



V SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2018

SUBJECT: COMPOSITE MATERIALS [AAE 4024]

REVISED CREDIT SYSTEM

(01/01/2019)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitable assumed.

- 1A. Explain the major functions of matrix and fiber material in polymer matrix composites. (03)
- 1B. Define thermoplastic and thermoset matrix system. List the difference between both of them. (03)
- 1C. With neat sketch, explain the fabrication process of polyethylene fibers. List the major properties and applications of the same. (04)
- 2A. Sketch and explain the compression moulding process and list the major advantages, disadvantages and applications of the same. (04)
- 2B. Explain the major steps involved in Ex- Pitch carbon fiber fabrication process. (03)
- 2C. With suitable diagram, explain vacuum assisted resin transfer moulding. List the major properties and applications of the same. (03)
- 3A. With neat sketch, explain squeeze-casting process involved in fabrication of MMC. (03)
- 3B. List the major steps involved in roll wrapping process. Also, explain major advantages, disadvantages and applications of the same. (04)
- 3C. Explain the process parameters influences the machining of composite materials in ultrasonic machining process. (03)
- 4A. With suitable diagram, explain the types of chemical vapour deposition process involved in fabrication of ceramic matrix materials. (04)
- 4B. Explain the mechanical theory of adhesive bonding considering one component, no mix adhesive as an example. (04)

- 4C.** Calculate volume fraction of fiber and density of a composite laminate **(02)** containing 50 wt% of E-glass fibers in a epoxy resin. Assume fiber density as 2.54 g/cm^3 and matrix density as 1.2 g/cm^3 .
- 5A.** With neat sketch, explain the Polymer Infiltration and Pyrolysis method used **(04)** for the fabrication of CMC.
- 5B.** Explain the laser ablation process of production of nano tubes. **(03)**
- 5C.** List the different types of metal matrix materials. List its major properties and **(03)** applications in automotive and aerospace industries.