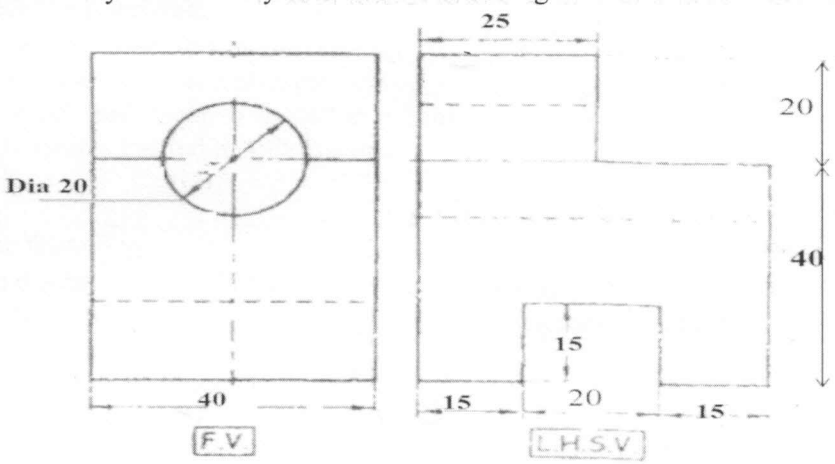
(3Hours) **(Total Marks: 80)**

N.B:

1. **Question No.1 is compulsory.**
2. **Illustrate your answer with neat sketches wherever necessary.**
3. **Missing data may be assumed suitably.**
4. **Figures to the right indicate full marks.**
5. **Solve any three questions from remaining five.**

Q.1 The component shown in figure is to be sand cast. Material of the component is C.I **(20)**
Assuming necessary data suitably. Answer the following:



a. Select parting line.
b. Design required pattern and core box.
c. Design the gating system design.
d. Design riser using Caine's method.
e. Sketch two views of mould showing gating system and riser.

Q.2

A. A 60mm x 60 mm section is to be rolled into diameter of 25mm. **(15)**
The following data is available:
Mill Specification: 350/6
λ average: 1.47.
Rolling temperature- assumed to be constant: 1200 ^{0}c.
Design the roll passes required and sketch all the roll passes with dimensions.

B. Explain defects in rolled products. **(5)**

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Q.3 Give reason for each of the following: **(20)**

A. Allowances are provided on pattern
B. Chills are used in sand mould casting.
C. Why riser is used in sand casting.
D. Cupola furnace is not suitable for melting of steel.
E. Zinc alloy is hot chamber die cast.
F. Forgings are inherently stronger than castings.
G. Flash and gutter is used in forging.
H. Preforming operation is carried out in closed die forging before final forging.

Q.4 Differentiate the following: **(20)**

A. Blind riser and open riser in sand casting.
B. Hot chamber and cold chamber die casting.
C. Neutral Angle and Angle of contact in rolling.
D. Direct extrusion and Indirect Extrusion.

Q.5 Attempt the following **(20)**

A. Explain the defect in sand cast component and their remedies.
B. Explain the working principle and application of shell mould casting.
C. Explain with sketches forging defects.
D. Defects in rolled components.

Q.6 Write a short note on following :(Attempt any four) **(20)**

A. Hydrostatic Extrusion.
B. Production of seamless tube by rolling.
C. Cupola furnace
D. Lost wax Investment casting process.
E. Defect in die cast component and their remedies.

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