

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)****IV B.Tech I Semester Supplementary Examinations, August-2021  
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) Explain the basic economic principles used by managerial economics. 7M  
b) Define law of demand. Explain its exceptions. 7M
- (OR)**
2. a) Define Managerial economics, Explain its nature and scope. 7M  
b) Define demand. Explain its significance of demand. 7M

**UNIT-II**

3. a) Define elasticity of demand. Explain its types of elasticity of demand 7M  
b) Time series data can be used for forecasting demand. What are the complexities involved in using the time series data? How do you resolve them? 7M
- (OR)**
4. a) Define price elasticity of demand. Explain the various types of price elasticity of demand. 7M  
b) Define trend projection method. Explain the trend projection method estimating equation. 7M

**UNIT-III**

5. a) Explain cob Douglas production function. 7M  
b) Explain the law of returns to scale. 7M
- (OR)**
6. a) Define cost. Explain its different types of cost. 7M  
b) The following data is obtained from the records of PVR&Co. 7M

	Period1	Period 2
Sales	6,50,000	8,50,000
Profit	1,00,000	1,75,000

Calculate: a) P/V ratio b) Break even sales c) Margin of safety

**UNIT-IV**

7. a) Explain the difference between perfect and monopoly competition 7M  
b) A project requires initial investment of Rs.20, 000 with a useful life of 5 years. The projected cash inflows for each year are as follows:- 7M

Year	1	2	3	4	5
CIF	7000	9000	8000	6000	10000

Calculate the payback period.

**(OR)**

8. a) Define monopolistic. Explain the price and output determination under monopolistic competition. 7M
- b) A limited company is considering investment in a requiring a capital outlay of Rs.2, 00,000. The projected annual cash inflows are as follows. 7M

Year	1	2	3	4	5
CIF	50,000	60,000	70,000	60,000	50,000

Calculate NPV and PI taking cost of capital as 10%

### UNIT-V

9. a) Define book keeping. Explain its advantages of book keeping. 7M
- b) From the following particulars prepare trading and profit and loss account and balance sheet as on 31.03.2010 Mr. Rakesh. 7M

Particulars	Amount
Cash in hand	5,000
Capital	
Rent	2,000
Wages	25,600
Office expenses	15,900
Rates & Taxes	50,900
Salaries	1,12,600
Octroi	5,000
Carriage inwards	4,400
Carriage outwards	3,72,000
Purchase returns	2,800
Sales returns	3,500
Sales	6,64,700
Drawings	8,700
Plant and Machinery	2,70,000
Furniture	15,000
Stock	47,500
Sundry debtors	80,000
Sundry creditors	50,000
Discount received	2,000

Additional Information:

1. Closing Stock Rs.56,000/

2. Depreciate plant and machinery by 10% and furniture by 5%

**(OR)**

10. a) From the following transactions write journal entries. 7M

Date	Particulars
1.7.2016	Pradeep commenced business with capital Rs.40,000
2 <sup>nd</sup>	Cash purchases Rs.10,000
6 <sup>th</sup>	Purchased good from Murali Rs.4,000
10 <sup>th</sup>	Sold goods to Murali on credit Rs.10,000
12 <sup>th</sup>	Cash received from Murali Rs.5,000
19 <sup>th</sup>	Cash Paid to Murali Rs.1,000
24 <sup>th</sup>	Cash Paid to Das Rs.2,000
27 <sup>th</sup>	Drawn for personal use Rs.100
29 <sup>th</sup>	Rent paid to landlord Rs.200/-
31 <sup>st</sup>	Salaries Paid Rs.500/-

- b) Define accounting. Explain rules of accounting 7M

# AR16

**CODE: 16EE4024**

**SET-2**

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

**IV B.Tech I Semester Supplementary Examinations, August-2021**

**POWER SYSTEM OPERATION AND CONTROL**

**(Electrical and Electronics 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) Explain the terms i) cost curve, ii) heat rate curve iii) Incremental fuel cost curve 7M  
b) A system consisting of two plants connected by a tie line and load is located at plant-2. When 100MW is transmitted from plant-1, a loss of 10MW takes place on the tie line. Determine the generation schedule at both the plants and the power received by load when  
 $\lambda$  of the system is 25Rs/MWh and IFC are given by  
 $dC1/dP1 = 0.03P1 + 17$  Rs/MWh,  $dC2/dP2 = 0.06P2 + 19$  Rs/MWh.  
(OR)
2. a) Derive general transmission line loss formula and state assumptions made for calculating B- coefficients 7M  
b) Write step by step procedure for computing economic allocation of generation in a thermal station. 7M

