S. Parmar, Khanna Publishsers.
2. Welding Engineering and Technology by R S Parmar

Text Books:

1. Welding technology by O.P. Khanna

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In Pursuit of Excellence	**Tutorial-1**	SESSION-2019-2020 SEM-8th

Tutorial 1 [CO -1]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**Welding Introduction, Applications and Arc Welding Power Source**	12/2/20	6/2/20	6/2/20	

1.	What is Welding? Classify welding processes in details.
2.	How welding is different from soldering and brazing?
3.	What are various industrial and domestic applications of welding?
4.	What is welding arc and how is an arc obtained in arc welding?
5.	Explain various types of welding arcs and also explain methods to initiate the arc.
6.	Explain the constant current and voltage characteristics of welding power sources.
7.	Explain the role of transformers, rectifiers and generators in welding.
8.	List the different types of commercially available arc welding power sources.
9.	What is the difference between AC and DC arc welding?
10.	What do you understand by polarity in DC arc welding? How can this be advantageously utilized?
11.	What is an arc blow? How is it controlled?

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In Pursuit of Excellence	**Tutorial-2** **[CO -2]**	SESSION-2019-2020 SEM-8th

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**Welding Processes: MMAW, GMAW, FCAW**	3/3/20	4/3/20	4/3/20	

1	State the important functions of flux coatings of electrodes used in manual metal arc welding process.
2	What are problems encountered with the use of coated electrode? Explain how these can be taken care of.
3	Explain briefly the principle and procedure of SMAW process.
4	Briefly explain the coding method used for the electrodes used in SMAW.
5	Enlist a few fluxes for ferrous and nonferrous electrodes.
6	Explain the GMAW (Gas Metal Arc welding) technique.
7	Explain the necessity of inert gas shielding in GMAW process?
8	What are various equipment used in GMAW process?
9	Explain the process of metal transfer in GMAW process with neat sketches.
10	Briefly explain the flux cored arc welding (FCAW) process mentioning its advantages.

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In Pursuit of Excellence	**Tutorial-3** **[CO -2]**	SESSION-2019-2020 SEM-8th

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**Welding Processes: TIG, MIG, SAW & Resistance Welding**	3/3/20	4/3/20	4/3/20	

1	Explain the TIG welding principle and operation with neat sketches.
2	What are the typical electrode materials used in TIG welding process?
3	Why is an AC power supply not normally used in TIG welding process
4	Describe the features of the power supply used in TIG welding.
5	What are various equipment used in TIG welding.
6	What are the differences between TIG and MIG welding processes?
7	Explain submerged arc welding technique in details.
8	What are the applications of submerged arc welding and how is it different from the inert gas shielded metal arc welding process?
9	Explain the resistance welding process and its applications.
10	What are the parameters to be controlled in the resistance welding process?

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In Pursuit of Excellence	Tutorial- 4	SESSION-2019-2020 SEM- 8th

Tutorial 4 [CO -2]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**Welding Processes: TIG, MIG, SAW & Resistance Welding**	21/3/20	21/3/20	24/3/20	

1	Briefly explain the Plasma arc welding process.
2	Describe the electro slag welding process in details.
3	What are the specific situations in which electro slag welding is used?
4	Compare the electro slag welding process with that of SAW from the stand point of heat liberated, joint preparation and welding position.
5	Explain the process of friction welding, giving the applications.
6	Describe the principle of an Oxy – fuel gas welding process.
7	Describe the types of flames obtained in an Oxy – acetylene gas welding process and applications.
8	Why is the neutral flame extensively used in Oxy acetylene welding?
9	Explain the working principle of plasma arc welding in detail with suitable sketch.
10	Explain the advantages and applications of oxy – acetylene welding.

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In Pursuit of Excellence	Tutorial-5	SESSION-2019-2020 SEM- 8th

Tutorial 5 [CO -2]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**Welding Processes: Explosive, Metal Surfacing, Underwater, Electron beam, Laser beam, Ultrasonic Welding**	30/3/21	3/4/21	30/3/21	

1	Explain the explosive welding process in details with applications.
2	Explain laser beam welding and compare it with electron beam welding.
3	Explain the principle of ultrasonic welding. Describe it with neat sketch.
4	List the various steps involved in metal surfacing.
5	What are the various methods of depositing metal? Explain any one in detail.
6	What surface preparation is needed for spray welding? With the help of neat sketch explain the process of electric arc wire spray process.
7	Write a short note on hard facing and cladding.
8	What do you understand by underwater welding? What are the problems in underwater welding?
9	Explain the dry under water welding process in brief.
10	Enlist the equipment required for under water welding and applications of underwater welding.

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In Pursuit of Excellence	Tutorial-6	SESSION-2019-2020 SEM- 8th

Tutorial 6 [CO -3]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**Thermal & Metallurgical Considerations**	13/4/21	13/4/21	13/4/21	

1	Explain the general theory of solidification of metals and alloys.
2	Explain the effect of thermal gradient on weld metal structure.
3	Explain the effect of welding speed on grain structure.
4	Explain the effect of microstructure on the properties of weld metal.
5	What is the effect of cooling rate on the formation of heat affected zone (HAZ)?
6	Explain what you understand by 'weld decay' in HAZ of stainless steel weld. Suggest remedies and solution to this problem
7	Explain the temperature distribution in welding.
8	Explain metallurgical effects of heat flow in welding.
9	Explain Time Temperature Transformation Diagrams (TTT curve).
10	Explain Continuous Cooling Transformation Diagrams (CCT Curves.)

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In Pursuit of Excellence	Tutorial-7	SESSION-2019-2020 SEM- 8th

Tutorial 7 [CO -4]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**D.T., HAZ & Weld Design**	4/5/20	4/5/20	5/5/20	

1	Explain some destructive testing techniques used for testing of weld joints.
2	Describe various types of weld joints used in weld design.
3	List some of the types of edge preparation for butt weld.
4	Explain with the help of neat sketch, the various regions of heat affected zone in a weld.
5	What are various useful formulas for design under different types of loading?
6	Explain the characteristics of fatigue failure in weld joint.

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In Pursuit of Excellence	Tutorial-8	SESSION-2019-2020 SEM-8th

Tutorial 8 [CO -5]

Sr. No.	No. of Periods	Topics/Sub Topics	Coverage Date			Sign
			Batch A	Batch B	Batch C	
1.	1	**Welding defects, Distortion and NDT**	19/5/20	19/5/20	20/5/20	

1	What are the defects generally found in welding? Describe their cause and remedies.
2	Explain cracking especially hot cracking and cold cracking with reasons and remedies.
3	What is welding distortion? Explain the influences of welding processes and procedures.
4	Describe the major forms of distortions that are likely to occur in arc welded butt joints.
5	Describe the major forms of distortions that are likely to occur in tee joints.
6	What are the methods available for controlling the distortions in welded assembly structures?
7	Explain the differences between nondestructive testing and destructive testing of weld. What are the advantages of each?
8	Describe how you will perform magnetic particle inspection on a weld. What are its limitations?
9	Explain the Liquid penetrant testing of weld joints with neat sketches.
10	Explain Ultrasonic testing of weld joints.

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In Pursuit of Excellence	**ASSIGNMENT - 1**	SESSION-2019-2020 SEM- 8th

Home Assignments

Unit 1[CO- 1]

1. What is the use and importance of Schacffler diagram?
2. What are the different modes of metal transfer?
3. Why is the neutral flame extensively used in Oxy acetylene welding?
4. What are the effects of gases in welding?
5. What are the various methods of depositing metal?
6. Compare brazing with soldering.
7. Classify welding processes in detail.
8. Explain health and safety measures taken in welding.

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In Pursuit of Excellence	ASSIGNMENT - 2	SESSION-2019-2020 SEM-8th

Unit 2 [CO- 2]

1. What are the differences between TIG and MIG welding processes?
2. What are problems encountered with the use of coated electrode?
3. How welding is different from soldering and brazing?
4. Differentiate between solid state and fusion welding.
5. Explain briefly the principle and procedure of SMAW process.
6. Explain the resistance welding process and its applications.
7. Explain laser beam welding and compare it with electron beam welding.
8. What materials are used for making the resistance welding electrodes?
9. Briefly explain the coding method used for the electrodes used in SMAW.
10. Explain the TIG welding principle and operation with neat sketches.

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In Pursuit of Excellence	**ASSIGNMENT - 3**	SESSION-2019-2020 SEM-8th

Unit 3 [CO- 3]

Q. 1 what is weld thermal cycle? Describe the factors effecting of WTC.

Q. 2 Explain with the help of neat sketch, the various regions of heat affected zone in a weld.

Q. 3 What is the effect of cooling rate on the formation of heat affected zone (HAZ)?

Q. 4 Explain the effect of welding speed on grain structure.

Q. 5 Explain the effect of microstructure on the properties of weld metal.

Q. 6 What is softening of work hardend material.

Q. 7 what are the condition for recrystallization?

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In Pursuit of Excellence	**ASSIGNMENT - 4**	SESSION-2019-2020 SEM- 8th

Unit 4 [CO- 4]

1. What are the Metallizing processes in welding? Describe their types with examples.
2. Explain Hard facing, Cladding & Surfacing with neat sketch..
3. What is Reclamation welding? Explain the influences of welding processes and procedures.
4. Describe the welding procedure of Aluminum & Cast Iron with applications.
5. Differentiate the Micro & Macro Structure of Weld zone.
6. What is Weldability? Describe their Effects of alloying elements on Weldability.

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In Pursuit of Excellence	ASSIGNMENT - 5	SESSION-2019-2020 SEM- 8th

Unit 5 [CO- 5]

1. What are the defects generally found in welding? Describe their cause and remedies.
2. Explain cracking especially hot cracking and cold cracking with reasons and remedies.
3. What is welding distortion? Explain the influences of welding processes and procedures.
4. Describe the major forms of distortions that are likely to occur in arc welded butt joints.
5. Describe the major forms of distortions that are likely to occur in tee joints.
What are the methods available for controlling the distortions in welded assembly structures?
6. Explain the differences between nondestructive testing and destructive testing of weld. What are the advantages of each?
7. Describe how you will perform magnetic particle inspection on a weld. What are its limitations?
8. Explain the Liquid penetrant testing of weld joints with neat sketches. 5. Explain Ultrasonic testing of weld joints.

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In Pursuit of Excellence	**List of Students**	SESSION-2019-2020 SEM- 8th

S. No.	Student Id	Roll No.	Name
1	1540443	1508240064	Kamal Prakash Singh Lodhi
2	1540472	1508240083	Mohammad Anas
3	1540206	1508240117	Priyanshu Kumar
4	1540606	1508240153	Shrikant Siddharth
5	1610349	1608210132	Rohan Dhariwal
6	1640121	1608240003	Ajeet Morya
7	1640442	1608240005	Akash Kumar
8	1640290	1608240006	Akash Yadav
9	1640252	1608240009	Aman Sisodia
10	1640436	1608240010	Amit Kumar
11	1640204	1608240011	Amitesh Kushwaha
12	1640385	1608240013	Ankit Kumar
13	1640332	1608240014	Ankur Singh
14	1640299	1608240015	Anuj Panwar
15	1640285	1608240016	Arjun Singh
16	1640122	1608240019	Ayush Rajput
17	1640205	1608240022	Dhaneshwar Chauhan
18	1640210	1608240024	Dinesh Kumar
19	1640173	1608240025	Dishant Pratap
20	1640249	1608240026	Gajendra Singh
21	1640154	1608240030	Harsh Thakur
22	1640169	1608240037	Kovit Kumar
23	1640250	1608240041	Mohammad Faizi
24	1640455	1608240042	Mohammad Areeb Saifi
25	1640381	1608240043	Mohd Ahtesham
26	1640164	1608240045	Mohd Anas
27	1640451	1608240046	Mohd Athar
28	1640055	1608240047	Mohd Daniyal
29	1640130	1608240048	Mohd Faiz
30	1640448	1608240049	Mohd Faizan
31	1640279	1608240051	Mohd Shazeb
32	1640251	1608240052	Mohd Asim
33	1640357	1608240053	Mohd Faraz

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34	1640389	1608240054	Mohd Saddam Husain
35	1640289	1608240055	Mudit Yadav
36	1640099	1608240056	Mumtaz Khan
37	1640282	1608240057	Nawaz Ali
38	1640405	1608240059	Nitesh Kumar Saroj
39	1640070	1608240060	Nuzaif Khan
40	1640090	1608240061	Ovais Khan
41	1640364	1608240065	Raja Kanchan
42	1640341	1608240073	Sagar Kumar
43	1640242	1608240074	Salman .
44	1640045	1608240075	Santosh Verma
45	1640277	1608240082	Shubham Kumar
46	1640208	1608240084	Sumit Kumar
47	1640305	1608240085	Ubaid Ur Rehman
48	1640047	1608240087	Vaibhav Singh
49	1640240	1608240088	Varun Rastogi
50	1640209	1608240089	Vikas Kumar
51	1640036	1608240091	Vishal Kumar
52	1640334	1608240092	Vishesh Kumar
53	1640331	1608240093	Vishnu Kumar Gautam
54	1640391	1608240094	Yash Rastogi
55	1640213	1608240095	Yasharth Gautam
56	2174026	1708240901	Ankur Saini
57	2174002	1708240902	Anuj Pal
58	2174030	1708240903	Devraj Singh
59	2174032	1708240906	Ravi Arya
60	2174020	1708240907	Rishabh Dhyani
61	2174021	1708240908	Shubham Raj
62	2174022	1708240909	Varun Chhatrawal

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In Pursuit of Excellence	**Record of Monthly Attendance**	SESSION-2019-2020 SEM- 8th

