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Subject Code:- AME0401

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - CARRY OVER THEORY EXAMINATION - APRIL 2023

Subject: Manufacturing Technology-II

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A

20

1. Attempt all parts:-

- 1-a. In how many groups, metal removal process can be classified? (CO1) 1
- (a) 2
- (b) 5
- (c) 4
- (d) 3
- 1-b. Which of the following parameters govern the value of the shear angle in continuous chip formation? (CO1) 1
- (a) true feed
- (b) chip thickness
- (c) rake angle of the cutting tool
- (d) all of the mentioned
- 1-c. Which type of surface can be produced by lathe? (CO2) 1
- (a) flat
- (b) curvilinear

- (c) all the above mentioned
(d) cylindrical
- 1-d. Which of the following is the example of speed lathe? (CO2) 1
(a) wheel lathe
(b) polishing lathe
(c) gap bed lathe
(d) all of the mentioned
- 1-e. Which of the following process have the lowest metal removal rate? (CO3) 1
(a) Drilling
(b) Milling
(c) Reaming
(d) Lapping
- 1-f. For practical honing conditions, cross hatch angle in degrees is generally taken in the range of (CO3) 1
(a) 20 to 40
(b) 40 to 50
(c) 50 to 60
(d) 10 to 15
- 1-g. In Abrasive jet machining, work piece material is removed by which of the following means? (CO4) 1
(a) Vaporization
(b) Electro plating
(c) Mechanical abrasion
(d) Corrosion
- 1-h. In machining system of AJM, which of the following controls the relative motion between work piece and nozzle? (CO4) 1
(a) Cam drives
(b) Pantographs
(c) Trace mechanisms
(d) All of the mentioned
- 1-i. The evolution of wire EDM took place in which part of history? (CO5) 1
(a) 1940s
(b) 1950s

(c) 1960s

(d) 1970s

1-j. How much amount of burr is produced in Electro Discharge Machining process? (CO5) 1

(a) 0.1

(b) 0.4

(c) 0.7

(d) No burr

2. Attempt all parts:-

2.a. What the factors considering selection of cutting fluids? (CO1) 2

2.b. Write down the difference between drilling and honing. (CO2) 2

2.c. What are feed drives? (CO3) 2

2.d. What is the purpose of transducer used in USM? (CO4) 2

2.e. List the applications of chemical machining. (CO5) 2

SECTION B

30

3. Answer any five of the following:-

3-a. Explain detail about different type of tool wear mechanisms? (CO1) 6

3-b. Write short notes of thermal aspect in metal cutting? (CO1) 6

3-c. Explain briefly Up-milling process and Down milling process. (CO2) 6

3-d. Write difference between the capstan and turret lathe? (CO2) 6

3.e. What is a 'bond'? Name and explain principal bonds.(CO3) 6

3.f. With a typical component explain the working of a wire EDM system.(CO4) 6

3.g. Explain the process of electrochemical machining with neat sketch and discuss about influences of process parameters in machining output. (CO5) 6

SECTION C

50

4. Answer any one of the following:-

4-a. List the important characteristics of cutting tool materials? (CO1) 10

4-b. During orthogonal machining with rake angle 10° rake tool, with depth of cut = 2 mm and feed rate of 0.20 mm/rev. The cutting speed is 200 m/min. The chip thickness ratio is 0.31. The vertical cutting force is 1200 N and horizontal cutting force is 650 N. Calculate from the Merchant's theory, the various work done in metal cutting and shear stress. (CO1) 10

5. Answer any one of the following:-

- 5-a. Sketch line diagram of a single spindle automatic lathe and briefly describe its feature? (CO2) 10
- 5-b. Discuss special attachment on lathes? (CO2) 10

6. Answer any one of the following:-

- 6-a. What is grinding process? Explain the centerless grinding process. Which material is used to make the grinding wheel? (CO3) 10
- 6-b. Describe the main constructional features of CNC machines, which distinguish them from conventional machine tools? (CO3) 10

7. Answer any one of the following:-

- 7-a. Draw the schematic layout of AJM and explain its operating characteristics. What are the methods adopted to have an effective control over the mass flow rate of the abrasive? (CO4) 10
- 7-b. State the working principle and construction detail of WJM process. (CO4) 10

8. Answer any one of the following:-

- 8-a. Explain the principle, construction of ultrasonic machining. Write the typical applications of ultrasonic machining. (CO5) 10
- 8-b. Explain the ECM process. Explain how a replica of the tool is obtained. Mention the advantages and applications. (CO5) 10