## **UNIT-II**

3. a) Explain clearly the mathematical formulation of optimal scheduling of hydrothermal system with a typical example. 7M  
b) Two generators rated 200 MW and 300 MW respectively are operating in parallel. The droop characteristics of their governors are 4% and 6% respectively from no load to full load. The speed changers of the governors are set so that a load of 500 MW is shared among the generators at 50 HZ in the ratio of their ratings. What are the no load frequencies of the generators?  
(OR)
4. a) State unit commitment also explain the necessity of unit commitment. 7M  
b) Explain the solution methods of unit commitment. 7M

## **UNIT-III**

5. a) Explain the necessity of maintaining a constant frequency in power system operation. 7M  
b) Explain the mathematical modeling of speed governing system 7M  
(OR)

6. a) Derive transfer function of steam turbine by making suitable assumptions 7M  
b) A 200MVA synchronous generator operates on full load at a frequency of 50 Hz. 7M  
The load is scheduled to 60 MW. Due to time lag in the governor system, the steam valve begins to close after 0.8 seconds. Determine the change in frequency that occurs in this time.  $M = 8 \text{ KW-S/KVA}$  of generator capacity

**UNIT-IV**

7. Distinguish between load frequency control and economic load dispatch control with neat block diagram. 14M
- (OR)**
8. Derive and draw the block diagram of representation of two area load frequency control. 14M

**UNIT-V**

9. a) Explain about the losses that occur due to VAR flow in power systems. 7M  
b) Explain briefly about shunt and series compensation of transmission lines. 7M
- (OR)**
10. a) Compare the different types of compensating equipment for transmission system? 7M  
b) Explain the uncompensated and compensated transmission lines. 7M

# AR16

**CODE: 16ME4027**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, August-2021**

**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 cylindrical coordinate system. 8 M
- b) A 150 mm steam pipe has inside diameter of 120 mm and outside diameter of 160 mm. It is insulated at the outside with asbestos. The steam temperature is 150°C and the air temperature is 20°C. Heat transfer coefficient ( $h$ , steam side) is 100 W/m<sup>2</sup>K, and  $h$  (airside) 30 W/m<sup>2</sup>K. Thermal Conductivity  $K$  (asbestos) is 0.8 W/mK and  $K$  steel is 42 W/mK. How thick should be the asbestos be provided in order to limit the heat losses to 2.1 kW/m<sup>2</sup>. 6 M

**(OR)**

2. a) State the effect of variation of temperature on thermal conductivity in the following cases (i) Pure Metals (ii) Alloys (iii) Gases (iv) Liquids 4 M
- b) A refrigerator door has dimensions 120 cm × 45 cm and is made up of 3 mm thick mild steel of  $K = 40$  W/mK with 5 cm of polyurethane foam insulation having  $K = 0.04$  W/mK sandwiched between them. The average values of convective heat transfer coefficient at the interior and exterior of the door are 10 W/m<sup>2</sup>K and 13 W/m<sup>2</sup>K respectively. The temperature inside the refrigerator is 3°C and outside is 20°C. Determine i) the rate of heat leak through door ii) interface temperatures and overall heat transfer coefficient. 10 M

## UNIT-II

3. a) Derive an expression for temperature in a plane wall with internal heat generation under steady state condition. 7 M
  - b) A long cylinder rod of radius 50 cm with thermal conductivity of 10 W/mK contains radioactive material, which generates heat uniformly within the cylinder at rate of  $3 \times 10^5$  W/ m<sup>3</sup>. The rod is cooled by convection from its cylindrical surface into the ambient air at  $T_a = 50^\circ\text{C}$  with a heat transfer coefficient of 60 W/ m<sup>2</sup>K. Determine the temperature at the centre and the outer surface of the cylindrical rod. 7 M
- (OR)**
4. a) Derive the generalized equation for temperature distribution along a constant cross sectional area fin. 7 M
  - b) An aluminium fin ( $K = 200$  W/mK) of 3 mm thick and 75 mm long protrudes from a wall at 300°C. The ambient temperature is 50°C with heat transfer coefficient of 10 W/ m<sup>2</sup>K. Calculate the heat loss from the fin for unit depth of material. Also calculate effectiveness and efficiency of the pin. 7 M

