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FACULTI OF MECHANICAL ENGINEERING UNIVERSITI MALAYSIA PAHANG BMM3643 (Sem II 2012/13) Assignment #4 1. a) What distinguishes machining from other manufacturing processes? b) What is a machining center? c) How important is the control of cutting-fluid temperature in operations performed in machining centers? Explain. (8 marks) 2. a) What are the primary considerations in tool selection? b) What is the advantage of a helical-tooth cutter over a straighttooth cutter for slab milling? c) What are the consequences if a cutting tool chips? (8 marks) 3. ) Why might it be desirable to use a heavy depth of cut and a light feed at a given speed in turning? b) Explain the reasoning behind the various design guidelines for turning. c) In drilling, the deeper the hole, the greater the torque. Why? (8 marks) 4. a) For producing flat surfaces in mass production machining, how does face milling differ basically from peripheral milling? b) Why is end milling such an important versatile process? c) Why is grain spacing important in grinding wheels? Explain the relationship between grit size and surface finish. (8 marks) 5. ) Why has the wire-EDM process become so widely used in industry, especially in tool and die manufacturing? Explain. e) What is meant by the term overcut in electric discharge machining? f) What is the nature of the surface obtained by electro discharge machining? (8 marks) 6. g) Estimate the time required for face milling an 20. 32 cm-long, 7. 62 cm-wide brass block using a 2032 cm-diameter cutter with 12 HSS teeth. (Given: Using the high-speed-steel tool, let’s take a recommended cutting speed for brass (a copper alloy) at 90 m/min = 1. 5 m/sand the maximum feed per tooth as 0. mm) h) In a surface grinding operation performed on hardened plain carbon steel, the grinding wheel has a diameter = 200 mm and width = 25 mm. The wheel rotates at 2400 rev/min, with a depth of cut (infeed) = 0. 05 mm/pass and a crossfeed = 3. 50 mm. The reciprocating speed of the work is 6 m/min, and the operation is performed dry. Determine ; i) the length of contact between the wheel and the work, ii) the volume rate of metal removed. iii) If there are 64 active grits/cm2 of wheel surface, estimate the number of chips formed per unit time. (10 marks)