

Sample Test Paper-I

Course Name : Diploma in Mechanical Engineering

Course Code : ME/PG/PT

Semester : Fifth

Subject Title : Advanced Manufacturing Processes

Marks : 25

17527

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.

Q1. Attempt any three only

9 Marks

- a) Differentiate between PAM and LBM with respect to principle, MRR, and suitability of machining (At least one point each)
- b) State the reasons for providing closed loop control in CNC machines.
- c) State any three conditions under which automat is preferred over conventional machines
- d) State any three limitations of EDM process.

Q2. Attempt any two

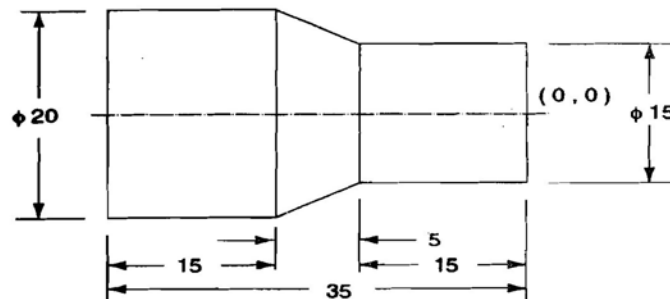
8 Marks

- a) Differentiate between AJM and WJM (At least four points each)
- b) Describe the concept of 'Adaptive Control' with example.
- c) State advantages and limitations of broaching operation. (At least two each)

Q3. Attempt any one

8 Marks

- a) With neat sketch, write step by step process of Wire Cut EDM. State any two applications also.
- b) For the component shown in figure 1, prepare the part programme for CNC taper turning operation using linear interpolation and absolute mode. Raw material M.S. bar $\Phi 20\text{mm}$



Sample Test Paper-II

Course Name : Diploma in Mechanical Engineering

Course Code : ME/PG/PT

Semester : Fifth

Subject Title : Advanced Manufacturing Processes

Marks : 25

17527

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.

Q1. Attempt any three only

9 Marks

- a) Why gear finishing operation is necessary and states its any three methods.
- b) Differentiate between dressing and truing of grinding wheel with respect to need, tools, and effects of not doing it.
- c) Differentiate between preventive maintenance and condition based maintenance (At least three points)
- d) State one application of the following super finishing processes
a) Buffing, b) Burnishing c) Lapping

Q2. Attempt any two

8 Marks

- a) An indexing device has brown & sharp plates as given below,
Plate No 1 – 15, 16, 17, 18, 19, 20
Plate No 2 – 21, 23, 27, 29, 31, 33
Plate No 3 – 37, 39, 41, 43, 47, 49
A gear is to be cut with 60 teeth. Calculate No of turns of index plate using simple indexing method. Also calculate No of turns of index plate for cutting gear of 35 teeth using appropriate index plate
- b) State the basic steps in the routine maintenance of
a) Flexible coupling, b) Drive chains
- c) Sketch and label the plain milling cutter. State the functions of rake angle, land, and relief angle on it.

Q3. Attempt any one

8 Marks

- a) With neat sketch, describe the construction of column and knee type milling machine stating function of each part.
- b) Describe the parameters considered in selection of grinding wheel. How grinding wheels are specified?

Sample Question Paper

Course Name : Diploma in Mechanical Engineering

Course Code : ME/PG/PT

Semester : Fifth

Subject Title : Advanced Manufacturing Processes

Marks : 100

17527

Time:3 hours

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

Q1. A Attempt any THREE

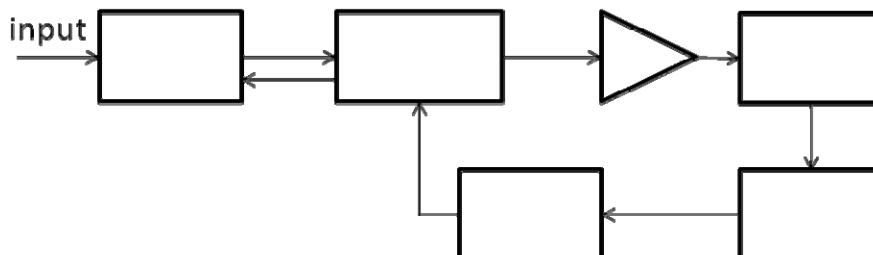
12 Marks

- a) Give four reasons supporting the need of development of non-traditional machining.
- b) Differentiate between absolute and incremental coordinate system used in CNC part programming with an example.
- c) Draw the sketch of the boring head. State the conditions under which it is used.
- d) Compare between EDM and wire cut EDM for its applications

