

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I M.Tech. II Semester Regular Examinations, JULY, 2017****REFRIGERATION AND AIR CONDITIONING
(Thermal Engineering)**

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Briefly explain the factors affecting the performance of Vapour Compression Refrigeration system 4M
(b) An ammonia refrigerator produces 20 tonnes of ice per day from and at 0°C . The condensation and evaporation take place at 20°C and -20°C respectively. The temperature of vapour at the end of isentropic compression is 50°C and there is no under cooling of the liquid. The actual COP is 70% of the theoretical COP. Determine: (i) The rate of NH_3 circulation; (ii) The size of single acting compressor when running at 240 rpm. Assuming $L=D$ and volumetric efficiency of 80%. Take latent heat of fusion of ice (h_{fg})= 335 kJ/kg ; v_{sup} , specific volume of dry vapour at -20°C $=0.624 \text{ m}^3/\text{kg}$. Specific heat of superheated vapour $= 2.8 \text{ kJ/kg}^{\circ}\text{C}$. 8M
- 2 A refrigeration plant comprises three evaporators of capacities 10 tonnes at 10°C 20 tonnes at 5°C and 30 tonnes at -10°C with individual expansion valves and individual compressors but one condenser operating at 40°C and sub cooling the liquid to 30°C . All the evaporators discharge dry saturated refrigerant Freon 12 to the compressor. Assume isentropic compression in each compressor. Use p-h diagram for R-12. Determine (i) Refrigeration effect in each evaporator; (ii) Mass flow rate in each evaporator; (iii) Compressor power required in each compressor; (iv) Heat rejected in the condenser; (v) Coefficient of performance 8M
3. (a) Briefly explain the working of Modified/Practical Vapour Absorption System with a neat sketch 8M
(b) Find the maximum COP of a Vapour Absorption Refrigeration System in which heating, cooling and refrigeration takes place at the temperatures of 100°C , 20°C and -5°C respectively. 4M
4. (a) What is the necessity of air craft refrigeration? Briefly explain the working of Boot-strap air refrigeration system without evaporative cooling. 6M
(b) A simple air cooled system is used for an aeroplane having a load of 9 tonnes. The atmospheric pressure and temperature are 0.9 bar and 10°C respectively. During ramming, pressure increases to 1.013 bar. In the heat exchanger, the temperature of air is reduced by 55°C . The pressure in the cabin is 1.01 bar and the temperature of air leaving the cabin is 25°C . Determine: (i) Power required to take the load of cooling in the cabin; (ii) C.O.P of the system 6M

AR16

CODE: 16MTE1019

SET - 1

5. (a) Discuss (i) Seebeck effect and (ii) Peltier effect. Draw a simplified sketch of Thermoelectric Refrigeration system 6M
(b) Enumerate the advantages, disadvantages and applications of Vortex Tube 6M
6. (a) Briefly explain the following psychrometric processes (i) Cooling and Dehumidification (ii) Heating and Humidification by showing the processes on Psychrometric chart 5M
(b) A sample of air has DBT and WBT of 35°C and 25°C respectively as recorded by a sling psychrometer. The barometric pressure is 1.0132 bar. Make calculations for (a) the vapour pressure (b) the relative humidity (c) the specific humidity (d) the degree of saturation (e) the dew point temperature and (f) the enthalpy of the mixture. 7M
7. (a) Briefly explain the working of Summer air conditioning system for Hot and Dry outdoor air conditions 6M
(b) The atmospheric air at 760mm of Hg, DBT of 15°C , WBT of 11°C enters a heating coil of temperature 41°C . Assume the bi-pass factor of heating coil as 0.5. Determine the DBT, WBT and RH of air leaving the coil. Also determine the sensible heat added to air per kg of dry air. 6M
8. (a) List out the cooling loads to be considered for providing air conditioning for Summer seasons 4M
(b) An air conditioned auditorium is to be maintained at 27°C DBT and 60 % RH. The ambient condition is 40°C DBT and 30°C WBT. The total sensible heat load is 1,00,000 kJ/hr and the total latent heat load is 40,000 kJ/hr. 60% of the return air is recirculated and mixed with 40% of make-up air after the cooling coil. The condition of air leaving the cooling coil is at 18°C . Show the processes on the psychrometric chart and determine the following (i) Room Sensible Heat Factor (ii) The condition of air entering the auditorium (iii) The amount of make-up air (iv) The Apparatus Dew Point (v) The By pass factor of the cooling coil 8M

