Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

I SEMESTER M.TECH. (AUTOMOTIVE ENGINEERING)
END SEMESTER EXAMINATIONS, February 2022
SUBJECT: AUTOMOTIVE MATERIALS AND STRUCTURES (AAE 5172)
REVISED CREDIT SYSTEM
(07/02/2022)

Duration: 1 Hour 15 minutes Max. Marks: 20

Instructions to Candidates:

- **Answer all the questions.**
- **Assume missing data if any.**

Q N	Question	**Max marks**	**CO**	**BT**
1A)	With a neat sketch explain Griffts criterion	(04)	CO1	Level 2=Undrestand
1B)	Explain the age hardening phenomenon and microstructure evolution in non-ferrous alloy with the help of TTT-Diagram.	(04)	CO3	Level 2=Undrestand
1C)	Write a short note on materials used for camshaft production	(02)	CO2	Level 1= Remember
2A)	Explain the manufacturing process of cast-in-fit for a dry liner for cylinder block	(02)	CO2	Level 2=Undrestand
2B)	Determine [A], [B] and [D] matrices for [+45|-45] angle-ply laminate. Each ply has the thickness of 0.125mm. E_1 = 140GPa, E_2 = 10GPa, E_6 = 5GPa, υ_{12} = 0.3	(06)	CO4	Level 3= apply
2C)	Evaluate Transverse modulus E_2 of a glass/epoxy composite lamina with properties E_f = 14.8GPa, E_m = 3.45GPa, V_f = 0.65, ν_m = 0.36 using Halpin-Tsai relationship (ξ = 1)	(02)	CO5	Level 3= apply