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Total Number of Pages: 02

B.Tech
PCPR4203

4th Semester Regular / Back Examination 2015-16
MANUFACTURING PROCESSES-II

BRANCH: PRODUCTION

Time: 3 Hours

Max Marks: 70

Q.CODE: W449

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1** Answer the following questions: **(2 x 10)**
- a) List various factors influencing tool-life. Explain any one of them.
 - b) Distinguish between orthogonal and oblique cutting processes.
 - c) Briefly explain the desirable properties of a cutting tool material.
 - d) List the various functions of a cutting fluid in metal cutting.
 - e) With necessary sketches, explain the types of tool wear.
 - f) Define tool signature and explain each term of a tool designated as 8,12,10,7,0,15,1.5 mm.
 - g) What are the effects of cutting variable on the chip reduction coefficient?
 - h) What is a multiple cutting tool? Explain.
 - i) Explain the relationship between various forces in orthogonal cutting.
 - j) What are the sources of generation in metal cutting?
- Q2** a) Derive an expression for shear angle in terms of chip thickness coefficient and rake angle for orthogonal cutting. **(5)**
- b) Explain the geometry of single point cutting tool with neat sketches. **(5)**
- Q3** Sketch merchant's circle diagram and explain the different quantities involved. **(10)**
- Q4** In an orthogonal turning operation **(10)**
- Cutting speed = 80 m/min
Cutting force = 20 kg.
Feed force = 8 kg.
Back rake angle = 15°
Feed 0.2 mm/ rev
Chip thickness = 0.4 mm
Determine the following:
- a) Shear angle
 - b) Work done in a shear
 - c) Shear strain

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- Q5** a) A tool cutting at 32 m/min has a life of 54 minutes when used for a rough cut. Determine tool life when used for a light finishing cut. (5)
b) What is machinability? State the factors which come into play while evaluating machinability of any metal. (5)
- Q6** a) Explain the relationship between the tool life and cutting speed. (5)
b) During a metal cutting test under orthogonal conditions it was found that cutting force is 110 kg and feed force 102 kg when cutting at 165 meter / minute. The rake angle of tool is 10° and shear plane angle was found to be at 19° . Determine the following : (5)
i. Shear velocity
ii. Chip flow velocity
iii. Work done per minute in shearing the metal and work done against friction.
iv. Show that the work in put is equal to the sum of work done in shearing and against friction.
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- Q7** a) With neat sketches, explain flank and crater wear. (5)
b) List the various methods of measuring chip-tool interface temperature. (5)
- Q8** Write short notes on any two: (5 x 2)
a) Dynamometer
b) Economics of metal machining
c) ASA system
d) Geometry of twist drill
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