Code No: 13MTE1019

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular/ Supplementary Examinations, August–2016

REFRIGERATION AND AIR CONDITIONING
(THERMAL ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks

1.	a)	What is the purpose of under cooling in vapour compression system? Differentiate between dry and wet compression. What are the advantages of one over the other?	[6M]
	b)	What is an expansion device? Explain with the help of a neat sketch the working principle of a Thermostatic expansion device	[6M]
2.		A two stage vapour compression refrigeration system with a flash chamber operates with ammonia as refrigerant. The evaporator and condenser temperatures -30 °C and 40 °C, respectively. If the capacity of the plant is 30tonnes of refrigeration, estimate the total work of compression and COP. Had the compression been done in a single stage, what would have been the percentage increase in the compression? What is the percentage increase in the COP owing to the staging of the compression process?	[12M]
3.	a)	Explain with a suitable diagram, the working of Cascade refrigeration system. Why and where does this system find itself particularly useful?	[6M]
	b)	Using the first and second laws of thermodynamics derive the expression for maximum COP of a vapour absorption refrigeration system in terms of temperatures	[6M]
4.		In an aircraft cooling system, air enters the compressor at 0.1MPa, 4°C, and is compressed to 0.3MPa with an isentropic efficiency of 72%. After being cooled to 55°C at constant pressure in a heat exchanger the air then expands in a turbine to 0.1MPa with an isentropic efficiency of 78%. The low temperature air absorbs a cooling load of 3tonnes of refrigeration at constant pressure before entering the compressor which is driven by the turbine. Assuming air to be an ideal gas, determine the COP of the refrigerator, the driving power required and the air mass flow rate.	[12M]
5.		Explain the working principle of vortex tube and explain that the energy exchange phenomenon in vortex tube is not a violation of second law of thermodynamics	[12M]
6.		Define human comport. Give the factors governing optimum effective temperature. Outline the main points considered for cooling load estimate and heating load estimate.	[12M]
7.		A classroom with seating capacity of 75 persons has to be air conditioned, first by heating and then humidifying, during winter. The outdoor conditions are: DBT 10 °C, WBT 8 °C. The indoor conditions are DBT20 °C, RH 50%. An amount of $0.3m^3$ per person is circulated. Calculate the capacity of the heating coil and its surface temperature and the bypass factor is 0.5 and also calculate the capacity of the humidifier.	[12M]
8.		An auditorium has to be air conditioned, first by cooling and dehumidifying, and then heating for summer when the outdoor conditions are: DBT 35 °C, RH 70%. The desired indoor conditions are DBT20 °C, RH 60%. The cooling coil dew point temperature is 10°C. The amount of free air to be circulated is $300m^3$. Estimate i) the capacity of the cooling coil and its bypass factor. ii) the capacity of heating coil and its surface temperature when the bypass factor is 0.25 and iii) the mass of water vapour removed.	[12M]

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AR13 **Set-02**

Code No: 13MDE1008

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M. Tech II Semester Regular / Supplementary Examinations, August-2016
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) With help of detailed block diagram explain the steps involved in the digital Image processing.
   b) Explain about the effects of sampling and quantization digital image.

2. a) Discuss about the fundamental of spatial filtering.
   b) Explain about smoothing spatial filter.

3. a)What do you mean by "thresholding"? Explain the role in image processing.
   b) Explain about point and line detection.

4. Distinguish between lossy and lossless compress techniques. Explain the role Huffman coding with an illustration.

5. a) Describe geometric image formation in detail.
   b) Discuss the sampling of video signals.

6. Discuss about any four methods of 2-D motion techniques.

7. a) State and prove the properties of Fourier transform.
   b) Explain DCT along with mathematical support.

8. Write short notes on the following
   a) JPEG standard
   b) LZW coding

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AR13 **Set-01**

Code No: 13MPE1015

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M. Tech II Semester Regular / Supplementary Examinations, August-2016

POWER QUALITY MANAGEMENT
(Power Electronics and Electric Drives)

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

Answer any FIVE questions.
All questions carry EQUAL Marks

1. Discuss the following characteristics of power quality events (3M+3M+3M+3M)
   (i) Short duration variations. (ii) DC Offset
   (iii) Long duration variations (iv) Voltage imbalance

2. Discuss about the computer Business Equipment Manufactures Associations (CBEMA) and ITI curves, Explain about the events described in the curves (6M+6M)

3. a) Discuss the sources of sags and interruption (6M)
   b) Discuss in detail about the sag performance evaluation indices (6M)

4. a) What are the different sources of transient over voltages? (6M)
   b) Discuss the computer tools for transient analysis? (6M)

5. Explain the role of capacitor in voltage regulation? (12M)

6. Discuss the Effects of Harmonics on (4M+4M+4M)
   (i) Transformers. (ii) Capacitors
   (iii) Energy and Demand Metering?

