

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK

UNIT NO.1-SPECIAL FORMING PROCESSES

SUBJECT: 402050A, Advanced Manufacturing Processes

COURSE: BE(2015 pattern)

- Q.1 Explain with sketch the principle of metal spinning process. 5
- Q.2 Write down any two points of comparison with schematic of stand-off technique and contact technique of explosive forming. 4
- Q.3. Explain with neat sketch unconfined type explosive forming. 5
- Q.4 Describe how high velocity forming process is beneficial in comparison to conventional forming process. 5
- Q.5 State process parameters of electromagnetic forming process. Also explain its working principle with schematic. 5
- Q.6 Flow forming has emerged as the most advanced metal forming technique in comparison to extrusion and tube drawing. Comment on the statement 6
- Q.7 Explain with schematic the process variables of metal spinning. 5
- Q.8 Explain with neat sketch Laser bending of micro parts. 4
- Q.9 Explain with sketch electro hydraulic forming. 6
- Q.10 Explain with neat sketch Stretch forming and list their applications. 6
- Q.11 Explain with neat sketch steps involved in fine blanking. 6
- Q.12 How petro forge hammer differs from conventional forging hammer? Justify with neat sketches. 6
- Q.13 Explain with neat sketch Electromagnetic forming. List their applications. 6
- Q.14 What is meant by micro forming and micro extrusion? Explain with neat sketch. 6
- Q.15 Explain in detail incremental sheet metal forming. 6

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QUESTION BANK

UNIT NO.2-ADVANCED JOINING PROCESSES

SUBJECT: 402050A, Advanced Manufacturing Processes

COURSE: BE (2015 pattern)

- Q.1 With neat sketch explain the principle of friction stir welding? Also state the important process parameters which affect the performance of FSW. 6
- Q.2 Describe with a neat sketch the different metallurgical zones in friction stir welding. 4
- Q.3 Describe the importance of joint design and tool geometry while carrying out FSW. 5
- Q.4 Material selection, design and cost are important considerations during FSW of hard materials. Comment on the statement. 5
- Q.5 Enumerate the key benefits of the friction stir welding process with respect to metallurgical, energy, and environment benefits. 5
- Q.6 Explain with neat sketch EBW. 6
- Q.7 List the advantages, drawbacks, and applications of LBM. 6
- Q.8 Explain with neat sketch under water welding and list the applications. 6
- Q.9 List the advantages, drawbacks, and applications of USW. 6
- Q.10 Write a note on Thermal spray coating. 5
- Q.11 Explain with neat sketch Explosive joining. 5
- Q.12 Explain with neat sketch hot gas welding of plastics. 5
- Q.13 Write short note on: a)Welding of plastics b)Cryogenic welding. 6
- Q.14 State and explain the different parameters which affect the heat generation during friction stir welding. 6
- Q.15 What is underwater welding? What are its types?4
- Q.16 Write short note on: a) Dry underwater welding b) Wet underwater welding 6
- Q.17 Explain adhesive bonding with its procedure. Also state its application. 6

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UNIT NO.3- HYBRID NON-CONVENTIONAL MACHINING TECHNIQUE

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| Q.1 | List the application of shaped tube electrolytic machining process | [4] |
| Q.2 | State with sketch the working principle and applications of the Electrochemical Grinding | [6] |
| Q.3 | List the application of electrolytic In process Dressing | [5] |
| Q.4. | With schematic explain the principal of Electrolytic In process Dressing. | [6] |
| Q.5 | List the application of electrolytic jet machining process | [4] |
| Q.6 | Differentiate between the conventional gridding and electrochemical grinding process. | [5] |
| Q.7 | How internal surface of the components can be deburred, polished by AFF? | [4] |
| Q.8 | Justify, how AWJM is a hybrid process with a sketch. | [5] |
| Q.9 | How ECG differ from conventional Grinding? | [4] |
| Q.10 | How Laser based heat treatment is more effective than conventional heat treatment. | [4] |
| Q.11 | Write the importance of dressing & grinding in electrolytic in-process dressing with different steps. | [5] |
| Q.12 | What are the different parameters affects the wire-EDM process? | [4] |

