Hall Ticket No: | | | | | | | | | | | Question Paper Code: 14CSU402-M1

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R14) Supplementary End Semester Examinations – Jan 2019

(Regulations: R14)

AI: KNOWLEDGE REPRESENTATION AND REASONING (MOOC)

(CSE)

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part A or Part B only

Q.1	i.	FOL representation of "Students only bunk classes they are not interested in"	1M
	ii.	What is entailment?	1M
	iii.	What is first order logic?	1M
	iv.	RDF- Explain	1M
	v.	What is Hilbert Style Proofs?	1M
	vi.	What are the Rules of Inference and Natural Deduction	1M
	vii.	What is The Cut Operator in Prolog?	1M
	viii.	List Incompleteness of Forward and Backward Chaining.	1M
	ix.	What are Taxonomies and Inheritance in DL	1M
	x.	Explain about Description Logics	1M
Q.2(A)		Explain The Tableau Method with an Example	10M
		OR	
Q.2(B)		Give a detailed note on Semantics and Reasoning	10M
Q.3(A)		Explain Unification Algorithm with an Example	10M
		OR	
Q.3(B)		Entailment and Models - Discuss	10M
Q.4(A)		Give a detailed note on Skolemization	10M
		OR	
Q.4(B)		Elaborate on CD Theory	10M
Q.5(A)		Describe about Clause Form and The Resolution Rule	10M
		OR	
Q.5(B)		With a neat sketch, explain the function of Depth First Search and Efficiency Issues	10M
Q.6(A)		Credulous and Skeptical Reasoning - Discuss	10M
		OR	
Q.6(B)		Epistemic Logic - Explain	10M

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 14ECE402-M2

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R14) Supplementary End Semester Examinations – Jan 2019

(Regulations: R14)

SEMICONDUCTOR OPTOELECTRONICS (MOOC)

(ECE)

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part A or Part B only

Q.1	i.	Consider an electron in the conduction band of a semiconductor with a kinetic energy of 0.2 eV. What is its de-Broglie wavelength?	1M
	ii.	Calculate the density of states for the 1st sub-band of the conduction band, for a quantum well of thickness 2 nm. Given: electron mass = 0.5 m_e	1M
	iii.	_____ and _____pair of elements are not used to make a binary semiconductor.	1M
	iv.	_____ does not lead to the formation of trap states.	1M
	v.	One of the most efficient methods of pumping a semiconductor to provide amplification of light is to employ a:_____	1M
	vi.	The intensity of a light beam doubles on passing through a particular semiconductor amplifier of device length 2.5 mm. What is the gain coefficient of the device?	1M
	vii.	A particular LED emits 10 mW of optical power at the wavelength of 620 nm, when the forward current (through the LED) is 100 mA. Calculate the external quantum efficiency (in %)?	1M
	viii.	Loss due to re-absorption of the generated photons in an LED can be minimized by_____.	1M
	ix.	When a light beam of wavelength 620 nm is incident on a photodiode of 50% quantum efficiency, the photocurrent generated is 2 μA. What is the incident optical power?	1M
	x.	A steady photon flux of 2×1014 photons/s is incident on a photoconductor of length 5 mm and quantum efficiency 0.5. If the excess carrier recombination time is 500 ns, and the applied bias voltage is 2 V, find the photocurrent generated in the external circuit. Given: Mobilities of holes and electrons are 3500 $cm^2 V^{-1}s^{-1}$ and 2500 cm2 $V^{-1}s^{-1}$, respectively.	1M
Q.2(A)		What a note on Quasi Fermi levels.	10M
		OR	
Q.2(B)		Explain in detail about E-K Diagram	10M
Q.3(A)		Write note on classification of semiconductor materials.	10M
		OR	
Q.3(B)		Briefly discuss about Quantum well structures.	10M

Q.4(A)	Brief about Amplification by Stimulated Emission	10M
	OR	
Q.4(B)	Explain about Absorption Spectrum of Semiconductor in detail.	10M
Q.5(A)	Briefly discuss about Light Emitting Diode device characteristics	10M
	OR	
Q.5(B)	Explain about semiconductor LASER with necessary diagrams.	10M
Q.6(A)	Explain about Vertical cavity Surface Emitting Laser (VCSEL) in detail.	10M
	OR	
Q.6(B)	Explain briefly about Quantum Well Laser.	10M

*** END***

29-01-19 (FN)

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 14ME401-M1

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III-II - MOOCS (2015-Batch) (R14) Supplementary End Semester Examinations - Jan 2019

INTRODUCTION TO COMPOSITES

(Common to ALL)

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.1 i. Wood is an example of _____ composite material. 1M

