Name.....Id Code.....

PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Midterm Examination : Semester 2 **Academic year : 2003**

Date : December 24, 2003. **Time : 09.00-12.00**

Subject : 226-304 Production Technology II **Room : A 401**

Instruction :

- Answer all questions in the answer book.
- Dictionary and a calculator with programming capability are allowed.
- All notes and books are not allowed.
- Total mark is 100 (30%).

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1. Write short notes on
   (a) Dead center
   (b) Running center
   (c) Steady rest
   (d) Follower rest
   (e) Live center
   (f) Independent chuck
   (g) Collet chuck
   (h) ¼ " – 20 UNC
   (i) M20 x 2.5
   (j) Face plate (10 marks)

2. Describe the condition which promote vibration and chatter in machine tools. (4 marks)

3. Differentiate between saddle-type and ram-type turret lathe. (4 marks)

4. Describe the operation of a six-spindle automatic lathe. (4 marks)

5. Describe four methods of locating the center of the stock before drilling a center hole. (4 marks)

6. Describe the precision methods of checking center alignment on a lathe.(3 marks)

7. What is the purpose of the feed shaft? The lead screw? (3 marks)

8. What is the carriage? What are the components which make up the carriage? What is the purpose of each component? (6 marks)

9. What is the quick change gear box? What is its function? (4 marks)

10. What is the effect on the rake and relief angles of setting a turning tool too high above the center line of the work? Too low? (4 marks)

11. Given a work diameter of 4 in., a negative back rake of 15°, an end relief angle of 8°, and an offset of 0.060 in. above center. Calculate the effects of this offset on the various angles of the tool bit. (4 marks)

12. What is the need of determining a reference cross-feed dial setting before starting a turning operation? Describe how you would use this reference reading. (3 marks)

13. A tapered reamer blank is to be turned. It has an overall length of 8.25 in. and a tapered section 5 in. long. The tapered section has a small diameter of 0.7748 in. and a large diameter of 0.9881 in. Find : (a) the taper per in.; (b) the taper per ft; (c) the set over. (5 marks)

14. Given a No. 8 Jarno taper , find : (a) the large diameters ; (b) the small diameter ; (c) the length of the taper. (3 marks)

15. Define : major and minor diameter , pitch diameter , pitch ,lead ,helix , and helix angle. (5 marks)

16. Given a 5/8 –11 NC thread, find : (a) the pitch ; (b) the width of the flat ; (c) the depth of the thread ; (d) the minor diameter of the screw ; (e) the tap drill size ; (f) the pitch diameter ; (g) the helix angle. (7 marks)

17. Given a $\frac{3}{4}$ -10 NC thread ,find : (a) the best wire size and (b) the measurement over wires. (4 marks)

18. Find the gears necessary to cut 2-mm. metric thread. The lathe constant is 8, the gear progression is 5, and the gears available are 25, 30, 35, ... ,100 and 127. (5 marks)

19. You are asked to cut 14 threads/in. You set the compound at 29°. How much is to be cut at 29°? (3 marks)

20. A cutting speed of 200 ft/min has been selected in turning a work piece 8 in. long and 3-in. diameter, a depth is 0.200 in. and a feed of 0.020 in. per revolution is used, find the rpm value and the time to take on cut. (5 marks)

21. A 14 teeth 80 mm diameter side milling cutter is to be used to cut a slot into a cast-iron block with a feed of 0.12 mm/tooth. If the cutting speed is to be 20 mpm. the depth of the slot to be cut is 10 mm and the length of the work is 200 mm, find ; (a) the rpm ; (b) the approach ; (c) the time to take one cut. (6 marks)

22. If the highest speed of a lathe is 1200 rpm and the lowest speed is 54 rpm, the lathe have 8 speeds in geometric progression, determine the speeds. (4 marks)

Pichit Pitsuwan

December, 2003.