

Workshop Practice(Gr-B/GrA)

Code: ME192

Contacts:

Contact Hours Per week: 1L+3P= 4

Credits: 3

A. THEORETICAL PART

1. INTRODUCTION TO MANUFACTURING; Socio-economic role, Definition, Major grouping and Examples. - 1L

2. ENGINEERING MATERIALS; Classification / Major grouping, Physical, Chemical and Mechanical properties, Applications - 1L

3. DIFFERENT CONVENTIONAL MANUFACTURING PROCESSES MAINLY COVERING BASIC PRINCIPLES, DIFFERENT METHODS AND GENERAL APPLICATIONS; Manufacturing by forming /shaping from solid (input) to solid (product); Forging, Rolling, Drawing, Extrusion; Press tool work- Bending, Shearing, Drawing and Coining. - 3L

4. FORMING / SHAPING FROM LIQUID TO SOLID- CASTING; General principles, General classification or Types of casting; Sand mould casting- procedural steps and requirements; Pattern, Mould, Melting, Pouring, Solidification, Extracting and Fettling. Other casting processes (for larger volume and quality); Centrifugal casting, Investment casting, Die casting. -3L

5. JOINING PROCESSES; Welding (Permanent Joining)- General classification and basis; Gas welding, Arc welding, Friction welding and Resistance welding, w r.t. Principle, Requirements, Relative Advantages and Applications; Brazing and soldering.

- 2L

6. REMOVAL (MACHINING) PROCESS; Principle and purpose of machining, Machining requirements, Machine tools- Definition, General classification w.r.t, functional principles and applications; Major machining parameters (and responses)- Speed, Feed and Depth of cut; Tool geometry (Rake, Clearance and Cutting angles), Cutting fluid application; Elementary machining operations- Facing, Centering, Turning, Threading, Drilling, Boring, Shaping and Milling.

-2L

B. SCHEDULE OF PRACTICAL CLASSES

Suggested apportionment / weightage:

- Machining (and fitting)- 50% (6 days) 18 hrs
- Casting (including pattern making molding and preparation) - 25% (3 days 9hrs)
- Welding (gas, arc and resistance) (2 days 6hrs) and Sheet Metal Working (1 day 3hr)- 25% (3 days 9hrs)

FEASIBLE TYPES / MODELS OF ASSIGNMENTS

i) FITTING (in 2 days or 6 hours); Making a gauge from MS plate as shown in Fig.1.

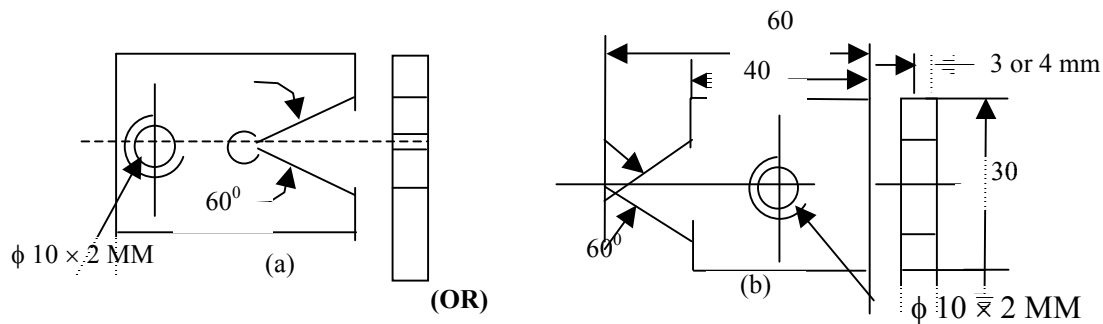


Fig.1: Job for fitting practice

Operations required:

18. Squaring and finishing of the blank by filing
19. Making the Vee-portion by sawing and filing
20. Drilling (in machine) and tapping (hand)

ii) MACHINING (in 3 days or 9 hours); To make a pin as shown in Fig.2 from a $\square 20$ mm mild steel rod in a lathe.