S. No.	Student Id	Roll No.	Name	Attendance held (30)	Attendance held (70)
1	1540443	1508240064	Kamal Prakash Singh Lodhi	18	50
2	1540472	1508240083	Mohammad Anas	17	52
3	1540206	1508240117	Priyanshu Kumar	18	50
4	1540606	1508240153	Shrikant Siddharth	17	49
5	1610349	1608210132	Rohan Dhariwal	17	57
6	1640121	1608240003	Ajeet Morya	24	64
7	1640442	1608240005	Akash Kumar	A	A
8	1640290	1608240006	Akash Yadav	24	64
9	1640252	1608240009	Aman Sisodia	29	69
10	1640436	1608240010	Amit Kumar	24	64
11	1640204	1608240011	Amitesh Kushwaha	22	62
12	1640385	1608240013	Ankit Kumar	14	54
13	1640332	1608240014	Ankur Singh	28	68
14	1640299	1608240015	Anuj Panwar	24	64
15	1640285	1608240016	Arjun Singh	25	65
16	1640122	1608240019	Ayush Rajput	24	64
17	1640205	1608240022	Dhaneshwar Chauhan	26	66
18	1640210	1608240024	Dinesh Kumar	24	64
19	1640173	1608240025	Dishant Pratap	28	68
20	1640249	1608240026	Gajendra Singh	26	66

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21	1640154	1608240030	Harsh Thakur	24	64
22	1640169	1608240037	Kovit Kumar	19	59
23	1640250	1608240041	Mohammad Faizi	19	59
24	1640455	1608240042	Mohammad Areeb Saifi	16	56
25	1640381	1608240043	Mohd Ahtesham	20	60
26	1640164	1608240045	Mohd Anas	22	62
27	1640451	1608240046	Mohd Athar	24	64
28	1640055	1608240047	Mohd Daniyal	24	64
29	1640130	1608240048	Mohd Faiz	22	62
30	1640448	1608240049	Mohd Faizan	25	65
31	1640279	1608240051	Mohd Shazeb	18	58
32	1640251	1608240052	Mohd Asim	20	60
33	1640357	1608240053	Mohd Faraz	22	62
34	1640389	1608240054	Mohd Saddam Husain	24	64
35	1640289	1608240055	Mudit Yadav	25	65
36	1640099	1608240056	Mumtaz Khan	24	64
37	1640282	1608240057	Nawaz Ali	24	64
38	1640405	1608240059	Nitesh Kumar Saroj	23	63
39	1640070	1608240060	Nuzaif Khan	23	63
40	1640090	1608240061	Ovais Khan	25	65
41	1640364	1608240065	Raja Kanchan	24	64
42	1640341	1608240073	Sagar Kumar	25	65
43	1640242	1608240074	Salman .	21	61
44	1640045	1608240075	Santosh Verma	25	65
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46	1640208	1608240084	Sumit Kumar	24	64
47	1640305	1608240085	Ubaid Ur Rehman	29	69

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48	1640047	1608240087	Vaibhav Singh	20	60
49	1640240	1608240088	Varun Rastogi	28	68
50	1640209	1608240089	Vikas Kumar	24	64
51	1640036	1608240091	Vishal Kumar	25	65
52	1640334	1608240092	Vishesh Kumar	24	64
53	1640331	1608240093	Vishnu Kumar Gautam	28	68
54	1640391	1608240094	Yash Rastogi	29	69
55	1640213	1608240095	Yasharth Gautam	28	68
56	2174026	1708240901	Ankur Saini	29	69
57	2174002	1708240902	Anuj Pal	24	64
58	2174030	1708240903	Devraj Singh	24	64
59	2174032	1708240906	Ravi Arya	25	65
60	2174020	1708240907	Rishabh Dhyani	26	66
61	2174021	1708240908	Shubham Raj	25	65
62	2174022	1708240909	Varun Chhatrawal	25	65

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In Pursuit of Excellence	Class Test Papers with Solution	SESSION-2019-2020 SEM- 8th

MORADABAD INSTITUTE OF TECHNOLOGY

Department of Mechanical Engg.

CLASS TEST SERIES-I

SUBJECT: ADVANCE WELDING **SUBJECT CODE: RME-081**

SEMESTER: VIII **BRANCH: MECHANICAL ENGINEERING**

Max marks: 20

Q.No.	1	2	3	4	5	6	7	8
CO	1	1	1	2	2	1	2	2

Part A

Note: Attempt all questions & each carry 1 marks only

Q1. What are the various modes of metal transfer in arc welding?

Q2. What are the effects of gases in welding?

Q3. Write short note on DC polarity in arc welding.

Part C

Attempt all questions & each carry 3 marks only

Q 4. What are the differences between TIG and MIG welding processes?

Q 5. Explain the Friction stir welding process and its applications.

Q 6. Explain the role of transformers, rectifiers and generators in welding.

Part C

Attempt all questions & each carry 4 marks only

Q 7. Explain laser beam welding and compare it with electron beam welding.

Q 8. What do you understand by underwater welding? Differentiate Wet & Dry underwater welding?

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In Pursuit of Excellence	Class Test Papers with Solution	SESSION-2019-2020 SEM- 8th

CLASS TEST SERIES-II

SUBJECT: ADVANCE WELDING **SUBJECT CODE: RME-081**

SEMESTER: VIII **BRANCH: MECHANICAL ENGINEERING**

Max marks: 20 **Time: 1 hour**

Q. No.	1	2	3	4	5	6	7	8
CO	5	4	4	4	2	5	5	4

Part A

Attempt all questions & each carry 1 marks only

Q1. Draw the weld symbols of Fillet joint, square butt joint, Double V- butt joint.

Q2. What is Reclamation welding?

Q3. Define the Weldability.

Part B

Attempt all questions & each carry 3 marks only

Q4. What are the differences between Cladding & Surfacing processes?

Q5. Explain the Submerged Arc Welding process with diagram and its applications.

Q6. Explain the Liquid penetrate testing of weld joints with neat sketches.

Part C

Attempt all questions & each carry 4 marks only

Q7. Explain the differences between nondestructive testing and destructive testing of weld with their advantages.

Q8. A plate 50 mm wide and 12.5 mm thick is to be welded to another plate by means of parallel fillet welds. The plates are subjected to a load of 50 kN. Find the length of the weld. Assume allowable shear strength to be 56 MPa.

OR

Describe how you will perform magnetic particle inspection on a weld. What are its limitations?

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In Pursuit of Excellence	**Class Test Attendance**	SESSION-2019-2020 SEM-8th

S. No.	Roll No.	Name	CT-1	CT-2
1	1508240064	Kamal Prakash Singh Lodhi	D	P
2	1508240083	Mohammad Anas	D	P
3	1508240117	Priyanshu Kumar	D	P
4	1508240153	Shrikant Siddharth	D	P
5	1608210132	Rohan Dhariwal	D	P
6	1608240003	Ajeet Morya	15	P
7	1608240005	Akash Kumar	D	P
8	1608240006	Akash Yadav	D	P
9	1608240009	Aman Sisodia	15	P
10	1608240010	Amit Kumar	10	P

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29	1608240048	Mohd Faiz	D	P
30	1608240049	Mohd Faizan	D	P
31	1608240051	Mohd Shazeb	D	P
32	1608240052	Mohd Asim	D	P
33	1608240053	Mohd Faraz	D	P
34	1608240054	Mohd Saddam Husain	D	P
35	1608240055	Mudit Yadav	D	P
36	1608240056	Mumtaz Khan	D	P
37	1608240057	Nawaz Ali	A	P
38	1608240059	Nitesh Kumar Saroj	D	P
39	1608240060	Nuzaif Khan	D	P
40	1608240061	Ovais Khan	D	P
41	1608240065	Raja Kanchan	D	P
42	1608240073	Sagar Kumar	D	P
43	1608240074	Salman .	D	P
44	1608240075	Santosh Verma	15	P
45	1608240082	Shubham Kumar	11	P
46	1608240084	Sumit Kumar	11	P
47	1608240085	Ubaid Ur Rehman	D	P
48	1608240087	Vaibhav Singh	A	P
49	1608240088	Varun Rastogi	14	P
50	1608240089	Vikas Kumar	13	P
51	1608240091	Vishal Kumar	10	P
52	1608240092	Vishesh Kumar	A	P
53	1608240093	Vishnu Kumar Gautam	D	P
54	1608240094	Yash Rastogi	12	P
55	1608240095	Yasharth Gautam	D	P
56	1708240901	Ankur Saini	13	P
57	1708240902	Anuj Pal	12	P
58	1708240903	Devraj Singh	A	P
59	1708240906	Ravi Arya	D	P
60	1708240907	Rishabh Dhyani	15	P
61	1708240908	Shubham Raj	14	P
62	1708240909	Varun Chhatrawal	D	P

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In Pursuit of Excellence	**Class Test Marks**	SESSION-2019-2020
	C.T-1	SEM-8

S. No.	Student Id	Roll No.	Name	Max. Marks								Total
				Q. 1	Q. 2	Q. 3	Q. 4	Q. 5	Q. 6	Q. 7	Q. 8	
				1	1	1	3	3	3	4	4	20
1	1540443	1508240064	Kamal Prakash Singh Lodhi	D	D	D	D	D	D	D	D	D
2	1540472	1508240083	Mohammad Anas	D	D	D	D	D	D	D	D	D
3	1540206	1508240117	Priyanshu Kumar	D	D	D	D	D	D	D	D	D
4	1540606	1508240153	Shrikant Siddharth	D	D	D	D	D	D	D	D	D
5	1610349	1608210132	Rohan Dhariwal	D	D	D	D	D	D	D	D	D
6	1640121	1608240003	Ajeet Morya	1	1	1	2	3	3	2	2	15
7	1640442	1608240005	Akash Kumar	D	D	D	D	D	D	D	D	D
8	1640290	1608240006	Akash Yadav	D	D	D	D	D	D	D	D	D
9	1640252	1608240009	Aman Sisodia	1	1	1	2	2	2	3	3	15
10	1640436	1608240010	Amit Kumar	1	1	1	1	1	1	2	2	10
11	1640204	1608240011	Amitesh Kushwaha	1	1	1	2	2	3	3	3	16
12	1640385	1608240013	Ankit Kumar	D	D	D	D	D	D	D	D	D
13	1640332	1608240014	Ankur Singh	1	1	1	2	2	3	4	4	18
14	1640299	1608240015	Anuj Panwar	D	D	D	D	D	D	D	D	D
15	1640285	1608240016	Arjun Singh	D	D	D	D	D	D	D	D	D
16	1640122	1608240019	Ayush Rajput	A	A	A	A	A	A	A	A	A
17	1640205	1608240022	Dhaneshwar Chauhan	D	D	D	D	D	D	D	D	D
18	1640210	1608240024	Dinesh Kumar	D	D	D	D	D	D	D	D	D
19	1640173	1608240025	Dishant Pratap	D	D	D	D	D	D	D	D	D
20	1640249	1608240026	Gajendra Singh	1	1	1	1	2	2	3	2	13
21	1640154	1608240030	Harsh Thakur	D	D	D	D	D	D	D	D	D
22	1640169	1608240037	Kovit Kumar	D	D	D	D	D	D	D	D	D
23	1640250	1608240041	Mohammad Faizi	D	D	D	D	D	D	D	D	D
24	1640455	1608240042	Mohammad Areeb Saifi	D	D	D	D	D	D	D	D	D
25	1640381	1608240043	Mohd Ahtesham	D	D	D	D	D	D	D	D	D
26	1640164	1608240045	Mohd Anas	D	D	D	D	D	D	D	D	D
27	1640451	1608240046	Mohd Athar	D	D	D	D	D	D	D	D	D
28	1640055	1608240047	Mohd Daniyal	D	D	D	D	D	D	D	D	D
29	1640130	1608240048	Mohd Faiz	D	D	D	D	D	D	D	D	D
30	1640448	1608240049	Mohd Faizan	D	D	D	D	D	D	D	D	D

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31	1640279	1608240051	Mohd Shazeb	D	D	D	D	D	D	D	D	D
32	1640251	1608240052	Mohd Asim	D	D	D	D	D	D	D	D	D
33	1640357	1608240053	Mohd Faraz	D	D	D	D	D	D	D	D	D
34	1640389	1608240054	Mohd Saddam Husain	D	D	D	D	D	D	D	D	D
35	1640289	1608240055	Mudit Yadav	D	D	D	D	D	D	D	D	D
36	1640099	1608240056	Mumtaz Khan	D	D	D	D	D	D	D	D	D
37	1640282	1608240057	Nawaz Ali	A	A	A	A	A	A	A	A	A
38	1640405	1608240059	Nitesh Kumar Saroj	D	D	D	D	D	D	D	D	D
39	1640070	1608240060	Nuzaif Khan	D	D	D	D	D	D	D	D	D
40	1640090	1608240061	Ovais Khan	D	D	D	D	D	D	D	D	D
41	1640364	1608240065	Raja Kanchan	D	D	D	D	D	D	D	D	D
42	1640341	1608240073	Sagar Kumar	D	D	D	D	D	D	D	D	D
43	1640242	1608240074	Salman .	D	D	D	D	D	D	D	D	D
44	1640045	1608240075	Santosh Verma	1	1	1	2	3	2	3	2	15
45	1640277	1608240082	Shubham Kumar	1	1	1	0	2	2	2	2	11
46	1640208	1608240084	Sumit Kumar	1	1	1	1	2	2	1	2	11
47	1640305	1608240085	Ubaid Ur Rehman	D	D	D	D	D	D	D	D	D
48	1640047	1608240087	Vaibhav Singh	A	A	A	A	A	A	A	A	A
49	1640240	1608240088	Varun Rastogi	1	1	1	1	2	3	3	2	14
50	1640209	1608240089	Vikas Kumar	1	1	1	1	2	2	3	2	13
51	1640036	1608240091	Vishal Kumar	1	1	1	1	0	2	2	2	10
52	1640334	1608240092	Vishesh Kumar	A	A	A	A	A	A	A	A	A
53	1640331	1608240093	Vishnu Kumar Gautam	D	D	D	D	D	D	D	D	D
54	1640391	1608240094	Yash Rastogi	1	1	1	1	2	2	2	2	12
55	1640213	1608240095	Yasharth Gautam	D	D	D	D	D	D	D	D	D
56	2174026	1708240901	Ankur Saini	1	1	1	1	2	2	3	2	13
57	2174002	1708240902	Anuj Pal	1	1	1	1	2	2	2	2	12
58	2174030	1708240903	Devraj Singh	A	A	A	A	A	A	A	A	A
59	2174032	1708240906	Ravi Arya	D	D	D	D	D	D	D	D	D
60	2174020	1708240907	Rishabh Dhyani	1	1	1	1	2	3	3	3	15
61	2174021	1708240908	Shubham Raj	1	1	1	1	2	2	3	3	14
62	2174022	1708240909	Varun Chhatrawal	D	D	D	D	D	D	D	D	D

