AR13

CODE: 13CE4024 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.TECH I SEMESTER REGULAR EXAMINATIONS, NOVEMBER-2016
ENVIRONMENTAL ENGINEERING
(CIVIL ENGINEERING)

Time: 3 Hours **Max. Marks: 70**

PART-A

ANSWER ALL QUESTIONS **1 x 10= 10M**

1. a) What is the main object of water supply scheme?
   b) What is Discrete particle in settling?
   c) Enumerate units of water treatment along with their purpose
   d) What are the methods of removal of temporary hardness
   e) What is the function of non-return valve?
   f) Where do you use Grease and Oil traps?
   g) What is significance of BOD/COD ratio?
   h) Distinguish between aerobic and anaerobic bacteria
   i) What is sewage farming?
   j) Explain the term MLSS.

PART – B

Answer one question from each unit **5 x 12= 60M**

UNIT-I

2. a) Explain factors affecting per capita demand of water?
   b) What are the various methods of forecasting population? Explain any two methods.

(OR)

3. a) What are the desirable limits for the following parameters for drinking as per IS 10500. What objections could be there if present excess in water.
   (i) PH value, (ii) Turbidity, (iii) Chlorides, (iv) Fluorides . (v) TDS and (vi) Nitrates.
   b) What are the functions of intake & describe river intake with neat sketch?

UNIT-II

4.a) Draw flow diagrams of water treatment for the following.
   (i) Ground water containing Iron and Manganese or other dissolved gases like Carbon dioxide.
   (ii) River water with high turbidity and may or may not be polluted.
   b) Design a circular clarifier to treat 5 MLD of water. The OFR should not exceed 30,000 lt/sq.m./day. Suitable data may be assumed.

(OR)

5. Describe working of rapid sand gravity filter with a neat sketch

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CODE: 13CE4024 **SET-2**

UNIT-III

6.a) What are the methods of analysis of distribution system. Explain about Hardy Cross method.
b) Write short note on laying and testing of pipe lines

(OR)

7. Determine storage capacity of a reservoir for a daily requirement of 2.0 lakh litres. The pumping is done from 8 am - 8 pm. The draw off is as follows

6AM - 8AM	45% of daily supply
8AM - 5PM	20% of daily supply
5PM - 8PM	35% of daily supply.

UNIT-IV

8. a) What are various types of decomposition of sewage? Describe the Nitrogen cycle of de composition.
b) What is BOD and what are the applications of BOD.

(OR)

9. a) Describe a typical manhole with neat sketch
b) What is Self Purification process of water bodies? Explain Oxygen Sag curve along with critical parameters.

UNIT-V

10. With the help of neat sketch describe the functioning of a trickling filter

(OR)

11. a) What are the features of Standard rate and High rate digestion.
b) Explain various methods of disposal of septic tank effluent.

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AR13

CODE: 13EE4022 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2016

POWER SEMI CONDUCTOR DRIVES

(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Draw the electric drive system?
   b) List the drawbacks of armature resistance control
   c) Why dc motor takes high current during starting?
   d) Three phase fully controlled rectifier are called six pulse converters, Justify?
   e) Mention the types of electrical braking methods
   f) State the advantages of dc chopper drives
   g) What are the advantages of V/F control?
   h) Mention the application of stator voltage control
   i) Give the applications of synchronous motors drives
   j) What is the difference between an induction motor and synchronous motor

PART-B

Answer one question from each unit **[5 x 12=60M]**

UNIT-I

2. a) When the Discontinuous conduction mode becomes continuous conduction mode in a single phase semi controlled converter connected to separately excited D.C motor and derive the expression for speed at that condition with relevant wave forms. 6M

   b) A 230V, 960rpm, 20A separately excited dc motor has armature resistance and inductance of 1.2 ohms & 50mH respectively. Motor is controlled by a single phase half controlled rectifier with source voltage of 230V, 50Hz.Identify the modes and calculate speeds for: (a) $\alpha = 60^0$ and torque =1000 N-m (b) $\alpha = 120^0$ and torque =1000 N-m 6M

(OR)

3. Derive expressions for Speed and torque for a Three phase fully controlled converter connected to separately excited D.C motor with continuous current operation. Draw the relevant waveforms and derive expressions for the output voltage and currents. 12M

UNIT-II

4. Motor drives four loads, two have rotational motion & two translational motions. Moment of inertia of motor is 1.2 kg-m^2. Motor runs at a speed of 1000rpm. Following are the details about the four loads. 12M

Load	Type of Motion	Speed	Inertia/Mass	Torque/Force
I	Rotational	200 rpm	7 kg-m^2	10 N-m
II	Rotational	200 rpm	5 kg-m^2	6 N-m
III	Translational	10m/s	10 kg	20N
IV	Translational	10m/s	20 kg	30N

Calculate the equivalent inertia of the system referred to the motor shaft & Power rating of the motor, assuming negligible loss in the transmission system.

