22563

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.

Marks

1. **Attempt any FIVE of the following:** 10

   a) Enlist any four process parameters in EDM.

   b) State the equation of cutting speed for milling operation.

   c) List the various gear finishing methods.

   d) Name the basic components of an CNC machine.

   e) Write only classification of CNC machine.

   f) Write meaning of following G and M-codes.

      (i) G02

      (ii) M30

   g) State any two examples of fixed automation.

Marks

2. **Attempt any THREE of the following:** **12**

a) Explain the purpose of electrolyte in ECM.

b) Compare between vertical and horizontal milling machine.

c) Describe automatic tool changer (ATC) of CNC machine.

d) Justify need of tool length compensation of CNC machine.

3. **Attempt any THREE of the following:** **12**

a) Differentiate between gear hobbing and gear honing.

b) Compare "Point to Point" and continuous path CNC machine.

c) Explain the meaning of following block format of CNC.

N020 G03 X12 Y14 Z-0.5 I0 J12 F90 E0B

d) Describe fixed and programmable automation.

4. **Attempt any THREE of the following:** **12**

a) Classify the different methods of gear manufacturing.

b) Apply right hand rule of axes identification to CNC vertical milling with neat diagram.

c) Calculate the cutting parameters and prepare process sheet for the component shown in Fig. No.1. with neat diagram. All dimensions are in mm.

Given: Raw material - Aluminium, stock size ϕ14 X42 length, feed (f) = 0.2 mm/rev, cutting speed (V) = 90 m/min. Consider work zero (W) as per the Fig. No.1.

Q. No. 4c & 4d   Fig. No. 1

[3]
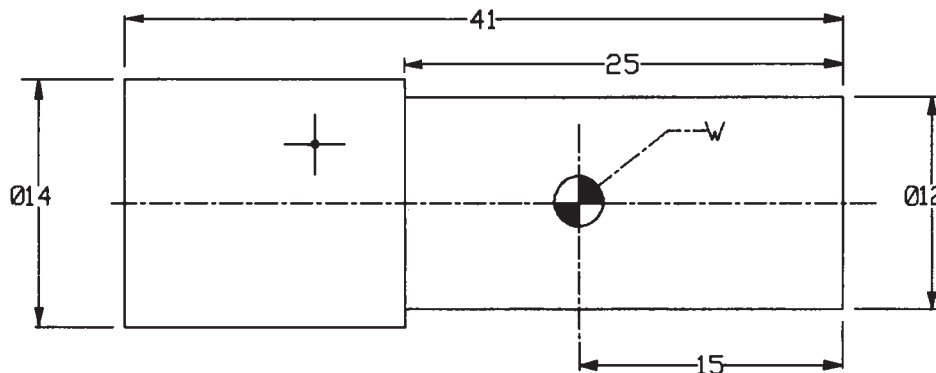
d) Develop full G and M code manual part program of CNC lathe for component shown in Fig. No.1. using word address format (WAF).

e) Justify the need of Group Technology in today's manufacturing situation.

5. **Attempt any TWO of the following:** 12

a) Draw set-up diagram of ECM processes showing all the elements. State the function of each elements.

b) Draw internal mechanism of universal dividing head and label the parts.

c) Explain need of virtual CNC machine simulators.

6. **Attempt any TWO of the following:** 12

a) Draw set-up diagram of wire cut EDM and label the parts, also suggest approximate range of following process parameters with it's measuring unit.

  (i) Discharge current **OR** Pulse frequency.

  (ii) Wire speed **OR** Wire tension.

b) Apply compound indexing method to divide 51 divisions on circular blank.

c) Use the different milling cutter to cut 'T' slot on rectangular block with neat diagram, also mention the sequence of operations and types of milling cutter used.

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