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3 Hours / 100 Marks

Seat No.

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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.

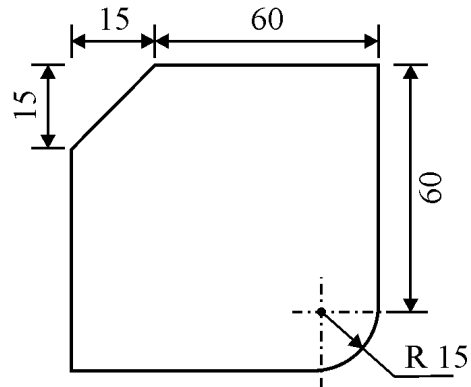
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3. Attempt any TWO :**8 × 2 = 16**

- (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.
- Machining profile of glass
 - Cutting of hot extrusion components
 - Cutting internal threads in hard material
 - 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**

- Draw sketches and state use of slab milling cutter and T-slot milling cutter.
- How gear manufacturing processor are classified ?
- Write safety precautions to be taken during grinding process.
- 83 divisions are to be indexed by differential indexing method. Calculate :
 - Gear ratio
 - No. of idler gear
 - Index crank movement
 - Sketch of gear train

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(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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