

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****IV B.Tech Semester Regular Examinations, November-2019
MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS
(Civil Engineering)****Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) What is Managerial Economics? How does it differ from traditional Economics? (7 M)
b) Explain the nature of Demand. What could be the different variations in the nature of Demand? (7 M)
- (OR)**
2. a) What is Demand function? How do you determine? (7 M)
b) State and explain the Law of Demand. What are its exceptions? (7 M)

UNIT-II

3. a) What do you understand by Elasticity of Demand? Explain the factors governing it. (7 M)
b) Explain how Point elasticity is more focussed than Arc elasticity? Illustrate. (7 M)
- (OR)**
4. a) Enumerate the factors involved in Demand Forecasting. State purpose of forecasting, both short term and long term. (7 M)
b) Examine the Trend Projection method and Collective Opinion method of Demand forecasting. (7 M)

UNIT-III

5. a) Explain various internal and external economies of scale. (7 M)
b) Define a production function. Explain and illustrate Isoquants and Iso-cost curves (7 M)
- (OR)**
6. a) Discuss the managerial uses of Break Even Analysis as a tool for profit planning. What are its limitations? (7 M)
b) From the following information calculate (7 M)
i). PV Ratio. ii) Break Even Point and iii) Margin of Safety.
Total Sales – Rs 6,00,000/-, Selling Price per unit – Rs20/-,
Variable cost per unit – Rs10/- and Fixed Cost – Rs 2,00,000/-.

UNIT-IV

7. a) Explain how the price is determined in case of perfect Competition. (7 M)
b) Compare and contrast various types of Market structures. (7 M)
- (OR)**
8. a) Define Capital Budgeting. Explain the steps in Capital Budgeting process. (7 M)
b) Calculate the Net Present Value for X project which initially cost Rs. 2,500/- and generates Year and Net Cash Inflows of Rs 900/-, Rs 800/-, Rs 700/-, Rs 600/- and Rs 500/- in one through five years. The required rate of return is 10%. (7 M)
Calculate the Net Present Value: PV Factors $Y_1 = 0.909$ $Y_2 = 0.826$ $Y_3 = 0.751$ $Y_4 = 0.683$ and $Y_5 = 0.621$.

UNIT-V

9. a) What do you understand by Double Entry Book Keeping? What are its advantages? (7 M)
- b) From the following transactions write Journal entries into the books of Prabath. (7 M)

2016	Particulars	Rs.
March 1	Goods sold for Cash	2,600
March 3	Goods Purchased for cash	200
March 5	Purchase of Goods on credit from Kumar	3,000
March 7	Sale of Goods to Manikanta on credit	4,000
March 9	Cash received from Manikanta	2,500
March 11	Cash paid to Kumar	2,000
March 15	Furniture purchased for cash	300

(OR)

10. From the following Trail Balance of Goutham. Prepare Trading Account, Profit and Loss Account for year ending 31st March 2013 and Balance Sheet as on date. (14M)

Trail Balance as on 31st March, 2013

Particulars	Dr. Rs	Cr. Rs
Buildings	20,000	
Capital		60,000
Purchases and Sales	10,000	30,000
Opening stock (1-4-2012)	5,000	
Debtors and Creditors	12,000	6,000
Drawings account	4,000	
Sales returns and Purchase returns	2,000	500
Freight	2,500	
Office Salaries	8,000	
Wages	1,500	
Postage & Telegrams	1,000	
Machinery	15,000	
Bills Receivables & Bills Payables	8,000	2,000
Advertisement	2,000	
Cash in Hand	3,500	
Loose Tools	4,000	
Total	98,500	98,500

Adjustments:

1. Closing stock valued at Rs. 6,00/-
2. Depreciation on Buildings by 10% and Loose Tools are valued at Rs.3,500/-
3. Interest on Capital at 10% and on Drawings at 5%.

