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GANPAT UNIVERSITY**M. TECH SEM-I(AMS)REGULAR EXAMINATION NOV-DEC 2016****3ME103 ADVANCED MANUFACTURING PROCESS-I****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 Answer the following: [10]**

- [A] What is the difference between conventional and true stress-strain. Derive an expression for relationship between them. Discuss the need of true stress-strain in metal forming analysis. (5)
- [B] What do you mean by High Energy Rate Forming? Explain magnetic pulse forming with neat sketch. (5)

OR**Q.1 Answer the following: [10]**

- [A] What is the effect of temperature in metal forming process? Explain how mechanical properties vary with temperature in carbon steel. (5)
- [B] Discuss the various forging defects. Describe the parameters responsible for defects and suggest the remedies. (5)

Q.2 Answer the following: [10]

- [A] A 100 mm diameter forging billet is decreased in height from 300 to 100 mm (5)
- (a) Determine the average axial strain and true strain in the direction of compression
 (b) What is the final diameter of the forging?
 (c) What is the transverse plastic strain?
- [B] Explain the effect of the following factors on the rolling load. (5)
- (a) The coefficient of friction (b) Forward and backward tension
 (c) Reduction (d) Diameter of rolls

OR**Q.2 Answer the following: [10]**

- [A] A strip 150 mm wide and 400 mm length and 10 mm thick is compressed in plane strain such that the dimension 400 mm remains same. The yield strength of material in uniaxial compression is equal to 200 N/mm^2 . Determine the average and maximum die pressure if the coefficient of friction on the interface between die and material is 0.10. (5)
- [B] How many types of chip formed in metal cutting? Discuss factors are responsible for formation of these different types of chips. (5)

Q.3 Answer the following: [10]

- [A] Discuss the following terms: (5)
- (1) Machinability (2) Tool life (3) Superplasticity (4) Bendability (5) Strain hardening

- [B] In orthogonal turning of a 70 mm dia. Mild steel bar on a lathe the following data were obtained: Rake angle = 15° , spindle speed = 450 rpm, Depth of cut 0.2 mm, cutting force = 150 kg, tangential force 60 kg. Find out shear plane angle, coefficient of friction, cutting power, the chip flow velocity and shear force, if the chip thickness 0.3 using merchant's circle diagram. (5)

Section: II

Q.4 Answer the following: [10]

- [A] Define electro chemical machining process? Explain the process parameters effect on surface finish in detail. (5)
- [B] Explain the aspect 'Degrees of freedom of movement of a free body' with special reference to jigs and fixture. (5)

OR

Q.4 Answer the following: [10]

- [A] Explain laser beam machining process with neat sketch and characterize the process by its merits and demerits. (5)
- [B] With suitable example enlist the necessities that contribute to the development of non-conventional machining process and classify them. (5)

Q.5 Answer the following: [10]

- [A] What basic requirements a good clamping device is expected to meet in jig or fixture? Discuss working of bridge clamp with suitable example. (5)
- [B] Draw the schematic diagram of complete electro discharge machining process and explain the importance of flushing system used in electro discharge machining also explain the concept of debris movement in gap. (5)

OR

Q.5 Answer the following: [10]

- [A] Explain why different abrasives produce different material removal rate. Also give reasons for inaccuracies in abrasive jet machining process. (5)
- [B] Why ductile material erodes less than brittle in ultrasonic machining process? Discuss the pros and cons of ultrasonic machining process. (5)

Q.6 Answer the following: [10]

- [A] Why thread rolling has become the most commonly used method for thread manufacture? Discuss the various thread rolling machines. (5)
- [B] What is the difference between form cutting and generating process, used for gear making? Explain the principle of gear hobbing process. (5)

End of Paper