GANPAT UNIVERSITY
M. TECH SEM- II (CAD/CAM)
CBCS (NEW) REGULAR EXAMINATION APRIL - JUNE 2017
3ME213 ADVANCED MANUFACTURING PROCESSES

MAX. TIME: 3 HRS   **MAX. MARKS: 60**

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate marks.
(3) Be precise and to the point in answering the descriptive questions.
(4) Assume suitable data if necessary.

Section: I

Q.1   **[10]**

[A] Describe principle, working and application of Gas Tungsten Arc Welding. What are the possible difficulties in it and how it can be dealt? (5)

[B] Derive an expression for the pressure distribution in rolling strip in plain strain condition. (5)

OR

Q.1   **[10]**

[A] Explain the role of fluids used in cutting operation? How it can be applied in machining area? List out pros and cons of using cutting fluids in machining? (5)

[B] Discuss the effect of voltage, current, polarity and traveling speed on weld profile in case of shielded metal arc welding. (5)

Q.2   **[10]**

[A] Low carbon steel having a tensile strength of 300 MPa and a shear strength of 220 MPa is cut in a turning operation with a cutting speed of 3.0 m/s. The feed is 0.20 mm/rev and the depth of cut is 3.0 mm. The rake angle of the tool is 5o in the direction of chip flow. The resulting chip ratio is 0.45. Using the orthogonal model as an approximation of turning, determine (a) the shear plane angle, (b) shear force, (c) cutting force and feed force. (5)

[B] Enumerate the assumptions made in Merchant's theory. Show schematically the Merchant's force circle in orthogonal cutting. Derive the equations for shear and friction forces. (5)

OR

Q.2   **[10]**

[A] A block of lead 25 x 25 x 150 mm is pressed between flat dies to a size 10 x 100 x 150 mm. if the uniaxial flow stress is 7.5MPa and μ=0.26. Determine the max. pressure and average pressure. Also calculate total forging load. (5)

[B] Enlist various testing methods used in welding and describe the any two methods with neat sketch. (5)

Q.3   **[10]**

[A] What do you mean by high energy rate forming? Explain the magnetic pulse forming process with neat sketch? State its applications. (5)

[B] Discuss the general defects observed during welding with neat sketch. Also suggest remedies to avoid it. (5)

Section: II

Q.4   **[10]**

[A] Explain the aspect 'Degrees of freedom of movement of a free body' with special (5)
reference to jigs and fixture.

[B] Why different abrasives produce different material removal rate? Give reasons for (5)
inaccuracies in abrasive jet machining.

<div align="center">OR</div>

Q.4   **[10]**

[A] What is the difference between form cutting and generating process, used for gear (5)
making? Explain the principle of gear hobbing process.

[B] Discuss the various forging defects. Describe the parameters responsible for defects (5)
and suggest the remedies.

Q.5   **[10]**

[A] With a neat sketch of the setup explain the principle of operation of Electron Beam (5)
Machining setup for machining applications. Also discuss how the machining rate
can be controlled in EBM process?

[B] What basic requirements a good clamping device is expected to meet in jig or fixture? (5)
Discuss working of bridge clamp with suitable example.

<div align="center">OR</div>

Q.5   **[10]**

[A] Discuss the thread milling and gear shaving process with neat sketch. Also state the (5)
importance of it.

[B] Discuss top, bottom and parting line gating system with respect to advantages, (5)
limitations and application.

Q.6   **[10]**

[A] Draw the schematic diagram and explain the working principle of electrochemical (5)
machining with its important characteristics, advantages, limitations and fields of
applications.

[B] What is solidification? Explain progressive and directional solidification. Also (5)
explain solidification behavior in pure metal and binary alloys.

<div align="center">**End of Paper**</div>