

Scheme – I

Sample Question Paper

Program Name : Diploma in Mechanical Engineering
Program Code : ME
Semester : Fifth
Course Title : Advanced Manufacturing Processes
Marks : 70

22563

Time: 3Hrs.

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.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) Enlist the different type non conventional machining processes.
- b) Name the various types milling machines.
- c) List various gear finishing methods.
- d) State advantages and limitations of CNC machine.
- e) Define the 'Work Zero position' and 'Machine Zero position' of CNC machine.
- f) Write meaning of following M-codes.
 - i) M03 and ii) M05
- g) Give one example of fixed automation and one example of flexible automation.

Q.2) Attempt any THREE of the following.

12 Marks

- a) Explain the functions of the dielectric fluid used in EDM.
- b) Compare between up milling and down milling process.
- c) Describe the concept of 'Tool Offset' for CNC machine with suitable example.
- d) Justify need of cutter radius compensation given for CNC milling programming.

Q.3) Attempt any THREE of the following.

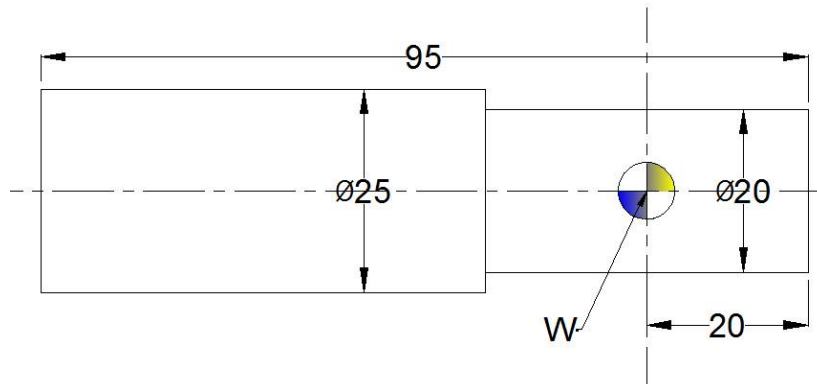
12 Marks

- a) Distinguish between gear shaping by pinion cutter and gear shaping by rack cutter.
- b) Compare lead screw of conventional machine and re-circulating ball screw of CNC machine.
- c) Differentiate between canned cycle and subroutine function for CNC machine.
- d) Draw the diagram of simple robot and show different components of it.

Q.4) Attempt any THREE of the following.

12 Marks

- Classify the different methods of gear manufacturing.
- Differentiate between automatic tool changer (ATC) and automatic pallet changer (APC) of CNC machine.
- Prepare process sheet and calculate cutting parameter for the following component with neat diagram. All dimensions are in mm. Given: Raw material stock size- $\text{Ø}25 \times 96$ length. Stock Material- Aluminum. Feed (f) =0.2 mm/rev. Cutting velocity (V) =90 m/min. Work Zero(W)



- Develop full G and M code manual part program of CNC lathe for above component in word address format (WAF).
- Justify the use of FMS in today's manufacturing situation.

Q.5) Attempt any TWO of the following.

12 Marks

- Draw set up diagram of wire cut EDM processes showing all the elements. State the functions of each element.
- Calculate cutter RPM to cut 'T' slot when cutting speed (V) = 90 m/min. Diameter of cutter $\text{Ø} = 10$ mm. and show work and cutter arrangement diagram for above operation.
- Apply right hand rule of axes identification for CNC lathe and CNC milling machine.

Q.6) Attempt any TWO of the following.

12 Marks

- Draw set up diagram and demonstrates the range of following process control parameters of abrasive jet machining process.
 - Grain types and size.
 - Gas type and pressure.
 - Nozzle material and hardness.
- Apply compound indexing method for indexing 69 divisions.
- Draw experimental set up of gear manufacturing by horizontal milling machine and show various elements on it with its function.

Scheme – I

Sample Test Paper - I

Program Name : Diploma in Mechanical Engineering
Program Code : ME
Semester : Fifth
Course Title : Advanced Manufacturing Processes
Marks : 20

22563

Time: 1 Hour

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.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) State any four characteristics of dielectric fluid used in EDM process.
- b) Write any two functions of electrolyte used in Electro Chemical Machining (ECM)
- c) List various type of cutters used in milling machining process.
- d) Name the various methods of indexing.
- e) Enlist the different type of gears.
- f) State the principle of gear honing process.

Q.2 Attempt any THREE.

12 Marks

- a) Differentiate between abrasive jet machining (AJM) and Ultrasonic machining (USM)
- b) Draw diagram of Wire Cut Electric Discharge Machining (WEDM) and show all elements on it.
- c) Explain the straddle milling operation with neat sketch.
- d) Apply compound indexing method to index 51 divisions on blank.
- e) Describe gear shaping by pinion method with suitable diagram.
- f) Justify, selection of gear material depends on amount of power transmitted.

Scheme – I

Sample Test Paper - II

Program Name : Diploma in Mechanical Engineering
Program Code : ME
Semester : Fifth
Course Title : Advanced Manufacturing Processes
Marks : 20

22563

Time: 1 Hour

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.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

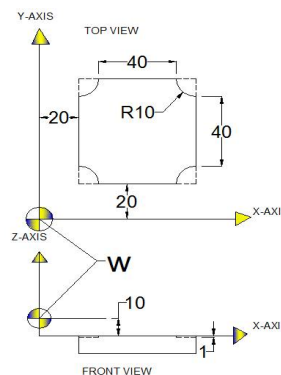
08 Marks

- a) Write any two feedback devices used in closed loop control CNC machine.
- b) State the thumb rule for axis identification for CNC machine.
- c) Write the meaning G00 and G01 code used in CNC programming.
- d) List various compensations required during CNC programming.
- e) Name the various types of automations in industry.
- f) Define- Automation

Q.2 Attempt any THREE.

12 Marks

- a) Explain, closed loop control system CNC machine with neat sketch.
- b) Apply right hand rule to identify axes of wire cut EDM CNC machine.
- c) Prepare process sheet and calculate cutting parameter for the following component with neat diagram. Use HSS end milling cutter of $\text{Ø}20\text{mm}$. Raw material – Aluminium Raw material size= 60 X 60 Feed rate=0.2 mm/rev. Cutting speed= 90 m/min.



- d) Develop full G & M code CNC manual part programme of CNC milling for above component. Use cutter radius compensation off.
- e) Explain various elements of Flexible Manufacturing System.
- f) Draw sketch of robot and show various parts on it.