VELAMMAL

INSTITUTE OF TECHNOLOGY
CHENNAI-601204

QUESTION BANK
ME 2252 MANUFACTURING TECHNOLOGY - II
UNIT 1

PART-B

1. Explain the conditions that promote the formation of following types of chips: (Nov/Dec 2007)

   i) Continuous chips without Built-up edge. (5 marks)

   ii) Continuous chips with built-up edge. (5 marks)

   iii) Discontinuous chips. (6 marks)

2. Define the various tool parts of a single point cutting tool with neat sketch. (6 marks, (Nov/Dec 2007)

3. What are the standard angles of cutting tools? Illustrate with an example. (10 marks, (Nov/Dec 2007)

4. The life of a turning tool obtained was 40 minutes and 25 minutes at cutting speed 80 m/ and 100 m/min respectively. Determine the tool life at 40m/min and 120 m/min. (10 marks, April/May 2008)

5. Draw the merchant's circle and derive the relationship between the various cutting forces. (16 marks, April/May 2008)

6. State the functions of the cutting fluids and their types. (6 marks, April/May 2008)

7. What is orthogonal rake system? Show the ORS of tool analysis with the help of the sketch. (16 marks, Nov/Dec 2008)

8. What is the use of a chip breaker? Discuss the various types of chips produced during metal machining process. (16 marks, Nov/Dec 2008)

9. Sketch a single point cutting tool under ASA system. Define various tool angles for machining mild steel and justify. (8 marks, Nov/Dec 2009)

10. List the various types of tool wear and discuss the factors affecting them. (8 marks, Nov/Dec 2009)

11. The following equation for tool life is given for the turning operation;

$$VT^{0.13} f^{0.77} t^{0.37} = C$$

A 60 minutes tools life was obtained while cutting at V=30 m/min, f=0.3 mm/rev and d=2.5 mm. Determine the change if the cutting speed, feed and depth of cut are increased by 20 % individually and also taken together. (10 marks, Nov/Dec 2009)

12. List the essential characteristics of a cutting fluid. (6 marks, Nov/Dec 2009)

13. Explain the geometry of a single point tool with suitable sketches. (16 marks, April/May 2009)

14. Explain the basic operations of cutting fluids. (6 marks, April/May 2009)

15. During orthogonal machining test, the following data were recorded

During back rake angle = 25 deg

Chip thickness = 0.15 mm/rev

Length of chip = 40mm

Length of chip = 100mm

Width of chip = 4mm

Width of chip before cut = 3.5 mm

Coefficient of friction = 0.75

Cutting speed Vc = 250 m/mm

Average shear stress = 250 N/min

Determine the power consumption. (10 marks, April/May 2009)

16. In the orthogonal cutting operation on a work piece of width 2.5 mm, the uncut thickness was 0.25 mm and the tool rake angle was zero degree. It was observed that the chip thickness was 1.25 mm. The cutting forces was measured to be 900 N and the thrust force was found to be 810 N

i) Find the shear angle. **(8 marks, Nov/Dec 2010)**

ii) If the co-efficient of the friction between the chip and the tool was 0.5, what is the machining constant cm? **(8 marks, Nov/Dec 2010)**

17. Describe the different type of chip with neat diagram. **(8 marks, Nov/Dec 2010)**

18. Mention the functions of cutting fluids. **(8 marks, Nov/Dec 2010)**

19. Discuss the various types of chips produced during metal machining. **(6 marks, April/May 2010)**

20. State the parameters that influencing the life of tool and discuss. **(10 marks, April/May 2010)**

21. What is meant by Orthogonal & Oblique cutting? **(6 marks, April/May 2010)**

22. Explain merchant force circle along with assumption. **(10 marks, April/May 2010)**

23. Describe the mechanism of metal cutting. **(8 marks, April/May 2011)**

24. Discuss the various types of chips produced metal machining. **(8 marks, April/May 2011)**

25. The Taylor tool-life equation for machining C-40 steel with HSS cutting tool at a feed of 0.2 mm/min and a depth of cut of 2 mm is given by VTn=C , Which n and C are constant. The following V and T observation have been noted:

