

MCA

**COLLEGE OF ENGINEERING, PUNE – 5**  
(An Autonomous Institute of Government of Maharashtra)

**End Semester Examination (Spring)**

**MT 433 – Wire Technology**

Programme: **B.Tech. (Metallurgical Engineering)**

Year: **2012-13**

Duration: **Three Hours**

Max. Marks: 50

Date: **27 April 2013**

Instructions:

- 1) Answer **all** questions.
- 2) Draw neat figures wherever required.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if required.
- 5) Use of non-programmable calculators is allowed.

- Q.1 (a) Explain the term 'Delta Factor' in wire drawing dies.  
A wire rod of 5.5mm diameter was subjected to different drawing reductions as follows-
- a. Final diameter 4.98 mm with die angle of  $14^{\circ}$
  - b. Final diameter 4.76 mm with die angle of  $8^{\circ}$
- Compute the Delta Factor in each case and compare the two situations with respect to efficiency of drawing process and wire properties. ....5
- (b) Explain dry lubrication and wet lubrication in wire drawing, including the substances used, lubrication mechanisms, advantages and shortcomings. ....5
- (c) What is effect of Cobalt, Tantalum and Titanium content on the Tungsten Carbide wire drawing dies? ....5
- Q.2 (a) Explain with the help of neat sketches the effect small approach angle and shorter die length on the lubricant take up. What is your recommendation for effective lubricant take-up? ....5
- (b) Draw self explanatory sketch of the G-casting process for production of wires directly from melt. Which types of wires are produced by this technique? What is their range of diameters? ....5
- (c) What is 'Die life' of a wire drawing die? Which factors affect the die life? ....5
- Q.3 (a) In case of pearlitic steel, coarse lamellae structure has low ductility and strength; also it fractures at lower strain. Hence fine lamellae pearlite is desired for tire-cord production. State the formula to estimate 'Lamellar Spacing' ( $S_0$ ) with meaning of each parameter. What measures can be taken to reduce the lamellar spacing? ....5
- (b) Define and explain Severity of Quench. List two of the quenchant commonly used in the wire industry. How can we increase the severity of a quenchant? ....5
- (c) Draw a schematic figure of single block wire drawing machine for two dies. State its limitation and formula for deciding the reduction in this machine. ....5
- (d) While deciding quality of wire rods of steels, shape, size, amount and distribution of slag inclusions is observed. State how the slag inclusions are classified. Which type of slag inclusions is desirable for wire drawing? ....5

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