AR 16 **Set-02**

Code No:16MTE1011

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT TEKKALI

(AUTONOMOUS)

I M.Tech. II Semester Regular & Supplementary Examinations, August-2018

FUELS COMBUSTION AND ENVIRONMENT

(Thermal Engineering)

Time : 3Hours **Max Marks : 60**

Answer any FIVE questions
All questions carry EQUAL marks

1.	a. Compare proximate and ultimate analysis of fuel.	6M
	b. The difference between the fixed carbon in the proximate analysis and ultimate analysis is less for a high rank than for a low rank coal. Explain.	6M
2.	a. Compare solid, liquid and gaseous fuels.	6M
	b. Explain combustion stoichiometry in detail.	6M
3.	a. Explain in brief Zeroth, first, second and third order reactions.	8M
	b. With the help of suitable graphs illustrate about the oxidation reaction of hydrocarbon.	4M
4.	a. Explain any one methodology used to calculate the adiabatic flame temperature.	5M
	b. Discuss the salient features of flame stability diagram by drawing the characteristic flame stability diagram	7M
5.	a. Explain in brief the combustion of fuel, droplets and sprays.	6M
	b. Describe various parameters influencing the turbulent flame.	6M
6.	a. Explain fluidised bed system.	6M
	b. Suggest a combustion system for a gaseous fuel and explain it in detail.	6M
7.	What are the legislative measures of pollutants and explain various methods of emission control.	4+8M
8.	Write in brief about the following.	
	a. Alcohols and biogas.	4M
	b. Burning velocity of fuels.	4M
	c. Effect of air pollution on human health.	4M

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SET-1

AR16

Code No: 16MPE1009

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, August-2018

SWITCHED MODE POWER CONVERTERS
(Power Electronics & Drives)

Time : 3 hours **Max Marks :60**

Answer any FIVE questions
All questions carry equal marks

1	a)	Explain the working of forward converter with neat waveforms.	[6M]
	b)	Explain about push-pull topologies.	[6M]
2	a)	Explain the working of half bridge converter with neat waveforms.	[6M]
	b)	Explain the working of full bridge converter with neat waveforms.	[6M]
3	a)	Develop the small signal model of buck-boost converter.	[6M]
	b)	Draw and explain averaged circuit model for an ideal boost converter.	[6M]
4	a)	Write the relationship between phase margin and closed loop damping factor.	[6M]
	b)	What are the specifications to design the DC regulator?	[6M]
5	a)	Explain the working of series resonant converter with neat waveforms.	[6M]
	b)	Classify and explain the basic resonant converters.	[6M]
6	a)	Explain the principle of operation of M-type ZVS buck converter.	[6M]
	b)	Explain the principle of operation of L-type ZCS boost converter.	[6M]
7	a)	Compare the ZVS and ZCS resonant converters.	[6M]
	b)	Compare the operation of PI controller with PD controller?	[6M]
8	a)	What is the requirement for isolation in switched mode converters?	[6M]
	b)	Explain the working of fly-back converter with neat waveforms.	[6M]

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AR16

CODE: 16MVL1009 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.TECH. II SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, AUGUST-2018

MIXED SIGNAL IC DESIGN
(VLSI System Design)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	What are the basic building blocks of a switched capacitor circuit?	6M
	(b)	Explain the operation of a simple switched capacitor integrator.	6M
2.	(a)	What are the Non-ideal effects in switched capacitor circuits?	6M
	(b)	Analyse the operation of a switched capacitor first order filter.	6M
3.	(a)	Draw the block diagram of a linear type-1 PLL and explain its operation.	6M
	(b)	Differentiate type 1 PLLs and charge pump PLLs.	6M
4.	(a)	Comment on the stability issues of PLLs.	6M
	(b)	Explain the effect of VCO jitter In phase locked loops.	6M
5.	(a)	Explain briefly about thermometer code converters with neat sketches.	6M
	(b)	What is the effect of quantisation noise on the code converters? Explain.	6M
6.	(a)	Explain the architecture of pipelined A/D converters with neat sketches.	6M
	(b)	Explain about two-step flash converter implementation.	6M
7.	(a)	Explain about stability considerations in higher order modulators.	6M
	(b)	Explain the concept of delta sigma modulators with multi bit quantizers.	6M
8.		Explain about the different loop configurations of delta sigma D/A converter.	12M

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AR16

CODE: 16MCS1010 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, August-2018