(OR)

5. a Explain the closed loop speed control schemes in multi motor drives? 6M
   b What are various functions of inner current control loop? 6M

UNIT-III

6. A 230v, 1000rpm 30A separately excited motor has the armature resistance and inductance of 0.7 Ω and 50mH, respectively. Motor is controlled in regenerative braking by a chopper operating at 800 Hz from a dc source of 239 V. Assuming continuous conduction 12M
   (i) Calculate duty ratio of chopper for rated torque and the speed of 800 rpm.
   (ii) What will be the motor speed for duty ratio of 0.6 and rated motor torque.

(OR)

7. a Analyze the Four quadrant chopper feeding to a separately excited DC motor and also draw the current and voltage wave forms for continuous current operation 6M
   b Derive expressions for speed and torque for two quadrant chopper feeding to a DC series motor and also draw the current and voltage wave forms for continuous current operation. 6M

UNIT-IV

8. A 3-Φ, Y-Connected, 50Hz,4-pole IM has the following parameters on Ω/phase referred to the stator:$R_1=R_2=0.034$ and $X_1=X_2=0.18$.The motor is controlled by the variable frequency control with a constant (V/f). Determine the following for an operating frequency of 15Hz. 12M
   i) The breakdown torque as a ratio of its value at the rated frequency for motoring and braking
   ii) The starting torque and rotor current in terms of their values at the rated frequency.

(OR)

9. A460V, 60Hz,1176rpm ,6 pole, star connected squirrel cage induction motor has a following equivalent circuit parameters per phase referred to the stator : Rs=0.29 Ω, Rr'=0.145Ω, Xs=0.21,Xr'=0.5Ω, Xm=13.3Ω, the motor is supplied from a current source inverter. The flux is maintained constant at the rated value. Calculate 12M
   (i) The stator current and DC link current when the machine operates at rated torque and 60Hz.
   (ii) The inverter frequency and dc link current for a speed of 600rpm and rated torque.

UNIT-V

10. What is meant by slip power recovery? Explain about static Scherbius drive scheme of induction motor drive and also draw the speed torque characteristics. 12M
    .

(OR)

11. a Discuss in detail self-controlled synchronous motor drive employing load commutated thyristor inverter? 6M
    b A 20 kW, 3-phase, 440V, 4 pole, delta connected permanent magnet synchronous motor has following parameters. Xs = 5 ohm, Rs = 0, rated power factor =1.0. Machine is controlled by variable frequency control at a constant (V/f) ratio. Calculate armature current, torque angle and power factor at half full load torque and 750 rpm. 6M

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AR13

CODE: 13ME4026 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.TECH I SEMESTER REGULAR EXAMINATIONS, NOVEMBER, 2016

REFRIGERATION AND AIR CONDITIONING

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Differentiate between Refrigeration and air conditioning.
   b) Define ton of refrigeration.
   c) How the effectiveness of a refrigeration system is measured.
   d) Give the chemical formula and name of the refrigerant R-22
   e) Write any two advantages of vapour absorption system over vapour compression refrigeration system.
   f) Mention the function of Hydrogen in a three fluid vapour absorption system.
   g) List out the merits of a thermo electric refrigeration system over other system.
   h) What is Peltier effect?
   i) Define Relative humidity
   j) Give the advantages of viscous filters over dry filters.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) With the help of P-v and T-s diagrams, explain the working of Carnot Refrigerator. Derive an expression for its COP. 6M
   b) A Bell-Coleman cycle works between 1 bar & 6 bar. The compression process follows $PV^{1.25}$=C and expansion process follows $PV^{1.3}$=C. The mass flow rate of air is 0.5 kg/s. The temperatures at the beginning of compression & expansion are 7 C & 37 C respectively. Find the C.O.P & Refrigerating capacity of the plant. 6M

(OR)

3. a) Differentiate between Open & Dense air systems of Air-Refrigeration. 5M
   b) An aircraft moving with speed of 200 km/h uses simple gas refrigeration cycle for air-conditioning. The ambient pressure and temperature are 0.36 bar and -12 C .The pressure ratio of compressor is 5. The heat exchanger effectiveness is 0.94. The isentropic efficiencies of compressor and expander are 0.82 each. The cabin pressure and temperature are 1.05 bar and 27 C. Determine (i) The temperature and pressures at all points of the cycle. (ii) The volume flow rates through the compressor inlet and expander outlet for 90 tonnes refrigerator. Take c_p =1.005 kJ/kgK; R=0.287 kJ/kgK and γ=1.4 7M