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

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Derive the expression for optimum load distribution of a power system network with 'N' generating units in operation by neglecting the transmission losses. 8M
 - b) List the equality and inequality constraints considered in economic dispatch problem. 6M
- (OR)**
2. a) Give various advantages of general loss formula and state the assumptions made for calculating B coefficients. 6M
 - b) In a thermal power station, incremental costs are given by the following equations 8M
 $dC_1/dP_1 = Rs.(0.15P_1 + 12);$
 $dC_2/dP_2 = Rs.(0.05P_2 + 14);$
 $dC_3/dP_3 = Rs.(0.21P_3 + 13);$
 Where P_1, P_2 and P_3 are the loads in MW. Determine the economic load allocation of three units when the total load on the station is 300MW.

UNIT-II

3. a) Explain clearly the mathematical formulation of optimal scheduling of hydro thermal system with a typical example. 7M
 - b) Discuss the advantages of operation of power plants with hydrothermal combinations. 7M
- (OR)**
4. a) Explain briefly the constraints on unit commitment problem. 7M
 - b) Explain the dynamic programming method of solving unit commitment problem. 7M

UNIT-III

5. a) Obtain the steady state response of an isolated power system with a free governor operation. 8M
- b) Draw the schematic diagram of speed governor and explain each part. 6M
6. a) With a block diagram, explain the proportional plus integral control of a single area system. 7M
- b) A 250MVA synchronous generator is operating at 1500 rpm, 50Hz. A load of 60MW is suddenly applied to the machine and the station valve to the turbine opens only after 0.3 sec due to the time lag in the generator action. Calculate the frequency to which the generated voltage drops before the steam flow commences to increase to meet the new load. Given that the valve of H of the generator is 3.2 kW-sec per kVA of the generator energy. 7M

UNIT-IV

7. Develop a linear mathematical model of two area system and also explain the tie line bias control of two area system. 14M
- (OR)**
8. From the fundamentals obtain the transfer function of a two area controlled power system network and also draw the corresponding block diagram. 14M

UNIT-V

9. a) Write a short note on compensated transmission lines. 7M
 - b) What is load compensation? Explain its objectives. 7M
- (OR)**
10. a) Explain different sources of reactive power generation and absorption of reactive power in power system network. 8M
 - b) List out the advantages of static VAR compensators 6M

AR16

CODE: 16ME4027

SET-2

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

IV B.Tech I Semester Regular Examinations, November-2019

**HEAT TRANSFER
(Mechanical Engineering)**

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Derive the general heat conduction equation in cartesian coordinate system. 8M
- b) A hollow steel cylinder of inner diameter 25 mm and outer diameter 32 mm having $K = 30 \text{ W/mK}$ is maintained at 60°C and 50°C at its inner and outer surfaces respectively. If the length of the cylinder is 0.75 m, determine the rate of heat transfer. Also find the conductance resistance. 6M

(OR)

2. a) Derive an expression for critical radius of insulation in case of spheres. 7M
- b) A composite slab consists of 250 mm fireclay ($K = 1.09 \text{ W/mK}$) inside, 100mm fired earth brick ($K = 0.26 \text{ W/mK}$) and outer layer of common brick (0.6 W/mK) of thickness 50 mm. if the inside surface is at 1200°C and outside surface is at 100°C , find i) heat flux ii) the temperatures of the junctions and iii) the temperature at 200 mm from the outer surface of the wall. 7M

UNIT-II

3. a) Derive the expression for the temperature as a function of time t in lumped heat capacity system. 6M
- b) Steel ball bearings ($\rho = 8000 \text{ kg/m}^3$, $C = 480 \text{ J/kg K}$, and $K = 35 \text{ W/mK}$) having diameter 1.2 cm are to be quenched in water. The balls are taken out from the furnace at 900°C and exposed to air at 30°C before they are dropped in water. What time will the balls take to reach 800°C in air with $h = 12.5 \text{ W/m}^2\text{K}$. 8M

(OR)

4. a) Derive the expression for heat transfer in case of an infinitely long fin. 7M
- b) A plane wall of 10 cm thick generates heat internally at the rate of $4 \times 10^4 \text{ W/m}^3$ when an electric current passed through its centre. If $h = 50 \text{ W/m}^2\text{K}$ between air and the wall on both sides determine i) surface temperature ii) Maximum temperature in the wall. Take the surrounding air temperature 20°C and thermal conductivity of wall $K = 15 \text{ W/mK}$. 7M