Q1. B Attempt any ONE

6 Marks

- a) With a neat labeled sketch, describe Laser Beam Machining process w.r.t. its principle, applications and limitations.
- b) Following block represents the elements of closed loop control system for CNC machine. Redraw the block diagram and label the blocks. Also state the function of each element.



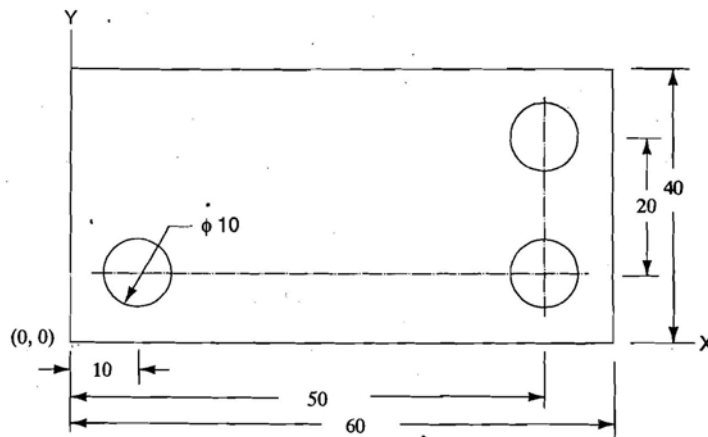
Q2. Attempt any FOUR

16 Marks

- a) With a neat sketch, describe the principle of PAM
- b) State the purpose of providing dry run facility and Jog mode for CNC machine.
- c) Describe how a grinding wheel is specified with an example.
- d) Two gears are to be manufactured with 25 and 35 teeth. Using simple indexing method, calculate number of turns for indexing. Consider standard sharp & brown plates.
- e) State types of maintenance applicable for Machine tools. Describe any one of them.

Q3. Attempt any TWO**16 Marks**

- a. Prepare a part program for milling $\Phi 10$ through openings in the component shown below. Material Aluminum Flat – thickness 10mm. Cutter Position 5mm. above work surface



- b. Following are the machining requirements. Select appropriate non-traditional machining method for each with justification
- Deep drilling
 - Machining of injection moulding mould
 - Profile cutting of turbine blade
 - Die block used in press tools
- c. Describe construction and working of column and knee type milling machine with neat sketch.

Q4. A Attempt any THREE**12 Marks**

- Differentiate between straddle milling and gang milling. (Four points)
- State different types of milling cutters mentioning the names of operations for which they are used.
- State the advantages of centerless grinding.
- How information collected from maintenance record, is useful for maintenance of a particular equipment?

Q4. B Attempt any ONE**6 Marks**

- List different types of gear finishing methods. Describe any one in detail.
- Small MS pin of 10 mm dia and 80 mm long are to be ground on external surface in the batch of 5000. Select suitable grinding process for mass production with justification. Draw neat sketch and describe the process with respect to operation.

Q5. Attempt any FOUR**16 Marks**

- What is "Repair Complexity". How it is important in preparing maintenance schedule. Also state significance of "repair cycle".
- With a neat sketch, describe working principle of honing process. State its two applications.
- Compare gear shaping and gear hobbing process with respect to accuracy, rate of production, quality and types of gears produced (At least one each)
- A "T" slot is to be manufactured. Describe the machining processes involved and the tools required for it.
- Differentiate between capstan and turret lathe. (At least four points each)

- f. Draw the neat labeled sketch of a broach and state the function of each element.

Q6. Attempt any FOUR

16 Marks

- a) Why gear finishing operation is required? Compare gear burnishing with gear grinding. (At least four points each)
- b) State advantages and limitations of broaching process. (At least four points each)
- c) State the general maintenance problems faced and their remedies related with a) bearings b) belts
- d) Sketch any four profiles which can be produced by broaching process.
- e) State the significance of – G01, G04, M06, M03 in part programming