UNIT-II

4. a) Sketch the T-s and p-h diagram for the compression cycles when the vapour after compression is (i) dry saturated and (ii) wet 6M
   b) Discuss the desirable properties of a good refrigerant. 6M

(OR)

5. a) Discuss the effect of variable suction and discharge pressures and sub-cooling on the performance of vapour compression system. 6M
   b) A Vapour compression refrigeration uses R-12 as refrigerant and liquid evaporator at -15 C. The temperature of this refrigerant at the delivery from the compressor is 15 C and vapour is condensed at 10 C. Find COP if (i) there is no sub-cooling (ii) liquid is cooled by 5 C before throttling. 6M

UNIT-III

6. a) Explain briefly with a neat diagram 'Practical vapour absorption system'. Derive an expression for the Maximum COP of an VAR system. 6M

   b) Discuss the merits and demerits of the vapour absorption system compared to the vapour compression system 6M

(OR)

7. a) In vapour absorption system, the heating, cooling, and refrigeration temperatures are 115C, 30 C and -10C, respectively. Find the COP of the system. 6M

   (i) In case the heating temperature is increased to 200 C and the refrigeration temperature is reduced to -33C with the cooling temperature is same, Find the new COP.

   b) What is the basic function of a compressor in vapour compression refrigeration system? How this function is achieved in vapour absorption refrigeration system? 6M

UNIT-IV

8. a) Explain the working principle of thermo-electric refrigeration system. Compare the working of different components of thermo-electric refrigeration system with the working of different components of vapour compression system. 6M

   b) What are the advantages of vortex tube? List out the fields of its applications. 6M

(OR)

9. a) Explain the working principle of pulse tube refrigeration system. What are the fields of it applications. 6M

   b) Explain the working principle of vortex tube and explain that the energy exchange phenomena in vortex tube is not a violation of second law of thermodynamics. 6M

UNIT-V

10. a) What is fog? Show on the psychrometric chart when two air streams yield fogged state of air. 6M

    b) A room has a sensible heat gain of 24kW and a latent heat gain of 5.2 kW and it has to be maintained at 26C DBT and 50%RH.180 m^3/min of air is delivered to the room. Determine the state of supply air. 6M

(OR)

11. a) Explain the difference between winter air conditioning and summer air conditioning. 6M

    b) What is the function of a fan in an air conditioning system? Explain the various types of axial flow fans. 6M

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AR13

Code No: 13EC4027 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular Examinations, November -2016

DIGITAL IMAGE PROCESSING
(Electronics & Communication Engineering)

Time: 3 hours **Max.Marks:70**

PART A

Answer all Questions **[1 x 10 = 10M]**

1. a) Distinguish between Digital Image and Binary Image.
   b) Define Image Sampling and Quantization.
   c) What is Gray Level Slicing?
   d) What are Prewitte and Sobels Operators
   e) Draw Homomorphic filtering approach for Image Enhancement.
   f) Define Image Restoration.
   g) Define Wavelet.
   h) What is Thresholding?
   i) What is the derivative operators used in Image Segmentation?
   j) What is meant by Psycho visual Redundancy?

PART – B

Answer one question from each Unit **[5 x 12 = 60 M]**

UNIT – I

2. a.Discuss about Image sampling and Quantization. [8M]
   b. Write Image geometry. [4M]

(OR)

3. Explain about the basic relationship between pixels in a digital image. [12M]

UNIT – II

4. Define Image transform and Explain Haar & Slant Transform. [12M]

(OR)

5. a. List the properties of 2D FFT. [4M]
   b. Explain Discrete cosine Transform and its properties with an example. [8M]

UNIT – III

6. Explain in detail Homomorphic filtering with neat diagram? [12M]

(OR)

7. What is the difference between enhancement in spatial domain and frequency domain? Explain about sharpening frequency domain filters. [12M]

UNIT – IV

8. Explain various restoration filters used in image restoration process. [12M]

(OR)

9. Write the fundamentals of color image processing and explain Pseudo color and Full Color Image Processing. [12M]

UNIT – V

10. Explain about Lossy and Lossless Predictive Compression Systems. [12M]

(OR)

11. List various approaches in Image segmentation? Explain the methods of region oriented segmentation. [12 M]

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CODE: 13CS4020 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.TECH I SEMESTER REGULAR EXAMINATIONS, NOVEMBER, 2016

UML AND DESIGNS PATTERNS

(Computer Science & Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS [1 x 10 = 10 M]

1. a) What is a use case?
   b) What is the purpose of specifications in UML?
   c) State the semantic equivalence between the sequence diagram and collaboration diagram.
   d) State the meaning of extend relationship between two use cases.
   e) What is a state chart diagram?
   f) What is a node?
   g) Provide any two advantages of design patterns.
   h) What is the difference between a pattern and framework?
   i) When to use Singleton pattern?
   j) List out the participants of Command pattern.