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In Pursuit of Excellence	**Class Test Marks**	SESSION-2019-2020
	C.T-2	SEM-8

S. No.	Student Id	Roll No.	Name	Max. Marks								Total
				Q. 1	Q. 2	Q. 3	Q. 4	Q. 5	Q. 6	Q. 7	Q. 8	
				1	1	1	3	3	3	4	4	20
1	1540443	1508240064	Kamal Prakash Singh Lodhi			1	2	2	2	3	2	12
2	1540472	1508240083	Mohammad Anas	1	1	1		3	2	3	2	13
3	1540206	1508240117	Priyanshu Kumar	1	1	1	1	3	2	3	2	14
4	1540606	1508240153	Shrikant Siddharth	1	1	1	3	2		3		11
5	1610349	1608210132	Rohan Dhariwal	1	1	1	2	3	2	3	4	17
6	1640121	1608240003	Ajeet Morya	1	1	1	2	2	2	3	4	16
7	1640442	1608240005	Akash Kumar	1	1	1	3	3	3	4	3	19
8	1640290	1608240006	Akash Yadav	1	1	1	2	2	2	2	2	13
9	1640252	1608240009	Aman Sisodia	1	1	1	2	3	3	3	4	18
10	1640436	1608240010	Amit Kumar	1	1	1	2	2	2	3	4	16
11	1640204	1608240011	Amitesh Kushwaha	1	1	1	2	2.5	2.5	2	4	16
12	1640385	1608240013	Ankit Kumar	1	1	1	1	3	2	2		11
13	1640332	1608240014	Ankur Singh	1	1	1	2	3	3	4	4	19
14	1640299	1608240015	Anuj Panwar	1	1	1	2	3	2	3	4	17
15	1640285	1608240016	Arjun Singh	1	1	1	2	3	3	4	4	19
16	1640122	1608240019	Ayush Rajput	1	1	1	2	3	3	4	2	17
17	1640205	1608240022	Dhaneshwar Chauhan	1	1	1	0	3	3	3	4	16
18	1640210	1608240024	Dinesh Kumar	1	1	1	2	2	2	2	4	15
19	1640173	1608240025	Dishant Pratap	1	1	1	2	3	3	3	4	18
20	1640249	1608240026	Gajendra Singh	1	1	1	2	3	3	3	3	17
21	1640154	1608240030	Harsh Thakur	1	1	1	3	3	3	3	4	19
22	1640169	1608240037	Kovit Kumar	1	1	1	2	2	2	3	3	15
23	1640250	1608240041	Mohammad Faizi	1	1	1	2	3	2	3	4	17
24	1640455	1608240042	Mohammad Areeb Saifi	1	1	1	2	3	3	3	4	18
25	1640381	1608240043	Mohd Ahtesham	1	1	1	2	3	3	3	4	18
26	1640164	1608240045	Mohd Anas	1	1	1	2	3	2	4	4	18
27	1640451	1608240046	Mohd Athar	1	1	1	2	3	1	2	4	15
28	1640055	1608240047	Mohd Daniyal	1	1	1	2	2	2	3	4	16
29	1640130	1608240048	Mohd Faiz	1	1	1	2	3	3	3	4	18

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30	1640448	1608240049	Mohd Faizan	1	1	1	2	3	3	3	4	18
31	1640279	1608240051	Mohd Shazeb	1	1	1	2	3	3	2	4	17
32	1640251	1608240052	Mohd Asim	1	1	1	3	3	2	3	4	18
33	1640357	1608240053	Mohd Faraz	1	1	1	2	3	2	3	4	17
34	1640389	1608240054	Mohd Saddam Husain	1	1	1	2	3	2	3	3	16
35	1640289	1608240055	Mudit Yadav	1	1	1	2	3	2	2	3	15
36	1640099	1608240056	Mumtaz Khan	1	1	1	2	3	3	3	4	18
37	1640282	1608240057	Nawaz Ali	1	1	1	2	3	2	3	4	17
38	1640405	1608240059	Nitesh Kumar Saroj	1	1	1	2	3	3	3	3	17
39	1640070	1608240060	Nuzaif Khan	1	1	1	2	3	2	3	4	17
40	1640090	1608240061	Ovais Khan	1	1	1	2	3	2		4	14
41	1640364	1608240065	Raja Kanchan	1	1	1	2	3	2	2	4	16
42	1640341	1608240073	Sagar Kumar	1	1	1	2	3	3	3	4	18
43	1640242	1608240074	Salman .	1	1	1	2		3	3	4	15
44	1640045	1608240075	Santosh Verma	1	1	1	2	3	2	3	4	17
45	1640277	1608240082	Shubham Kumar	1	1	1	2	3	3	3	3	17
46	1640208	1608240084	Sumit Kumar	1	1	1	2	3	1	3	4	16
47	1640305	1608240085	Ubaid Ur Rehman	1	1	1	2	3	3	3	4	18
48	1640047	1608240087	Vaibhav Singh	1	1	1	1	1	3	3	3	14
49	1640240	1608240088	Varun Rastogi	1	1	1	2	2	3	4	4	18
50	1640209	1608240089	Vikas Kumar	1	1	1	2	2	2	2	3	14
51	1640036	1608240091	Vishal Kumar	1	1	1	2	3	3	3	3	17
52	1640334	1608240092	Vishesh Kumar	1	1	1	2	3	3	3	3	17
53	1640331	1608240093	Vishnu Kumar Gautam	1	1	1	2	3	3	3	4	18
54	1640391	1608240094	Yash Rastogi	1	1	1	2	3	2	3	4	17
55	1640213	1608240095	Yasharth Gautam	1	1	1	2	3	3	2	4	17
56	2174026	1708240901	Ankur Saini	1	1	1	2	3	3	4	3	18
57	2174002	1708240902	Anuj Pal	1	1	1	3	3	2	3	2	16
58	2174030	1708240903	Devraj Singh	1	1	1	2	3		3	3	14
59	2174032	1708240906	Ravi Arya	1	1	1	2	3	2	3	4	17
60	2174020	1708240907	Rishabh Dhyani	1	1	1	3	3	3	3	4	19
61	2174021	1708240908	Shubham Raj	1	1	1	2	3	3	3	4	18
62	2174022	1708240909	Varun Chhatrawal	1	1	1	2	3	3	3	3	17

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In Pursuit of Excellence	**List of Students having short attendance**	SESSION-2019-2020 SEM- 8th

S. No.	Student Id	Roll No.	Name	Attendance held (30)
1	1540443	1508240064	Kamal Prakash Singh Lodhi	18
2	1540472	1508240083	Mohammad Anas	17
3	1540206	1508240117	Priyanshu Kumar	18
4	1540606	1508240153	Shrikant Siddharth	17
5	1610349	1608210132	Rohan Dhariwal	17
6	1640385	1608240013	Ankit Kumar	14
7	1640279	1608240051	Mohd Shazeb	18

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In Pursuit of Excellence	**List of Weak Students** (Action taken for Improvement)	SESSION-2019-2020
		SEM- 8th

S. No.	Student Id	Roll No.	Name
1	1540443	1508240064	Kamal Prakash Singh Lodhi
2	1540472	1508240083	Mohammad Anas
3	1540206	1508240117	Priyanshu Kumar
4	1540606	1508240153	Shrikant Siddharth
5	1610349	1608210132	Rohan Dhariwal
6	1640169	1608240037	Kovit Kumar
7	1640250	1608240041	Mohammad Faizi
8	1640455	1608240042	Mohammad Areeb Saifi
9	1640381	1608240043	Mohd Ahtesham
10	1640164	1608240045	Mohd Anas

Action plan for Weak students

(1) A question bank based on the previous years' question papers, is provided to the students for better preparation.

(2) Regular monitoring of their progress is done by observing their performance in lectures, tutorials and labs.

(3) Separate special classes for weak students are arranged. It helps in clarifying the doubts and re-explaining of difficult topics to such students.

(4) Important study material is provided to the weak students for better preparation.

(5) Regular counseling of weak students to enhance their habit of self learning.

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MORADABAD INSTITUTE OF TECHNOLOGY

Question Bank

Even SEMESTER (2019-20)

B.Tech. 8th Sem.

Branch- Mechanical Engineering. Section- E

Subject Name: - Advance Welding **Paper Code: RME-081**

Question Type	Difficulty	Category, Sub Category	Question
Single Choice	Easy	Advanced Welding, physic of arc	Q1. In arc welding, the temperature of the arc is of the order of a. 100° C b. 1000° C **c. 3500° C** d. 35000° C
Single Choice	Medium	Advanced Welding, physic of arc	Q2. The arc has a. Linear resistance characteristics b. Positive resistance characteristics **c. Negative resistance characteristics** d. Highly inductive characteristics
Fill in the Blank	Medium	Advanced Welding, physic of arc	Q3. Arc can be produced by_____ a. AC current only b. DC current only **c. Either AC or DC current** d. All of the above
Single Choice	Medium	Advanced Welding, physic of arc	Q4. The resistance of the arc **a. Decrease with an increase of the current** **b.** Increases with increases of the current **c.** Does not depends on current **d.** None of the above
Single Choice	Medium	Advanced Welding, Power source	Q5. In arc welding, the voltage on A.C supply system is in the range a. 1000-1200 V b. 400-500 V c. 200-250 V **d. 70-100V**
Fill in the Blank	Medium	Advanced Welding, Power source	Q6. In arc welding by dc supply, the voltage required is____ a. 10 to 20 V **b. 50 to 60 V** c. 100 to 120 V d. 200 to 250 V

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Single Choice	Medium	Advanced Welding, Power source	Q7. In arc welding, once the arc is struck, the voltage required to maintain the arc will be **a. 20-30 V** b. 100-120 V c. 200-220 V d. 500-1000 V	1
Fill in the Blank	Medium	Advanced Welding, Power source	Q8. The Polarity of A.C welding sets is_____ a. Positive b. Negative **c. No polarity** d. Infinite	1
Fill in the Blank	Medium	Advanced Welding, Application	Q9. Steel rails are welded by_____ a. Resistance welding **b. Thermit Welding** c. Argon arc welding d. Gas welding	1
Single Choice	Easy	Advanced Welding, Welding Processes	Q10. In which of the following process, heat is created by blacksmith fire **a. Forge welding** **b.** Spot welding **c.** Projection welding **d.** Seam welding	1
Single Choice	Easy	Advanced Welding, Welding Processes	Q11. In gas welding the gases used are a. Oxygen and nitrogen b. Argon and Helium c. Helium and carbon dioxide **d. Acetylene and oxygen**	1
Single Choice	Easy	Advanced Welding, Welding Processes	Q12. What is an example of plastic welding? a. Gas Welding **b. Resistance welding** c. Thermit welding without pressure d. None of these	1
Single Choice	Medium	Advanced Welding, physic of arc	Q13. In fusion welding, penetration is the ratio of- **a. width of the weld to its depth** **b.** length of the weld to its depth **c.** depth of the weld to its width **d.** depth of the weld to its length	1
Single Choice	Easy	Advanced Welding, Welding Processes	Q14. Which of the following is an example of fusion welding? **a. Arc welding** **b.** Forge welding **c.** Resistance welding **d.** Thermit welding with pressure	1

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Single Choice	Medium	Advanced Welding, Wealdability	Q15. Gray iron is usually welded by **a. Arc welding** **b.** Gas welding **c.** TIG welding **d.** MIG welding	1
Single Choice	Medium	Advanced Welding, Power sources	Q16. A rectifier for welding has voltage/current characteristic as **a. Drooping** **b.** Rising **c.** Static **d.** Variable	1
Single Choice	Medium	Advanced Welding, Wealdability	Q17 In resistance welding, aluminum, as compared to steel, requires a. Larger welding time **b. Smaller welding time** c. Equal welding time d. Welding time depends upon the value of weld current	1
Single Choice	Medium	Advanced Welding, Metal transfer	Q18. In MIG welding, the metal is transferred in the form of. **a. A fine spray of metal** **b.** Molten drops **c.** Weld pool **d.** Molecules	1
Single Choice	Medium	Advanced Welding, Types of joints	Q19. Which of the following is strongest for brazing joints? a. Butt b. Scarf (inclined) **c. Lap** d. All are equally strong	1
Single Choice	Easy	Advanced Welding, Health and safety	Q20. Which of the following is not a welding accessory? a. Electrode holder b. Work Clamp c. Cable **d. Gloves**	1
Single Choice	Easy	Advanced Welding, Welding processes	Q21. The welding method which is used to join thin metal sheets? a. Arc welding b. Gas welding **c. Resistance welding** d. Hydrogen welding	1
Single Choice	Easy	Advanced Welding, Gas welding	Q22. In acetylene cylinder, the acetylene is dissolved in a. Carbon dioxide b. Water c. Oxygen **d. Acetone**	1