UNIT 4. Micro Machining and Nano fabrication techniques

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| Q.1 | Explain principle & working of Micro Ultrasonic Machining with its neat sketch | [5] |
| Q.2 | With a schematic of diamond turn machine (DTM) name the various components and write their functions | [5] |
| Q.3 | Explain principal and application of the Micro Electro Discharge Machining Process. | [5] |
| Q.4 | Give classification of Micro Ultrasonic Machining With its different tool heads | [5] |
| Q.5 | Need of micro machining components is increasing in the industries. Justify it | [4] |
| Q.6 | Differentiate between ultrasonic machining with USMM | [4] |
| Q.7 | Justify how diamond turn lathe machine produces mirror like surface finish on the micro components; also write the importance of diamond material as a cutting tool. | [4] |
| Q.8 | Write the detail description about focused ion beam machining. How FIB is differ from SEM. | [4] |
| Q.9 | List the performance characteristics of the ultrasonic micromachining process (USMM) and with cause and effect diagram show the various process parameters in USMM which influence the micromachining performance. | [8] |
| Q.10 | Describe the effect of process parameters on material removal rate and tool wear when using USMM | [8] |
| Q.11 | Explain optical lithography process. | [6] |
| Q.12 | State the advantages of gas assisted FIB machining | [4] |

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QUESTION BANK

UNIT NO.5- ADDITIVE MANUFACTURING PROCESSES

SUBJECT: 402050A, Advanced Manufacturing Processes

COURSE: BE (2015 pattern)

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| Q.1 | What is additive manufacturing? Describe the different steps by which a part or component is build using additive manufacturing process. | [6] |
| Q.2 | With a schematic state the principle of powder bed fusion (PBF) additive manufacturing process. Also, state the different fusion mechanisms used in PBF process. | [6] |
| Q.3 | With a schematic explain the working principle and process steps of extrusion based additive manufacturing process | [5] |
| Q.4 | With a schematic state the working principle of sheet lamination process. Also, state various methods to manufacture a component using this technique. | [6] |
| Q.5 | Name the seven categories of additive manufacturing processes as specified by ASTM standard | [6] |
| Q.6 | State the fusion mechanisms in PFB | [5] |
| Q.7 | State the disadvantages of sheet lamination process | [5] |
| Q.8 | What is post processing of parts after additive manufacturing? | [4] |
| Q.9 | Explain the role of software, which executes the manufacturing process in AM (additive manufacturing) technique? | [5] |
| Q.10 | What is design for Additive Manufacturing and compare it with concept DFMA | [5] |
| Q.11 | Write a short note on DFAM guidelines | [5] |
| Q.12 | Write applications of AM in aerospace industry | [4] |
| Q.13 | Write applications of AM in medical field | [4] |

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QUESTION BANK

UNIT NO.6-MATERIAL CHARACTERIZATION TECHNIQUES

SUBJECT: 402050A, Advanced Manufacturing Processes

COURSE: BE (2015 pattern)

1. With a schematic explain the working principles of scanning electron microscope, transmission electron microscope. 6
2. Explain with schematic the geometric principle of triangulation. 4
3. State with sketch the principle of the stylus type surface profilers? Also state advantages and limitations of these contact type profiles? 6
4. Explain with schematic the working principle of Atomic force microscope. Also state its main components and give their functions. 6
5. Explain with schematic the principle of online dimensional measurement using laser based diffraction method technique. 5
6. State the different imaging modes and contact scanning modes of AFM. 5
7. Explain nuclear magnetic resonance spectroscopy with respect to its principle and working. 6
8. Mention the various X-ray diffraction methods. Explain in detail on any one. 5
9. Write the comparison between SEM and TEM. 6
10. What is nuclear shielding? Give applications of NMR spectroscopy. 4
11. What is a chemical shift in X-ray photoelectron spectroscopy? Give applications of XPS. 5
12. Why is continuous spectrum produced? Write about characteristic spectrum. 5