Printed Page:- Subject Code:- AMTME0213

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech.

SEM: II - CARRY OVER THEORY EXAMINATION - JUNE (2021 - 2022)

Subject: Advanced Welding Technology

Time: 3 Hours Max. Marks: 70

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 mark each.
3. Section B - Question No-3 is based on external choice carrying 4 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 7 marks each.
5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

## SECTION A 15

1. Attempt all parts:-

1-a. Within the Heat Affected Zone (HAZ) in a fusion welding process, the work material undergoes [CO1] 1

(a) Microstructural changes but does not melt.

(b) Neither melting nor microstructural changes

(c) Both melting and microstructural changes after solidification

(d) Melting and retains original microstructure after solidification

1-b. Steel pipes are manufactured by [CO2] 1

(a) Arc welding

(b) Thermit welding

(c) Resistance welding

(d) Argon arc welding

1-c. Which of the following is not resistance welding? [CO3] 1

(a) Projection welding

(b) MIG welding

(c) Seam welding

(d) Flash butt welding

1-d. The arc blow defect is seen in following welding. [CO4] 1

(a) Arc welding using D.C current

(b) Arc welding using A.C current

(c) Gas welding

(d) Thermit welding

1-e. Spot welding robot works on_____. [CO5] 1

(a) Point to point path system

(b) Contouring path system

(c) Both

(d) None

2. Attempt all parts:-

2.a. What is the use of filler material in welding? [CO1] 2

2.b. What is hydrogen embrittlement? [CO2] 2

2.c. What is Friction stir welding? [CO3] 2

2.d. Define throat thickness? [CO4] 2

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|---|---|---|
| 2.e. | what are the types of welding robots? [CO5] | 2 |

SECTION B 20

3. Answer any five of the following:-

| | | |
|---|---|---|
| 3-a. | Explain the effect of shielding gas used during welding? [CO1] | 4 |
| 3-b. | How is brazing different from welding and soldering? [CO1] | 4 |
| 3-c. | Explain the objectives of post welding heat treatment. [CO2] | 4 |
| 3-d. | Explain the mechanism of arc welding process used for welding stainless steel? [CO2] | 4 |
| 3.e. | Define Plasma Arc Welding( PAW) .What are the advantages and applications PAW? [CO3] | 4 |
| 3.f. | How does the weldability of steel change as its carbon content increases? [CO4] | 4 |
| 3.g. | What do you understand by robot coordinate system representation? [CO5] | 4 |

SECTION C 35

4. Answer any one of the following:-

| | | |
|---|---|---|
| 4-a. | Differentiate Between Electrogas welding and Electroslag welding? [CO1] | 7 |
| 4-b. | Assume that two 1.5mm thick steel sheets are being spot welded at a current of 5500A and current flow time t=0.15s. Using electrodes 6mm in diameter, estimate the amount of heat generated and its distribution in the weld zone. Use an effective resistance of 250μΩ. [CO1] | 7 |

5. Answer any one of the following:-

| | | |
|---|---|---|
| 5-a. | What is Hot Cracking Test ? Explain the various types of hot cracking tests? [CO2] | 7 |
| 5-b. | Can we join dissimilar materials? If so give those process names and describe the basic principle of working. [CO2] | 7 |

6. Answer any one of the following:-

| | | |
|---|---|---|
| 6-a. | With suitable sketches explain the mechanism of Friction welding process also write down the different variants of friction welding. [CO3] | 7 |
| 6-b. | With neat labeled sketch explain the working principle of Ultra sonic Welding. Also write down the limitations and application of Ultra sonic welding. [CO3] | 7 |

7. Answer any one of the following:-

| | | |
|---|---|---|
| 7-a. | Explain different types of flames with neat sketches in gas welding process. Give applications for each type. [CO4] | 7 |
| 7-b. | During welding, the parent metal in HAZ undergoes certain changes, Discuss these changes. [CO4] | 7 |

8. Answer any one of the following:-

| | | |
|---|---|---|
| 8-a. | Explain the future trends in industrial robotics. [CO5] | 7 |
| 8-b. | Discuss the general characteristics of industrial work situations that tend to promote the substitution of robots for human labour. [CO5] | 7 |