22563

23124

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.

Marks

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

a) State any four needs of non-conventional machining processes.

b) Enlist different milling operations (Any four).

c) List various gear finishing method (Any four).

d) State two advantages of CNC machines over conventional machines.

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

i) G 03

ii) M 08

f) State the meaning of subroutine and canned cycle in CNC part programming.

g) Define robotics. State two application of robot.

P.T.O.

Marks

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

a) Explain working principle of Abrasive Jet Machine (AJM) with neat sketch.

b) Compare between up milling and down milling process. (four points)

c) Describe the concept of cutter radius compensation for CNC machine with suitable example.

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

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

a) Classify the different method of gear manufacturing.

b) Explain absolute and incremental co-ordinate system in CNC machines with suitable example.

c) Explain the term preparatory function and miscellaneous function in the context of CNC Part programming.

d) Describe fixed and programmable automation.

Marks

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

a) Differentiate between gear hobbing process and gear shaping process (four points).

b) Explain work holding devices used in CNC lathes.

c) Prepare process sheet and calculate cutting parameters for turning on CNC lathe for the component shown in Figure No. 1. Neglect tool compensation. Assume suitable data if necessary.

Given – Raw material stock : $\phi 35 \times 50$ mm

Stock : Aluminium

Feed (f) : 0.2 mm/rev.

Cutting velocity (v) = 90 m/min.

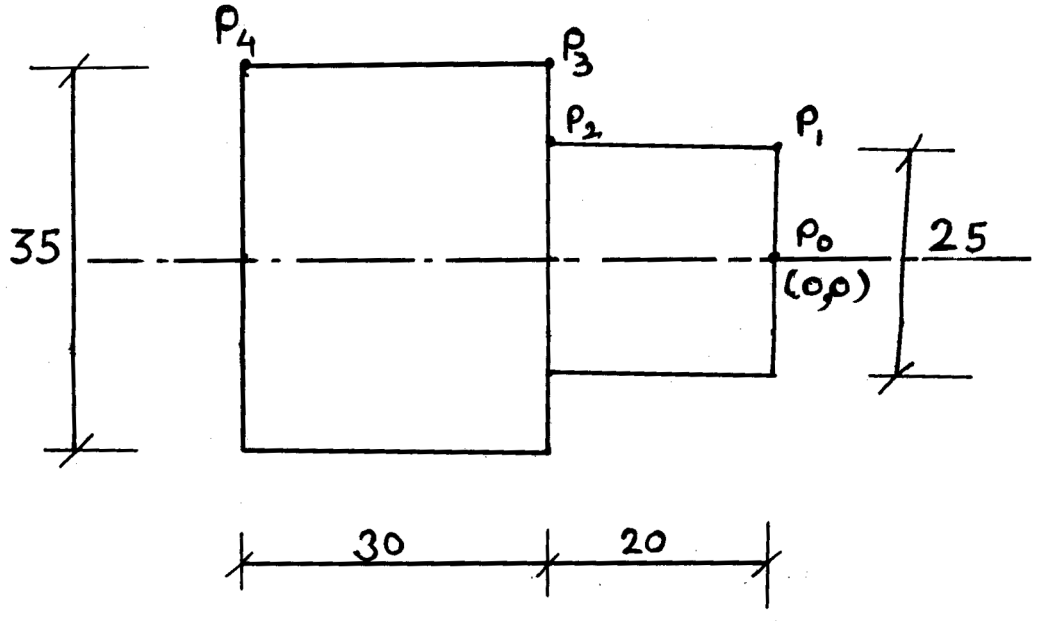

Fig. No. 1

d) Develop full G and M - code manual part program of CNC lathe for component given in Figure No. 1 in Word Address Formate (WAF).

e) Justify the need of group technology in today's manufacturing system.

Marks

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

a) Draw set up diagram of EDM process showing all the elements. State function of dielectric fluid with example.

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

c) Illustrate axes nomenclature of CNC lathe and milling with sign conventions.

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

a) Draw the setup diagram of Laser Beam Machining (LBM). Explain the function of elements in setup.

b) Apply compounding indexing method for indexing 69 divisions.

c) Justify the need of gear finishing. Demonstrate any one gear finishing process with important process parameters.

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