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 the general characteristics of data sets.	6
	(b)	Discuss about different visualization techniques	6
2.	(a)	Explain the methods for expressing attribute test conditions.	8
	(b)	Discuss about Model Overfitting	4
3.	(a)	What are the characteristics of Nearest Neighbour classifiers.	4
	(b)	Write an algorithm for k-nearest neighbour classification.	8
4.	(a)	Discuss about association rule mining.	4
	(b)	Write an algorithm for apriori approach.	8
5.	(a)	Explain various methodologies for applying association analysis to continuous data.	8
	(b)	Discuss about concept hierarchy.	4
6.	(a)	Explain about strengths and weaknesses of hierarchal clustering.	4
	(b)	Write an algorithm for DBSCAN.	8
7.	(a)	Explain the functionalities of data mining.	6
	(b)	What are the requirements of a clustering?	6
8.	(a)	What is the advantage with FP-growth approach when compared to apriori approach?	4
	(b)	Explain various types of support vector machines.	8

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AR16

CODE: 16MSE1011 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, August-2018

FINITE ELEMENT METHOD IN STRUCTURAL ENGINEERING
(Structural Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

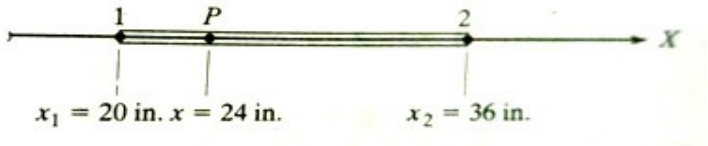
1. (a) Explain about Finite Element formulations. 6M

   (b) Explain the General procedure of F.E.M 6M

2. (a) With the help of a neat diagram, describe the various components of stress and strains. 6M

   (b) Derive the stress-strain relationship and strain displacement elevation 6M

3. (a) Derive the load vectorr for Evaluate ξ,N1and N2 at point P as shown in the figure



6M

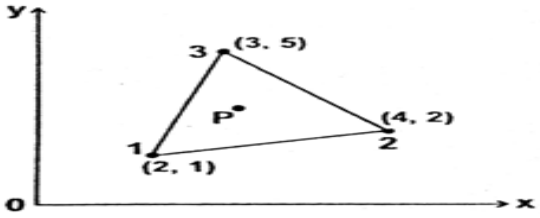
   (b) Write the properties of stiffness matrix and also differentiate between global coordinate system and local coordinate system. 6M

4. (a) Derive the stiffness matrix for a 2D beam element 8M

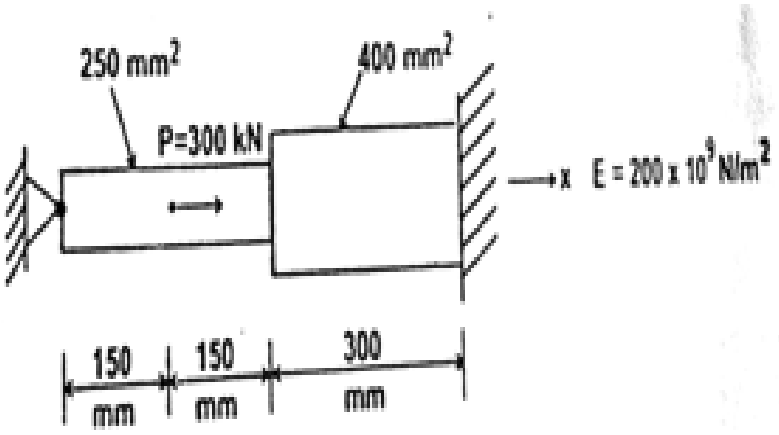
   (b) What is the difference between H-refinement and p-refinement 4M

5. (a) Derive the expressions for natural co - ordinates in a CST(constant strain triangular) element. Show that they are nothing but area co - ordinates. 6M

   b) For the point p located inside the triangular element shown in figure if the shape functions N_1 and N_2 are 0.3 and 0.5 respectively, find its X and Y coordinates and the left out shape functions 6M



6. (a) A stepped bar is subjected to an axial load of 300KN as shown in figure find the nodal displacements, element stresses and support reactions 7M



(b) Derive the rayleigh's-ritz method. 5M

7. (a) Derivation of stiffness matrix for truss element 6M

(b) Derive the shape functions for beam element. 6M

8. (a) Derive and determine the stiffness matrix for a four noded tetrahedral solid element 7M

(b) Explain basic concept of hexahedral element. 5M

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