**AR 13** **Set-01**

**Code No:13MTE1011**

# ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT TEKKALI

**(AUTONOMOUS)**

**I M.TECH II SEMESTER REGULAR EXAMINATION, JULY - 2014**

**FUELS COMBUSTION AND ENVIRONMENT**

**(Thermal Engineering)**

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

**Answer any FIVE questions**
**All questions carry EQUAL marks**

1. a. Explain in detail proximate and ultimate analysis of fuel. 8M
   b. Discuss the problems associated with very low calorific value fuels. 4M

2. Explain carbonization, Gasification and liquefaction. 4+4+4M

3. A producer gas has the following composition by volume: $H_2$ = 10.4%, $CH_4$ = 35%, CO = 25%, $CO_2$ – 10.8%, $N_2$ = 50.3%. Calculate the quantity of air required per $m^3$ of gas. If 20% of excess air is supplied, find the percentage composition of the products of combustion. 12M

4. a. Explain collision theory of reaction kinetics. 6M
   b. What are the differences between molecularity and order of a reaction? 6M

5. a. Explain flame propagation in combustion chambers with the help of flame stability. 7M
   b. Describe the thermodynamics of enthalpy of formation of species in combustion. 5M

6. a. List out the relative advantages of pulverized fuel firing system. 4M
   b. Compare the combustion systems for a gas fired and solid fuel fired systems. 8M

7. List out the effects of air pollution. Also explain different methods of controlling air pollution. 5+7M

8. Write in brief about the following.
   a. Petroleum based fuels. 4M
   b. Dew point of products. 4M
   c. Equilibrium composition of gaseous mixtures. 4M

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**AR13** **Set - 01**

**Code No.13MVL1009**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TAKKALI**
**(AUTONOMOUS)**
**I M.Tech. II Semester Regular Examinations, July-2014**
**DSP PROCESSORS AND ARCHITECTURE**
**(Common to VLSI System Design and DECS)**

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

**Answer any FIVE questions**
**All questions carry EQUAL marks**
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1. a) For an FIR filter $y(n) = \frac{x(n)+x(n-1)+x(n-2)}{3}$ determine
   (i) Magnitude and Phase response
   (ii) Poles and zeros

   b) Compute the FFT of the sequence x(n) = {1,0,0,0,1}.

2. a) What is dynamic range and precision in DSP system?
   b) Explain the function of compensating filter.

3. (a) With suitable architecture explain the different data addressing capabilities for programmable DSP devices.
   (b) Explain about multiply and accumulate unit.

4. Explain about various pipeline programming models.

5. (a) Write briefly on commercial digital signal processing devices.
   (b) Write about program control unit of TMS320C54xx.

6. (a) Write about Q-notation in DSP algorithms.
   (b) What values are represented by the 16 bit fixed point number N=4000h in the Q15 and the Q7 notation?

7. (a) Implement 8 point FFT on the TMS320C54xx processor.
   (b) What is overflow and scaling?

8. Explain
   (a) Direct Memory Access (b) CODEC (c) MCBSP Programmer

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**AR13** **Set - 02**

**CODE: 13MIT1007**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(Autonomous)**

**I M.Tech, II Semester Regular Examinations, July – 2014**

**IMAGE PROCESSING**

**(Information Technology)**

Time: 3 Hours Max. Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. Explain the fields that use Digital Image Processing. (12M)

2. a) Explain the basic relationships between pixels in an image. (6M)
   b) Discuss about DCT. (6M)

3. a) Explain some basic gray level transformation. (6M)
   b) Explain spatial domain filters which perform sharpening operation on images. (6M)

4. a) Explain about frequency domain filters which perform smoothing operation. (6M)
   b) Explain color segmentation. (6M)

5. a) Explain the different noise models. (6M)
   b) Explain constrained least square filtering. (6M)

6. Discuss about 2D discrete wavelet transforms. (12M)

7. Discuss about lossy and loss less predictive coding techniques. (12M)

8. a) Explain region based segmentation. (6M)
   b) Explain Regional Descriptors. (6M)

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**AR 13** **Set-01**

**Code No:13MPE1009**

# ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT TEKKALI

**(AUTONOMOUS)**

**I M.TECH .II SEMESTER REGULAR EXAMINATION ,JULY - 2014**

**SWITCHED MODE POWER CONVERTERS**

**(Power Electronics and Electric Drives)**

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

**Answer any FIVE questions**
**All questions carry EQUAL marks**

1. With the help of circuit diagram and waveforms explain the working of push pull converter? 12M

2. (a) Draw schematic diagram of a switching mode power supply and explain its operation briefly? 6M
   (b) Explain in detail the transformer isolation in switch mode power converter 3M
   (c) State the merits and demerits of switch mode power supply 3M

3. (a)Explain the operation of buck converter and its modes of operation with neat waveforms? 6M
   (b) Derive the transfer function for buck converter by using small signal model? 6M

4. Explain the operation of full bridge converter with steady state waveforms in continues mode. 12M

5. Explain the concept of bode plots to determine stability of linear time invariant system? 12M

6. Explain working of series resonant converter using neat circuit diagram and waveforms? 12M

7. Explain various modes of operation of L-type Zero current switching with neat circuit diagram? 12M

8. Explain the different modes of operation of M-type ZVS resonant converter? 12M

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**AR13** **Set-02**

**Code No : 13MCS1007**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**
**(AUTONOMOUS)**
**I M.Tech II Semester Regular Examinations, July -2014**
**DATA WAREHOUSING AND DATA MINING**
**(Computer Science and Engineering)**

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

**Answer any FIVE questions**
**All questions carry equal marks**

1) a)With a neat sketch explain the architecture of data warehouse. [8M]
b) Write short notes on data warehouse metadata. [4M]

2) a) What is Data mining ? What are motivating challenges for data mining? [6M]
b) List the major data mining tasks. Differentiate between predictive and descriptive data Mining tasks giving suitable examples [6M]

3) a) Explain the K-Means clustering algorithm with an example. [6M]
b) Compare Neural Network-based classification? Explain with example [6M]

4) a)Explain DBSCAN Algorithm, with an example. [8M]
b) Explain different types of clusters. [4M]

5) a)Explain Navie Bayesian classifier and Explain with an Example. [6M]
. b)Explain Similarity Measures for various Kinds of data in clustering. [6M]

6) a) Explain any one density based clustering Method and Explain its merits over other kinds of Clustering Methods. [8M]
b) Explain any two Hierarchical Methods for clustering and Write the difference between Them. [4M]

7) a) Describe the Methods to Improve efficiency of a Apriori Algorithm. [6M]
b) Explain genetic Algorithms and Rough Set Approach. [6M]

8) a)Explain at least Three Measures for selecting Right attributes for splitting a decision Tree. [6M]
b)What are various classification accuracy measures? Also write the differences between classification and prediction. [6M]

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