(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

FOURTH SEMESTER [B.TECH] MAY-2010

Paper Code: ETME 206 **Subject: Manufacturing Machines**

Time : 3 Hours **Maximum Marks :75**

Note: Attempt any five questions. Assume suitable missing data if any.

Q1. (a) Briefly describe functions of following lathe parts.
(i) Head stock (ii) Carriage (iii) Tail stock **(6)**

(b) A two-start external square thread of 10mm pitch and outside diameter of 62mm is to be cut on a centre lathe which has a 6mm pitch lead-screw. Calculate. **(9)**
(i) Depth of thread to give 0.12mm clearance.
(ii) Lead of thread
(iii) Care diameter
(iv) Helix angle at a core diameter
(v) Helix angle of thread
(vi) Gear ratio between the head stock spindle and the lathe lead screw.
(vii) Tool width, angles at leading and trailing edges of the tools.

Q2. Briefly describe different factors influencing torque and thrust in drilling. Find out the torque and thrust force when drilling a solid block of mild steel with a normal twist drill. Given. **(15)**

D =20mm, T_s work material $= 400\frac{N}{mm^2}$

rpm = 240, feed = 0.25 mm/revolution

Q3. What is difference between upmilling and down milling? A mild steel block of 20mm width is being milled using a straight slab milling cutter with 20 teeth, 50mm diameter and 10^0 radial rake. The feed velocity of the table is 15mm/ min. and the cutter rotates at 60rpm. If a depth of cut of 1mm is used, what will be the power consumption? **(15)**

Q4. Explain quick return mechanism. Find the time required for taking a complete cut on a plate of 600X900mm, if the cutting speed is 9 meter/minute. The return time to cutting time ratio is 1:4 and the feed is 3mm. The clearance at each end is 75mm. **(15)**

Q5. Mild steel is being machined at a cutting speed of 200m/min with a tool of rake angle 10^0. The width of cut and uncut thickness are 2mm and 0.2mm respectively. If the average value of the coefficient of friction between the tool and chip is 0.5 and the shear stress is of the work material is 400 N/mm^2, determine (i) the shear angle (ii) the cutting and thrust components of the machining force. **(15)**

Q6. Discuss different factors on which performance of grinding wheel depends.
Calculate the grinding force in surface grinding operation using grinding wheel of 250mm diameter, rotating at 2500 rpm. The work piece is of mild steel having width of 20mm. Depth of cut = 0.05 mm and feed velocity of table = $2\frac{mm}{Sec}$. Assume the number of grits/mm^2=3. Take value of specific energy for mild steel= 1.4J/mm^3. **(15)**

Q7. Write short notes on **any three**: **(15)**
(a) Centerless grinding
(b) Lappeng and Honing.
(c) Differential Indexing
(d) Geometry of Single point cutting tool.

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