PART-B

Answer one question from each unit [5x12=60M]

UNIT-I

2.	a	What is a model? Explain importance of modelling.	6M
	b	With suitable example, explain how to model database schema using a class diagram?	6M
		(OR)	
3.	a	Explain basic relationships in UML. Provide suitable example for each.	6M
	b	Explain UMLs approach to software architecture.	6M

UNIT-II

4.	a	Draw the sequence diagram to show the integration involved in a two-party phone call.	6M
	b	What is an activity diagram? Draw the activity diagram for Process order use case of Retile Store System.	6M
		(OR)	
5.	a	Draw the collaboration diagram for Register use case whose function is to register a new student in a university through online course registration system.	6M
	b	Explain with an example how to organize use cases.	6M

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CODE: 13CS4020 **SET-2**

UNIT-III

6.	a	What is a state machine? Draw the state machine for ATM system.	6M
	b	What is the difference between a component and a class? Explain different kinds of components.	6M
		(OR)	
7.	a	Write short notes on time and space.	6M
	b	What is a deployment diagram? Write properties and common uses of deployment diagrams.	6M

UNIT-IV

8.		Explain in detail how to select a design pattern.	12M
		(OR)	
9.	a	Explain terms involved in MVC pattern.	3M
	b	Explain implementation of MVC pattern with an example. Provide necessary Java code for this.	9M

UNIT-V

10.		Briefly explain various creational patterns.	12M
		(OR)	
11.		Briefly explain various behavioural patterns.	12M

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AR13

CODE: 13IT4009 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2016

UNIX PROGRAMMING

(INFORMATION TECHNOLOGY)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What is the use of tar – c command?
   b) What command is used in vi editor to save file and remain in the editing mode?
   c) Write the responsibilities of shell.
   d) List out shell meta characters.
   e) What do you mean by formatted I/O?
   f) What are the system calls available in Unix?
   g) What is the use of signal?
   h) Define process control.
   i) What is the use of pipe in IPC?
   j) How shared memory is used in IPC?

PART-B

Answer one question from each unit [5x12=60M]

UNIT-I

2. a) Explain parent-child relationship of UNIX file system with a diagram. [6 M]
   b) Interpret the significance of seven fields of ls – l output. [6 M]

(OR)

3. a) Discuss the following commands with syntax. [8 M]
      i) fgrep ii) who iii) sort iv) find
   b) Explain with example absolute pathname and relative path name. [4 M]

UNIT-II

4. a) What are the basic functions of shell? Explain the different types of shells used in UNIX OS. [8 M]
   b) Discuss about here documents. [4 M]

(OR)

5. a) Explain shell features of 'for' with syntax and example. [6 M]
   b) Write a shell script so that distance between two cities is entered in kilometers through keyboard and it is printed in meters. [6 M]

UNIT-III

6. a) Which command is used to change permission associated to File/Directories? List and explain methods to change permission of File/Directories. [6 M]
   b) Explain some system calls related to file handling in UNIX. [6 M]

(OR)

7. a) What do you mean by device file? Where can you locate them? How can you find out whether a device is block or character oriented? [7 M]
   b) Explain the link, unlink and symlink system calls with a program. [5 M]

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CODE: 13IT4009 **SET-2**

UNIT-IV

8.	a)	What is a process? Mention briefly the role of fork-exec mechanism in process creation.	[6 M]
	b)	Explain following signal handling functions? (i) sleep (ii) pause (iii) abort	[6 M]
		(OR)	
9.	a)	List the system calls used for process management with a program.	[6 M]
	b)	Brief about the initial process sequence while the system boots up. What are various IDs associated with a process?	[6 M]

UNIT-V

10.	a)	Explain the concept of piping and pipe operator with respect to C shell. Write examples.	[6 M]
	b)	Explain how message queue is used for IPC with a suitable program.	[6 M]
		(OR)	
11.	a)	Write a program which will demonstrate the use of semaphore for IPC.	[6 M]
	b)	What is shared memory? How it is used for IPC? Explain with a suitable program.	[6 M]

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