AHMEDABAD UNIVERSITY
School of Engineering and Applied Science
2025-2026 Winter

MEC408 Additive Manufacturing
Mid-Term Examination
Monday 23 February 2026. 14:00 – 15:30

Name:	Roll no.	A	U	2							Marks /30

Attach this sheet to the answer book and then submit it. Answer all questions. Figures to the right indicate marks for each question. All acronyms and symbols carry their usual meaning. Assume suitable data wherever necessary and specify it clearly in your answers. The use of electronic gadgets is strictly prohibited; only a non-programmable scientific calculator is allowed for calculations.

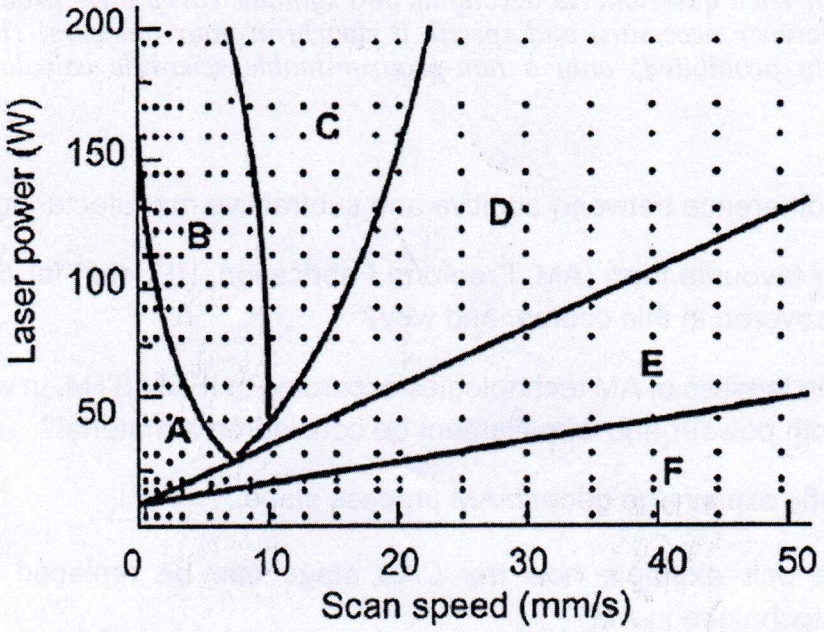
1. What is the difference between additive and subtractive manufacturing? *(1)*
2. What is your favourite term (AM, Freeform Fabrication, RP, etc.) for describing the technology covered in this course, and why? *(2)*
3. List the seven families of AM technologies according to ISO/ASTM. In which of these types can both powder and wire filament be considered a material? *(4)*
4. List and briefly explain the generic AM process steps. *(4)*
5. Explain with one example how the CAD stage can be replaced with another appropriate technique in AM? *(2)*
6. John received a parcel containing photopolymer from his friend, who wants to fabricate a complex 3D structure. Now John needs to select a suitable AM process and provide the rationale for the selection, along with a description of how the process works. Help John select, justify, and describe the appropriate AM process. *(3)*
7. What is the difference between curing and sintering in terms of their mechanisms? *(2)*
8. Why is a hybrid resin of epoxies and acrylates better than acrylates and epoxies? *(2)*
9. Explain the working curve for resin and draw the graph. Also, write down the working curve equation, defining each term. *(3)*
10. Which of the following option(s) is/are correct from the given statements *(2)*

    (a) An STL file contains no information on units
    (b) An STL file contains no information on colour
    (c) An STL file contains information on the material
    (d) An STL file contains information on units

11. Which of the following phenomenon occurs above melting temperature either fully or partially? *(2)*

    (a) Solid state sintering
    (b) Liquid phase sintering
    (c) Full melting
    (d) Chemically induced binding

12. Estimate the minimum laser dwell time (how long a spot is under the laser as it passes) needed to maintain a type B scan track at 100 W. Refer to the process map for track type and beam size. *(3)*



-150/+75 µm M2, 1.1 mm beam size