UNIT-III

5. a) Explain the development of thermal boundary layer over a flat plate. 6M
- b) Air at atmospheric pressure and at 50°C flows through a tube bundle of inline arrangement having each tube diameter 2 cm and maintained at a uniform temperature of 100°C . The longitudinal and transverse pitches of the bundle are equal to 4 cm. there are 15 rows in the direction of flow and 10 tubes in each row. The tube length is 1.2 m. the velocity of air entering the tube bank is 8 m/s. Find the heat transfer coefficient and exit temperature of air. 8M

(OR)

6. a) What is flow separation? What causes it? What is the effect of flow separation on the drag coefficient? 5M
- b) Calculate the pressure drop in 100 m of 2 cm x 2.5 cm smooth rectangular duct when water at 40°C flows through it with a velocity of 0.5 m/s. 9M
($v = 0.66 \times 10^{-6} \text{ m}^2/\text{s}$, $\rho = 995 \text{ kg/m}^3$)

UNIT-IV

7. a) What is the criterion for transition from laminar to turbulent flow in free convection heat transfer? 5M
- b) An air-conditioned duct carries air at an average temperature of 10°C. The duct size is 300 mm x 200 mm and is exposed to the surrounding air at 30°C. Find the heat gain by the air in the duct per meter length. Assume 200 mm side is vertical. 9M
- (OR)**
8. Derive an expression for effectiveness in terms of NTU for 14M
i) a parallel flow heat exchanger ii) a counter flow heat exchanger

UNIT-V

9. a) Explain electrical network analogy for thermal radiation systems 6M
- b) Two parallel plates 3m x 2m, placed 1m apart, are maintained at 5000°C and 2000°C, their respective emissivity being 0.3 and 0.5. If the temperature of the room in which these plates are located is 400°C, estimate the heat lost by the hotter plate. Consider radiation only 8M
- (OR)**
10. a) Derive Stefan-Boltzmann's law from Planck's law 7M
- b) Determine the radiation heat loss (Watts) from each meter of 20 cm diameter heating pipe placed centrally in the brick duct of square section 30 cm side. Temperature of pipe surface = 200°C, Brick duct temperature = 20°C, Emissivity of the pipe surface = 0.8, Brick duct emissivity = 0.9, Assume only radiation heat transfer between pipe and brick duct. If the system is in steady state condition then find the "surface heat transfer coefficient" of the brick duct. Take the temperature of the surroundings of the duct is 10°C. 7M

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

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the fundamental steps involved in DIP with its applications. 9
- b) Write about Image geometry 5

(OR)

2. a) Consider the image shown below 9

$$\begin{array}{cccc}
 3 & 1 & 2 & 1 \text{ (q)} \\
 2 & 2 & 0 & 2 \\
 1 & 2 & 1 & 1 \\
 \text{(p)} & 1 & 0 & 1 & 2
 \end{array}$$

By explaining the Path, Adjacency and Connectivity. Compute D4, D8 and Dm distances for $V=\{0,1\}$ and $V=\{1,2\}$

- b) What is DIP? Explain different types of images? 5

UNIT-II

3. a) Define Image transform and Explain Walsh Transform. 7
- b) Hadamard Transform. 7

(OR)

4. a) Derive the convolution property of 2D FFT. 7
- b) Explain Discrete Cosine Transform. 7

UNIT-III

5. a) Explain Histogram processing. 9
- b) Write about Point Processing. 5

(OR)

6. a) What is spatial filtering? Explain various spatial smoothing masks? 8
- b) Explain in detail spatial sharpening filters? 6

UNIT-IV

7. a) Illustrate about Image Restoration Model 7
- b) Explain various restoration filters used in image restoration process. 7

(OR)

8. a) Write about the fundamentals of Color image processing and Explain Pseudo Color Image Processing. 8
- b) Full Color Image Processing. 6

UNIT-V

9. a) Explain in detail about detection of Discontinuities. 7
- b) Explain the methods of removing the redundancy. 7

(OR)

