

**Ex/PG/MetIM/T/128A/2018**

**M.E. METALLURGICAL & MATERIAL ENGINEERING 1<sup>ST</sup> YEAR 2<sup>ND</sup> SEMESTER  
EXAM-2018**

**Subject: Joining of Materials**

**Time : Three Hours**

**Full Marks: 100**

**Answer question no. 1 and any four(4) from the rest.**

1. Answer any five(5) 5x4
  - i). What is the Principle of Arc welding?
  - ii). Why fusion is not a prerequisite for welding metals.
  - iii). Why heat input is an important parameter in fusion welding?
  - iv). How arc is generated and become self-sustaining in arc welding?
  - v). What is flash butt welding?
  - vi). What is thermit welding?
  - vii). What is meant by Nugget in electric resistance welding?
  - viii). Why inert gas is used in welding?
  
2. 10+10
  - (a). Explain TIG welding with schematic diagram.
  - (b). Write the various advantages and disadvantages of the above process with applications..
  
3. Distinguish between 5x4
  - (a). Flat characteristics curve and Dropping Characteristics curve.
  - (b). Rutile electrode and Basic electrode
  - (c). Flash welding and Upset welding
  - (d). Soldering and Brazing
  - (e). Autogeneous welding and homogeneous welding

5+15

4. (a). State various processes included under fusion welding.
- (b). Describe the Microstructure of a fusion weld in a low carbon steel in relation to its position in the weld.

12+8

5. (a). State the principle of resistance welding and describe the projection welding with schematic diagram.
- (b). Write the Chemistry of Oxy-acetylene process.

6. 8+12

- (a). State the principle of CO<sub>2</sub> process.
- (b). Write the various solid-state welding processes and describe any one of them with schematic diagram

7. Short notes: 2x10

- i). Laser Beam Welding
- ii). Weldability of metals & Alloys