

MANUFACTURING PROCESS – I

Written by Administrator

Sunday, 01 November 2009 10:12 -

Sub Code

: 06 ME 35

IA Marks

: 25

Hrs/week

: 04

Exam Hours

: 03

Total Lecture Hrs

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: 52

Exam Marks

: 100

PART – A

CASTING PROCESS

UNIT 1:□□□□□□□□□□□□□□

Introduction: Concept of Manufacturing process, its importance. Classification of Manufacturing processes.

Introduction to Casting process & steps involved.

Varieties of components produced by casting process.

Advantages & Limitations of casting process.

Patterns: Definition, functions, Materials used for pattern, various pattern allowances and their importance. Classification of patterns.

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Binder: Definition, Types of binder used in moulding sand.

Additives: Need, Types of additives used. □□□□□□□□□□□□□□□□□□

6 Hours

UNIT 2: □□□□□□□□□□□□

Sand Moulding □□ : Types of base sand, requirement of base sand. Types of sand moulds.

Sand moulds: Moulding sand mixture ingredients (base sand, binder & additives) for different sand mixtures. Method used for sand moulding.

Cores: Definition, Need, Types. Method of making cores, Binders used.

Concept of Gating & Riser. Principle involved. and types.

Fettling and cleaning of castings. Basic steps involved. Casting defects-causes, features and remedies.

Moulding machines : Jolt type, squeeze type, Jolt & Squeeze type and Sand slinger.

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WELDING

UNIT 5:□□□□□□□□□□□□□□□□

Welding process: Definition, Principles, Classification, Application, Advantages & limitations of welding.

Arc Welding: Principle, Metal Arc welding (**MAW**), Flux Shielded Metal Arc Welding (**FSMAW**)

Inert Gas Welding

(**TIG & MIG**)

Submerged Arc Welding

(**SAW**)

and Atomic Hydrogen Welding processes.

(**AHW**)

Gas Welding: Principle, Oxy – Acetylene welding, Reaction in Gas welding, Flame characteristics, Gas torch construction & working. Forward and backward welding.

7 Hours

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UNIT 6: Resistance welding

Special type of welding: Resistance welding - principles, Seam welding, Butt welding, Spot welding and projection welding.

Friction welding, Explosive welding, Thermit welding, Laser welding and Electron beam welding.

Resistance welding is a process of joining two metal surfaces by the application of heat and pressure. The heat is generated by the electrical resistance of the metal surfaces. The pressure is applied to the metal surfaces to bring them into contact and to form a bond.

The process of resistance welding involves the following steps:

1. Preparation of the metal surfaces.
2. Application of heat and pressure.
3. Formation of the weld.
4. Cooling of the weld.

The main types of resistance welding are:

- Spot welding
- Seam welding
- Projection welding
- Friction welding
- Explosive welding
- Thermit welding
- Laser welding
- Electron beam welding

7 Hours

UNIT 7: Metallurgical aspect in welding

Metallurgical aspect in welding: Structure of welds, Formation of different zones during welding. Heat affected zone (HAZ). Parameters affecting

HAZ

. Effect of

carbon content on

structure and properties of

steel.

Shrinkage in welds & Residual stresses.

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2. **“Manufacturing Process-I”**, Dr.K.Radhakrishna, Sapna Book House, 2nd Edition 2007.

Reference Books:

1. **“Manufacturing Technology”**, Serope Kalpakjain, Steuen.R.Sechmid, Pearson Education Asia, 5th Ed. 2006.
2. **“Process and Materials of Manufacturing:”**, Roy A Lindberg, 4th Ed. Pearson Edu. 2006.

Scheme of examination:

One Question to be set from each chapter. Students have to answer any FIVE full questions

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out of EIGHT questions, choosing at least 2 questions from part A and 2 questions from part B.