15116

3 Hours / 100 Marks   Seat No.

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

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

                                                                                    Marks

1. **(A)** **Attempt any THREE :**   **4 × 3 = 12**

(a) Describe setup of WJM with neat sketch.

(b) Distinguish between absolute and incremental coordinate system of CNC.

(c) Compare pull broach with push broach.

(d) State need of non-traditional machining processes.

(B) **Attempt any ONE :**   **6 × 1 = 6**

(a) Explain controlling parameters in WEDM.

(b) Explain the closed loop control system with block diagram and state functions of each element.

2. **Attempt any FOUR :**   **4 × 4 = 16**

(a) How laser beam is used for welding ?

(b) Explain the use of following codes in part programming : G95, G41, M06, M98.

(c) Compare plain milling machine with universal milling machine.

(d) Explain with neat sketch Pinion cutter gear shaping process.

(e) Describe contents of maintenance manual.

P.T.O.

3. Attempt any TWO : **8 × 2 = 16**

(a) Prepare a part program for machining component as shown in Fig. 1. Use following data : Cutting speed = 1000 rpm, Feed = 50 mm/min, thickness of component 2 mm, Tool reference position is 5 mm above the surface of the workpiece, Assume suitable data if any. Neglect cutter radius compensation.
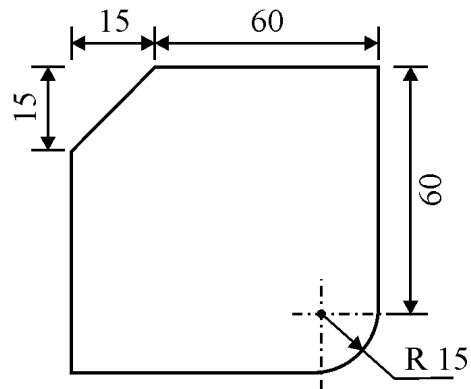
Fig. No. 1

(b) Following are the machining requirements, select appropriate non-traditional machining process for each with justification.

(i) Machining profile of glass

(ii) Cutting of hot extrusion components

(iii) Cutting internal threads in hard material

(iv) Cutting and engraving pattern in thin films

(c) With suitable example, explain the steps for compound indexing.

4. (A) Attempt any THREE : **4 × 3 = 12**

(a) Draw sketches and state use of slab milling cutter and T-slot milling cutter.

(b) How gear manufacturing processor are classified ?

(c) Write safety precautions to be taken during grinding process.

(d) 83 divisions are to be indexed by differential indexing method. Calculate :

(i) Gear ratio

(ii) No. of idler gear

(iii) Index crank movement

(iv) Sketch of gear train

(B) Attempt any ONE :   **6 × 1 = 6**

   (a) How hexagonal head of a bolt is prepared by using straddle milling operation ?

   (b) What is centreless grinding ? Explain the methods of feed in centreless grinding.

5.   Attempt any FOUR :   **4 × 4 = 16**

   (a) Prepare a sample history card for the milling machine. State it's importance.

   (b) Explain each term of grinding wheel designation :

       W A 46 K 5 V 17

   (c) What is gear finishing ? State the need of gear finishing.

   (d) List basic parts of column and knee type of milling machine. State functions of any four.

   (e) Draw labelled sketch of horizontal broaching machine and state function of any four parts.

   (f) List types of boring tools and explain any two with sketches.

6.   Attempt any FOUR :   **4 × 4 = 16**

   (a) Compare gear burnishing with gear grinding.

   (b) Differentiate between planer & planomiller.

   (c) Describe the maintenance practices for gears.

   (d) State applications of broaching.

   (e) Give the maintenance practice for bearings and chains of machine.

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