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Single Choice	Easy	Advanced Welding, Gas welding	Q23. Oxidizing flame is a flame which is obtained by supplying **a. less volume of acetylene and more volume of oxygen** **b.** more volume of acetylene and less volume of oxygen **c.** equal volume of acetylene and oxygen **d.** None of the above	1
Single Choice	Easy	Advanced Welding, Welding source	Q24. Following energy source can be used for welding a. electron beam b. friction c. ultrasound **d. all of the above**	1
Single Choice	Medium	Advanced Welding, Physics of arc	Q25. In arc welding, the length of arc is directly related to the a. current **b. voltage** c. both (A) and (B) d. None of the above	1
Single Choice	Medium	Advanced Welding, Power source	Q26. The voltage used in resistance welding is generally kept between- **a. 4-12 volts** **b.** 12-20 volts **c.** 20-28 volts **d.** 28-36 volts	1
Single Choice	Easy	Advanced Welding, Material	Q27. In resistance welding, two electrodes are made of a. Aluminium **b. Copper** c. Iron d. Bronze	1
Single Choice	Easy	Advanced Welding, Inert gases	Q28. Which of the following gas mixtures is not used in Gas tungsten arc welding (TIG)? a. Argon-Helium **b. Argon-Nitrogen** c. Argon-Hydrogen d. Argon-Carbon dioxide	1
Single Choice	Medium	Advanced Welding, Welding processes	Q29. Carbon arc welding is..... a. A process which uses a mixture of iron oxide and granular aluminium b. Accomplished by maintaining a hot molten metal pool between plates c. Used to weld carbon rods **d. None of the above**	1

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<table>
<tr><td>Single Choice</td><td>Easy</td><td>Advanced Welding, Welding processes</td><td>Q30. The following welding process is used to weld fastener to plates without drilling or punching holes?
a. Electroslag welding
b. Oxy-acetylene welding
c. Butt welding
d. Stud welding</td><td>1</td></tr>
<tr><td>Single Choice</td><td>Easy</td><td>Advanced Welding, Power source</td><td>Q31. Equipment is used for arc welding a material by carbon electrode.....
a. A.C welding set
b. Rectifier
c. Motor Generator
d. D.C. welding set with straight polarity</td><td>1</td></tr>
<tr><td>Fill in the Blank</td><td>Easy</td><td>Advanced Welding, Welding processes</td><td>Q32. Which process is used for repairing of tracks and spokes of driving wheels?
a. Electroslag welding
b. Plasma arc welding
c. Thermit welding
d. Electron beam welding</td><td>1</td></tr>
<tr><td>Match the Following</td><td>Medium</td><td>Advanced Welding, Welding processes application</td><td>Q33 Match list I with list II and select the correct answer using the code given below the list.
<table><tr><th>List-I (Welding process)</th><th>List-II (Applications)</th></tr><tr><td>a. Laser welding
b. Friction welding
c. Ultrasonic welding
d. Explosive welding</td><td>1. Uniting large arc sheets
2. Repairing Large parts
3. Welding a rod to flat surface
4. Fabrication of nuclear reactor component
5. Welding very thin material</td></tr></table><table><tr><td></td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>a.</td><td>5</td><td>4</td><td>3</td><td>2</td></tr><tr><td>b.</td><td>1</td><td>4</td><td>2</td><td>5</td></tr><tr><td>c.</td><td>1</td><td>3</td><td>4</td><td>2</td></tr><tr><td>d.</td><td>5</td><td>3</td><td>4</td><td>1</td></tr></table></td><td>1</td></tr>
<tr><td></td><td>Easy</td><td>Advanced Welding, Welding processes</td><td>Q34- Following welding process (es) use consumable electrode.
a. Shielded metal arc welding
b. gas metal arc welding
c. both (A) and (B)
d. gas tungsten arc welding</td><td>1</td></tr>
<tr><td>Single Choice</td><td>Medium</td><td>Advanced Welding, Joints</td><td>Q35- Why are butt welded joints longitudinal joints?
a. High strength requirements
b. Low strength requirements
c. Low as well as high strength requirements
d. None</td><td>1</td></tr>
</table>

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Single Choice	Medium	Advanced Welding, Weld	Q36-Single full fillet welded joint cannot be used for a plate thickness greater than a. 1/8" b. 2/8" **c. 3/8"** d. None	1
Single Choice	Easy	Advanced Welding, Weld	Q37- By overlapping the plates, which type of welded joint is made **a. Fillet welded joint** **b.** Butt welded joint **c.** Fillet-Butt welded joint **d.** None	1
Single Choice	Easy	Advanced Welding, Weld	Q38- Transverse fillet welds are under a. Shear stress b. Compressive stress **c. Tensile stress** d. None	1
Single Choice	Medium	Advanced Welding, Weld	Q39- Parallel fillet welds are under **a. Shear stress** **b.** Compressive stress **c.** Tensile stress **d.** None	1
Single Choice	Easy	Advanced Welding, Weld symbol	Q40- Quantity which is not a part of the weld symbol a. Length of welding b. Weld is made in the welding shop c. Welding is on both sides **d. Machine used in welding**	1
Single Choice	Easy	Advanced Welding, Inert gases	Q41-In inert gas metal arc welding, a. Argon is used for welding thin materials and helium is used for welding thick materials b. Both argon and helium are used for welding thin materials **c. Both argon and helium are used for welding thick materials** d. Argon is used for welding thick materials and helium is used for welding thin materials	1
Fill in the Blank	Easy	Advanced Welding, Joints	Q42- The production of sound welds is not governed by _____ a. type of joint **b. choice of electrode** c. type of metal plate d. arc length	1
Fill in the Blank	Medium	Advanced Welding, Welding processes	Q43-Submerged arc welding is..... a. A process which uses a mixture of iron oxide and granular aluminium b. Accomplished by maintaining a hot molten metal pool between plates c. A process in which arc is maintained under a blanket of flux d. All of the above	1

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Single Choice	Easy	Advanced Welding, Welding processes	Q44- Thermit welding is a form of..... a. Resistance welding b. Gas welding c. Fusion welding d. Forge welding	1
Single Choice	Medium	Advanced Welding, Welding processes	Q45- Seam-welding is..... a. Multi-spot welding process **b. Continuous spot welding process** c. Used to form mesh d. Used for welding cylindrical objects	1
Single Choice	Easy	Advanced Welding, Welding processes	Q46- Projection welding is a. Electric arc welding b. Gas welding c. Spot welding **d. None**	1
Single Choice	Easy	Advanced Welding, Joints	Q47- Type of welded joint which do not exit a. Groove type b. Spot type c. Plug type **d. Surface type**	1
Single Choice	Easy	Advanced Welding, weld	Q48- In which case, molten metal is used to do welding? a. Groove type b. fillet type **c. Plug type** d. None	1
Fill in the Blank	Easy	Advanced Welding, Joints	Q49- T-joints are not used to fabricate _____ a. I-shape b. T-shapes c. Brackets **d. Plates joined at straight angles**	1
Single Choice	Medium	Advanced Welding, Joints	Q50- Which of the following are correct regarding butt joints over lap joints? a. Lap joints eliminates eccentricity whereas butt joints develops eccentricity **b. Butt joints minimizes the size of connection** c. Lap joints are aesthetically pleasing over butt joints d. Butt joint obtained from full penetration groove weld has 50% efficiency	1
Fill in the Blank	Easy	Advanced Welding, Defects	Q51- Cold cracks can be prevented by _____ a. uniform heating **b. by use of low hydrogen electrode** c. faster cooling d. slower cooling	1
Fill in the Blank	Easy	Advanced Welding, Power Source	Q52- The temperature of plasma torch is of the order of..... a. 1000 °C b. 5000 °C c. 10000 °C **d. 33000 °C**	1

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Single Choice	Medium	Advanced Welding, Weld	Q53- Double full fillet welded joint cannot be used for a plate thickness greater than a. 1/8" b. 3/8" **c. 5/8"** d. None	1
Single Choice	Easy	Advanced Welding, Weld	Q54- Term which is not applicable to a welded joint a. Higher efficiency **b. Easy process** c. Faster process d. None	1
Single Choice	Medium	Advanced Welding, Parameters	Q55- In resistance welding, the pressure is released. a. Just at time of passing the current b. After completion of current **c. After the weld cools** d. During heating periods	1
Single Choice	Medium	Advanced Welding, Gas welding	Q56- The carburising frame as compared to oxidising flame is.. **a. More luminous** **b.** Less luminous **c.** Equally luminous **d.** Unpredictable	1
Single Choice	Medium	Advanced Welding, Gas welding	Q57- Neutral flame has. a. 1 zone **b. 2 zones** c. 3 zones d. 4 zones	1
Single Choice	Medium	Advanced Welding, Brazing	Q58- The following flux is used for brazing cast iron. a. Mixture of boric acid, borux and a wetting agent **b. Boric acid, borax or fluoride with a wetting agent** c. Chlorides and fluorides mixed with water d. All of the above	1
Single Choice	Easy	Advanced Welding, Welding process	Q59- In which welding process the electric energy required for welding is stored in the capacitor? **a. Percussion welding** **b.** Explosion welding **c.** Diffusion welding **d.** Thermit welding	1
Single Choice	Easy	Advanced Welding, Welding process	Q60- Which of the following welding is also known as arc and gas welding? a. Electro slag welding **b. Atomic hydrogen welding** c. Laser beam welding d. Ultrasonic welding	1

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Single Choice	Easy	Advanced Welding, Heat flow welding	Q61- Brittle coat method is used in measuring.. **a. Residual stresses** **b.** Distortion **c.** Weld defects **d.** All the above	1
Single Choice	Easy	Advanced Welding, physic of arc	Q62- In arc welding, if arc is too short, it will result in..... **a. Electrode sticking to the base metal and base metal not melting and bead resting on top of the work, leading to poor fusion and gas and slag holes** **b.** Formation of large globules in an irregular pattern because of wandering of arc, leading of poor fusion with base petal **c.** Arc extinction **d.** Operator hazard	1
Single Choice	Easy	Advanced Welding, physic of arc	Q63- In arc welding, if arc is too long, it will result in..... a. Electrode sticking to the base metal and base metal not melting and bead resting on top of the work, leading to poor fusion and gas and slag holes **b. Formation of large globules in an irregular pattern because of wandering of arc, leading of poor fusion with base petal** c. Arc extinction d. Operator hazard	1
Single Choice	Easy	Advanced Welding, physic of arc	Q64- Too low welding current in arc welding would result in..... **a. Excessive piling up of weld metal, poor penetration, wasted electrodes** **b.** Excessive spatter, under cutting along edges, irregular deposits, wasted electrodes **c.** Too small bead, weak weld, and wasted electrodes **d.** None of the above	1
Single Choice	Easy	Advanced Welding, physic of arc	Q65-Too low welding current in arc welding would result in..... a. Excessive piling up of weld metal, poor penetration, wasted electrodes **b. Excessive spatter, under cutting along edges, irregular deposits, wasted electrodes** c. Too small bead, weak weld, and wasted electrodes d. None of the above	1
Single Choice	Medium	Advanced Welding, Metallurgy	Q66- Welding metallurgy is concerned with. a. Melting of electrode and base metal b. Solidification of weld metal c. Solid state reaction **d. All the above**	1

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Single Choice	Medium	Advanced Welding, parameters	Q67- In arc welding, open circuit voltage is used..... a. 18-40 volts **b. 40-95 volts** c. C.100-125 volts d. D.130-170 volts	1
Single Choice	Easy	Advanced Welding, Soldering	Q68- A soldering iron is used mainly to a. Heat the metal **b. Melt the solder** c. Heat the flux d. None of these	1
Single Choice	Easy	Advanced Welding, Resistance welding	Q69- In electrical resistance welding cleaning of metals to be welded a. Is immaterial **b. Is important** c. Can be neglected d. Does not have any effect on the welding	1
Single Choice	Easy	Advanced Welding, Resistance welding	Q70- Which one of the following methods is generally not used in welding of chromium molybdenum steels a. Oxyacetylene b. Submerged arc c. Thermit **d. Resistance**	1
Single Choice	Medium	Advanced Welding, Soldering	Q71- Principal materials used in soldering are **a. Tin and lead** **b.** Copper and tin **c.** Zinc and copper **d.** Copper and lead	1
Single Choice	Easy	Advanced Welding, Welding process	Q72- The method of joining metals by means of cast iron alloy whose melting point is below 425?C is known as a. Non-ferrous welding b. Galvanising c. Adhesive bonding **d. Soldering**	1
Fill in the Blank	Medium	Advanced Welding, Welding process	Q73- Grey iron is usually welded by_____ a. Arc welding **b. Gas welding** c. TIG welding d. MIG welding	1
Single Choice	Medium	Advanced Welding, ultrasonic welding	Q74- In ultrasonic welding the frequency range is generally a. 100 - 4000 cps **b. 4000 - 20,000 cps** c. 20,000 - 80,000 cps d. 80,000 - 800,000 cps	1

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Single Choice	Easy	Advanced Welding, Gas welding	Q75- Oxygen cylinders are a. Cast iron cylinders b. Steel cylinders, welded structure c. Die cast **d. Seamless steel cylinders**	1
Single Choice	Easy	Advanced Welding, Power source	Q76- The welding transformer used in resistance welding will **a. Step up current** **b.** Step down current **c.** Step up voltage **d.** Step up power	1
Single Choice	Medium	Advanced Welding, Weldability	Q77- Which method would you recommend for the welding of aluminum alloys? a. DC arc welding b. AC arc welding **c. Tungsten Welding** d. Acetylene oxygen gas welding	1
Single Choice	Easy	Advanced Welding, Inert gas	Q78- Argon is a. Inactive gas **b. Inert gas** c. Rare gas d. Oxidizing agent	1
Single Choice	Easy	Advanced Welding, Power source	Q79- The advantages of welding motor generator is usually in the range of a. Easily Portable b. Used for ferrous and Non-ferrous material c. Can be used for all welding position **d. Less maintenance**	1
Single Choice	Medium	Advanced Welding, Power source	Q80- The welding electric circuit is **a. Always earthed** **b.** Never earthed **c.** Through cables only **d.** None of the above	1
Single Choice	Easy	Advanced Welding, Arc welding	Q81- The danger of electric shock is maximum a. During arcing b. After arcing c. Before welding **d. While inserting an electrode into the holder**	1
Single Choice	Easy	Advanced Welding, Welding process	Q82- Which of the following is different from the remaining? a. Spot welding b. Seam welding c. Butt welding **d. Argon arc welding**	1

