11819

3 Hours / 70 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.

(6)   Use of Non-programmable Electronic Pocket Calculator is permissible.

(7)   Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(8)   Preferably, write the answers in sequential order.

Marks

1.   **Attempt any FIVE of the following :** $5 \times 2 = 10$

(a)   State the function of Lathe machine.

(b)   Enlist the principal parts of centre lathe.

(c)   List various drilling machine operations.

(d)   Define 'counter sinking' operation performed on drilling machine. Give its applications.

(e)   Enlist the principal parts of column and knee type milling machine.

(f)   State the various factors that influence selection of a grinding wheel.

(g)   Define 'Indexing'. Why it is performed for gear manufacturing ?

2. **Attempt any THREE of the following :** 4 × 3 = 12

   (a) Find the time required for one complete cut on a piece of work 350 mm long and 50 mm in diameter. The cutting speed is 35 m/min and feed is 0.5 mm per revolution.

   (b) A drilling machine is used to drill a hole of 30 mm diameter and 80 mm depth. Considering feed as 1.5 mm/rev and cutting speed as 40 m/min, calculate the total drilling time required. Assume tool approach and lever travel as 3 mm each.

   (c) State the difference between up milling and down milling (any four points).

   (d) Why a grinding wheel is to be balanced ? Explain.

3. **Attempt any THREE of the following :** 4 × 3 = 12

   (a) Explain compound indexing with suitable example.

   (b) What is boring bar ? Describe its utility with sketch.

   (c) State the specifications of horizontal broaching machine.

   (d) Select the suitable lathe operation for the following :

   - Reducing the diameter of shaft

   - For providing grip on shaft

   - For reducing length of shaft

   - For machining stepped shaft

4. **Attempt any THREE of the following :** 4 × 3 = 12

   (a) Explain with neat sketch the twist drill nomenclature.

   (b) Index an angle 19° 40' by angular indexing.

   (c) Describe with neat sketch the elements of internal pull broach.

    (d) Describe with neat sketch the following operations performed on milling machine :

        (i)   Plain milling

        (ii)   Side milling

    (e) Select the suitable machine for machining rectangular key way in a shaft. Justify your answer.

5.   **Attempt any TWO of the following :**   **6 × 2 = 12**

    (a) Describe 'Dressing and Trueing' of grinding wheels with it's importance.

    (b) A plain surface 80 mm wide and 240 mm long is to be milled on a horizontal milling machine with a cutter diameter 80 mm and cutting speed 40 m/min. Take feed per tooth as 0.10 mm and number of teeth on cutter as 12. Compute machining time.

    (c) Select the suitable grinding process for grinding needle of fuel injector, justify.

6.   **Attempt any TWO of the following :**   **6 × 2 = 12**

    (a) Explain the various cutting parameters of turning operation.

    (b) Explain 'Gear Shaping and Gear Hobbing' processes.

    (c) Draw a neat sketch of radial drilling machine. State the function of principal parts.

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