7. Give the procedure for designing a filter with an example? (12M)

8. a) Give the objectives of power quality monitoring? (6M)
   b) List the major power quality measuring equipment (6M)

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AR13 **Set-02**

Code No: 13MVL1015

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I M. Tech II Semester Regular / Supplementary Examinations, August-2016

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) Differentiate between PLA, PAL and ROM with neat Block Diagram? [6M]
   (b) Realize the function F_1=DC+D'C'+BA'+ B'A; F_2=DA+ CB'+D'C'BA using PAL? [6M]

2. (a) Sketch MAX 5000 Architecture & Macrocell? [6M]
   (b) Discuss the architecture of AMD's Mach 4 – CPLD with neat Diagram? [6M]

3. (a) Sketch FPGA Design Flow? [6M]
   (b) Explain ALTERA's FLEX 8000 Series FPGAs? [6M]

4. (a) Discuss in detail about Top Down Design Approach? [6M]
   (b) Explain about Encoded State Machine? [6M]

5. (a) What are the properties of Petrinets? Explain the State Machine Petrinets for with an example? [6M]
   (b) Describe briefly about Finite State Machine with an example? [6M]

6. (a) Explain about the applications of Onehot Design Method? [6M]
   (b) Discuss the following [6M]
   (i) Synchronization.
   (ii)In System Programmability.

7. (a) Compare and contrast the salient features of CPLD and FPGA? [6M]
   (b) Discuss about front end digital design tools for FPGA & ASIC? [6M]

8. (a) Design 4x1 Multiplexer using 2x4 Decoder? [6M]
   (b) Design 4 bit Synchronous Up Counter? [6M]

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SET-1

AR13

Code No: 13MCS1016

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M. Tech II Semester Regular / Supplementary Examinations, August-2016

NETWORK SECURITY AND CRYPTOGRAPHY

(Computer Science and Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1 a) Apply Play fair cipher technique and construct Key matrix with the key 'LARGEST'. Encrypt the following plain text "ALL THE BEST FOR THE EXAMINATIONS"
b) Draw general block diagram of DES Encryption & Decryption with neat diagram. Brief out each component.

2 a) What is Brute force Attack
b) Show Encryption operation of RSA algorithm?

3 a) Differentiate between weak and strong collision resistance?
b) Define Message authentication Code (MAC)?

4 a) Demonstrate Diffie Hellman Key Exchange Algorithm with an example. Justify each operation.
b) Differentiate between Tunnel and Transport modes of IP security?

5 a) How the keys are determined in Internet Key Exchange (IKE) protocol?
b) List the major security services provided by ESP and AH respectively?

6 Demonstrate the functions of Authentication & Confidentiality of PGP Email protocol with neat diagram

7 Demonstrate the following mathematical operations with respect to Encryption/Hash algorithms
i) Boolean Logic Operation XOR
ii) Logical Shift operation
iii) GF Modular Arithmetic

8 a) How TLS protocol differs from SSL. Emphasize the differences in detail manner
b) Show SSL Record Protocol packet operation with neat diagram

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AR 13

Code No: 13MSE1014 SET-1

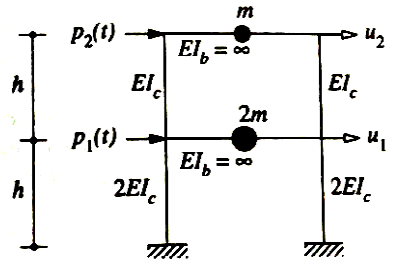
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
M. Tech. II Semester Regular Examinations, August-2016

Structural Dynamics and Earthquake Resistant Design
(STRUCTURAL ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks

1. Derive the response for free vibration with viscous damping and plot the response?
2. A free vibration test is conducted on an empty elevated water tank. A cable attached to the tank applies a lateral force of 50kN and pulls the tank horizontally by 60mm. cable is suddenly cut and resulting free vibration is recorded. At the end of four complete cycles, the time is 4sec and amplitude is 20mm. from these data compute the following: a) damping ratio b) natural period of undamped vibration c) stiffness d) weight e) damping coefficient f) number of cycles required for the displacement amplitude to decrease to 2mm?
3. Using Duhamel's integral, compute the response of an undamped system to a rectangular pulse force of amplitude (p) & duration (t)?
4. Summarize the characteristics of Response Spectrum and compare the design and response spectra?
5. Calculate the Natural frequency of Generalized SDOF Lumped mass system three story building plan area 5*5m size of column 300*300 mm, size of beam 300*450mm ,slab thickness 150mm height of each floor 3m
6. Formulate the equations of motion for the two-story shear frame shown in fig. Also compute the natural frequencies of the frame considering free vibration?



7. A five storied RCC framed building of residential type is to be constructed at Vijayawada. Plan area of building is 12m x 12m. There are three bays on either side with each bay of 4m span. All beams are of 300mmx450mm size and all columns are of size 300mmx300mm. Floor height is 3.5m. Slab thickness is assumed to be 120mm. Determine the seismic forces at all floor levels by seismic coefficient method. Assume any other data suitably.

8. A five storied RCC framed building of commercial type is to be constructed at Hyderabad. The plan area of building is 20m x 15m. Size of the bay on either side is 5m. Height of floor is 3.7m. The lumped weight due to dead loads is 15kN/m^2 on the floors and 10kN/m^2 on the roof. Determine the base shears on the structure using response spectrum method at each slab level. Assume any other data suitably.

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2 of 2

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