10. a) Explain the Hough Transform for Edge Linking. 7
- b) Write about Region oriented segmentation. 7

**IMAGE PROCESSING
(Computer Science and Engineering)****Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. Draw the block diagram representing the steps in Digital image processing and explain each in detail 14M
- (OR)**
2. Write a short note on 14M
a) Zooming b) Shrinking

UNIT-II

3. a) Define image enhancement? In what ways, image enhancement is done in spatial domain? 7M
b) Discuss how Histogram matching is suitable for enhancing processed image 7M
- (OR)**
4. a) Relate the 1-D Fourier Transform pair to 2-D Fourier Transform pair with necessary equations 7M
b) Distinguish smoothing filters and sharpening filters in spatial domain. 7M

UNIT-III

5. a) Explain the following terms 7M
i) Dilation ii) Erosion
b) Explain the morphological operation to extract the boundary of object for binary image 7M
- (OR)**
6. How an RGB model is represented using HIS format? Describe the transformation in detail 14M

UNIT-IV

7. a) Explain Source encoder and decoder of compression model. 7M
b) Discuss the concept of variable-length coding in detail. 7M
- (OR)**
8. a) Classify error-free compression techniques. 7M
b) What is compression ratio? Explain different types of redundancies. 7M

UNIT-V

9. a) Write a short notes adaptive thresholding in image segmentation. 7M
b) Differentiate region-based segmentation from edge-based segmentation in detail. 7M
- (OR)**
10. a) Define image segmentation? Write a short notes on image segmentation. 7M
b) Classify the detection of discontinuities and explain each detection in detail 7M

**MULTIMEDIA APPLICATION DEVELOPMENT
(Information Technology)****Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

- | | | |
|-------------|--|-----|
| 1. a) | What is file format? Discuss different file formats. | 8 M |
| b) | What is multi-media? List its applications. | 6 M |
| (OR) | | |
| 2. a) | Describe some significant differences between vector graphics and bit mapped images. | 10M |
| b) | Explain about RGB colour model. | 4 M |

UNIT-II

- | | | |
|-------------|---|------|
| 3. a) | Discuss about video compression techniques. | 10 M |
| b) | Explain the video standards. | 4 M |
| (OR) | | |
| 4. a) | Discuss about streaming video and video conferencing. | 7 M |
| b) | Explain about digitizing video and video standards. | 7 M |

UNIT-III

- | | | |
|-------------|---|------|
| 5. a) | Write a short note on digital sound and analog sound. | 10 M |
| b) | Explain about audio sampling. | 4 M |
| (OR) | | |
| 6. | Explain the protocol MIDI. | 14 M |

UNIT-IV

- | | | |
|-------------|--|-----|
| 7. a) | Demonstrate movie clips with example. | 7 M |
| b) | Explain control structures and loops in action script. | 7 M |
| (OR) | | |
| 8. a) | Demonstrate buttons events with example. | 7 M |
| b) | Demonstrate sound class with example. | 7 M |

UNIT-V

- | | | |
|-------------|---|-----|
| 9. a) | Explain in detail about multicast internet (MBone). | 7 M |
| b) | What is Real Time Transport Protocol? Why is it important in an IP network? | 7 M |
| (OR) | | |
| 10. a) | What is H.323 and SIP in wireless networking? | 8 M |
| b) | What is the role of H.323 protocol in VoIP? | 6 M |

AR13

CODE: 13CE4029

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

IV B.Tech I Semester Supplementary Examinations, November-2019

GROUND IMPROVEMENT TECHNIQUES

(Elective -2)

(Civil Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What are applications of grouting?
b) Which type of soil is dewatered in vacume dewatering?
c) Which method is used in vibrate at depth of densifying in granular soil?
d) Which phenomenon is occurred in densifying of cohesionless soil?
e) What are applications of stabilization?
f) What is function of facing element in earth retaining wall?
g) Which types of materials are used in manufacturing of geosynthatic materials?
h) Why geosynthatic materials are used in soil?
i) Write example for expansive soil?
j) What is reason to swell expansive soil?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What is the working principle of vacuum well point system? Explain with neat sketch and process of dewatering carried out in-situ by vacuum well point system.
b) What is grouting? and write the different methods of grouting and different grouting materials.
- (OR)**
3. a) Why dewatering is required in soil? Explain with neat sketches of dewatering by sumps and interceptor ditches.
b) . Explain the post grout test with the help of diagram