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Single Choice	Medium	Advanced Welding, Arc physics	Q83- Too fast welding speed in arc welding would result in... a. Excessive piling up of weld metal, poor penetration, wasted electrodes b. Excessive spatter, under cutting along edges, irregular deposits, wasted electrodes **c. Too small bead, weak weld, and wasted electrodes** d. None of the above	1
Single Choice	Medium	Advanced Welding, process	Q84- Oxygen to acetyline ratio in case of oxidising flame is..... a. 1:1 b. 1.2:1 **c. 1.5:1** d. 2:1	1
Single Choice	Medium	Advanced Welding, Defects	Q85- Which of the following defects occur when the deposited metal is not focused on the root of weld? a. Inclusion of slag **b. Inadequate penetration** c. Incomplete fusion d. Porosity	1
Single Choice	Medium	Advanced Welding, Defects	Q86- Which of the following defects occur due to filler material having a different rate of contraction compared to parent metal? a. Undercut b. Spatter **c. Cracking in weld metal** d. Cold cracking	1
Single Choice	Medium	Advanced Welding, Defects	Q87- Which of the following defect is influenced by sulphur and carbon content of weld metals? a. Undercut **b. Spatter** c. Cracking in weld metal d. Cold cracking	1
Single Choice	Medium	Advanced Welding, Defects	Q88- The defect that occurs at lower temperature? a. Undercut b. Spatter c. Cracking in weld metal **d. Cold cracking**	1
Single Choice	Easy	Advanced Welding, Weld symbol	Q89- A weld symbol is necessary because of a. Aesthetic sense b. Finishing **c. Manufacturing** d. None	1
Single Choice	Easy	Advanced Welding, Welding processes	Q90-Filler rod is used in a. TIG welding **b. Gas welding** c. Forge welding d. Seam welding	1

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Single Choice	Easy	Advanced Welding, Welding processes	Q91-Electric arc welding is a a. Chemical process b. Pressure welding process **c. Fusion welding process** d. Non-conventional welding process	1
Single Choice	Easy	Advanced Welding, Welding processes	Q92-Which is not a fusion welding process a. Gas welding b. Arc welding c. Brazing **d. Resistance welding**	1
Single Choice	Medium	Advanced Welding, Application	Q93-Aircraft body has a. Bolted structure b. Precast structure c. Welded structure **d. Riveted structure**	1
Single Choice	Easy	Advanced Welding, Gas welding	Q94-Which flame is used for welding of brass a. Neutral flame **b. Oxidizing flame** c. Carburizing flame d. None of these	1
Single Choice	Easy	Advanced Welding, Resistance welding	Q95-Electrode in resistance welding is made out of a. Al base alloy **b. Cu base alloy** c. Stainless steel alloy d. M.S based	1
Single Choice	Easy	Advanced Welding, Welding processes	Q96- Which of the following welding process the weld joint is obtained by means of filler material and not by melting? a. Diffusion welding b. Thermit welding c. Electroslag welding **d. Brazing**	1
Single Choice	Medium	Advanced Welding, Brazing	Q97- Which of the following statements is not true? a. Brazing occurs at a temperature above 450°C b. Soldering occurs at a temperature below 450°C c. Epoxy resins are used to join metals, ceramics etc **d. Epoxy resins are not used to join metals, ceramics etc**	1
Single Choice	Easy	Advanced Welding, Welding processes	Q98- Voltage used in resistance welding is..... a. 1 V **b. 10 V** c. 100 V d. 1000 V	1

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Single Choice	M Easy	Advanced Welding, Welding processes	Q99- Which of the following are the properties of a laser? a. Highly collimated b. Monochromatic c. Coherent light beam **d. All of the mentioned**	1
Single Choice	Medium	Advanced Welding, Welding processes	Q100- In Plasma arc welding the electrode is made of **a. tungsten** **b.** copper **c.** bass **d.** steel	1

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In Pursuit of Excellence	**List of Bright Students** (Action taken for enhancing performance)	SESSION-2019-2020
		SEM- 8th

S.No	Student no.	Roll No.	Student Name
1.	1640252	1608240009	Aman Sisodia
2.	1640332	1608240014	Ankur Singh
3.	1640285	1608240016	Arjun Singh
4.	1640173	1608240025	Dishant Pratap
5.	1640154	1608240030	Harsh Thakur
6.	1640448	1608240049	Mohd Faizan
7.	1640305	1608240085	Ubaid Ur Rehman
8.	1640240	1608240088	Varun Rastogi
9.	1640391	1608240094	Yash Rastogi
10.	1640213	1608240095	Yasharth Gautam

Action Plan for Fast Learner

(1) Students are encouraged to enhance their skills by joining NPTEL/MOOC or any other special training course based on their area of interest.

(2) Questions of competitive exam level regularly taught to students.

(3) Strong monitoring of self learning activities of students.
   (a) Students are encouraged to read different books and present various topics as seminar in order to enhance the presentation and communication skills.
   (b) Students are encouraged to prepare their own notes of each topics.

(4) Each topic of the syllabus as well as additional topics/case studies discussed with students thoroughly.

(5) They are encouraged to participate in workshops and seminars to gain knowledge on the latest developments.

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Lecture: 1

Introduction: Joining

This chapter presents the fundamental approaches used in manufacturing namely casting, forming, welding and machining. Further, common methods of developing joint and selection of suitable methods have been described. Applications, advantages and limitations of welding as a fabrication technique have also been covered.

Keywords: Manufacturing process, selection of joint, welding vs. manufacturing processes, selection of welding process, advantages, application and limitation of welding processes

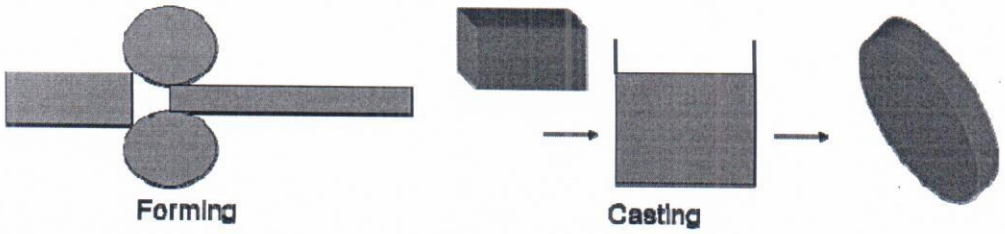
1.1 Introduction

The manufacturing technology primarily involves sizing, shaping and imparting desired combination of the properties to the material so that the component or engineering system being produced to perform indented function for design life. A wide range of manufacturing processes have been developed in order to produce the engineering components ranging from simple to complex geometries using materials of different physical, chemical, mechanical and dimensional properties. There are four chief manufacturing processes i.e. casting, forming, machining and welding. Selection of suitable manufacturing process for a produce/component is dictated by complexity of geometry of the component, number of units to be produced, properties of the materials (physical, chemical, mechanical and dimensional properties) to be processed and economics. Based on the approach used for obtaining desired size and shape by different manufacturing processes; these can be termed as positive, negative and or zero processes.

- Casting: zero process
- Forming: zero process
- Machining: negative process
- Joining (welding): positive process

Casting and forming are categorized as zero processes as they involve only shifting of metal in controlled (using heat and pressure singly or in combination) way from one region to another to get the required size and shape of product. Machining is considered as a negative process because unwanted material from the stock is removed in the form of small chips during machining for the shaping and sizing of a product purpose. During manufacturing, it is frequently required to join the simple

shape components to get desired product. Since simple shape components are brought together by joining in order to obtain desired shape of end useable product therefore joining is categorized as a positive process. Schematic diagrams of few typical manufacturing processes are shown in Fig. 1.1.



a) b)

c) Machining

d) Joining

Fig. 1.1 Schematic diagram showing shaping approaches using different manufacturing processes a) forming, b) casting, c) machining and d) joining

1.2 Selection of Joint

The fabrication of engineering systems frequently needs joining of simple components and parts. Three types of joining methods namely mechanical joining (nuts & bolts, clamps, rivets), adhesive joining (epoxy resins, fevicol), welding (welding, brazing and soldering) are commonly used for manufacturing variety of engineering product/component. Each type of joint offers different load carrying capacity, reliability, compatibility in joining of similar or dissimilar materials besides their fitness for use in different environments and cost. It will be appropriate to consider following aspects while selecting type of joints for an application:

a) type of joint required for an application is temporary or permanent

b) Whether similar or dissimilar materials are to be joined in order to take care of the compatibility aspect as metallurgical incompatibility can be disastrous for performance of the joints

c) Physical, chemical metallurgical properties of materials to be joined

d) requirements of the service from the joint under special conditions of temperature, corrosion, environment, and reliability

e) type and nature of loading conditions (static and dynamic loading under tension, shear, compression, bending etc.)

f) economy or cost effectiveness is one most important factors influencing the selection of joint for manufacturing an engineering component

1.3 Welding and its comparison with other manufacturing processes

Welding is one of the most commonly used fabrication techniques for manufacturing engineering components for power, fertilizer, petro-chemical, automotive, food processing, and many other sectors. Welding generally uses localized heating during common fusion welding processes (shielded metal arc, submerged arc, gas metal arc welding etc.) for melting the faying surfaces and filler metal. However, localized and differential heating & cooling experienced by the metal during welding makes it significantly different from other manufacturing techniques:

- Residual stresses are induced in welded components (development of tensile residual stresses adversely affects the tensile and fatigue properties of work piece)
- Simple shape components to be joined are partially melted
- Temperature of the base metal during welding in and around the weld varies as function of time (weld thermal cycle)
- Chemical, metallurgical and mechanical properties of the weld are generally anisotropic
- Reliability of weld joint is poor.
- Little amount of metal is wasted in the form of spatter, run in and run off
- Process capabilities of the welding in terms of dimensional accuracy, precision and finish are poor.
- Weld joints for critical applications generally need post weld treatment such as heat treatment or mechanical working to get desired properties or reline residual stress.

- Problem related with ductile to brittle transition behaviour of steel is more severe with weld joints under low temperature conditions.

1.4 Selection of welding process

A wide range of welding processes are available to choose. These were developed over a long period of time. Each process differs in respect of their ability to apply heat for fusion, protection of the weld pool and soundmen of welds joint the so performance of the weld joint. However, selection of a particular process for producing a weld joint is dictated by the size and shape of the component to be manufactured, the metal system to be welded, availability of consumables and machines, precision required and economy. Whatever process is selected for developing weld joint it must be able to perform the intended function for designed life. Welding processes with their field of applications are given below:

- Resistance welding: Automobile
- Thermite welding: Rail joints in railways
- Tungsten inert gas welding: Aerospace and nuclear reactors
- Submerged arc welding: Heavy engineering, ship building
- Gas metal arc welding: Joining of metals (stainless steel, aluminium and magnesium) sensitive to atmospheric gases

1.5 Advantages and Limitation of Welding as a Fabrication Technique

Welding is mainly used for the production of comparatively simple shape components. It is the process of joining the metallic components with or without application of heat, pressure and filler metal. Application of welding in fabrication offers many advantages, however; it suffers from few limitations also. Some of the advantage and limitations are given below.

Advantages of welding are enlisted below:

1. Permanent joint is produced, which becomes an integral part of work piece.
2. Joints can be stronger than the base metal if good quality filler metal is used.
3. Economical method of joining.
4. It is not restricted to the factory environment.

Disadvantages of welding are enlisted also below:

1. Labour cost is high as only skilled welder can produce sound and quality weld joint.

2. It produces a permanent joint which in turn creates the problem in dissembling if of sub-component required.
3. Hazardous fumes and vapours are generated during welding. This demands proper ventilation of welding area.
4. Weld joint itself is considered as a discontinuity owing to variation in its structure, composition and mechanical properties; therefore welding is not commonly recommended for critical application where there is a danger of life.

1.6 Applications of welding

General applications

- The welding is widely used for fabrication of pressure vessels, bridges, building structures, aircraft and space crafts, railway coaches and general applications besides shipbuilding, automobile, electrical, electronic and defense industries, laying of pipe lines and railway tracks and nuclear installations.
- Specific components need welding for fabrication includes

1. Transport tankers for transporting oil, water, milk etc.
2. Welding of tubes and pipes, chains, LPG cylinders and other items.
3. Fabrication of Steel furniture, gates, doors and door frames, and body
4. Manufacturing white goods such as refrigerators, washing machines, microwave ovens and many other items of general applications

The requirement of the welding for specific area of the industry is given in following section.

Oil & Gas

1. Welding is used for joining of pipes, during laying of crude oil and gas pipelines, construction of tankers for their storage and transportation. Offshore structures, dockyards, loading and unloading cranes are also produced by welding.

Nuclear Industry

2. Spheres for nuclear reactor, pipe line bends, joining of pipes carrying heavy water require welding for safe and reliable operations.

Defense industry

3. Tank body fabrication, joining of turret mounting to main body of tanks are typical examples of applications of welding in defense industry.

Electronic industry

4. Electronic industry uses welding to limited extent e.g. joining leads of special transistors but other joining processes such as brazing and soldering are widely used.
5. Soldering is used for joining electronic components to printed circuit boards (PCBs).
6. Robotic soldering is very common for joining of parts to printed circuit boards of computers, television, communication equipment and other control equipment etc.

Electrical Industry

7. Components of both hydro and steam power generation system, such as penstocks, water control gates, condensers, electrical transmission towers and distribution system equipment are fabricated by welding. Turbine blades and cooling fins are also joined by welding.

Surface transport

8. Railway: Railway uses welding extensively for fabrication of coaches and wagons, repair of wheel, laying of new railway tracks by mobile flash butt welding machines and repair of cracked/damaged tracks by thermite welding.
9. Automobiles: Production of automobile components like chassis, body and its structure, fuel tanks and joining of door hinges require welding.

Aerospace Industry

10. Aircraft and Spacecraft: Similar to ships, aircrafts were produced by riveting in early days but with the introduction of jet engines welding is widely used for aircraft structure and for joining of skin sheet to body.
11. Space vehicles which have to encounter frictional heat as well as low temperatures require outer skin and other parts of special materials. These materials are welded with full success for achieving safety and reliability.

