Si Si	ubjec	t Code: 1720808 Date:15/05/2015	5
Ti In	me: structi	02:30 pm to 5:00 pm Total Marks: 70 ons:	
	1 2 3	<ul> <li>Attempt all questions.</li> <li>Make suitable assumptions wherever necessary.</li> <li>Figures to the right indicate full marks.</li> </ul>	
Q.1	(a) (b)	Discuss the effects of following parameters on working accuracy and rate of metal removal in AJM: 1. Grain size 2. Jet velocity 3. Jet pressure 4. Standoff distance. Describe ultrasonic machining process with neat sketch. Discuss how the	07 07
		<ul><li>following factors effects the material removal rate of USM.</li><li>1. Grain Size 2.Concentration of slurry 3. Frequency of vibration</li><li>4. Amplitude 5. Feed force 6. Hardness ratio</li></ul>	01
Q.2	(a)	Give classification of metal forming processes. Discuss forces and geometrical relationship in rolling process with neat sketch.	07
	(b)	A strip of Lead with initial dimensions $24 \times 24 \times 150$ mm is forged between two flat dies to a final size of $6 \times 96 \times 150$ mm. If the coefficient of friction between the job and the dies is 0.25, determine the maximum forging force. The average yield stress of Lead in tension is 7 N/mm <sup>2</sup> .	07
	(b)	<b>OR</b> A steel wire is drawn from an initial diameter of 12.7 mm to a final diameter of 10.2 mm at a speed of 90 m/min. The half cone angle of the die is $6^{\circ}$ and the coefficient of friction at the job die interface is 0.1. A tensile test on the original steel specimen gives a tensile yield stress of 207 N/mm <sup>2</sup> . A similar specimen shows a tensile yield stress of 414 N/mm <sup>2</sup> at a strain rate of 0.5. Assuming a linear stress-strain relationship for the material, determine the drawing power.	07
Q.3	(a) (b)	Describe upper bound analysis for metal forming process. How steel casings should be designed to minimize internal stresses ? OR	07 07
Q.3	(a) (b)	Describe the method for calculation of size of welds for static and dynamic loading? Explain permanent mould casting and full mould casting.	07 07
Q.4	(a) (b)	Why cryogenic coolants are preferred over the conventional coolants? Explain the working principle of cryogenic machining and its limitations.	07
	(U) (a)	OR Explain Pollistic particle manufacturing with its advantages and limitation	07
Q.4	(a) (b)	Write short note on tool wear and cutting forces in cryogenic machining.	07 07
Q.5	(a) (b)	Write the basic principles of RP. What are the three types of starting materials in RP? Explain Fused deposition modeling and Selective laser sintering.	07 07
Q.5	(a) (b)	Explain solid-base curing method with its advantages and disadvantages. Evaluate: The operations of cleaning and finishing cannot be ignored in RP processes.	07 07

\*\*\*\*\*