AR16

CODE: 16MDE1009 **SET-2**
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular Examinations, JULY, 2017

ADAPTIVE SIGNAL PROCESSING (DECS)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Define Eigen values and Eigen vectors with an example 6M
(b) Explain the Adaptive Linear Combiner. 6M
2. (a) Explain Linear Optimum Filtering with an example 6M
(b) Explain Weight Vectors of an Adaptive System with an example 6M
3. (a) Derive Minimum Mean Square Error in an Adaptive System 6M
(b) Explain Gradient Searching Algorithm with an example 6M
4. (a) Explain Stability & Performance analysis of LMS Algorithms with an example 6M
(b) Write a short notes on convergence of LMS algorithm 6M
5. (a) How Noise cancellation is done in LMS Adaptation algorithms 6M
(b) Explain Adaptive Beam forming with an example 6M
6. (a) Explain Matrix Inversion lemma in RLS Algorithm 8M
(b) Write a short notes on convergence of RLS algorithm 4M
7. (a) Briefly Explain Gradient Search by Newton's Method in Steepest Descent Algorithm 8M
(b) Write a short notes on Comparison of Learning Curves 4M
8. Explain with examples
(a) Eigen Value computations 4M
(b) Wiener- Hopf equations 4M
(c) Update recursion for the sum of weighted error squares 4M

**POWER QUALITY MANAGEMENT
(PED)**

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. What is power quality and Discuss the following characteristics of power quality events
(i) Short duration variations. (12)
(ii) Long duration variations
(iii) Voltage imbalance
2. Write briefly on
(i) Voltage flicker (12)
(ii) CBEMA curve
3. Discuss the sources of sags, and the sag performance evaluation indices. (12)
4. Explain the sources of transient over voltages and computer tools for transient analysis. (12)
5. Discuss the voltage regulating devices in use on utility and industrial power systems. (12)
6. Explain the sources of harmonics. (12)
7. Discuss the various devices for controlling harmonic distortion. (12)
8. Write short notes on different power quality measurement equipment. (12)

AR16

CODE: 16MVL1015

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I M.Tech. II Semester Regular Examinations, JULY, 2017

**CPLD AND FPGA ARCHITECTURE AND APPLICATIONS
(VLSI System Design)**

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Explain various applications of programmable logic devices? [6M]
(b) Based on architecture explain how FPGAs are different from CPLDs. [6M]
2. (a) Explain the Architecture of Cypress FLASH 370 CPLDs. [6M]
(b) Compare the different versions of AMD's Mach series CPLDs? [6M]
3. (a) Explain briefly about Xilinx XC4000 FPGA device. [6M]
(b) Explain FPGA design Flow with neat block diagrams. [6M]
4. (a) Explain briefly about realization for state machine charts using microprogramming with an example. [6M]
(b) Explain about encoded state machine with an example. [6M]
5. (a) Explain how universal shift register can be used for the design of an FSM. [6M]
(b) Design a one to Three pulse generator using a PLA. [6M]
6. (a) Explain the concept of extended petrinets used for synchronous parallel controllers. [6M]
(b) Explain the application of One hot design method to a serial 2's complementer. [6M]
7. (a) Explain briefly about the concept of controller and data path in a digital system design. [6M]
(b) Elaborate on system level design using mentor graphics EDA tool. [6M]
8. (a) Explain the design of three bit parallel adder with accumulator using CPLD? [6M]
(b) Explain the Design considerations using CPLDs and FPGAs of parallel adder cell. [6M]