Ship Industry

12. Ships were produced earlier by riveting. Welding found its place in ship building around 1920 and presently all welded ships are widely used. Similarly submarines are also produced by welding.

Construction industry

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13. Arc welding is used for construction of steel building structures leading to considerable savings in steel and money.
14. In addition to building, huge structures such as steel towers also require welding for fabrication.

References and books for further reading

1. Mikell P. Groover, Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, John Willey and Sons, (2010) USA
2. Richard Little, Welding and Welding Technology, McGraw Hill, (2001), 1st edition
3. Welding handbook, American Welding Society, (1983), 7th edition, volume 1 & 2, USA
4. http://www.roymech.co.uk/Useful_Tables/Manufacturing/Welding.html
5. http://www.everlastgenerators.com/importance-of-welding-in-manufacturing-industries.php
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In Pursuit of Excellence	**Previous Year Question Papers**	SESSION-2019-2020
		SEM- 8th

Printed Pages: 01
Paper Id: 140250

Sub Code: NME055
Roll No.

B TECH
(SEM-VIII) THEORY EXAMINATION 2018-19
ADVANCED WELDING TECHNOLOGY

Time: 3 Hours *Total Marks: 100*

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.** **2 x 10 = 20**

a. What types of welded joints used in welding?
b. What do you mean by cladding & surfacing?
c. Define welding? Make comparison with other joining process?
d. Describe various welding symbols.
e. Write short note on arc blow in welding process?
f. What is weld distortion and its prevention?
g. Explain weld affected zone?
h. List different type of brazing techniques available? Explain any one in detail.
i. What is physics of arc welding?
j. Define reclamation welding?

SECTION B

2. **Attempt any *three* of the following:** **10x3=30**

a. Make comparison between Laser beam welding and electron beam welding?
b. Explain type of underwater welding and their working mechanisms?
c. List type of weld defects explains any two with neat diagram?
d. Explain the effects of various alloying elements on weldability.
e. Write short note on use of Transformer,Rectifier and Generators in welding.

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SECTION C

3. **Attempt any *one* part of the following:** **10x1=10**

a. What do you mean by heating and cooling rate? How it affects the properties of weld.

b. What are the methods used for measuring the stresses in weld structure? Explain any one of them.

4. **Attempt any *one* part of the following:** **10x1=10**

a. What do you mean by metalizing and hard facing? Explain process giving its advantage and applications.

b. Write short note on
   i. Welding of cast iron.
   ii. Welding of low carbon steel.
   iii. Welding of aluminum.

5. **Attempt any *one* part of the following:** **10x1=10**

a. Discuss the principle and working of ultrasonic inspections .Also describes its advantage, limitations and applications.

b. Define cracking of weld? Explain hot cracking and cold cracking? List the rules that must be followed to avoid cracking?

6. **Attempt any *one* part of the following:** **10x1=10**

a. What do you understand by explosive welding; Write its advantage, disadvantage and applications in detail?

b. Explain the principle and working of FCAW welding? Differentiate MIG &FCAW? What variables affect weld quality of FCAW welding?

7. **Attempt any *one* part of the following:** **10x1=10**

a. The arc length voltage characteristic is given by expression $V=24+4L$ (L=Length of arc in mm).The volt ampere characteristics of power source can be approximated by a straight line with open circuit voltage $80V$ and short circuit current $600A$ determine optimum arc length and maximum power.

b. Explain in detail the mechanism and types of metal transfer in various arc welding processes.

Printed Pages: 02
Paper Id: 1 4 0 8 1 3

Sub Code: NME055
Roll No.

B.TECH
(SEM VIII) THEORY EXAMINATION 2017-18
ADVANCED WELDING TECHNOLOGY

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. Differentiate between gas welding and gas cutting.
b. State the use(s) of welding flux.
c. Name the types of resistance welding.
d. Which welding process requires creation of vacuum?
e. Define heat affected zone (HAZ).
f. Name any two non-destructive techniques for residual stress determination in welds.
g. What are the applications of cladding process?
h. What do you mean by hard facing?
i. State any two general source(s) of welding defects.
j. What are the causes for undercut in welding?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Explain in detail the advantages, limitations, applications of welding process.
b. State the principle of ARC welding and explain the working of MIG welding, with suitable diagrams.
c. Define residual stresses in welding. State and explain the major factors responsible for residual stress.
d. Explain in detail the advantages of hard facing with Oxy-acetylene torch?
e. Explain in detail – inspection before welding, inspection in between welding, inspection after welding.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) Using block diagram, classify the welding processes and explain the same.
(b) What are the similarities and differences between casting and welding process?

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Using neat sketch, explain TIG welding process. State its applications. What are the variants of TIG welding?
(b) Explain the procedure of electron beam welding process. What are the difficulties encountered during EBW? Support with neat sketch.

5. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain any two destructive techniques for residual stress determination.

(b) What are the main types of weld distortion? What are the causes for distortion?

6. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Briefly discuss the welding of cast iron. What kinds of defects are expected in such welding and what are their remedies?

(b) Explain in detail aluminium welding by double-operator method?

7. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain any five welding defects along with the causes and remedies.

(b) Using neat sketches, broadly categorize the welding joints. Also draw sketches for the different welding positions.

In Pursuit of Excellence	**QUESTION BANK**	SESSION-2019-2020 SEM- 8th

1. What is the use and importance of Schaeffler diagram?
2. What are the different modes of metal transfer?
3. Why is the neutral flame extensively used in Oxy acetylene welding?
4. What are the effects of gases in welding?
5. What are the main factors affecting the welding design?
6. What are the various methods of depositing metal?
7. Name any four weld defects.
8. What are the factors that cause slag inclusion?
9. Give two examples of adhesives and mention its general characteristics.
10. Compare brazing with soldering.
11. Explain air blow in welding.
12. Classify welding processes in detail.
13. Explain health and safety measures taken in welding.
14. Explain the role of transformers, rectifiers and generators in welding.
15. What are the differences between TIG and MIG welding processes?
16. What are problems encountered with the use of coated electrode?
17. How welding is different from soldering and brazing?
18. Write short note on DC polarity in arc welding.
19. Explain the constant current and voltage characteristics of welding power sources.
20. Differentiate between DC and AC welding power sources.
21. What are various industrial and domestic applications of welding?
22. How welding arc is obtained in arc welding?
23. Differentiate between solid state and fusion welding.
24. Explain briefly the principle and procedure of SMAW process.
25. Explain the resistance welding process and its applications.
26. Explain laser beam welding and compare it with electron beam welding.
27. What materials are used for making the resistance welding electrodes?
28. Briefly explain the coding method used for the electrodes used in SMAW.
29. Explain the TIG welding principle and operation with neat sketches.
30. Explain submerged arc welding technique in details.
31. Describe the electro slag welding process in details.
32. Describe various types of weld joints used in weld design.
33. Explain the welding symbol with an example.

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34. Explain the differences between nondestructive testing and destructive testing of weld. What are the advantages of each?
35. Describe the reasons that fatigue failure generally occur in HAZ of welds instead of through the weld bead itself.
36. Explain how different process parameter influence Laser Beam Welding.
37. With suitable sketch explain the process of TIG welding. What are its disadvantages?
38. Describe Principle of operation of EBW (Electron beam welding). What is the possible problem or difficulties and how it can be dealt with? Write down the advantage and limitation.
39. Explain the general theory of solidification of metals and alloys.
40. Explain the following:
    a. Dye Penetrant Testing
    b. Inspection of welds.
    c. Discontinuities in welds and their causes.
41. Explain with neat labeled sketch the working of Ultra Sonic Welding.
42. What do you understand by polarity in DC arc welding? How can this be advantageously utilized? Which Polarity you will select when welding with Aluminum and Copper.
43. Explain the Liquid penetrant testing of weld joints with neat sketches.
44. Explain cracking especially hot cracking and cold cracking with reasons and remedies.
45. What do you understand by underwater welding? What are the problems in underwater welding?
46. Explain metallurgical effects of heat flow in welding.
47. What are the various methods of depositing metal? Explain any one in detail.
48. Explain the process of metal transfer in GMAW process with neat sketches.
49. Compare the electroslag welding process with that of SAW from the stand point of heat liberated, joint preparation and welding position.
50. Explain the principle underlying the resistance welding process. Give names of products wherein following processes are used
    a. Spot Welding
    b. Seam Welding
    c. Flash Welding

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In Pursuit of Excellence	**Final Internal Marks**	SESSION-2019-2020
		SEM- 8th

S.No	Student Name	Roll No.	Class Test Marks		C.T Total (20)	C.T Total	Attendance	T.A	Total MM
			C.T-1(20)	C.T-2 (20)	(best of one)	20	(AT) (5)	(TA)(5)	30
1	Kamal Prakash Singh	1508240064	D	12	12	12	4	4	20
2	Mohammad Anas	1508240083	D	15	15	15	4	4	23
3	Priyanshu Kumar	1508240117	D	14	14	14	4	4	22
4	Shrikant Siddharth	1508240153	D	11	11	11	4	5	20
5	Rohan Dhariwal	1608210132	D	17	17	17	3	4	24
6	Ajeet Morya	1608240003	15	18	18	18	5	5	28
7	Akash Kumar	1608240005	D	19	19	19	3	3	25
8	Akash Yadav	1608240006	D	13	13	13	5	4	22
9	Aman Sisodia	1608240009	15	18	18	18	5	5	28
10	Amit Kumar	1608240010	10	16	16	16	5	5	26

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11	Amitesh Kushwaha	1608240011	16	18	18	18	5	5	28
12	Ankit Kumar	1608240013	D	11	11	11	4	5	20
13	Ankur Singh	1608240014	18	19	19	19	5	5	29
14	Anuj Panwar	1608240015	D	17	17	17	3	4	24
15	Arjun Singh	1608240016	D	19	19	19	3	3	25
16	Ayush Rajput	1608240019	A	17	17	17	4	3	24
17	Dhaneshwar Chauhan	1608240022	D	16	16	16	4	5	25
18	Dinesh Kumar	1608240024	D	15	15	15	4	4	23
19	Dishant Pratap	1608240025	D	18	18	18	3	4	25
20	Gajendra Singh	1608240026	13	17	17	17	5	5	27
21	Harsh Thakur	1608240030	D	19	19	19	3	3	25
22	Kovit Kumar	1608240037	D	15	15	15	4	4	23
23	Mohammad Faizi	1608240041	D	17	17	17	4	3	24
24	Mohammad Areeb Saifi	1608240042	D	18	18	18	4	3	25
25	Mohd Ahtesham	1608240043	D	18	18	18	3	5	26
26	Mohd Anas	1608240045	D	18	18	18	3	4	25
27	Mohd Athar	1608240046	D	15	15	15	4	4	23
28	Mohd Daniyal	1608240047	D	16	16	16	4	3	23
29	Mohd Faiz	1608240048	D	18	18	18	3	3	24
30	Mohd Faizan	1608240049	D	18	18	18	4	3	25
31	Mohd Shazeb	1608240051	D	17	17	17	3	4	24

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32	Mohd Asim	1608240052	D	18	18	18	4	3	25
33	Mohd Faraz	1608240053	D	17	17	17	4	5	26
34	Mohd Saddam Husain	1608240054	D	16	16	16	5	3	24
35	Mudit Yadav	1608240055	D	15	15	15	4	4	23
36	Mumtaz Khan	1608240056	D	18	18	18	5	3	26
37	Nawaz Ali	1608240057	A	17	17	17	4	3	24
38	Nitesh Kumar Saroj	1608240059	D	17	17	17	3	5	25
39	Nuzaif Khan	1608240060	D	17	17	17	4	3	24
40	Ovais Khan	1608240061	D	14	14	14	4	5	23
41	Raja Kanchan	1608240065	D	16	16	16	4	5	25
42	Sagar Kumar	1608240073	D	18	18	18	5	3	26
43	Salman .	1608240074	D	15	15	15	4	4	23
44	Santosh Verma	1608240075	15	17	17	17	5	5	27
45	Shubham Kumar	1608240082	11	17	17	17	5	5	27
46	Sumit Kumar	1608240084	11	16	16	16	5	5	26
47	Ubaid Ur Rehman	1608240085	D	18	18	18	3	3	24
48	Vaibhav Singh	1608240087	A	14	14	14	4	4	22
49	Varun Rastogi	1608240088	14	18	18	18	5	5	28
50	Vikas Kumar	1608240089	13	16	16	16	5	5	26
51	Vishal Kumar	1608240091	10	17	17	17	5	5	27
52	Vishesh	1608240092	A	17	17	17	3	4	24

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	Kumar								
53	Vishnu Kumar Gautam	1608240093	D	18	18	18	4	3	25
54	Yash Rastogi	1608240094	12	17	17	17	5	5	27
55	Yasharth Gautam	1608240095	D	17	17	17	4	3	24
56	Ankur Saini	1708240901	13	18	18	18	5	5	28
57	Anuj Pal	1708240902	12	16	16	16	5	5	26
58	Devraj Singh	1708240903	A	14	14	14	3	3	20
59	Ravi Arya	1708240906	D	17	17	17	4	3	24
60	Rishabh Dhyani	1708240907	15	19	19	19	5	5	29
61	Shubham Raj	1708240908	14	18	18	18	5	5	28
62	Varun Chhatrawal	1708240909	D	17	17	17	4	3	24

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In Pursuit of Excellence	**Course outcome Attainment**	SESSION-2019-2020
		SEM- 8th

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Course Name	Advance Welding
Course Code	RME081
Batch	2016 2020
Semester	8
Session	2019 2020
L:T:P	3.1.0

CO Attainment Gap

Course Code	CO	CO Targets	CO Attainment	CO Attainment Gap (Target - Attainment)
RME081	CO1	60	87.36	-27.36
	CO2	60	87.36	-27.36
	CO3	60	87.36	-27.36
	CO4	60	87.36	-27.36
	CO5	60	87.03	-27.03

If Gap > 0 : Target not attained
If Gap ≤ 0 : Target attained

Closure of Quality Loop

Course Code	CO	CO Targets	CO Attainment Gap	Action proposed to bridge the gap where targets are not achieved	Modification of targets where Achieved
RME081	CO1	60	-27.36		Target is increased to 85%
	CO2	60	-27.36		Target is increased to 85%
	CO3	60	-27.36		Target is increased to 85%
	CO4	60	-27.36		Target is increased to 85%
	CO5	60	-27.03		Target is increased to 85%

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In Pursuit of Excellence	**Sample Teaching learning Resources**	SESSION-2020-2021
		SEM-8th

1. Microsoft team app

2. Hand written & Word/PDF file Notes

3. Video Lecture

https://youtu.be/UM_QXX6hvqc.
https://youtu.be/4eV1zSdVVlU
https://youtu.be/UM_QXX6hvqc
https://youtu.be/44Db1Z59_eo
https://youtu.be/cQEUJnMYf_U

4. Power Point Presentation

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"Heat flow" in welding

Weld Thermal Cycle

Weld thermal cycle indicates that when heat is applied how the temp. variation of a particular region as a function of time takes place. So, this variation in temp as a function of time of a particular location indicates many information which may be in form of heating rate, cooling rate, soaking time & time required for reacting a particular temp.