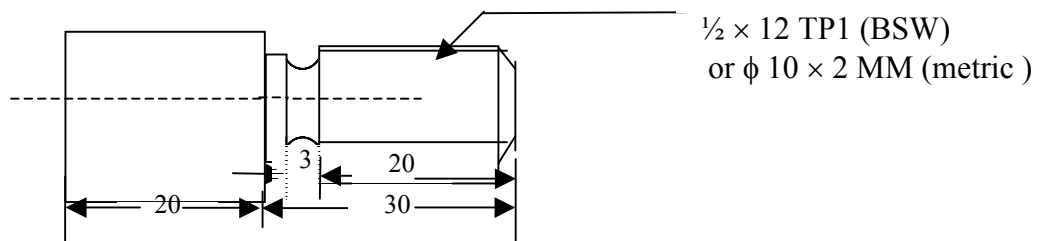


Fig.2: Job for practice on a lathe

iii) MACHINING (in 1 day or 3 hours); To make a MS prism as shown in Fig.3 from a $\square 20$ mm mild steel rod in a shaping and / or milling machine.

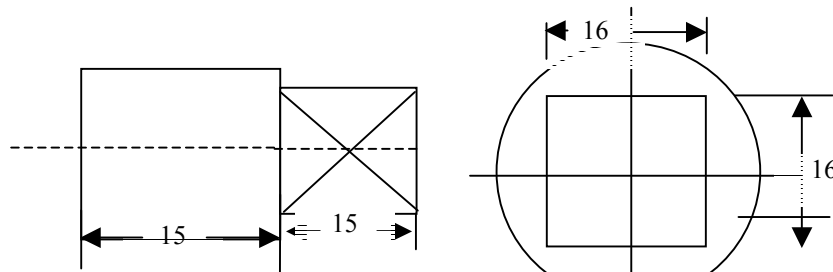


Fig.3: Job for practice on a shaping and/or milling machine

iv) PATTERN MAKING, SAND MOULDING AND CASTING (in 3 classes or 9 hours); To make a wooden pattern and a sand mould with that pattern for casting a cast iron block as shown in Fig.4.

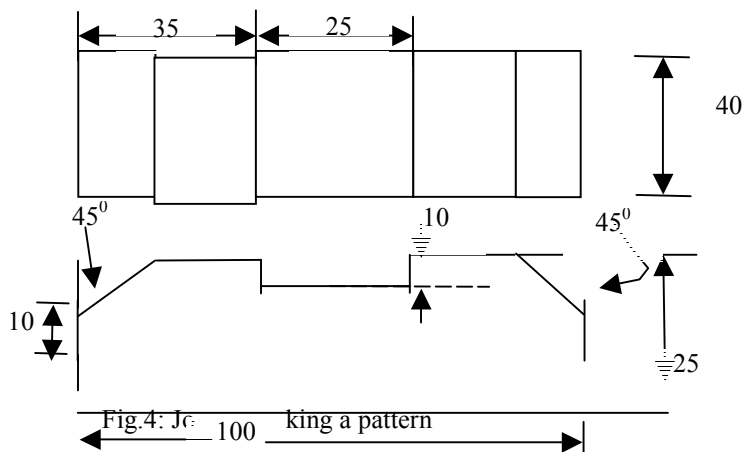


Fig.4: Job for making a pattern

v) WELDING (GAS WELDING) (in 1 class or 3 hours); To join two thin mild steel plates or sheets (1 to 3 mm thick) as shown in Fig. 5 by gas welding.

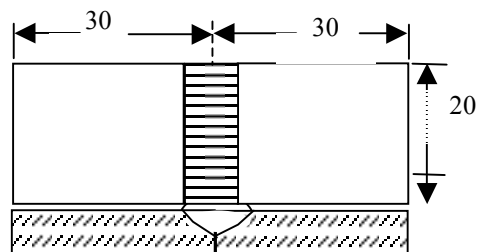


Fig.5: Welding specimen for practice

- vi) WELDING (ARC WELDING) (in 1 day or 3 hours); To join two thick (6mm) MS plate as shown in Fig. 5 by arc welding.
- vii) SHEET METAL WORK (in 1 day or 3 hours); Forming a cone, for example.