UNIT-II

4. a) Explain the method of Impact at the ground surface of densifying the granular soils
b) Explain the method of installing lime columns with help of diagrams
- (OR)**
5. a) Explain the method of vibration at the ground surface of densifying the granular soils
b) Explain the installation procedure and components of sand drains and geo-drains

AR13

CODE: 13CE4029

UNIT-III

6. a) Explain the mechanical stabilization
b) Write distinguish and advantages of reinforced earth retaining walls over conventional retaining wall
- (OR)**
7. a) What are factors affecting soil-cement stabilization? And explain
b) Explain the external stability checks of reinforced earth retaining walls with help of diagrams

UNIT-IV

8. a) Explain different functions and field applications of geodrills
b) Explain the different types of geotextiles
- (OR)**
9. a) What are different functions and field applications of geotextiles
b) Explain the different functions and field applications of geomembranes

UNIT-V

10. a) Explain about to find swelling pressure for expansive soil.
b) Explain about underreamed piles.
- (OR)**
11. a) Explain any two foundations are adopted in expansive soil
b) Explain any three problems are faced due to expansive soil.

PART-A**ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Why refrigeration is required in Air crafts?
- b) Why superheated vapour is preferred at the inlet of the compressor?
- c) The compressor of the vapour compression refrigeration cycle is replaced by which equipment in absorption refrigeration cycle?
- d) In a vapour absorption refrigerator, heat is rejected in which component?
- e) What is the value of relative humidity for zero wet bulb depression?
- f) Which is refrigerant in aqua ammonia absorption refrigeration system?
- g) What type of psychometric process is employed for summer air conditioning?
- h) What is wet bulb depression?
- i) What is relative humidity of saturated air?
- j) The atmosphere air at dry bulb temperature of 15°C enters a heating coil maintained at 40°C. The air leaves the heating coil at 25°C. What is the value of by-pass factor of the heating coil?

PART-B**Answer one question from each unit****[5x12=60M]****UNIT-I**

2. a. Differentiate between simple air refrigeration system and bootstrap air refrigeration system. [5]
- b. The atmospheric air at a pressure of 1 bar and temperature -8°C is drawn in the cylinder of the compressor of a Bell Coleman refrigerating machine. It is compressed isentropically to a pressure of 5 bar. In the cooler, the compressed air is cooled to 15°C, pressure remaining the same. It is then expanded to a pressure of 1 bar in an expansion cylinder, from where it is passed to the cold chamber. Find [7]
 - i. The work done per kg of air and
 - ii. COP of the plant

For air assume law for expansion $p v^{1.2} = C$, law for compression $p v^{1.4} = C$ and the specific heat of air at constant pressure = 1.005 kJ/kg.K.

(OR)

3. a. What are the factors to be considered for the adoption of a refrigeration system for an aircraft? [5]
- b. A refrigeration plant working on Bell - Coleman cycle maintains a refrigeration temperature of -15°C and compresses the air from 1 bar to 7 bar with an index of compression 1.3. Heat from the compressed air is then removed such that the air cooled to 30°C before expansion. The index of expansion is 1.35 calculate: [7]
 - (i) The ideal COP
 - (ii) Quantity of air circulated per minute so as to manufacture the ice at the rate of 2 metric tons per day from water available at 30°C.
 - (iii) What is the capacity of the plant then in tons of refrigeration?

For air cp 1.05 kJ/kgK, $\gamma = 1.4$, latent heat of fusion of ice at 0°C is 335 kJ/kg. Cp of water = 4.1868 kJ/kgK.