* Affect of weld thermal cycle on performance of weld joints
  * Bead geometry
  * Mechanical & metallurgical Properties
  * Residual stress & distortion

* Why to study heat flow?

To control metallurgical reactions during welding thermal conditions must be controlled properly including
- Peak temperature & its distribution
- Cooling rate in weld & HAZ
- Solidification rate in weld zone.

All three are governed by weld thermal cycle experienced by different zone during welding

"Need"

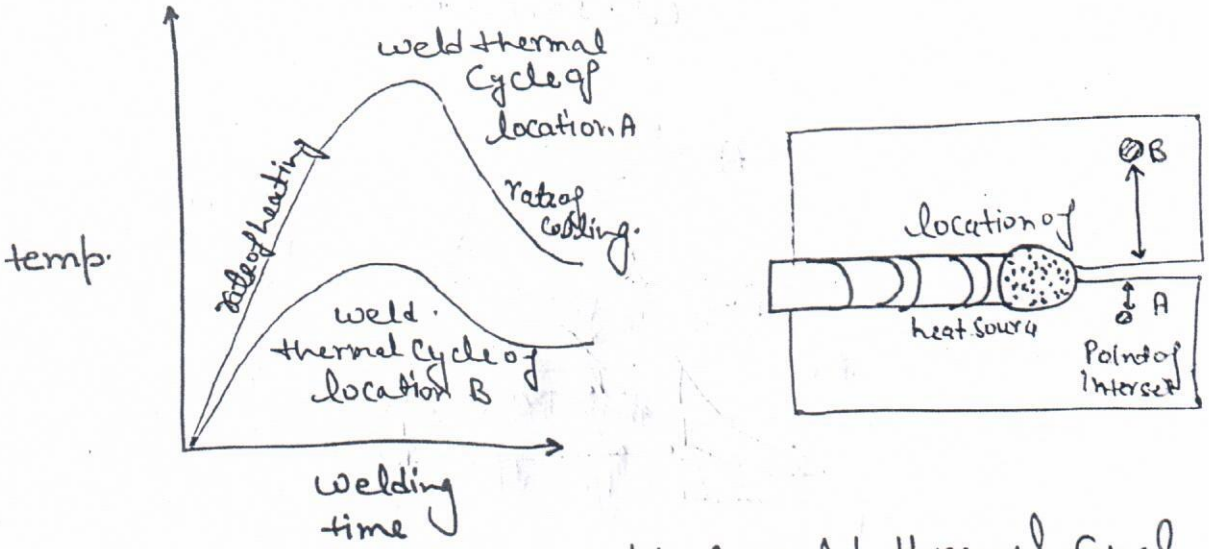
→ Since heating, Soaking & Cooling Cycle affects the metallurgical mechanical Properties development of residual stresses & distortion.

→ Therefore, it is pertinent to study various aspects related with heat flow in Welding such as weld thermal cycle Cooling rate & solidification time, peak temp., width of HAZ.

Weld thermal Cycle:

* Weld thermal Cycle shows variation in temperature of a particular location (in & around the weld) as a function of welding time.
* As heat source (welding arc or flame) approaches close to the location of interest temp. increased followed by cooling
* A typical weld thermal Cycle shows the rate of heating (Slope of a b), Peak temp; and time required for attaining the peak temp. Cooling rate (Slope of b c).

* Some figures on Page No. 3

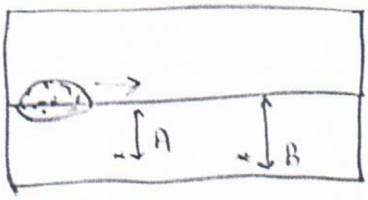


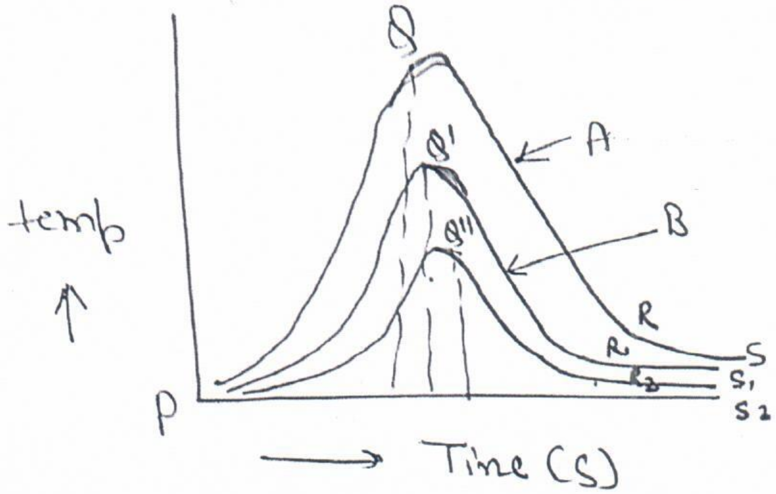
typical weld thermal Cycle

* factors affecting welding thermal Cycle

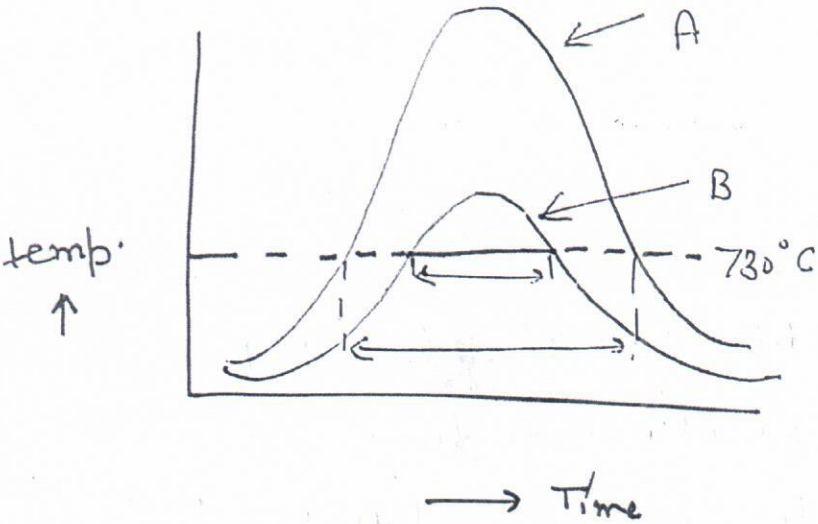
However, weld thermal cycle varies with distance from the weld centre line but it is also influenced by:

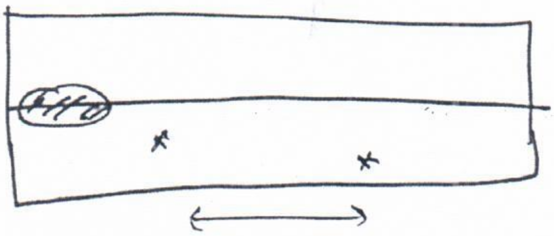
- heat input rate
- → initial plate temp.
- → weld joint design
- → thermal properties base metal





PQ → rate of heating
QR – Rate of Cooling





Soakingtime.

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Hardfacing: Hardfacing is the deposition of thick coatings of hard, wear resistant materials on a worn or new component surface that is subjected to wear in service.
Thermal spraying, spray-fuse & welding process are generally used to apply the hardfacing layer

Weld hardfacing is used to deposit very thick (1 to 10mm) dense layers of wear resistant material with high bond strength
Various welding techniques can be used including MIG, TIG PTAW, SAW, MMA. A very broad range of coating materials can be applied.

Hardfacing may be applied to a new part during production to increase it's wear resistance, or it may be used to restore a worn-down surface.
Hardfacing by arc welding is a surface operation to extend the service life of industries components, Preemptively on new components or as part of maintance program.

Cladding: It is a type of thermal surface treatment process in which a layer of hard or corrosion resistant alloy is placed on a cheaper substrate, so as to increase the corrosion resistant, wear resistance, & hardness of a component with an objective of increasing the service life of the same.

Cladding welding:
Cladding is a welding procedure that puts weld metal on the surface of work, as opposed to joining two pieces of material. Generally this is used for corrosion resistance or wear resistance & frequently a different is used for the clad than for the base metal.

Weld cladding is not only used to increase corrosion resistant properties of a surface but also is employed to repair a worn out component to restore its original working condition, such as turbine blades in a power plant.

Technologies commonly used for cladding are:

* Thermal Spraying
* laser-based methods.
* Arc welding

Surfacing:

Surfacing is a welding process used to apply a hard, wear-resistant layer of metal to surface or edges of worn-out parts. It is one of the most economical methods of conserving & extending the life of machines, tools & construction equipment.

Surfacing is a process of depositing one metal or alloy over another (base metal or substrate) to improve its wear resisting properties like resistance to abrasion, corrosion, friction or for achieving dimensional control & metallurgical needs.

The processes commonly used for surfacing are the fusion welding processes like gas welding, arc welding etc.

The process of surfacing appears to have been developed initially for the needs of oil-well drilling industry but is now widely used on all types of equipment implements & containers to enhance their lives against wear & chemical action.

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Surfacing is equally applicable to the manufacture of new products & reclamation of worn products. In both cases it extends the service life of the product & saves expensive material

Types of Surfacing:

Surfacing is of different types cladding, hardfacing build up & buttering to achieve corrosion resistance (for chemical wear), wear resistance (for physical wear) dimensional control (to rebuild worn components) and metallurgical needs respectively.

"Cladding & hardfacing discuss previously"

Build up: It overlay is the rebuiding of worn out parts to restore them to original shape & dimensions. Unlike cladding & hardfacing the strength of weld metal forming the build-up is a necessary consideration in the component design because the material has to replace some of original part of the component which has worn away.

Buttering:

Buttering is the process of depositing one or more layers of material between those metallurgically non-compatible materials which individually have compatibility with the material forming the buttering layer. It is used especially for joining of stainless steel to a carbon or low alloy steel base metal.

Welding Symbols

Elementary welding symbols

No.	*Designation*	*Illustration*	*Symbol*
1.	Butt weld between plates with raised edges (the raised edges being melted down completely)		
2.	Square butt weld		
3.	Single-V butt weld		
4.	Single-bevel butt weld		
5.	Single-V butt weld with broad root face		
6.	Single-bevel butt weld with broad root face		
7.	Single-U butt weld (parallel or sloping sides)		
8.	Single-U butt weld		

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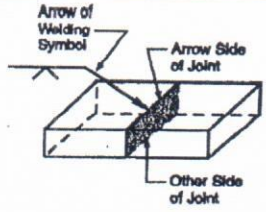
Supplementary Symbols

Weld-All-Around	Field Weld	Melt-Thru	Consumable Insert
			(Square)

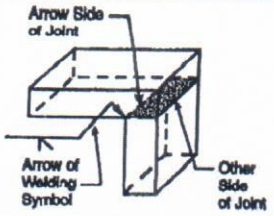
Backing/Spacer (Rectangular)	Contour		
Backing / Spacer	Flush or Flat	Convex	Concave

Basic Joints
Identification of Arrow Side and Other Side Joint

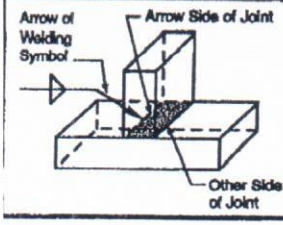
Butt Joint



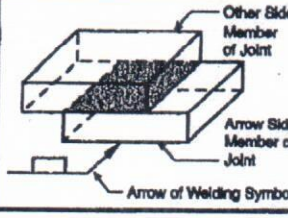
Corner Joint



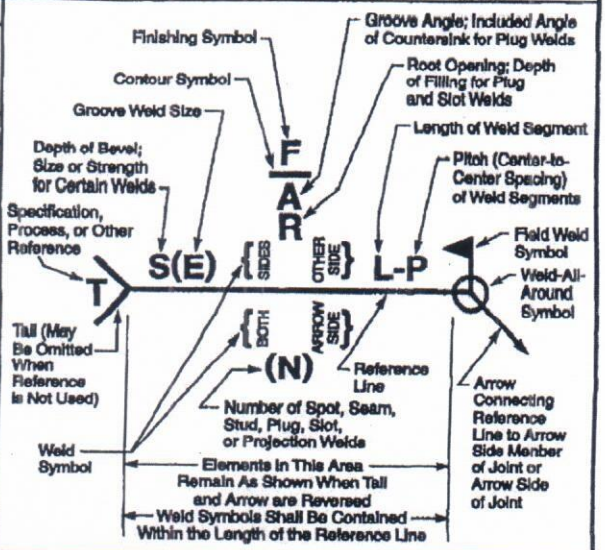
T-Joint



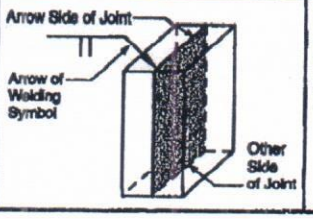
Lap Joint



Location of Elements of a Welding Symbol



Edge Joint



Letter Designations

Where letter designations are to be included in the tail of the welding symbol, reference is made to Table 1, Letter Designations of Welding and Allied Processes and Their Variations, of AWS A2.4-98.

