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10ME/AU45

Fourth Semester B.E. Degree Examination, Dec.2015/Jan.2016

Manufacturing Process - II

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1
 - a. Sketch a three principal views of a 25mm square tool bit having tool signature of 15, 15, 10, 10, 15, 10(3mm). Show the various angles over it. (12 Marks)
 - b. In an orthogonal cutting test with a tool of rake angle 10° , the following observations were made : Chip thickness ratio = 0.3 ; Cutting force = 1290N ; Thrust force = 1650N. From Merchant's theory, calculate the Frictional force and Normal force on rake face, the shear force and Normal force on shear face and co-efficient of friction at the chip and tool interface. (08 Marks)
- 2
 - a. What are the desirable characteristics of a cutting tool material? Explain how these are satisfied in the case of HSS. (10 Marks)
 - b. With the help of sketch, explain the sources of heat generation in metal cutting. Show their approximate percentages. (10 Marks)
- 3
 - a. Differentiate between a Capstan and a turret lathes. (06 Marks)
 - b. A mild steel plate 500mm × 750mm × 25mm is to be shaped along its wider face by taking only one cut. The ratio of return time to cutting time is 2:3 and the feed per cycle is 3mm. Tool approach and the over travel are 40mm each. The cutting speed is 24m/min. The side clearance is 5mm on each side. Calculate the time required for machining the given plate on the shaper. (08 Marks)
 - c. Explain the following planer operations :
 - i) Planning horizontal surface
 - ii) Planning vertical surface. (06 Marks)
- 4
 - a. Describe i) Gang drilling machine ii) Multi spindle drilling machine. (08 Marks)
 - b. Show with neat sketches, the constructional features of twist drill and label the important features. (06 Marks)
 - c. List the different types of holes commonly used in engineering components and processes used to produce them. (06 Marks)

PART - B

- 5
 - a. Explain the following Milling methods :
 - i) Peripheral milling
 - ii) Face milling
 - iii) End milling. (09 Marks)
 - b. Explain the principal parts of column and knee type of milling machine. (05 Marks)
 - c. With a neat sketch, explain the differential indexing mechanism. (06 Marks)
- 6
 - a. Describe the designation process of manufacture and properties of following grinding wheels with i) Vitrified bond ii) Rubber bond. (12 Marks)
 - b. Explain principle of centreless grinding machine and advantages of it. (08 Marks)
- 7
 - a. With the help of diagram, explain the construction of a pull broach. (08 Marks)
 - b. What is Lap? What for it is used and how does it differ from grinding. (06 Marks)
 - c. With the help of sketch, explain the construction of honing tool. (06 Marks)
- 8
 - a. List and explain the equipments of Ultrasonic machining. (06 Marks)
 - b. With a sketch, explain the laser beam machining. (08 Marks)
 - c. Describe the process parameters of Abrasive Jet machining. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.