UNIT-II

4. a. What are the important types of vapour compression cycles? Explain with the help of P-h diagram. [4]
b. A simple vapour compression cycle using F-12 is designed to take a load of 10 tons. The refrigerator and ambient temperatures are 0°C and 30°C respectively. A minimum temperature of 5°C is required in evaporator and condenser for heat transfer. Find [8]
(i) Mass flow rate through the system
(ii) Power required in kW
(iii) Cylinder dimensions assuming L/D ratio as 1.2 for a single cylinder and single acting compressor running at 300 RPM with a volumetric efficiency of 0.9.
(OR)
5. a. What are the desirable properties of a good refrigerant? [4]
b. A food storage locker requires a refrigeration capacity of 12 TR and works between the evaporating temperature of -8°C and condensing temperature of 30°C . The refrigerant R-12 is sub-cooled by 5°C before entry to expansion valve and the vapour is super heated to -2°C before leaving the evaporator coil. Assuming a two cylinder, single acting compressor operating at 1000 rpm with stroke equal to 1.5 times the bore. Accurately determine i) COP ii) Theoretical power per ton of refrigeration iii) Bore and stroke of compressor when there is no clearance [8]
The specific heat of liquid of R-12 is 1.235 kJ/kgK and of vapour is 0.733 kJ/kgK.
Represent TD cycle on T-s and p-h coordinates.

UNIT-III

6. a. What is the effect of Latent Heat of refrigerant on performance of the $\text{NH}_3 - \text{H}_2\text{O}$ absorption system? [6]
b. Explain working of $\text{NH}_3 - \text{H}_2\text{O}$ vapour absorption system and compare practical $\text{NH}_3 - \text{H}_2\text{O}$ system with theoretical $\text{NH}_3 - \text{H}_2\text{O}$ system. [6]
(OR)
7. a. What are the desirable requirements of a Refrigerant – Absorption pair? [6]
b. What are the conventional working pairs for absorption systems and explain with line diagram any one pair. [6]

UNIT-IV

8. a. What are the advantages of pulse tube cooling? [6]
b. What is thermo electric refrigerator and what are the materials used for the thermoelectric refrigeration? [6]
(OR)
9. a. Describe briefly the principle of production of hot and cold air using Vortex tube. [6]
b. What are the limitations of thermoelectric Refrigerator over conventional absorption system? Explain how thermoelectric refrigerator works. [6]

UNIT-V

10. a. Explain how air washers can be used for the following processes with a diagram. Indicate the processes on the psychrometric chart. [6]
(i) Heating and humidification
(ii) Cooling and Humidification
(iii) Cooling
(iv) Cooling and Dehumidification

- b. The following data refers for a space to be air-conditioned: Inside design conditions = 23°C DBT, 48% RH, outdoor air conditions = 45°C DBT, 28°C WBT, room sensible heat gain = 18 kW, room latent heat gain = 6 kW, by-pass factor of the cooling coil = 0.12, the return air from the space is mixed with the outside air before entering the cooling coil in the ratio of 5 : 1 by mass. [6]
- Determine
- (i) Apparatus dew point
 - (ii) Condition of air entering and leaving the cooling coil
 - (iii) Dehumidified air quantity
 - (iv) Fresh air mass flow and volume flow rate
 - (v) Total refrigeration load on the air-conditioning plant.

(OR)

11. a. Discuss briefly the factors, which govern the optimum effective temperature for comfort. [4]
- b. The following data refer to summer air conditioning of a restaurant: Inside design conditions = 25°C DBT and 19°C WBT, outside design conditions = 36°C DBT and 25°C WBT, sensible heat load = 1,30,000 kJ/h, latent heat load = 50 000 kJ/h, the outside air is supplied at the rate of $23 \text{ m}^3/\text{min}$ directly into the room through ventilators and by infiltration. The outside air to be conditioned is passed through a cooling coil which has an apparatus dew point of 10°C and 58% of the total air is re-circulated from the conditioned space and mixed with conditioned air after the cooling coil. Find: [8]
- (i) condition of air after the cooling coil before mixing with re-circulated air
 - (ii) condition of air entering the restaurant
 - (iii) mass of fresh air entering the cooling coil
 - (iv) by-pass factor of the cooling coil
 - (v) total refrigeration load of the cooling coil.

