AR16

CODE: 16MTE1011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular Examinations, July-2017

FUELS, COMBUSTION AND ENVIRONMENT
(Thermal Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	A coal sample has the following compositions: proximate analysis: moisture= 2.2%; ash= 18%; volatile matter=25%; fixed carbon= 54.8%, Ultimate analysis: carbon=85%, Hydrogen= 6%, sulphur= 0.56%; nitrogen=3.2% and remaining oxygen. Calorific value Kcal/kg air dried= 6789. Calculate its calorific value using modified Dulong formula , Goutal formula and modified Mazumdar formula and compare it with given calorific value	8
	(b)	Discuss in detail the biomass energy conversion.	4
2.	(a)	Write about short note on coal carbonisation and gasification	8
	(b)	Discuss in detail the properties of petroleum	4
3.	(a)	Determine the flue gas analysis and air-fuel ratio by weight when a medium viscosity fuel oil with 84.9% carbon, 11.4% hydrogen , 3.2% sulphur,0.4% oxygen and 0.1% ash is burned with 30% excess air. Assume complete combustion	9
	(b)	Explain the term combustion efficiencies	3
4.	(a)	Explain the temperature -pressure distribution of propane/oxygen combustion system with a suitable graph.	8
	(b)	Derive the Arrhenius equation using fundamentals of combustion kinetics	4
5.	(a)	Explain adiabatic flame temperature briefly	6
	(b)	What is submerged combustion and pulsating combustion	6
6.	(a)	Discuss in detail characterization of flames	8
	(b)	Discuss the factors effecting the flame velocities	4
7.	(a)	Explain Oil burners with neat sketches	8
	(b)	Explain pressurised fluidised bed combustion with a sketch	4
8.		Discuss briefly of various methods to remove particulate matter	12

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tabular data for Question No: 1a)

V'	a
5	145
10	130
15	117
20	109
25	103
30	98
35	94
38	85
40	80

AR16

CODE: 16MDE1005 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular Examinations, July, 2017

SPREAD SPECTRUM COMMUNICATIONS
ELECTRONICS AND COMMUNICATION ENGINEERING
(DECS)

Time: 3 Hours Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	With neat block diagram explain the modulation and demodulation of direct sequence spread spectrum system	6M
	(b)	Write a short note on Chirp spread spectrum system	6M
2.	(a)	Explain time hopped signal analysis	6M
	(b)	Explain Coherent direct sequence receivers with a neat sketch	6M
3.	(a)	Explain Acquisition of spread spectrum signals with matched filters	8M
	(b)	Explain the concept of Acquisition cell by cell searching	4M
4.		Explain the method of carrier tracking in spread spectrum signals	12M
5.	(a)	Explain Delay lock loop analysis in detail	6M
	(b)	Write a short note on energy and Bandwidth efficiency in multiple accesses	6M
6.	(a)	How error correction coding is done in spread spectrum communications?	4M
	(b)	Explain the generation & detection of SAW device PN generators with a neat diagram?	8M
7.		Explain Non coherent frequency hop receiver with a neat diagram	12M
8.	(a)	Write a short note on Anti jam Considerations	5M
	(b)	Compare Hybrid Spread spectrum and Chirp spread spectrum systems.	7M

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CODE: 16MSE1011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular Examinations, July-2017

Finite Element Method in Structural Engineering

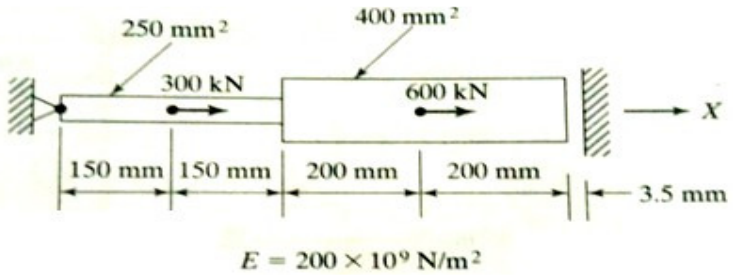
(Structural Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Explain the various steps involved in solving a problem using finite element method.	6M
	(b)	Briefly explain the concept of potential energy approach.	6M
2.	(a)	Distinguish between local, natural and global coordinates	6M
	(b)	Explain the following: (i) Variational method and (ii) Importance of Boundary conditions.	6M
3.	(a)	Derive the stiffness matrix by strain displacement matrix.	6M
	(b)	Derive the stress –strain relations and also explain plane stress and plane strain conditions	6M
4.	(a)	A beam of length 2 m is fixed at both ends. Estimate the deflection at the center of the beam where load is acting vertically downward of 10 kN. Divide the beam into two elements. Compare the solution with theoretical calculations. Take E = 2 × 1011 N/m2 , A = 250 mm2 .	8M
	(b)	Derive the assembly of global stiffness matrix and load vector	4M
5.	(a)	Why three noded triangular element called as CST element.	6M
	(b)	Define 1)iso parametric element 2)sub parametric element 3)super parametric element	6M

