BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.ME-2022
Course Name – Advanced Manufacturing Process
Course Code - DMEPC501
(Semester V)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Select the primary purpose of a machine tool.

a) To cut materials using hand tools
b) To shape or form materials through controlled movement
c) To transport materials within a factory
d) To assemble components

(ii) Identify the following which is associate with the machine tool.

a) A handheld device used for cutting metals
b) A device used only for measuring and inspection purposes
c) A powered device designed for machining or shaping materials
d) A tool used in agriculture for plowing and digging

(iii) Select following is NOT a feature of machine tools.

a) The ability to perform multiple machining operations
b) Precision in material removal
c) Controlled power-driven movement
d) Completely manual operation without automation

(iv) Select the purpose of the flank face in the single-point cutting tool.

a) To provide support to the cutting edge
b) To control the cutting depth
c) To allow clearance between the tool and workpiece
d) To create the chip

(v) In single-point turning, Identify angle which helps in reducing cutting forces and extending tool life by controlling the thickness of the chips.

a) Relief angle
b) Rake angle
c) Side cutting edge angle
d) Lead angle

(vi) The end relief angle in ASA geometry primarily relate to

a) Control chip flow.
b) Reduce friction between the tool and the workpiece.
c) Support the cutting edge.
d) Determine the surface finish.

(vii) In ORS geometry, select the plane is used to measure the clearance angles.

a) Principal cutting plane
b) Normal plane
c) Orthogonal plane
d) Auxiliary plane

(viii) Identify the following system,uses angles measured in the orthogonal cutting plane

a) ASA
b) ORS
c) Both
d) Neither

(ix) Select the key difference in between up milling and down milling.

a) The direction of chip flow
b) The feed rate
c) The depth of cut
d) The type of tool used

(x) Identify the importance of non-traditional machining processes.

a) To improve tool life
b) To machine materials that are difficult or impossible to machine using traditional methods
c) To increase the hardness of the tool material
d) To reduce cutting speeds and feeds

(xi) Identify the following non-traditional machining processes uses a high-energy beam to remove material.

a) Electric discharge machining (EDM)
b) Ultrasonic machining (USM)
c) Laser beam machining (LBM
d) Electrochemical machining (ECM)

(xii) Identify the primary energy source used in Laser Beam Machining (LBM).

a) Mechanical
b) Thermal
c) Chemical
d) Electrical

(xiii) Identify the following uses a high-pressure jet of water for machining.

a) Ultrasonic Machining
b) Laser Beam Machining
c) Water Jet Machining
d) Chemical Machining

(xiv) Electrochemical machining (ECM) removes material by the process is recognize as

a) Erosion
b) Melting
c) Chemical Dissolution
d) Mechanical Impact

(xv) A company wants to reduce the cycle time of an assembly process. Choose the following special purpose machine to help reduce in time.

a) By increasing the workforce
b) By simplifying the product design
c) By automating repetitive operations
d) By using more complex fixtures

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Compare the ultrasonic machining process to a traditional grinding process. (3)
3. Explain how the ultrasonic frequency affects the machining process in USM. (3)
4. Name three materials that can be processed using Wire Cut EDM. (3)
5. Describe the role of the nozzle in Abrasive Jet Machining. (3)
6. Compare the effectiveness of AJM for machining metals versus non-metals. (3)

OR

Analyze how nozzle wear can affect the precision of the AJM process. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Compare EDM with traditional machining in terms of the material removal mechanism. (5)
8. Analyze the effect of beam intensity on the quality of the cut. (5)
9. Define cutting speed, feed and depth of cut in machining process. Illustrate all of them considering turning operation. (5)
10. Describe the tool geometry in ASA system with proper diagram. (5)
11. Explain how the table in a planning machine contributes to the workpiece movement and describe the types of movement it undergoes during machining. (5)
12. Analyze the effect of increasing the frequency of the ultrasonic vibrations on the machining rate. (5)

OR

Evaluate the advantages and limitations of Ultrasonic Machining compared to other nontraditional machining processes. (5)

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