

**DETAILED SYLLABUS FOR THE POST OF TRADESMAN -**  
**MOULDING /FOUNDRY IN TECHNICAL EDUCATION - DIRECT**  
**RECRUITMENT**

**(Cat. Nos: 424/2023)**

**Module 1 Safety Precautions (8marks)**

General safety precautions to be observed in the shop floor, General safety machine safety, Personal safety, Soft skills, PPE, First aid ,5S concept, Housekeeping, Occupational hazards Type of occupational health hazards, Safety signs, Fire extinguisher, Prevention of fire, Classification of fires and recommended extinguisher agents.

**Module 2 Metals and material science (8 marks)**

Metals, Nonmetals, Ferrous metals, Nonferrous metals, Properties of metals, Physical properties, Mechanical properties, Chemical properties, Alloys, Alloys of copper, Brass, Bronze etc.

**Module 3 Die casting process (8 marks)**

Die casting, Low pressure and high pressure die casting process, Die casting machines, Cold chamber process, Type of die casting machines, Hot chamber machine, Cold chamber machine, Air blown or goose neck machine, Metals for die casting, Gravity die casting, Cost estimation in foundry shop.

**Module 4 Special casting process (8 marks)**

Classification of casting process, Metal mould casting, Gravity or permanent mould casting, Die casting, Slush casting, Non-metallic mould casting, Centrifugal casting, Carbon di oxide moulding, Shell moulding, Plaster moulding, Continuous casting.

**Module 5 Hand tools Equipments and raw materials used for moulding (8 marks)**

Measuring and marking tools, Outside caliper, Inside caliper, Steel rule, Divider, Try square, Four-fold wooden rule, Cutting tools, Flat chisel, Diamond point chisel, Hacksaw, Moulding hand tools, Trowel, Cleaner, Rammers, Vent wire, Draw spike, Leveller, Draw screw and rapping plate, Leveller, Spirit Level, Hand bellow, Foundry brush, Mallet, Swab, Draw screw and rapping plate.

**Module 6 Moulding Sand (8 marks)**

Types of sand, Natural Sand, Synthetic sand, Properties of moulding sand, Advantages and Disadvantages of natural sand, Advantages and Disadvantages of synthetic sand, Ingredients of moulding sand and their additives, Grain shape, Facing sand, Baking sand, Unit sand.

## Module 7 Moulding process (7 marks)

Bench moulding, Types of bench moulding, Advantages of each type, Floor moulding process, Types of floor moulding process and its advantages and disadvantages, Machine moulding process and its advantages and disadvantages, Types of moulding machines, Hand operated machines, Power operated machines, Classification of power operated machines.

## Module 8 Heat treatment of casting (7 marks)

Annealing, Normalizing, Hardening, Tempering, Case hardening, Surface hardening, Quenching, Nitriding, Carburising, Liquid carburising, Pack carburising, Lower critical Temperature, Upper critical Temperature.

## Module 9 Gating system (5 marks)

Gating system, Gating system elements, classification of gates, Top run gate, Parting line gate, Bottom run gate and their classifications, Runner, Riser, Pre-requisites of a gating system.

## Module 10 Pattern (5 marks)

Patterns, Pattern materials, Advantages and disadvantages of plaster wood, Plastic and metallic patterns, Types of patterns, Pattern accessories, Pattern allowances, Pattern colour code.

## Module 11 Types of Foundry (5 marks)

Classification of foundries, Captive foundry, Jobbing foundry, Production foundry, Semi production foundry, Ferrous foundry, Non-ferrous foundry.

## Module 12 Types of sand moulds (4 marks)

Green sand mould, Loam sand mould, Cement bonded sand mould, Advantages and disadvantages of each mould.

## Module 13 Furnaces (4 marks)

Cupola furnace, Blast furnace, Open hearth process, Bessemer process, Acid open hearth process, Basic open-hearth process, Air furnaces.

## Module 14 Moulding boxes (4 marks)

Moulding box types, Box flask, Snap flask, Frame flask, Tapered snap flask.

## Module 15 Core making (3 marks)

Steps involved in core making, Core mixing machine types, Roller muller, Core sand mixer, Characteristics of core sand, Uses of core, Types of core boxes, core making machine.

Module 16            Fettling and finishing of casting (3 marks)

Fettling steps, Cleaning of casting surfaces, Thumbling, Air blasting, Sand blasting, shot blasting, Wheelabrator system, Hydro blasting chemical cleaning, Finishing of casting, buffing, Polishing, Grinding etc.

Module 17            Casting Defects (3 marks)

Misrun, Cold shuts, Shrinkage, Porosity, Blow holes, Mismatch, Cracks.

Module 18            Inspection of casting (2 marks)

Dimensional inspection, Destructive method, non- destructive method, Hardness test, Fatigue test, Visual test, pressure and leak test, Dye penetrant test

**NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.**

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