AR16

CODE: 16MTE1019 **SET - 2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

REFRIGERATION AND AIR CONDITIONING
(Thermal Engineering)

NOTE: (i) Refrigerant and Psychometric Properties -
***(ii) Steam tables* – must be supplied in the examination hall**

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Explain the working of Vapour Compression Refrigeration system with the help of T-s and P-h diagrams and derive the expression for COP of that system	6M
	(b)	A cold storage plant is required to store 20 tonnes of fish. The temperature of the fish when supplied is at 25^0C and storage temperature of the fish required is 8^0C. Specific heat of fish above freezing point is 2.93 kJ/kgK and below the freezing point is 1.25 kJ/kgK. Freezing point of the fish is -3^0C. Latent heat of fish is 232 kJ/kg. If the cooling is achieved within 8 hours find out: (i) Capacity of the refrigerating plant. (ii) Carnot COP between this temperature range. (iii) If actual COP is 1/3rd of the Carnot COP, find out the power required to run the plant.	6M
2.	(a)	Draw the schematic diagram of 3 stage compression with multiple expansion valves and flash intercooling system and also show the cycle on p-h diagram.	4M
	(b)	A two stage vapour compression refrigeration system with a direct contact heat exchanger (flash chamber) operates with ammonia as the refrigerant. The evaporator and condenser temperatures are -30^0C and 40^0C respectively. If the capacity of the plant is 25 tonnes of refrigeration, estimate the total work of compression and the COP	8M
3.	(a)	What are the limitations of VCR system for production of low temperatures?	4M
	(b)	What is Cascade refrigeration system? Briefly explain two stage cascade system with a neat sketch and discuss its advantages	8M
4.	(a)	Briefly explain the working of Lithium Bromide vapours absorption system with a neat sketch.	6M
	(b)	Make a comparison between VCR and VAR systems	6M

5. (a) Briefly explain the working of Steam Jet refrigeration system with a neat sketch. 6M

(b) The speed of an aircraft flying at an altitude of 8000 m, where the ambient air is at 0.341 bar pressure and 263 K temperature, is 900 km/h. The compression ratio of the air compressor is 5. The cabin pressure is 1.01325 bar and the temperature is 27^0C. On the basis of 1 kg/s flow of air, determine the following: 6M

(i) The power requirement of the air craft for pressurization(excluding ram work);
(ii) Additional power required for refrigeration; and
(iii) Refrigerating effect.
Taking for air C_p =1.005 kJ/kgK and γ = 1.4

6.. (a) Briefly explain the following psychrometric terms (i) Specific humidity (ii) Relative humidity (iii) Degree of Saturation (iv) DPT (v) Adiabatic saturation temperature (vi) Enthalpy of moist air 6M

(b) Draw a Psychrometric chart and discuss how it was constructed? 6M

7. (a) Briefly explain the working of Winter air conditioning system for Mild Cold outdoor air conditions 4M

(b) An auditorium of 100 seating capacity is to be conditioned for the given specifications: 8M

Outdoor conditions = 35^0C DBT and 65 % RH
Required air inlet conditions = 15^0C DBT and 40 % RH.
The required condition is achieved first by cooling and adiabatic dehumidification and then by heating. Find the following :
(i) The capacity of the cooling coil in tons of refrigeration;
(ii) Capacity of the heating coil in kW
(iii) By pass factor of the heating coil if the surface temperature of the coil is 22^0 C

8. (a) Illustrate the following terms (i) SHF ((ii) RSHF (iii) ERSH and (iv) GRSHF 4M

(b) An air conditioned plant is to be designed for a small office room for winter air conditioning system with the following data: 8M

Outdoor conditions = 10^0C DBT and 8^0C WBT
Required indoor conditions = 20^0C DBT and 60 % RH.
Amount of free air circulation = 0.3 m^3/min/person
Seating capacity of the office = 50 persons
The required condition is achieved first by heating and then by adiabatic humidification. Find the following :
(i) Heating capacity of the cooling in kW and surface temperature of the coil if the BPF of the coil is 0.32;
(ii)The Capacity of the humidifier

