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R18

Course Code: A30353



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations November-2024

Course Name: **Micro Machining Processes**

(Mechanical Engineering)

Date: 26.11.2024 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks.

10x2=20M

1. Write the classification of micro machining processes. 2 M
2. List the difference between mechanical micro machining and traditional machining. 2 M
3. Write the role of chemicals in Chemo Mechanical Polishing (CMP). 2 M
4. What is the advantage of MRF over conventional abrasive finishing? 2 M
5. What materials are suitable for processing with EDDG? 2 M
6. What is the role of a focusing lens in LBMM? 2 M
7. Define electrochemical micromachining (ECMM) and its primary application. 2 M
8. What are the environmental concerns associated with chemical micromachining? 2 M
9. How micro milling is different from traditional milling? 2 M
10. Write the concept of "process selection" in micro machining. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Illustrate the process flow of Abrasive Water Jet Micro Machining (AWJMM) 10M
- OR**
- 11.B). Summarize the applications of mechanical type micro machining processes in the aerospace industry. 10M
- 12.A). Illustrate the setup of Magnetic Abrasive Finishing (MAF) and explain how magnetic fields impact the polishing process. 10M
- OR**
- 12.B). Discuss the various types of abrasive particles used in CMP, AFF, and MAF. Analyze how particle characteristics influence the finishing process. 10M
- 13.A). Explain the principle of Electric Discharge Micromachining (EDMM) and its application in machining hard-to-cut materials. 10M
- OR**
- 13.B). Explain the working of Electron Beam Micromachining (EBMM). 10M
- 14.A). Illustrate the Electrochemical Micro Deburring process and discuss its applications in precision manufacturing. 10M
- OR**
- 14.B). Evaluate the advantages and limitations of photochemical micromachining. Propose potential improvements to overcome its limitations. 10M

(P.T.O..)

15. A). Explain the principle of micro turning and analyze its applications in industries requiring high-precision components. 10M

OR

15. B). Explain the Focused Ion Beam (FIB) machining process and assess its applications in microelectronics and nanotechnology. 10M

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Course Code: A30374



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Regular/Supplementary Examinations November-2024

Course Name: Non Conventional Sources of Energy
(Mechanical Engineering)

Date: 28.11.2024 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks.

10x2=20M

1. What is solar constant? 2 M
2. Why are non-conventional energy sources important? 2 M
3. What are the different types of solar radiation that can be measured using instruments and name any one instrument? 2 M
4. Give the working principle of direct energy conversion system. 2 M
5. What are the various sources of wind energy? 2 M
6. What is the capacity factor of a wind turbine? 2 M
7. Classify biogas plants. 2 M
8. Name the various factors that affect bio-digestion. 2 M
9. List any three important difficulties faced while operating a wave energy convertor. 2 M
10. What is the site selection criteria for setting up an OTEC plant? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). How do non-conventional energy sources contribute to the reduction of greenhouse gas emissions? 10M

OR

11. B). How does the scalability of renewable energy technologies influence their potential for widespread adoption? 10M

12. A). Explain any one instrument used for the measurement of solar radiation in detail. 10M

OR

12. B). Enumerate and explain in brief the different types of concentrating type collectors. 10M

13. A). Analyse the working of a wind energy conversion system in detail. 10M

OR

13. B). Explain the working of horizontal wind turbine. 10M

14. A). Classify and explain nature of Geothermal sources and their utilizations. 10M

OR

14. B). Briefly explain the critical criteria in the design of ocean thermal energy conversion plants. 10M

15. A). What is the need for direct conversions of wave energy? Explain its limitations. 10M

OR

15. B). How does the discharge of cold deep water from OTEC systems affect the surrounding marine environment? 10M

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Course Code: A30355



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Supplementary Examinations November-2024

Course Name: **Surface Engineering**

(Mechanical Engineering)

Date: 03.12.2024 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks.

10x2=20M

1. What is Vapor Phase Degreasing? 2 M
2. Write any two-surface preparation method. 2 M
3. Define metallic coating. 2 M
4. What is chemical conversion coating? 2 M
5. What is surface modification by Friction based processes? 2 M
6. What are application of chemical vapor deposition (CVD)? 2 M
7. What is thermal spray process? 2 M
8. What are the types of spray guns? 2 M
9. What is aluminizing process? 2 M
10. What is siliconizing process? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain with suitable examples need of surface preparation methods for different materials and its process. 10M
- OR**
11. B). How can surface engineering improve the life of an engineering component in a specific industrial application? Explain in brief. 10M
12. A). What is difference between chromating and phosphating? Also explain in brief Anodizing. 10M
- OR**
12. B). Discuss thermochemical corrosion process with at least two different examples. 10M
13. A). What is PVD & CVD surface coating vapor phase? Explain with application, advantages, disadvantages and its limitation. 10M
- OR**
13. B). Explain role of surface modification. What is the purpose of sputtering, also write the steps of sputtering process? 10M
14. A). Brief about thermal spray coating finishing treatment. Also write any one best thermal spray coating practice. 10M
- OR**
14. B). Discuss various standards for thermal spray coating. What are the major disadvantages of thermal spray coating. 10M
15. A). What is diffusion coating process? Write difference between carbonitriding and carburizing. 10M
- OR**
15. B). Explain in brief process of boronizing. What is difference between boronizing and boronitriding. 10M

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Course Code: A30375



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Regular Examinations November-2024

Course Name: **Jet Propulsions & Rocket Engineering**
(Mechanical Engineering)

Date: 03.12.2024 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks.

10x2=20M

1. What is the principle of jet propulsions? 2 M
2. List out the applications of jet propulsion. 2 M
3. Differentiate between propulsive efficiency and thermal efficiency of jet propulsion system. 2 M
4. Define the function of a nozzle and name some applications where it is used? 2 M
5. State Dalton's law of partial pressure. 2 M
6. Discuss about the adiabatic flame temperature and equivalent ratio. 2 M
7. Compare the solid and liquid propellants. 2 M
8. Why liquid propellants are preferred in rocket propulsion? 2 M
9. State the operating principle of a ram jet engine. 2 M
10. Name the modes of operation of a supersonic inlet. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain the thermodynamic analysis of turbojet engines. 10M
- OR**
11. B). Compare Turbo Prop, Turbo – Fan and Turbo Jet engines. 10M
 12. A). Explain about the construction and working of turbofan Engine with clear diagram and state its advantages & disadvantages. 10M
- OR**
12. B). Explain the theory of one dimensional convergent-divergent nozzles. 10M
 13. A). Explain the composite propellants and double base propellants. 10M
- OR**
13. B). What do you mean by burning rate, burning surface and grain geometry? What are the factors that affect the non-ideal burning? 10M
 14. A). Explain the construction and working of a solid propellant rocket engine with a neat sketch. 10M
- OR**
14. B). Explain with neat sketch working principle of Liquid Propellant rocket engine with pump feed system and its advantages and disadvantages. 10M
 15. A). With a neat sketch, explain the construction and working of Ramjet Engine. State its advantages and disadvantages. 10M
- OR**
15. B). What are the advantages, disadvantages and applications of ram jet and scram jet engines? 10M
