3 Hours/100 Marks   Seat No. [ ][ ][ ][ ][ ][ ][ ][ ]

Instructions : *(1)* **All** *questions are* **compulsory**.

                (2) Answer **each** *next main question on a* **new** *page.*

                (3) Illustrate your answers with **neat** *sketches* **wherever** *necessary.*

                (4) Figures to the **right** *indicate* **full** *marks.*

                (5) Assume suitable data, **if necessary**.

                                                  Marks

1. Solve **any ten** :   **(2×10=20)**

   a) Define :

      i) Fatigue

      ii) Resilience

   b) List types of cast iron.

   c) Give composition of 25 Cr4 Mo2.

   d) List any four objectives of heat treatment.

   e) Give application of heat treatment in Automobile.

   f) Define Tempering.

   g) Define Pattern.

   h) List any four pattern materials.

   i) List any four defects in casting process.

   j) List the types of chips produced in manufacturing process.

   k) List the types of cutting tools.

   l) Define :

      i) Speed

      ii) Depth of cut.

2. Solve **any four** :   **(4×4=16)**

   a) State effects of alloying elements on steel.

   b) Explain stainless steel with types.

   c) Explain thermosetting with application.

    d) Explain cyaniding surface hardening process with application.

    e) List the different types of annealing processes and explain any one.

    f) Name types of pattern, explain gated pattern with neat sketch.

3. Solve **any four**.   **(4×4=16)**

    a) Explain gray cast iron with its composition.

    b) Give composition and application of Y alloy.

    c) Draw label Fe-C diagram, show all critical temperatures.

    d) Explain pattern colour coding.

    e) Explain types of cores.

    f) Give advantages and disadvantages of foundry process.

4. Solve **any four**.   **(4×4=16)**

    a) Give composition and application of gun metal.

    b) List any four properties and any two applications of copper.

    c) Describe Diecasting with neat sketch.

    d) Explain properties of sand.

    e) State any four properties of cutting tool.

    f) Enlist types of cutting fluids and also give any four properties of cutting fluid.

5. Solve **any four**.   **(4×4=16)**

    a) Draw neat sketch of gating and risering system of sand casting.

    b) Explain types of pattern allowances.

    c) Draw labelled sketch of tool geometry of single point cutting tool.

    d) List any eight lathe operations.

    e) State lathe specifications with neat sketch.

    f) Explain Taper turning operations with taper turning attachment.

6. Solve **any four**.   **(4×4=16)**

    a) List different types of lathes (any six).

    b) Describe built up edge. Explain the cause and remedy for BUE.

    c) Give classification of drilling machines.

    d) List any four factors affects the selection of tool material.

    e) Compare follower rest with steady rest.

    f) Find the angle that compound rest should be sent to cut a taper having large diameter 1.5 cm and smaller diameter 0.625 cm and length of taper is 3.75 cm.

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