### **UNIT-III**

5. a) Explain the development of hydrodynamic 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) State the Buckingham's  $\pi$  theorem. Using dimension analysis obtain an expression for Nusselt number in terms of Reynolds and Prandtl numbers 8M  
b) A thin flat plate has been placed longitudinally in a steam of air at 200°C and while flows with undisturbed velocity of 7.5 m/s. The surface of plate is maintained at a uniform temperature of 1200°C. (i). Calculate the heat transfer coefficient 0.8 m from the leading edge of the plate 6M

### **UNIT-IV**

7. a) Distinguish between film wise condensation and drop wise condensation 6M  
b) A vertical pipe of 15 cm diameter and 3 m long whose surface area is maintained at 100°C is kept in a room air 20°C. Determine the rate of heat lost from pipe (i) when it is 3m long ii) if the pipe is of 1m length iii) if the pipe is 50 cm long. 8M
- (OR)**
8. a) Define heat exchanger effectiveness and explain its significance. 7M  
b) Cold water at 1495 kg/hr enters at 25°C through a parallel flow heat exchanger to cool 605 kg/hr of hot water entering at 70°C and leaving at 50°C. Find the area of heat exchanger with the individual heat transfer coefficients on both sides are 1590 W/ m<sup>2</sup>K. Use LMTD and NTU methods find also the exit temperatures of cold and hot streams if the flow of hot water is doubled. Assume the individual heat transfer coefficients are proportional to (mass flow rate)<sup>0.8</sup>. For water  $C_p = 4200$  J/kg K. 7M

### **UNIT-V**

9. a) What are the factors that influence the radiant heat exchange between two bodies? 6M  
b) A pipe carrying steam having outside diameter of 20 cm runs in a large room and is exposed to air at a temperature of 30°C. The pipe surface temperature is 400°C. i). Calculate the loss of heat to surroundings per meter length of pipe due to thermal radiation. The emissivity of the pipe surface is 0.8. ii) What would be the loss of heat due to radiation if the pipe is enclosed in a 40 cm diameter brick conduit of emissivity 0.91? 8M
- (OR)**
10. a) What is the Stefan-Boltzmann Law? Explain the concept of total emissive power of a surface? 7M  
b) Two large parallel planes having emissivity 0.3 and 0.4 are maintained at a temperature 800°C and 500°C respectively. A radiation shield of emissivity 0.05 on both sides is placed in between. Determine the i) rate of heat transfer per unit area if shield is not there ii) heat transfer with the shield iii) the temperature of the shield. 7M

# AR16

**CODE: 16EC4028**

**SET-2**

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

**IV B.Tech I Semester Supplementary Examinations, August-2021**

**DIGITAL IMAGE PROCESSING**

**(Electronics and Communication 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) Discuss about Image sampling and Quantization 8M  
b) Explain simple image formation model? 6M
- (OR)**
2. a) Explain about the basic relationship between pixels in a digital image. 8M  
b) Explain various image operations on a pixel basis? 6M

## **UNIT-II**

3. a) Define Image transform and Explain Haar Slant Transform. 8M  
b) Slant Transform. 6M
- (OR)**
4. a) List the properties of 2D FFT. 6M  
b) Explain Hadamard Wavelet Transform. 8M

## **UNIT-III**

5. a) Explain in detail Homomorphic filtering with neat diagram? 8M  
b) Explain about smoothing frequency domain filters. 6M
- (OR)**
6. a) What is the difference between enhancement in spatial domain and frequency domain? 6M  
b) Explain about sharpening frequency domain filters. 8M

## **UNIT-IV**

7. a) Explain Wiener filter restoration method. 8M  
b) Elaborate about different colour models. 6M
- (OR)**
8. a) Discuss about Constrained Least Squares 7M  
b) Write short notes on Least mean square filters 7M

## **UNIT-V**

9. a) Explain about Lossy and Lossless Predictive Compression Systems. 8M  
b) Write about Edge linking and boundary detection 6M
- (OR)**
10. a) List various approaches in Image segmentation? Explain the methods of region Oriented segmentation. 7M  
b) Discuss about the Image Compression Model 7M

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 zooming and shrinking in digital images, how it takes place? 6M
- b) Consider the two image subsets,  $S_1$  and  $S_2$  shown below. For  $V = \{1\}$ , determine 8M  
whether these two subsets are (a) 4-adjacent, (b) 8-adjacent, or (c) m-adjacent.