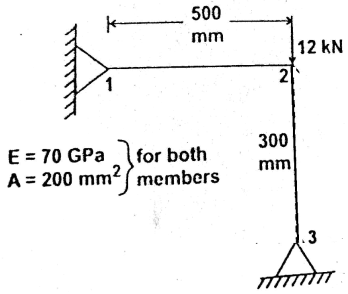
6. (a) Consider the bar as shown in the figure .Determine the nodal displacements, element stress and support reactions 8M



(b) Derive the jacobian matrix for triangular element. 4M

7. (a) Derive the shape functions for 2-D truss element. 4M

(b) For the two bar truss as shown in figure determine the displacements at node 2 the stresses in both elements 8M



8. (a) What are the types of three dimensional finite elements. explain briefly. 6M

(b) Write the properties of shape functions for 3-D tetrahedral element. 6M

AR16

CODE: 16MPE1009 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular Examinations, July-2017

SWITCHED MODE POWER CONVERTERS
(PED)

Time: 3 Hours Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	With neat circuit diagram explain Fly-Back converter and obtain the expression of output voltage.	7M
	(b)	Discuss the significance of transformer connection in isolated power supplies with circuit model.	5M
2.	(a)	Describe the operation of Forward converter with circuit diagram. Also derive the expression of output voltage and inductor current.	7M
	(b)	Compare various types of isolated dc-dc power supplies.	5M
3.	(a)	Explain the operation Push-Pull converter with circuit diagram under various switching modes.	6M
	(b)	Discuss the operation of half-bridge isolated dc-dc converter with necessary diagrams.	6M
4.	(a)	Explain buck converter with necessary circuit and waveforms. Also derive steady state output voltage and inductor current from dynamic model.	7M
	(b)	Discuss boost converter transfer function for steady state operation.	5M
5.	(a)	Describe how system stability of control system is analysed by using bode plot.	7M
	(b)	Write short notes various controllers to make output steady and stable.	5M
6.	(a)	Discuss the operation of series resonant converter with necessary circuits and waveforms.	7M
	(b)	Explain various features of resonant switches.	5M
7.	(a)	Brief the operation of parallel resonant converter and derive expression for resonance frequency.	6M
	(b)	Explain the concept of ZCS by M-type resonant converter with waveforms.	6M
8.	(a)	With necessary circuit and waveform explain working principle ZVS resonant converter.	7M
	(b)	Differentiate ZCS and ZVS resonant converter.	5M

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CODE: 16MVL1009 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular Examinations, July- 2017

MIXED SIGNAL IC DESIGN
ELECTRONICS AND COMMUNICATION ENGINEERING
(VLSI System Design)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Derive the transfer function expression for parasitic-insensitive integrator?	6M
	(b)	Estimate the resistor equivalence of a switched capacitor circuit with neat sketches?	6M
2.	(a)	Explain the operation of High-Q switched capacitor biquad filter?	6M
	(b)	With signal flow graph explain the working principle of first order switched capacitor filter?	6M
3.	(a)	Explain in detail about PFD/CP nonidealities in PLL?	6M
	(b)	Analyze the problem of lock acquisition in charge pump PLL?	6M
4.	(a)	Explain the operation of 4-bit R-2R D/A converter?	6M
	(b)	Describe the working principle of thermometer code current mode D/A converter?	6M
5.	(a)	Illustrate the operation of one bit per stage pipe lined A/D converter?	6M
	(b)	List the major issues in designing Flash A/D converters?	6M
6.	(a)	Explain in detail about delta-sigma D/A converters?	6M
	(b)	Enumerate in detail about interpolative higher order modulator?	6M
7.	(a)	Compare resistor-string and folded resistor-string D/A converters with necessary diagrams?	12M
8.	(a)	Analyze the operation of D/A converter based Successive Approximation A/D converter?	6M
	(b)	Explain the block diagram of four channel time-interleaved A/D converter with clock waveforms?	6M

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CODE: 16MCS1010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular Examinations, July-2017

DATA MINING AND KNOWLEDGE DISCOVERY
(Computer Science Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Explain in detail about different data pre-processing operations.	8
	(b)	Discuss about different OLAP operations.	4
2.	(a)	Write an algorithm for decision tree induction.	8
	(b)	Explain various attribute selection measures.	4
3.	(a)	Discuss about bayes theorm	4
	(b)	Explain the different ways for estimating the conditional probabilities of continuous attributes.	8
4.	(a)	Explain the various methods for candidate generation and pruning.	8
	(b)	Discuss about frequent item sets and closed item sets.	4
5.	(a)	Write an algorithm for sequential pattern discovery	8
	(b)	Discuss about sequential patterns.	4
6.	(a)	Explain about various clustering methods.	6
	(b)	Write an algorithm for k-means and mention the demerits of this algorithm,	6
7.	(a)	Discuss about density based methods.	4
	(b)	Explain the various methods for evaluating the performance of a classifier.	8
8.	(a)	Discuss about support and confidence in association rule mining.	4
	(b)	Explain about monotone property and anti-monotone property with example.	8

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