**DIGITAL IMAGE PROCESSING
(Computer Science and Engineering)**

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Define the terms sampling and quantization. What is their role in image quality and size? [6M]
(b) Write a brief note about the components of image processing systems [6M]
2. (a) Describe various distance measures. [6M]
(b) Explain the following: i) Connectivity ii) Region and Boundaries [6M]
3. (a) Explain the basic Gray level transformations with a neat sketch? [6M]
(b) What is meant by Enhancement by point processing? Explain. [6M]
4. (a) Distinguish between Smoothing and Sharpening Spatial filters? [6M]
(b) Explain the Second order derivative for image enhancement [6M]
5. (a) Explain the Hit-or Miss Transformation [6M]
(b) Explain the following: i) Erosion ii) Dilation [6M]
6. (a) Define image segmentation? Explain the various discontinuity detection methods. [6M]
(b) Explain the Edge Linking and Boundary Detection in image segmentation. [6M]
7. (a) Explain the Different Redundancy Techniques in image Compression [6M]
(b) What is Error Free Compression? Explain about Variable Length Coding [6M]
8. (a) Draw the functional Block diagram of pseudo colour image processing and explain [6M]
(b) Discuss about full colour image processing. [6M]

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I M.Tech. II Semester Regular Examinations, JULY, 2017****DESIGN OF SUBSTRUCTURES
(Structural Engineering)**

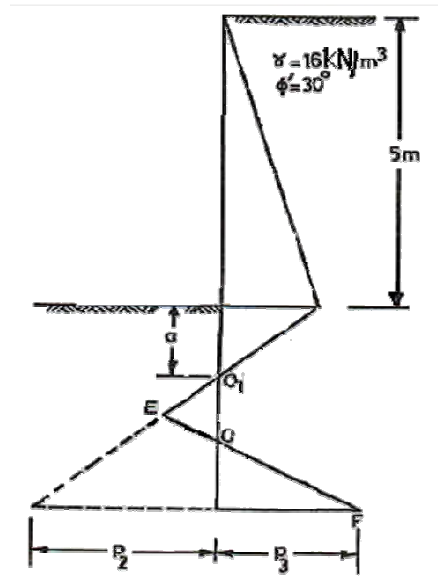
Time: 3 Hours

Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) What is a substructure? List some of the important substructures. 6
(b) What is the role of a foundation engineer? 6
2. (a) List the types of marine substructures? Explain about the two main methods used to destroy water waves or reducing their size? 6
(b) Explain about the forces to be considered in the design of a waterfront structure? 6
3. Design a (i) wall type breakwater, and (ii) mound type breakwater using the following data : 12
Depth of water = 20m
Wind velocity = 150 kmph
Fetch of wave = 200km.
(Assume any other data suitably)
4. Explain the procedure to determine the dredge depth using the fixed earth support method for an anchored sheet pile wall? 12
5. (a) List the details of information required for design and construction of foundation for a transmission line tower? List the forces for which a transmission line tower is to be designed? 8
(b) What are the general design criteria of design for transmission line tower? 4
6. With neat sketches, write a very brief note on types of machine foundations and their design criteria? 12

7. Determine the required dredge depth of a cantilever sheet pile shown in the adjacent figure.



12

8. (a) What is a seawall and how is it constructed? 6
- (b) What is a wharf? What are the types of construction and discuss their merits? 6

AR13

Set-01

Code No: 13MDE1008

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I M.Tech II Semester Supplementary Examinations, July -2017

IMAGE AND VIDEO PROCESSING

(Digital Electronics & Communications Systems)

Time: 3 hours

Max.Marks:60

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

1. a. Explain about the basic relationships and distance measures between pixels in digital image. [8M]
b. Explain briefly about Sampling and Quantization of an Image. [4M]
2. What is histogram of an image? Explain Histogram Equalization with example. [12M]
3. Define Image Segmentation and Explain about Point, Line and Edge Detection.[12M]
4. a. What is meant by Image Compression? Discuss about Huffman Coding with suitable example. [8M]
b. Discuss in brief about LZW coding. [4M]
5. Explain about different Time varying Image Formation Models. [12M]
6. Explain any three Motion estimation algorithms in detail. [12M]
7. a. State and Prove properties of Fourier Transforms. [6M]
b. What are the applications of Digital Image processing? Explain how a digital image is formed eye. [6M]
8. What are the applications of Compression? Explain in detail general Image Compression System Model. [12M]