V, m/min	25	35
T, min	90	20

Calculate

1) n and C

2) Hence recommend the cutting speed for a desired tool life of 60 min.
(8 marks,(April/May 2011, Nov/Dec 2005)

26. List the various tools materials used in industries. State the optimum temperature of each of the materials. (8 marks, April/May 2011)

27. Discuss the advantage and limitation of the following cutting tool materials.

1) Cemented carbides.
2) Cubic Boron Nitride.

Also state the desirable characteristics of a cutting tool material. (Nov/Dec 2011)

28. With the help of sketches, explain the following types of chips produced during metal machining.

1) Continuous chips.
2) Continuous chips with built-up-edge. (8 marks, Nov/Dec 2011)

29. With the help of a sketch, show crater wear and flank wear on a cutting tool.
(4 marks, Nov/Dec 2011)

30. Explain the types and applications of the types of cutting tools.
(8 marks, Nov/Dec 2011)

31. Enumerate the factors that affect the cutting temperature during machining.
(4 marks, Nov/Dec 2011)

32. In the orthogonal cutting test with tools of take angle 10˚, the following observations were made:

Chip thickness ratio = 0.3

Horizontal components ratio= 1290 N

Vertical component of cutting force=1650 N

From merchant's theory, *calculate* the various components of the cutting forces and the coefficient of the cutting forces and the coefficient of friction at the chip tool interface. (10 marks, April/May 2012)

33. Describe the mechanism of chip formation in orthogonal cutting.
(April/May 2012)

34. Explain the following mechanism of tool wear:

1) Attribute

2) Diffusion. **(6 marks, April/May 2012)**

35. A cutting tool when used for machining work piece at a cutting speed of 50 m/min lasted for 100 min. Taking n=0.26 in the Taylor's tool-life equation, 1) the life of the tool for an increase in cutting speed by 25% and 2) the cutting speed to obtain a tool life of 180 min. **(April/May 2012)**

36. A specimen of 100 mm length along the stroke of shaper is machine with a tool with 15˚ rake angle. The uncut chip thickness is 1.5 mm. If a chip length od 40 mm is obtained during one stroke of machining, *find* the shear plane angle and the thickness of cut-ship. **(4 marks, April/May 2012)**

37. Sketch and describe the basic types of milling cutting and milling operations. **(8 marks, Nov/Dec 2005)**

38. What are the difference among the planer and shaper? **(8 marks, Nov/Dec 2005)**

39. Describe the expression for determination of shear angle in orthogonal metal cutting. **(8 marks, Nov/Dec 2005)**

40. The following cutting speed of cutting time observations has been noted in the machining process. *Calculate*

1) n and N

2) Recommended the cutting speed for a desired tool life of 60 min

Cutting speed, V	25m/min	35m/min
Cutting Time,	90min	20min

(8 marks, Nov/Dec 2005)

41. What is a chip? What are different types of chip? How are they formed? **(2+3+3 marks, Nov/Dec 2005)**

42. What is the measurement of the metal removing process machinability? What are the factors that are affected it? **(8 marks, Nov/Dec 2005)**

43. What is tool life? (Nov/Dec 2006)

44. Describe the forms of wears on the cutting tool with neat sketch. (Nov/Dec 2006)

45. Discuses the orthogonal cutting (or) Explain orthogonal metal removal process. (April/May 2006 & April/May 2011)

46. Explain various cutting tool materials. (April/May 2011)

47. Write a brief note on the cutting fluids used for metal removal process. (April/May 2006)

48. Explain the types of chip formed during machining process. (Nov/Dec 2006)

49. Using Merchants circle diagram, derive the expression for estimating the cutting force during machining, mention the assumptions made. (Nov/Dec 2006)