

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination : Semester 1

Academic year : 2008

Date : July 28, 2008.

Time : 13.30-16.30

Subject : 226-312 Machine Tools Engineering

Room : A400

ทฤษฎีในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น
และพักการเรียน 1 ภาคการศึกษา

Instruction :

- Answer all questions in the answer book.
- All notes, books and calculators are not allowed.
- Total score is 100 (45%).

Questions:

1. Describe the basic principle of turning, boring and broaching Operation. (6 marks)
2. Describe the two common types of Single-Spindle Automatic Screw Machines (3 marks)
3. What is the carriage? What are the components which make up the carriage? What is the purpose of each of the components? (6 marks)
4. Describe the use of a face plate for machining eccentric holes on a disc. (3 marks)
5. Describe a universal chuck and an independent chuck. How are they used? How do they differ? (3 marks)
6. Sketch a single point cutting tool and indicate all the angles. (3 marks)
7. What are the advantages and disadvantages of increasing the SCEA ? (3 marks)

8. Why are negative rake angles necessary when taking interrupted cuts with carbide tools? (3 marks)
9. What is the major advantage of negative-rake inserts used in throwaway insert-type tools? (3 marks)
10. What is the purpose of the carbide seat provided to support the throwaway insert? (3 marks)
11. What are the precautions which should be taken when grinding a tool bit? (3 marks)
12. Describe the procedure for testing a lathe to ensure that it will turn a true cylinder. (3 marks)
13. A tapered piece is to be turned. It has an overall length of 12 in. and a tapered section 8 in. long. The tapered section has a small diameter of 0.84 in. and a large diameter of 1.20 in. Find: (a) the taper per in.; (b) the taper per ft.; (c) the set-over; (d) the imaginary large diameter. (4 marks)
14. The offset of the tailstock may be accomplished in several ways, describe all of them. (3 marks)
15. Given a $\frac{1}{2}$ -12 NC thread, calculate: (a) the pitch ; (b) the depth of the thread ; (c) the minor diameter of the screw ; (d) the tap drill size ; (e) the pitch diameter. ($d = 0.6495p$) (5 marks)
16. Explain fully the process of setting a lathe for cutting threads. (5 marks)
17. Find the rpm of lathe spindle to turn a 2 in. diameter piece of work with a cutting speed of 100 fpm. Also determine the time required to take one cut over the stock if the length is 10 in. and the feed used is 0.020 in. per revolution. (4 marks)

- 18.Explain the fundamental structure of a bed milling machine. (3 marks)
- 19.How does a universal milling machine differ from a turret universal milling machine? (3 marks)
- 20.How does a universal milling head differ from a vertical milling head? (3 marks)
- 21.What is the knee of a milling machine? What is its use? (3 marks)
22. Describe the main parts of a milling fixture. (4 marks)
- 23.Why are keys mounted to the base of mill fixtures? (3 marks)
- 24.How does a staggered-tooth milling cutter differ from a side milling cutter? (3 marks)
- 25.What is the purpose of an interlocking cutter? (3 marks)
- 26.Describe the difference between a two-flute center-cutting end mill and a four-flute center-relieved end mill. (3 marks)
- 27.In the selection of milling cutter, why should the cutter diameter be kept as small as possible? (3 marks)
- 28.When is the right-hand-cut–left-hand-helix end mills used? Why? (3 marks)
- 29.Generally speaking, why should milling cutters with straight flutes be avoided? (3 marks)

Pichit Pitsuwan
July, 2008

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