AR13

CODE: 13EC4027

SET-2

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

IV B.Tech I Semester Supplementary Examinations, November-2019

**DIGITAL IMAGE PROCESSING
(Electronics & Communication Engineering)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is Dynamic Range?
b) What do you mean by Gray level?
c) Why DCT is preferred for image compression?
d) What are the Properties of Slant transform?
e) What is Image Negatives?
f) Define Histogram?
g) Define image degradation model.
h) Give the difference between Enhancement and Restoration?
i) What are different Compression Methods?
j) How the discontinuity is detected in an image using segmentation?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Describe image formation in the eye with brightness adaptation and discrimination 6M
b) Discuss about the following relationships between pixels with neat diagrams 6M
i) Neighbors of a pixel ii) Connectivity iii) Distance measures iv) Path
(OR)
3. a) Describe the functions of elements of digital image processing system with a diagram 6M
b) Explain the process of image sampling and quantization. 6M

UNIT-II

4. a) Explain the properties of 2D Fourier Transform. 5M
b) Write about Slant transform and What are the properties of Slant transform? 7M
(OR)
5. a) Write about Walsh transform 4M
b) Discuss the properties and applications of 1) Hadamard transform II) Discrete Cosine Transforms 8M

UNIT-III

6. a) What are image sharpening filters? Explain the various types of it. 6M
b) Explain spatial filtering in image enhancement. 6M
(OR)
7. a) Explain Homomorphic filtering in detail 6M
b) Explain image enhancement in frequency domain using 6M
i) Low Pass Filter ii) High Pass Filter

UNIT-IV

- | | | | |
|----|----|--|----|
| 8. | a) | What is meant by Inverse filtering? Explain. | 6M |
| | b) | Explain the method of Least Mean Squares Filtering for image restoration | 6M |
| | | (OR) | |
| 9. | a) | Explain image degradation model /restoration process in detail | 5M |
| | b) | Explain full color image processing | 7M |

UNIT-V

- | | | | |
|-----|----|--|----|
| 10. | a) | Classify error free compression techniques. | 5M |
| | b) | Explain various edge detectors. | 7M |
| | | (OR) | |
| 11. | a) | Explain about JPEG compression standard and the steps involved in JPEG compression | 7M |
| | b) | Explain in detail the threshold selection based on boundary characteristics | 5M |

PART-A**ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Define Sampling
b) Differentiate between CMY and CMYK color models
c) Write general form of log transformation?
d) What is a Median filter
e) What is histogram equalization?
f) What is Data Compression
g) What is JPEG?
h) Write any four applications of DIP.
i) Write the applications of segmentation.
j) What are the three types of discontinuity in digital image?

PART-B**Answer one question from each unit****[5 x 12 = 60 Marks]****UNIT-I**

2. a) Explain various components of general purpose image processing system. 6M
b) Explain the following terms: 6M
i. Adjacency ii. Connectivity
(OR)
3. a) Explain about zooming and shrinking of digital images 6M
b) Explain about pseudo color image processing 6M

UNIT-II

4. a) Explain the basics of spatial filtering in detail. 6M
b) Define histogram. Discuss histogram processing in detail. 6M
(OR)
5. a) With necessary equations, Explain histogram equalization technique for image enhancement. 6M
b) Explain about various smoothing filters in spatial domain. 6M

UNIT-III

6. a) Explain the following terms: 6M
i. Coding redundancy ii. Psycho-visual redundancy
iii. Variable length coding
b) Explain Lossless predictive coding. 6M
(OR)
7. a) Explain image compression model. 6M
b) Explain the different steps in JPEG compression standard. 6M

UNIT-IV

8. Briefly discuss about:
i. Dilation
ii. Erosion
iii. Opening and closing
(OR)
9. a) Explain about Thickening and skeletons
b) Discuss the pruning problem in image processing

12M

8M

4M

UNIT-V

10. List and explain the techniques for detecting gray level discontinuities in a digital image.
(OR)
11. a) Discuss region splitting and merging algorithm with an illustration.
b) Explain the basic formulation of edge modeling and detection.