American Welding Society
550 N.W. LeJeune Road
Miami, Florida 33126

Basic Welding Symbols and Their Location Significance

Location Significance	Fillet	Plug or Slot	Spot or Projection	Stud	Seam	Back or Backing	Surfacing	Edge
Arrow Side								
Other Side				Not Used			Not Used	
Both Sides		Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	
No Arrow Side or Other Side Significance	Not Used	Not Used		Not Used		Not Used	Not Used	Not Used

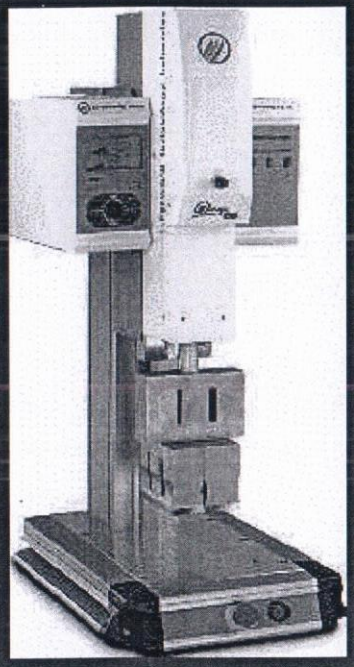
Location Significance	Groove							Scarf for Brazed Joint
	Square	V	Bevel	U	J	Flare-V	Flare-Bevel	
Arrow Side								
Other Side								
Both Sides								
No Arrow Side or Other Side Significance		Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used

Ultrasonic Welding

Ganesh Kumar Sharma
Mechanical engineering department
Moradabad institute of technology

Content:-

- Ultrasonic device and components
- Basic operation
- Applications
- Advantages and disadvantages
- Types of material
- Other welding Techniques



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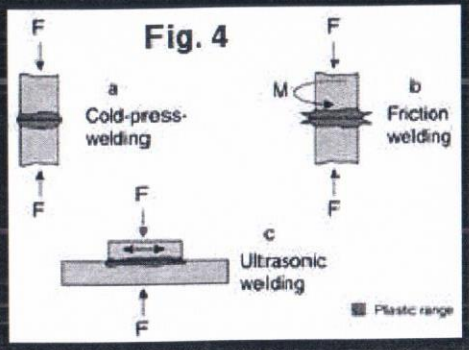
Types of Welds

- Friction weld
- Cold press weld
- Ultrasonic weld
- Use of binder material



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Hot Gas Welding

- Less common
- Uses hot gas to create localized melt
- Binder material added

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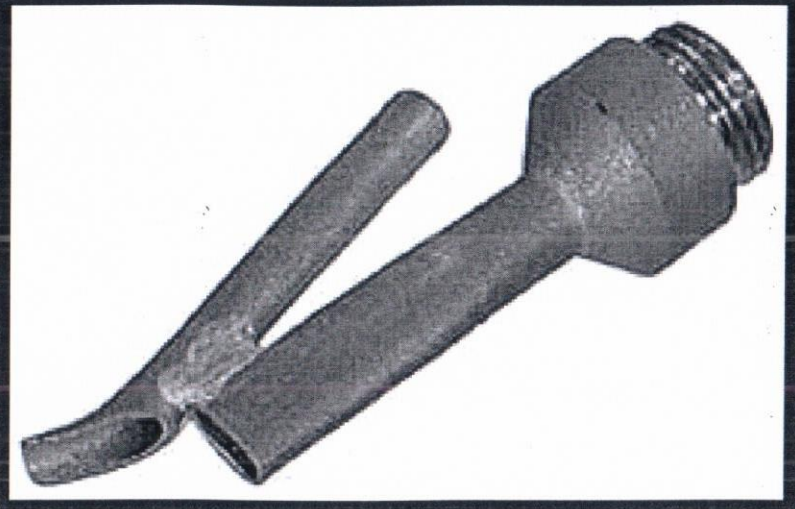
Advantages

- Simple equipment
- Simple Operation
- Low Cost



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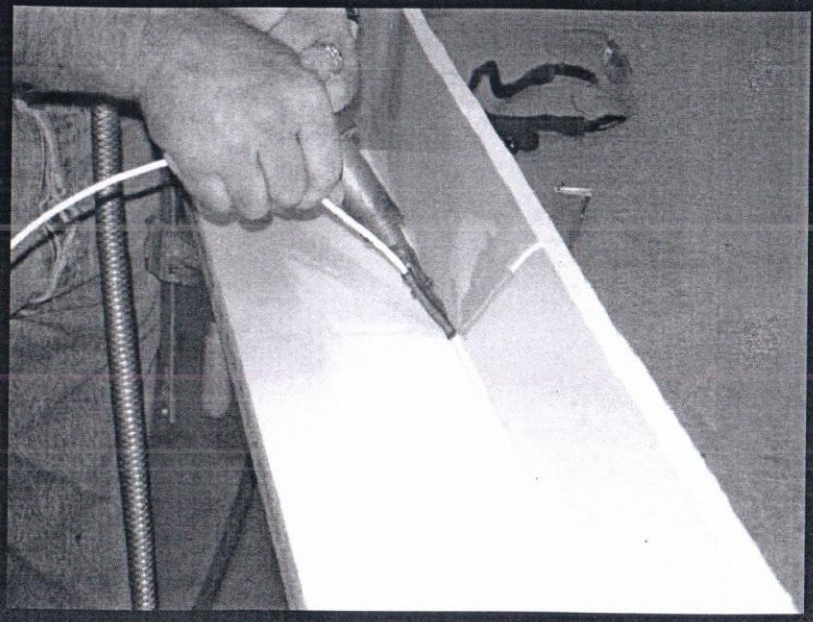
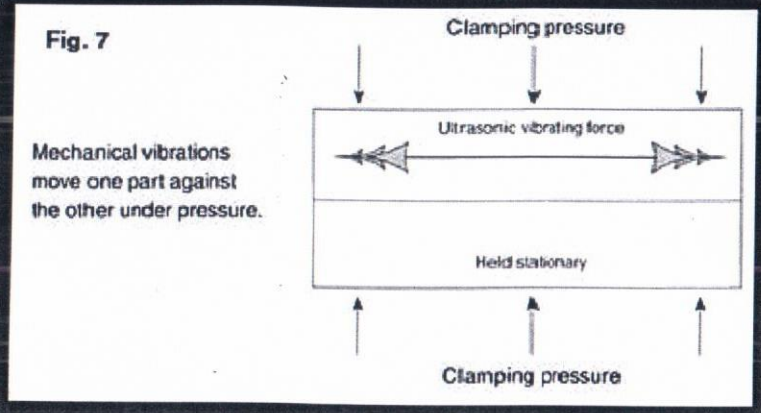
Disadvantages

- Limited Materials
- Limited part geometry (sheet joining)
- Lower strength



Ultrasonic welding of plastic

- Vibrations
- Local Plastification
- Melting points must be equal



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Welding equipment

- Ultrasonic generator
- Ultrasonic welding device
- Ultrasonic transducer system
- Anvil and fixtures

Ultrasonic generator

- 20 KHZ
- 35 KHZ
- 40 KHZ
- Required holding and welding time

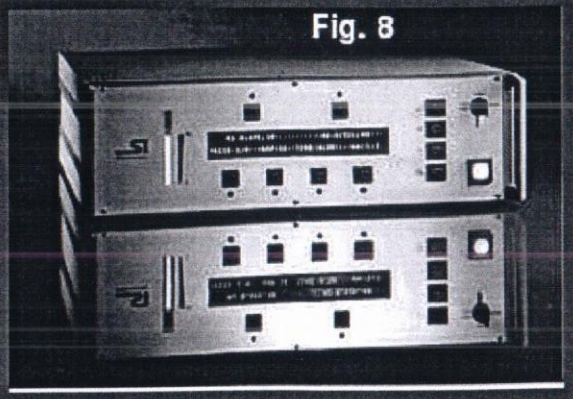

Fig. 8

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Ultrasonic welding device

- 1. Sonotrode
- 2. High-tensile threaded pin
- 3. Height adjustment
- 4. Converter
- 5. Oscillating disk
- 6. Booster

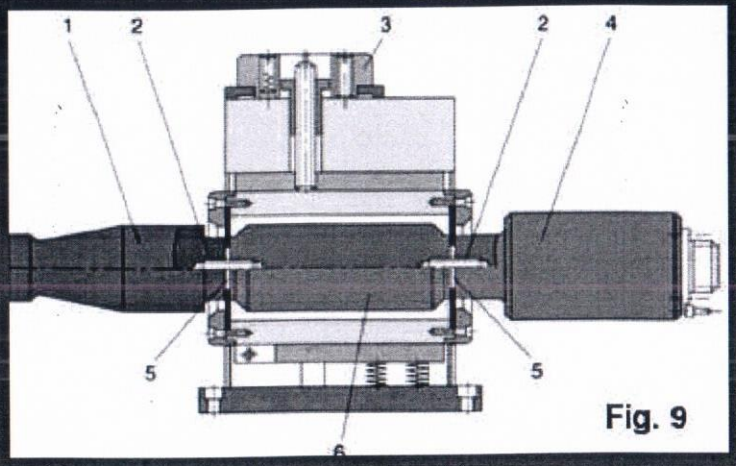

Fig. 9

Ultrasonic transducer system

- Converter
- Booster
- Sonotrode

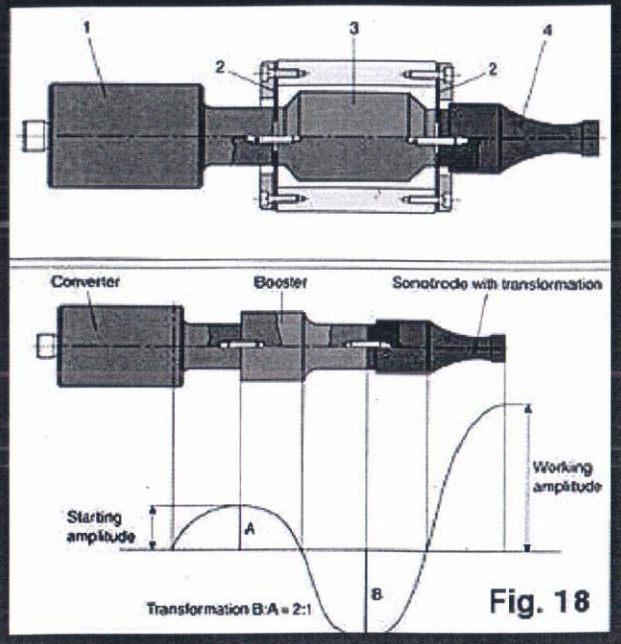

Fig. 18

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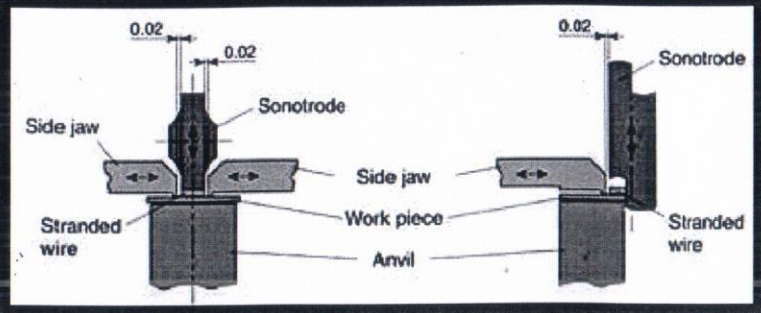
Anvil and Fixture



- Typical example of sonotrode and fixture

Welding Parameters

- Welding Energy
- Mechanical Stress
- Thermal Stress

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Welding Energy

- Contact pressure
- Amplitude
- Welding time
- Welding tools
- Trigger point
- Ultrasonic frequency

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Mechanical Stress

- Amplitude

- Mechanical pressure

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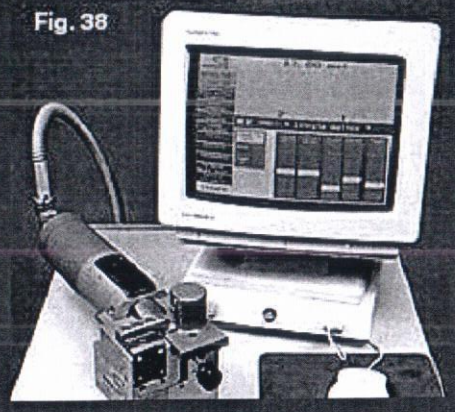
Thermal stress

- Welding time
- Amplitude
- Mechanical pressure

Quality control

- Changeable process-variable parameters
- Similar characteristics
- Parameter control

Fig. 38

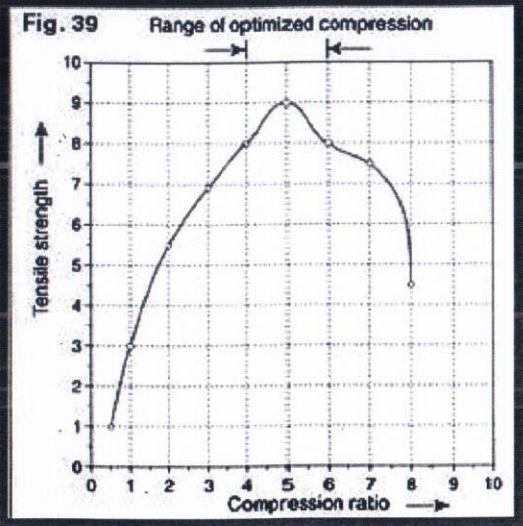


Changeable process-variable parameters

- Weld time
- Weld energy
- Mechanical compression of the parts to be welded

Mechanical Compression

- Wrongly positioned parts
- Selection of wrong parts
- Strongly contaminated parts
- Deficiencies in welding equipment



Welded parts should have similar characteristics

- Chemical
- Mechanical
- Process