VTU B.E/B.TECH QUESTION PAPER SET

CBCS
SEMESTER V

NON- TRADITIONAL MACHINING

Use bookmarks to easily navigate between question papers

CBCS Scheme

USN | | | | | | | | | | 15ME554

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Non – Traditional Machining

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Differentiate between Traditional and Non-traditional machining process. **(08 Marks)**

b. Explain the need for Non-Traditional machining processes. **(08 Marks)**

OR

2 a. Classify the NTM processes on the basis of type of energy, mechanism of metal removal, transfer media, energy source. **(10 Marks)**

b. Write in brief note on the selection of non-traditional machining processes. **(06 Marks)**

Module-2

3 a. Sketch and explain the principle, equipment and operation of ultrasonic machining process. **(10 Marks)**

b. Discuss the influence of the following parameter on USM process :
   i) Amplitude and frequency of vibration
   ii) Abrasive gain size
   iii) Effect of slurry **(06 Marks)**

OR

4 a. Explain the process variables that influence the metal removal rate in abrasive jet machining. **(10 Marks)**

b. What are applications of water jet machining process? **(06 Marks)**

Module-3

5 a. Explain with a neat sketch, the Electro chemical Grinding process. **(08 Marks)**

b. Explain the effect of following parameters on Electrochemical machining process.
   i) Current density
   ii) Tool feed rate
   iii) Type of electrolyte
   iv) Velocity of electrolyte flow. **(08 Marks)**

OR

6 a. Explain with a neat sketch, the sequence of process steps involved in chemical blanking process. **(10 Marks)**

b. Briefly explain the process characteristics in chemical machining process. **(06 Marks)**

Module-4

7 a. Explain with the help of neat sketches the different types of Flushing used in EDM process. **(10 Marks)**

b. What are the essential requirements of a dielectric fluid, used in EDM process? What functions does the dielectric fluid performs? **(06 Marks)**

OR

8 a. With a neat sketch, explain the construction and working of plasma arc machining process. **(08 Marks)**

b. Write the applications and advantages of plasma Arc machining. **(08 Marks)**

Module-5

9 a. Draw a neat sketch of Laser Beam machining (LBM). And explain briefly. **(10 Marks)**

b. What are the advantages and limitations of LBM process? **(06 Marks)**

OR

10 a. Explain with sketch, the working of Electron Beam Machining (EBM). **(10 Marks)**

b. Write the applications and limitations of Electron Beam Machining (EBM). **(06 Marks)**

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15ME554

Fifth Semester B.E. Degree Examination, June/July 2018
Non Traditional Machining

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. What is NTM? Classify NTM process. **(08 Marks)**

b. Differentiate between conventional and non-conventional machining processes. **(08 Marks)**

OR

2 a. What are basic factors upon which the unconventional manufacturing processes are classified? Explain. **(12 Marks)**

b. Explain the need for development of NTM. **(04 Marks)**

Module-2

3 a. What is ultrasonic machining? Explain the ultrasonic machining process with neat sketch. **(10 Marks)**

b. Mention merits, demerits and applications of AJM. **(06 Marks)**

OR

4 a. Explain with schematic diagram the abrasive jet machining process. **(10 Marks)**

b. Explain tool feed mechanism in USM with neat sketches. **(06 Marks)**

Module-3

5 a. With a neat sketch, explain the working principle of ECM process. **(10 Marks)**

b. List the factors to be considered in the selection of etchants in chemical machining. **(06 Marks)**

OR

6 a. With the help of neat sketches, explain the different steps involved in chemical blanking. **(08 Marks)**

b. With neat sketch, explain electro chemical Honing. **(08 Marks)**

Module-4

7 a. Explain the working principle of EDM with a neat sketch. **(10 Marks)**

b. What are the important considerations are to be made in the design of plasma torch. **(06 Marks)**

OR

8 a. Explain with neat sketch the principle of PAM. **(10 Marks)**

b. List the commonly used dielectric fluids in EDM process. What properties should they posses? **(06 Marks)**

Module-5

9 a. Explain with a neat sketch, the principle of operation and mechanism of metal removal in laser beam machining. **(10 Marks)**

b. State the advantages, disadvantages and application of EBM. **(06 Marks)**

OR

10 a. Sketch and explain electro beam machining process. **(10 Marks)**

b. What are the advantages and applications of LBM process? **(06 Marks)**

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages

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15ME554

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Non Traditional Machining

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. How do you classify Non-traditional machining processes? Discuss briefly. **(08 Marks)**

b. Compare the traditional and non-traditional machining processes. **(08 Marks)**