(a) Unidirectional
(b) Bidirectional
(c) Multidirectional
(d) None of the options are correct

ii. Matrices [A], [B] and [D] are called_____. 1M

(a) extensional, coupling, and bending stiffness matrices, respectively.
(b) extensional, decoupling, and bending stiffness matrices, respectively.
(c) coupling, bending, and extensional stiffness matrices, respectively.
(d) None of the above

iii. Which one of the following assumptions does not relate to the classical lamination theory? 1M

(a) Each lamina is orthotropic and in a state of plane stress.
(b) Thickness of laminate is equal to sum of thickness of all individual layers.
(c) Each lamina is elastic.
(d) Slip may occur between lamina interfaces.

iv. The extensional stiffness matrix [A] for a laminate will not change if 1M

(a) stacking sequence is changed.
(b) angle of plies is changed.
(c) elastic properties of the lamina are changed.
(d) None of these

v. Mid-plane curvatures for a laminate are zero according to classical laminate theory if the 1M

(a) laminate is symmetric
(b) laminate is asymmetric
(c) laminate is symmetric and is subjected to only in-plane forces
(d) D16 = D26 = 0

vi. Which of the following sentence is not true regarding bond between adjacent layers of a composite laminate. 1M

(a) Thickness of laminate is equal to sum of thickness of all individual layers.
(b)Bond between two layers is perfectly rigid.

(i) Only a is true
(ii) Only b is true
(iii) Both a and b are true
(iv) None of these are true

vii. Which of the following laminates behave as a specially orthotropic material? 1M

(a) Angle-ply laminates.
(b) Cross-ply laminates.
(c) Anti-symmetric laminates.
(d) All of these.

viii. Which of the following is usually the stronger constituent of a composite laminate? 1M

(a) Matrix
(b) Reinforcement
(c) Both
(d) None of the options are correct.

ix. For an isotropic material, Young's modulus and shear modulus are always positive. 1M

(a) Only c
(b) a and b
(c) a and c
(d) all a, b and c

x. Which of the following laminates has a zero [B] matrix? 1M

(a) [0,90]
(b) [0,45]
(c) [0,45,45,0]
(d) [0,45, -45]

Q.2(A) List out some thermoplastic and thermosetting plastic resins and explain in detail about them. 10M

OR

Q.2(B) Calculate v_{XY} at 30° for a balanced lamina with following properties: E_L =15GPa, E_T=15GPa, G_{LT}=2.5GPa, $v_{LT} = v_{TL}$= 0.20 10M

Q.3(A) Calculate the major Poisson's ratio for Kevlar-epoxy composite with a fiber volume fraction of 30%. The Poisson's ratios for Kevlar and epoxy are 0.20 and 0.35, respectively. 10M

OR

Q.3(B) Derive the density of the composite in terms of volume fractions. 10M

Q.4(A) Calculate E_X at 60° for a balanced lamina with following properties: E_L = 15GPa, E_T= 15GPa, G_{LT} = 2.5GPa, $v_{LT} = v_{TL}$ = 0.20 10M

OR

Q.4(B) A balanced cross-ply laminate possessing mid-plane symmetry is made up of laminae having the following properties: 10M

$E_L = 15$ GPa $\quad G_{LT} = 3$ GPa

$E_T = 6$ GPa $\quad \nu_{LT} = 0.5$

0°
90°
90°
0°

The laminate is subjected to a normal axial stress of 15 MPa and a shear stress of 1.0 MPa. (Assumption: Laminate has a unit thickness and unit cross section.)
Find mid-plane strains for the laminate.

Q.5(A) Derive an expression for Young's modulus of fiber reinforced composite in iso stress condition. 10M

OR

Q.5(B) Calculate m_X at 70° for a balanced lamina with following properties: E_L=15GPa, E_T=15GPa, G_{LT}=2.5GPa, v_{LT}= v_{TL}=0.20 10M

Q.6(A) Estimate the coefficient of thermal expansion for a unidirectional glass-polyester composite in the longitudinal direction. The fiber volume fraction of the composite is 40%. Assume the following constituent properties. 10M
Coefficient of thermal expansion for fiber (α_f) =0.5*10^{-5}/ $^\circ$C
Coefficient of thermal expansion for matrix (α_m) =9.0*10^{-5}/$^\circ$C
Young's modulus of fiber (E_f) =70 GPa ;
Young's modulus of matrix (E_m)=3.5 GPa
Poisson's ration of fiber (v_f) = 0.2
Poisson's ration of matrix (v_m) = 0.35

OR

Q.6(B) Derive the expression of the Major Poisson's Ratio of the composite. 10M

*** END***