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VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (Mech. Engg.) III Year II-Semester Advanced Supplementary Examinations, June/July-2017

Machine Tools and Metal Cutting

Time: 3 hours Max. Marks: 70

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. What is the difference between a live center and a dead center, when these terms are used in the context of work holding in a lathe?
2. What is the distinguishing feature of a radial drill press?
3. How does a universal milling machine differ from a conventional knee-and-column machine?
4. Explain Thread chasing with a neat sketch.
5. Why are jigs and fixtures used?
6. Explain the principle of EBM.
7. Identify the four forces that act upon the chip in the orthogonal metal cutting model but cannot be measured directly in an operation.
8. What are the parameters involved in machining operation.
9. Explain why heat is generated while machining metals.
10. Name the three modes of tool failure in machining.

Part-B (5 × 10 = 50 Marks)
(All bits carry equal marks)

11. a) Compare Gang drilling and multi spindle drilling machines.
    b) Explain any one Quick return mechanism in detail for planer.

12. a) Explain superiority of centre less grinding over cylindrical grinding.
    b) Compare Thread grinding and Thread rolling while explaining their application.

13. a) Explain the working of EDM with a neat sketch and give its applications.
    b) Explain 3-2-1 location principle.

14. a) Compare the nomenclature ASA & ORS with sketches.
    b) A seamless tube of 32 mm outside diameter is turned on a lathe. Cutting velocity of tool relative to the workpiece is 90 m/min and length of the chip is 43.23 mm.
    (i) Calculate the chip velocity in the orthogonal machining process for which the cutting conditions are:

Feed	=	0.15mm/rev
Depth of cut	=	5mm
Rake angle	=	10^0
Clearance angle	=	8^0
Tangential force	=	220 kgf
Feed force	=	120 kgf

    (ii) In the above process, also calculate the specific energy.

Contd... 2

15. a) What do you understand by Term Machinability. Compare the Machinability of pure metals and alloys.

    b) Explain how heat is generated and dissipated in metal machining.

16. a) Compare the performance of Capstan and Turret lathes with sketches.

    b) Why finishing is required after rough machining, explain at least two finishing methods.

17. Answer any ***two*** of the following:

    a) Compare orthogonal and oblique Machining.

    b) BUE

    c) Derive an equation to find the optimum cutting speed to minimize the cost of production.