OR

2 a. Explain the need for non-traditional machining processes. **(08 Marks)**

b. Write in brief note on the selection of non traditional machining processes. **(08 Marks)**

Module-2

3 a. With a neat sketch, explain the working principle and operation of USM process. **(08 Marks)**

b. Discuss the influence of the following parameters on USM process:
(i) Amplitude and frequency of vibration.
(ii) Abrasive grain size.
(iii) Effect of slurry.
(iv) Applied static load. **(08 Marks)**

OR

4 a. Explain the process variables that influence the metal removal rate in abrasive jet machining. **(08 Marks)**

b. Mention any two advantages, disadvantages and applications of water jet machining process. **(08 Marks)**

Module-3

5 a. Briefly explain the electrolytes used in ECM process. **(08 Marks)**

b. With a schematic diagram, explain the Electro Chemical Honing process. **(08 Marks)**

OR

6 a. List out the various process parameters and briefly explain their effects on chemical machining process. **(08 Marks)**

b. Write a short note on chemical blanking. **(08 Marks)**

Module-4

7 a. With a neat sketch, briefly explain the Feed control in EDM process. **(08 Marks)**

b. What are the requirements of Dielectric fluid? Mention any two dielectric fluids used in EDM process. **(08 Marks)**

OR

8 a. With a neat sketch, briefly explain PAM process. **(08 Marks)**

b. Discuss some of the important considerations in the design of plasma Torch in PAM. **(08 Marks)**

Module-5

9 a. With a neat sketch, briefly explain the principle and working of laser beam machining. **(08 Marks)**

b. What are the advantages and limitations of LBM process? **(08 Marks)**

OR

10 a. With a neat sketch, briefly explain working of electron beam machining. **(08 Marks)**

b. Write the applications and limitations of Electron Beam Machining (EBM). **(08 Marks)**

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15ME554

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Non Traditional Machining

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain non-traditional machining, by defining it and discuss about the need of non-traditional machining in detail. **(08 Marks)**

b. Discuss the comparison between traditional and non-traditional machining in detail. Classify the general NTM processes in detail. **(08 Marks)**

OR

2 a. Analyze the classification of non-traditional machining based on nature of energy employed in machining. **(10 Marks)**

b. Explain the specific advantages, limitations and applications of non-traditional machining. **(06 Marks)**

Module-2

3 a. Explain construction and working process of USM (Ultrasonic Machining) in detail by drawing a neat figure. Discuss the effect of amplitude and frequency and grain diameter. **(10 Marks)**

b. Describe application and limitations of USM. **(06 Marks)**

OR

4 a. Explain AJM (Abrasive Jet Machining) by drawing a neat schematic diagram. Describe "SOD" (Stand-Off Distance) and MRR (Material Removal Rate). **(08 Marks)**

b. Discuss WJM (Water Jet Machining) process in detail by drawing a neat schematic diagram. Describe Application, Advantages and Limitations. **(08 Marks)**

Module-3

5 a. Explain in detail for the ECM (Electro Chemical Machining). The element of ECM processes D.C. power and control system by drawing the adequate figures. **(08 Marks)**

b. Describe the chemistry of the ECM process and MRR by drawing a neat figure. **(08 Marks)**

OR

6 a. Discuss in CHM (Chemical Machining) the RESISTS (MASKANTS), Chemical Balance. **(08 Marks)**

b. Discuss about the Etchants, Applications and Advantages of CHM. **(08 Marks)**

Module-4

7 a. Explain EDM (Electrical Discharge Machining) principle, by drawing a neat figure and discuss in detail about DIELECTRIC FLUID. **(08 Marks)**

b. Discuss in detail about Pressure Flushing in EDM. Describe the Applications and Advantages of EDM. Explain Travelling Wire EDM. **(08 Marks)**

OR

8 a. Explain PAM (Plasma ARC Machining) in detail by drawing neat sketch. **(08 Marks)**

b. Discuss the safety precautions, application, advantages and limitations of PAM. **(08 Marks)**

Module-5

9 a. Explain in LBM (Laser Beam Machining) the Ruby Laser by drawing energy level diagram. **(08 Marks)**

b. Explain types of laser and discuss in detail the laser beam cutting with gas by drawing a neat figure. List out the advantages and applications. **(08 Marks)**

OR

10 a. Discuss the principle of EBM (Electron Beam Machining) by drawing a neat figure. **(08 Marks)**

b. Draw a graph of MRR (Material Removal Rate) by assuming 15% efficiency and explain advantages and limitations of EBM. **(08 Marks)**

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Fifth Semester B.E. Degree Examination, Aug./Sept. 2020
Non-Traditional Machining

