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Printed Pages—4 **ME—504**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4017 **Roll No.**

B.Tech.

FIFTH SEMESTER EXAMINATION, 2005-2006

MANUFACTURING SCIENCE - II

Time : 3 Hours *Total Marks : 100*

Note : *(i) Answer **ALL** questions.*

(ii) All questions carry equal marks.

(iii) Be precise in your answer.

1. Attempt ***any two*** of the following : **(10x2=20)**

(a) What are the uses of cutting fluids ? Discuss some of the cutting fluids used during machining and their method of application.

(b) Draw a neat and labelled sketch of right hand single point cutting tool, showing various tool angles. What are effects of various tool angles on machining ? Explain what is built up edge.

(c) Using the modified formula of tool life $VT^nd^xf^y = C$, calculate the change in tool life if the depth of cut (d) is reduced 1.5 times, feed is reduced 2.5 times and the cutting speed is made double. Assume the exponent have following values $n = 0.15$, $x = 0.15$ and $y = 0.6$.

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2. Attempt *any two* of the following : **(10x2=20)**

(a) List the different types of lathes available giving salient features of each. What are the uses of (i) lead screw (ii) feed rod (iii) tail stock (iv) half nut (v) compound slide in a lathe.

(b) What is a Universal milling machine ? Draw atleast one part which cannot be machined on a horizontal milling machine. List various types of milling cutters available and draw any two.

(c) Classify the different types of milling machines. Explain what are the following operations.

(i) Boring (ii) Reaming

(iii) Tapping (iv) Counter boring

(v) Sinking (vi) Counter sinking

3. Attempt *any four* of the following : **(5x4=20)**

(a) Explain the differences between capstan and Turret Lathe. How is automation achieved using them.

(b) Explain three different ways in which the wear of grinding wheel can take place. What can be done to prevent them ?

(c) Describe any four types of bond for bonded abrasives on a grinding wheel.

(d) How are grinding wheels specified ? Take a suitable example and explain what the different terms in specification of a wheel by international standard, stand for.

(e) Explain any two of the following finishing processes :

(i) Lapping

(ii) Buffing

(iii) Electro-polishing

(f) With the help of a neat sketch explain the process of honing. What are the limitations of this process ?

4. Attempt ***any four*** of the following : **(5x4=20)**

(a) Draw the different types of flames used in gas welding. How would you identify these flames ? What are the specific uses of each of these flames ?

(b) What are the different types of power sources used in arc welding ? What are the advantages and limitations of each ?

(c) With the help of a neat sketch explain the process of resistance spot welding. How heat balance is obtained on spot welding process.

(d) What are the advantages and limitations of friction welding process ? Explain the effect of various process parameters on friction welding ?

(e) Why is the current used on resistance spot welding larger than for resistance seam welding ? What are the advantages of projection welding ?

(f) What is Heat Affected Zone (HAZ) ? How it affects the weldment ?

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Attempt *any two* of the following : **(10x2=20)**

(a) How are non conventional machining process different from conventional machining processes. Clarify the different types non-conventional machining processes. In what situation would you use the following processes ?

(i) Laser Beam welding.

(ii) Ultrasonic welding.

(iii) Plasma arc welding.

(b) With the help of a neat sketch, explain the principle and working of Abrasive Jet Machining (AJM). List the variables and limitations of AJM process.

(c) Explain with the help of a neat sketch how explosive welding takes place. What are the variables, limitations and uses of explosive welding process ?

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