Code: 9D04206c

M.Tech II Semester Supplementary Examinations August/September 2018

MECHANICS & MANUFACTURING METHODS OF COMPOSITES

(Common to CAD/CAM & PEED)

(For students admitted in 2013, 2014, 2015 & 2016 only)

Time: 3 hours Max. Marks: 60

Answer any FIVE questions

All questions carry equal marks

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1 What are the different types of composites used in industry? Also list out their aerospace and structural applications.

2 For a glass epoxy composite E_f = 85 GPa, E_m = 3.4 GPa, Poisson's ratio V_m = 0.3 and V_f = 0.25. Find the minor Poisson's ratio V_{21} and G_{21} for a fiber volume fraction of 60%.

3 Obtain an expression for the longitudinal tensile strength, minimum fiber volume fraction and critical fiber volume fraction of a unidirectional lamina using mechanics of material approach.

4 What is Hooke's law? Derive the Hooke's law for the two dimensional unidirectional lamina.

5 Explain the various features of the following laminates:
(a) Cross – ply laminates.
(b) Angle – ply laminates.

6 Discuss the following in detail:
(a) Free – edge effects.
(b) Failure envelope.

7 Derive the governing differential equation for a laminated unidirectional anisotropic plate and deduce the conditions for orthotropic and isotropic plates.

8 Explain the following in detail:
(a) Resin transfer molding.
(b) Preparation of fiber reinforced laminates by hand lay – up.

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