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Question Paper Code : 80910

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Fourth Semester

Mechanical Engineering

ME 8451 – MANUFACTURING TECHNOLOGY – II

(Common to: Industrial Engineering/Industrial Engineering and Management/Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write any two examples for single point and multipoint tools.
2. Define “machinability”.
3. What is called as “swing of the lathe”?
4. State whether you would set the height of the tool in turning operation at the centre of the work piece, a little above it or a little below it. Mention why?
5. State true or false “Machining time in drilling operation will increase with increase in speed of the drill”. Justify your answer.
6. Differentiate between up milling and down milling.
7. What is called as G-Ratio?
8. Write your understanding about surface integrity.
9. Mention an example for parametric programming.
10. List out any four applications of micro machining.

PART B — (5 × 13 = 65 marks)

11. (a) In an orthogonal cutting operation, the following data have been observed:

Cutting speed = 0.223 m/s

Uncut chip thickness = 0.06 mm

Width of cut = 3.83 mm

Chip thickness ratio = 0.51

Rake angle = 20°

Cutting force = 363 N

Thrust force = 127 N

Determine: Shear angle, friction angle, shear stress along the shear plane and shear strain in the chip.

Or

- (b) The following equation for tool life has been obtained for high speed steel (H.S.S.) tool. $VT^{0.13}f^{0.6}d^{0.3} = C$. A 60 min tool life was obtained using the following cutting conditions: $V = 40$ m/min; $f = 0.25$ mm; $d = 2$ mm. Calculate the effect on tool life if speed, feed and depth of cut are together increased by 25% and also if they are increased individually by 25%.

12. (a) Explain with suitable sketches the different operations performed on a lathe.

Or

- (b) Explain with a neat sketch the working of single spindle automatic lathe.

13. (a) What are the various kinds of reamers? Explain their utility in industries.

Or

- (b) Briefly describe the gear generating processes with suitable sketches.

14. (a) What essential factors you will take into consideration while choosing a grinding wheel? Explain any one type of grinding process in detail.

Or

- (b) Discuss in detail the need for various elements present in a push type broach construction.

15. (a) Enumerate various torque transmission elements in CNC machines.

Or

- (b) Explain in detail the steps involved in wafer machining process.

PART C — (1 × 15 = 15 marks)

16. (a) Explain in detail about the selection of processes to finish the component shown in Fig.16 (a).

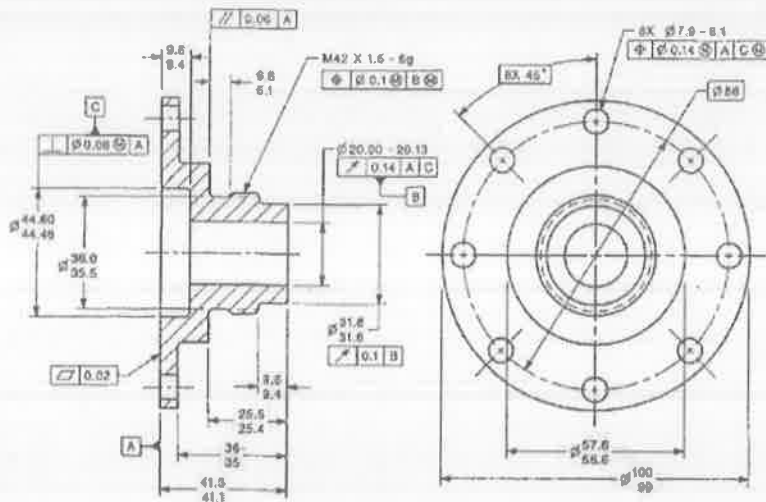


Fig. 16 (a)

Or

- (b) Write a manual Part Programming for the given component shown in figure 16 (b) by using M codes and G codes. (All are in mm).

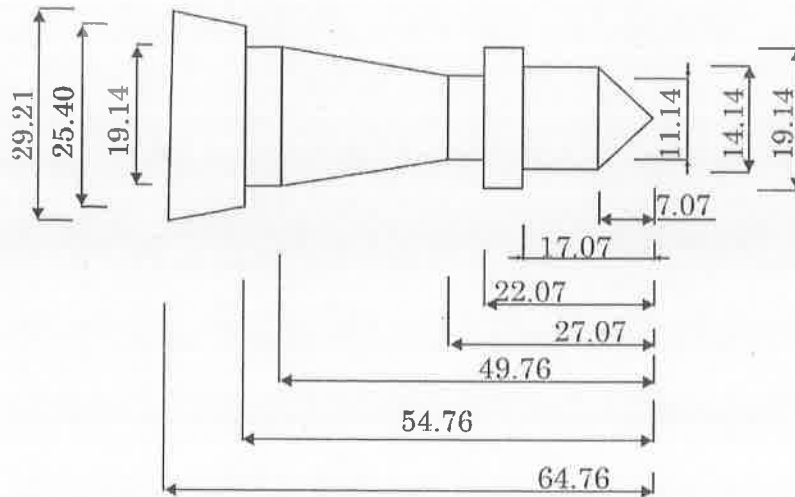


Fig. 16 (b)