****

AR16

CODE: 16MPE1015 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

POWER QUALITY MANAGEMENT
(PED)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	a.	Why are we concerned about the power quality? Explain	6 M
	b.	Discuss in detail the power quality measures and standards.	6 M
2.		Discuss the following a. EMC standards b. IEEE guides c. Power frequency disturbances	12 M
3.	a.	Explain the concept of power interruption frequency and duration.	6 M
	b.	Discuss the various steps involved in the voltage sag performance.	6 M
4.		Explain the following in detail a. Ferro resonance b. Computer tools for transient analysis	12 M
5.		Discuss the working principle and applications of the capacitors used for voltage regulation.	12 M
6.		Explain the following a. Harmonic sources from commercial loads b. Harmonic sources from industrial loads c. System response characteristics	12 M
7.	a.	What are the devices used for the control of the harmonic distortion.	6 M
	b.	Sketch and explain the role of harmonic filter design in the power quality monitoring.	6 M
8.	a.	Discuss the various power quality monitoring standards.	6 M
	b.	What are the various considerations involved in the power quality monitoring.	6 M

****

AR16

CODE: 16MCS1021 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

DIGITAL IMAGE PROCESSING
(Computer Science and Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	What are the various fundamental components of digital image processing? Explain	6M
	(b)	Explain the following: i) neighbours of a pixel ii) Adjacency	6M
2.	(a)	Explain the basic Relationship between pixels. How they are useful in image processing.	6M
	(b)	Define Spatial and Gray level resolution? and Explain the Zooming and Shrinking Digital images.	6M
3.	(a)	How do you enhance a monochrome image by histogram? (i) Equalization (ii) Specification technique how do you assess the qualities of enhancement?	6M
	(b)	Explain the Histogram Matching? with a neat sketch.	6M
4.	(a)	Explain the First order derivative for image enhancement.	6M
	(b)	Explain the Arithmetic and Logical Operations with a neat sketch?	6M
5.	(a)	Define Morphological image processing? Explain the following: i) Open ii) Closing	6M
	(b)	Explain any **TWO** Basic Morphological Algorithms?	6M
6.	(a)	Explain the Local Thresholding and Global Thresholding.	6M
	(b)	Explain the Detection of Discontinuities i) Point Processing ii) Line Detection	6M
7.	(a)	Explain the following i) Inter pixel redundancy ii) Psycho visual redundancy	6M
	(b)	Draw and Explain general compression system model	6M
8.	(a)	Describe the Various colour models available in image processing.	6M
	(b)	Explain about colour fundamentals.	6M

****

AR16

CODE: 16MSE1020 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

DESIGN OF SUBSTRUCTURES
(Structural Engineering)

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

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	Define "Substructure" and Give Examples of varieties of substructures	6
	(b)	What is the role of "Foundation engineer " in deciding the scope of substructure	6
2.	(a)	Review the varieties of Substructures with suitable sketches	6
	(b)	Illustrate with neatly drawn sketches i) Break waters ; ii) Wharfs	6
3.	(a)	Explain the anchored bulkhead wharf structures in detail	6
	(b)	Review "Rubble mound break water structure".	6
4.	(a)	Show "Apparent Earth Pressure diagram" for braced cuts placed in all types soils	6
	(b)	Recall what is a sheet pile and review its varieties with suitable sketches	6
5.	(a)	Report on the information required in the design of a substructure for a transmission line tower	6
	(b)	Give examples of various types of foundations used for transmission line towers.	6
6.	(a)	Express what is a "Machine Foundation" and discuss about its varieties	6
	(b)	Report on "Vibration Isolation"	6
7.	(a)	Review "Lock and Mooring"	6
	(b)	Show "Wave action and wave pressure on vertical walls of a marine structure"	6
8.	(a)	In a two layered system of sand (5m) under lay by clay (7m) an open cut has to be made. The struts are to be introduced at the levels 1.5 m , 4m, 6.5m, 9m and 11.5m below ground level. The Properties of Soils are : Sand layer has bulk unit weight of 1.78Mg/m^3, Ø=32° & Clay layer has a bulk unit weight of 1.95Mg/m^3 and drained cohesion of 2.8Mg/m^2, coefficient of progressive failure 0.75. Determine the maximum BM to which the sheet pile is subjected.	6
	(b)	Determine the depth of penetration of the cantilever pile passing through a sandy strata with Ø=32°. The cantilever sheet pile is 6m above water level on one side and supports Sandy soil Ø=32°. The saturated unit weight of Sandy soil is 1.1Mg/m^3	6