

No. of Printed Pages : 4

BAS-022

**B.TECH. AEROSPACE ENGINEERING
(BTAE)****Term-End Examination, 2019****BAS-022 : COMPOSITE MATERIALS****Time : 3 Hours]****[Maximum Marks : 70**

Note : Attempt any seven questions. All questions carry equal marks. Use of Scientific Calculator is permitted.

1. (a) Describe the characteristic of Composite Materials. [5]
- (b) What are the advantages and disadvantages of Composite Materials ? [5]
2. (a) Discuss how the properties of Composite Materials are affected by incorporating a reinforcement. [5]
- (b) What Ceramic Matrix Composite would you select for the cutting tool application ? Give your reasons. [5]

3. (a) A unidirectional composite comprises 65% by volume of carbon fibres (modulus 240 GPa) in an epoxy resin matrix (modulus 4 GPa). Calculate the longitudinal modulus of the composite. [5]
- (b) Define degree of Polymerisation ? If a particular type of polyethylene has a molecular mass of 1,40,000 g/mol, what is its degree of polymerisation ? [5]
4. (a) Distinguish between the structure and the properties of Thermosetting and Thermoplastic resins. [5]
- (b) What are two of the most important matrix plastics for fiber reinforced plastics ? What are some advantages of each type ? [5]
5. (a) Distinguish between addition and condensation polymerisation and state which of these are applied for processing polyethylene and polycarbonates. [5]

- (b) A Metal-matrix composite is made with 75 percent by volume of aluminium alloy 2124 - T6 and 25 percent by volume of SIC whiskers. The density of the 2124 - T6 alloy is 2.75 g/cm^3 and that of the whiskers is 3.12 g/cm^3 . Calculate the average density of the composite material. [5]
6. (a) Describe Injection moulding process for plastics. How is it different from other thermoplastic forming techniques. [5]
- (b) Discuss in brief Ultrasonic NDT. [5]
7. (a) State three ways to improve the impact strength of Plastics. [5]
- (b) Describe the mechanism of adhesion for polymers that are used as adhesive. [5]
8. (a) Discuss in brief the production of composite structure. [5]
- (b) What are the different forms of Polymer Chains? Give examples of each form. [5]

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