12M

6M

6M

AR13

CODE: 13IT4014

SET-1

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

IV B.Tech I Semester Supplementary Examinations, November-2019

ADVANCED COMPUTER NETWORKS

(Information Technology)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) For n devices in a network, what is the number of cable links required for a mesh and ring topology?
 b) What is redundancy?
 c) Define Masking?
 d) Abbreviate DHCP.
 e) What is meant by segment?
 f) What is advantage of VLAN?
 g) Define LAN.
 h) Define metrics of Routing.
 i) What are the types of physical media?
 j) What is a switch?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. What is OSI Model? Explain the functions and protocols and services of each layer? 12 M

(OR)

3. Define the following : 12 M
 i) internet backbone ii) Novel Netware iii) Network Core iv)ISP

UNIT-II

4. a) Where to use static and where to use dynamic routing? 6 M
 b) What is flooding? Write applications of Flooding. 6 M

(OR)

5. Explain the different message formats in OSPF protocol. 12 M

UNIT-III

6. a) What is VTP and How it works? 6 M
 b) What is STP and How does it work? 6 M

(OR)

7. Explain the different types of Switches in detail. 12 M

UNIT-IV

8. a) What is NAT? Explain its types in detail. 5 M
 b) What is WAN? Explain the different types of WAN. 7 M

(OR)

9. What is DHCP? And explain various functionalities in DHCP. 12 M

UNIT-V

10. Explain the Security in MANETs 12 M

(OR)

11. What is MANNET? Explain the properties of MANNET. 12 M

AR13

CODE: 13EE4024

SET-2

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

IV B.Tech I Semester Supplementary Examinations, November-2019

POWER SYSTEM OPERATION AND CONTROL

(Electrical & Electronics Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a. Define 'Incremental Production Cost' of a generating station
b. Draw the incremental fuel cost curve
c. What is unit commitment problem?
d. Define hydrothermal scheduling problem
e. Give a block diagram representation for speed governor and power system load
f. What are the factors effecting Automatic generation control?
g. Write the incremental balance equation of a two area case. If the power is exported from area 1
h. If the two areas are identical. What is the relation between two tie-line powers?
i. Compare series capacitors and shunt capacitors
j. What is the need of reactive power compensation in transmission system?

PART-B

Answer one question from each unit

[5 x 12=60M]

UNIT-I

- 2.a) Describe the computational procedure for economic distribution of load between Units [8M]

- b). Incremental fuel costs in Rs/MWh for a plant consisting of two units are

$$\frac{df_1}{dpg_1} = 0.2pg_1 + 40 \quad \frac{df_2}{dpg_2} = 0.25pg_2 + 30$$

Assume both units are operating at all times and total load varies from 40MW to 250MW and maximum and minimum loads are to be 125 and 20MW respectively. How will the loads be shared between the two units as the system load varies in steps of 50MW over full range? What are the corresponding values of the plant incremental costs [4M]

(OR)

3. .Derive the transmission line loss equation in terms of B-Coefficients [12M]

UNIT-II

- 4.(a) Derive the coordination equation for the optimal scheduling of hydrothermal interconnected power plants [6M]

- (b) Explain the constraints in Unit commitment Problem [6M]

(OR)

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CODE: 13EE4024

SET-2

- 5.a) Explain the dynamic programming method of solving unit commitment problem. [6M]
b) Explain about Unit commitment problem [6M]

UNIT-III

- 6 a) Draw a neat sketch of a typical turbine speed governing system and derive its block representation and transfer function [8M]
b) Two generators rated at 120MW and 250MW are operating in parallel have governor droop characteristics of 4% and 3% respectively. Determine the load taken by each machine for a total load of 200MW [4M]
(OR)
7 a) With a block diagram, explain the proportional plus integral control of a single area system. [8M]
b) Explain the necessity of maintaining constant frequency in a power system [4M]

UNIT-IV

8. Derive an expression for steady state change of frequency and tie-line power transfer of a two area power system [12M]
(OR)
9. Obtain the block diagram of load frequency control of two area control [12M]

UNIT-V

10. Explain various compensations carried out in power system [12M]
(OR)
11.a) Explain the importance of reactive power and its control in the operation of a power system [6M]
b) What is load compensation? Explain its objectives. [6M]