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**2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS

**PRODUCTION TECHNOLOGY-III**  
(MECHANICAL ENGINEERING)

NOVEMBER 2005

TIME: 3 HOURS

MAX MARKS: 80

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Answer any FIVE Questions  
All Questions carry equal marks  
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1. (a) Compare the properties of cold worked and hot worked parts.  
(b) Give the fundamentals of rolling process. [8+8]
  
2. (a) With a sketch explain roll bending process.  
(b) Explain how the power is calculated in cold working process. [8+8]
  
3. (a) Describe the types of metal flow that occur in extrusion. Why they are important  
(b) Compare forward and backward extrusion processes [10+6]
  
4. (a) Derive an expression for the total forging force in forging of strip.  
(b) A strip of size 24 x 24 x 200 mm is to be forged four times, keeping length constant. Determine the forging force, taking coefficient of friction between strip and die as 0.25. Average yield stress of strip in tension is 7 N/mm<sup>2</sup>.  
[8+8]
  
5. (a) Explain the terms:
  - i. Lower Deviation
  - ii. Upper Deviation
  - iii. Fundamental Deviation(b) Differentiate between Hole Based System of Limits and Fits and Shaft Based System of Limits and Fits.  
(c) Show on a sketch the disposition of tolerances on holes and shafts for the 3 basic types of fits both in hole based system and shaft based system. [6+5+5]
  
6. (a) The angle of a wedge shaped block is being checked using a 200 mm sine bar. With slip gauges of 28.87 mm height under one end of the sine bar. The dial gauge readings at each of the work piece ends differ by 0.08 mm, the slip gauge

end being less.

i. If the work piece is 50 mm long what should be the correct height of slip gauges to be used.

ii. Calculate the angle of the work piece.

(b) It is well understood that when sine bar is used for measuring angles greater than  $45^\circ$ , the accuracy of measurement falls. However, you face a situation to use a sine bar angles greater than  $45^\circ$  (say  $70^\circ$ ) without losing the accuracy, how do you perform the measurement ? Explain with proper sketches

7. (a) Explain the principle of measurement by light wave interference method.

(b) Describe the use of optical flats and monochromatic light for dimensional comparison. [8+8]

8. The operation of a pressure type pneumatic comparator is represented by the equation:  $p/P = -0.5(M/C) + 1.1$  for  $0.6 < (p/P) < 0.8$  (where  $p$  = pressure between the two orifices,  $P$  = operating pressure,  $M$  = effective area of measuring orifice,  $C$  = geometric area of the control orifice) The control orifice is 0.5 mm diameter and the measuring orifice is a 1 mm diameter hole. Find:

(a) the range of linear measurement,

(b) the pneumatic sensitivity of the back pressure gauge for a supply pressure of 200 KN/m<sup>2</sup> gauge pressure