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Give a brief history that led to the development of non-traditional machining processes. (04 Marks)
b. Compare between traditional and non-traditional machining processes. (04 Marks)
c. Give a broad classification of NTM processes. (08 Marks)

OR

2 a. List out the factors while selecting the NTM process and explain any two factors. (10 Marks)
b. Discuss the advantages and applications of NTM process. (06 Marks)

Module-2

3 a. With a neat sketch, explain USM process. (10 Marks)
b. Discuss the effect of abrasive grain diameter, effect of slurry on material removal rate in USM process. (06 Marks)

OR

4 a. With a neat sketch, explain AJM process. (08 Marks)
b. Explain applications, advantages and limitations for WJM process. (08 Marks)

Module-3

5 a. With a neat diagram, explain ECM process. (08 Marks)
b. Discuss the parameters like current density, S.O.D., velocity of electrolyte on MRR in ECM. (08 Marks)

OR

6 a. Explain the different steps involved in Chemical Machining Process (CHM). (08 Marks)
b. Enumerate the various advantages applications and limitations of CHM. (08 Marks)

Module-4

7 a. Explain with a diagrams, electrode feed control system in EDM process. (08 Marks)
b. What is flushing? Discuss various methods in flushing for EDM process. (08 Marks)

OR

8 a. With a neat sketch, explain the principle and process in PAM. (08 Marks)
b. What safety precautions are to be taken while operating PAM? (05 Marks)
c. Write different applications of PAM process. (03 Marks)

Module-5

9 a. With a neat sketch, explain Laser Beam Machining process. (08 Marks)
b. Explain different advantages and limitations for LBM. (08 Marks)

OR

10 a. With a neat diagram, explain Electron Beam Machining process. (08 Marks)
b. Enumerate different applications, advantages and limitations for EBM process. (08 Marks)

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USN | | | | | | | | | | 17ME554

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Non-Traditional Machining

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Define Non-Traditional Machining. What are the need for N.T.M process. Explain briefly. **(06 Marks)**

b. What are the comparison between conventional and non-conventional machining. **(06 Marks)**

c. What are the various aspects to be considered before selecting a N.T.M process? Discuss briefly. **(08 Marks)**

OR

2 a. Give classification of N.T.M process. **(06 Marks)**

b. What are the specific advantages, limitations and applications of non-traditional machining processes? **(10 Marks)**

c. Enumerate the physical parameters of the Non-traditional machining process. **(04 Marks)**

Module-2

3 a. With the help of neat sketch, explain working principle of ultrasonic machining process. **(10 Marks)**

b. Explain with neat diagrams, process parameters in USM. **(06 Marks)**

c. What are the process characteristics of USM? Explain briefly. **(04 Marks)**

OR

4 a. Explain with neat sketch, working principle of Abrasive Jet machining and also give advantages and applications of A.J.M process. **(10 Marks)**

b. With the help of neat sketch, explain water jet machining process and also give advantages and disadvantages of W.J.M. **(10 Marks)**

Module-3

5 a. With a neat sketch, explain the working principle of ECM process. **(10 Marks)**

b. Explain with a neat sketch, Electro Chemical Grinding (ECG). **(06 Marks)**

c. What are the process parameters of ECM? Explain briefly. **(04 Marks)**

OR

6 a. Explain the following in Chemical Machining Process :
i) Maskants ii) Etchants. **(06 Marks)**

b. Sketch and explain Electro Chemical Honing (ECH). **(06 Marks)**

c. Explain with neat sketches of chemical blanking and Chemical Milling process. **(08 Marks)**

Module-4

7 a. With the help of a neat diagram, working principle of Electrical Discharge Machining process. **(08 Marks)**

b. Explain with neat sketch, the travelling wire EDM process. **(06 Marks)**

c. Mention various dielectric flow pattern of EDM process. Explain any two with sketches. **(06 Marks)**

OR

8 a. Explain with neat diagram, construction and working principle of Plasma Arc Machining (PAM). **(10 Marks)**

b. What are the process parameters of PAM? Explain briefly. **(05 Marks)**

c. What are the safety precautions in PAM? Explain. **(05 Marks)**

Module-5

9 a. Explain with neat sketch, working principle of Laser Beam Machining process (LBM). **(08 Marks)**

b. What are the advantages, limitations and applications of LBM? **(06 Marks)**

c. What are the process parameters and characteristics of LBM? **(06 Marks)**

OR

10 a. Explain with the help of a neat diagram, Operation Principle of Electron Beam Machining (EBM). **(10 Marks)**

b. What are the advantages , limitations and applications of EBM process? **(06 Marks)**

c. Explain need for EBM and mechanism of metal removal of EBM process. **(04 Marks)**

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