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FACULTY OF ENGINEERING AND TECHNOLOGY

M.E (Mechanical) Year Examination - June – 2015

Modern Engineering Materials

(Revised)

[Time: Three *Hours*] **[Max. Marks: 80]**

"Please check whether you have got the right question paper."

i) Solve any three questions from each section.

ii) Figures to the right indicate full marks.

iii) Draw neat sketches wherever necessary.

SECTION-A

Q.1	a)	List the four classifications of steels for each briefly explains the properties & typical applications.	07
	b)	Hardening of steels is always followed by tempering. Is it true? If true, give reasons.	06
Q.2	a)	What do you understand by solution annealing as applied to stainless steel? How does it differ from conventional annealing?	07
	b)	What is carburizing? Why it is done? Why 0.2% carbon steel carburizes fast than pure iron at 875 ^{0}C?	06
Q.3	a)	What principle of design should be followed to minimize cracking by internal stress resulting from heat treatment?	07
	b)	Give composition & uses of the following alloys? i) 90/10 alluminium bronze ii) Plumber's solder iii) Brazing brass	06
Q.4	a)	Justify the sentence for composite material "Young's modulus of laminated composite materials in transverse direction is almost seven times less than in the longitudinal direction".	07
	b)	Explain in detail application of composites for following i) Automobile & aerospace application ii) Non structural application	06
Q.5		Write notes on any two i) HSLA ii) Polymer matrix material iii) High nitrogen steels	14

SECTION –B

Q.6	a)	A glass fibre reinforced polysterene contains 40 volume% of parallel fibres. Estimate the youngs modulus of composite in the longitudinal direction of the fibres. Young's modulus of glass is 70GN/m^2 & that of polystyrene is 2.6 GN/m^2	07
	b)	Explain in detail unidirectional fibre composites.	06
Q.7	a)	With specific example explain angle plied composites.	07
	b)	Explain crystallization of polymers.	06
Q.8	a)	Give classification of ceramics with the properties of each class	07
	b)	Explain in detail electronics ceramics.	06
Q.9		Write short notes on any two a) Abrasive materials b) Types of fiber c) Beryllium branzes	14