$S_1$					$S_2$				
0	0	0	0	0	0	0	1	1	0
1	0	0	1	0	0	1	0	0	1
1	0	0	1	0	1, p	1	0	0	0
0	0	1	1	1, q	0	0	0	0	0
0	0	1	1	1	0	0	1	1	1

**(OR)**

2. a) What are the fundamental steps in Digital Image Processing? 10M
- b) Write the expression to find the number of bits to store a digital image? Find the 4M  
number of bits required to store a 256 X 256 image with 32 gray levels?

**UNIT-II**

3. a) Explain periodicity and convolution properties of 2D DFT. 7M
- b) If all the pixels in an image are shuffled, will there be any change in the 7M  
histogram? Justify your answer with an example.

**(OR)**

4. a) Perform histogram equalisation of the image. 10M

4	4	4	4	4
3	4	5	4	3
3	5	5	5	3
3	4	5	4	3
4	4	4	4	4

- b) Write the basic image transformations in spatial domain. 4M

**UNIT-III**

5. a) Consider two structuring elements  $s_1$  and  $s_2$ , where  $s_1$  is a disc of radius  $r$  and  $s_2$  7M  
is a circle with radius  $r$ . The center of the disc and circle respectively is the  
origin. Will dilation and erosion using  $s_1$  or  $s_2$  yield the same results with any  
set? Justify your answers.
- b) Explain about pseudocolor image processing. 7M

**(OR)**



6. a) Explain the following applications of morphological algorithm 7M  
i) Region filling ii) convex hull  
b) How the color helps in better image analysis? Discuss various color models to specify a color in a standard way? 7M

#### **UNIT-IV**

7. a) Define image compression. Explain about the redundancies in a digital image 7M  
b) Explain about fidelity criterion. 7M  
(OR)  
8. a) Explain in detail about the general model of the image compression system. 7M  
b) Explain a method of generating variable length codes with an example. 7M

#### **UNIT-V**

9. a) Explain about the edge linking process in image segmentation. 9M  
b) What is thresholding? Explain about global thresholding. 5M  
(OR)  
10. a) Explain in detail about detection of discontinuities point, line and edge. 8M  
b) What is region based segmentation? Give the basic formulation for a region based segmentation 6M

# AR16

**CODE: 16IT4001**

**SET-2**

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

**IV B.Tech I Semester Supplementary Examinations, August-2021**

**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. | Explain in detail about various file formats. | 14M |
|    | (OR)  |     |
| 2. | a) Define Multimedia, in terms of computing?  | 4M  |
|    | b) Classify Multimedia systems.               | 10M |

**UNIT-II**

- |    |  |     |
|----|--|-----|
| 3. | a) Differentiate analog and digital video.             | 5M  |
|    | b) Explain digitization of video signal?               | 9M  |
|    | (OR)   |     |
| 4. | Explain, in detail about video compression techniques? | 14M |

**UNIT-III**

- |    |  |     |
|----|--|-----|
| 5. | a) Write short notes on speech compression.      | 7M  |
|    | b) Explain about Perceptually Based Compression. | 7M  |
|    | (OR)   |     |
| 6. | What is MIDI? Explain about MIDI messages.       | 14M |

**UNIT-IV**

- |    |   |     |
|----|---|-----|
| 7. | Explain about Event Handling in Action Script.  | 14M |
|    | (OR)  |     |
| 8. | Discuss how looping statements are implemented in Action Script, with suitable example. | 14M |

**UNIT-V**

- |     |  |     |
|-----|--|-----|
| 9.  | Write short notes on : a) RSVP      b) VOIP      c) H.323                                      | 14M |
|     | (OR)   |     |
| 10. | a) Explain the parameters that define the quality of service (QoS) required by an application. | 8M  |
|     | b) Explain about any two networking devices.   | 6M  |

**DIGITAL IMAGE PROCESSING  
(Electronics & Communication Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Explain the function of image sensor.  
b) Show the matrix form representation of digital images.  
c) Write the properties of DCT.  
d) List the properties of Walsh transform.  
e) Discuss the need for image enhancement.  
f) What are the parameters used in defining the quality of an image?  
g) Compare Image Enhancement and Image Restoration.  
h) Write the purpose of colour model.  
i) What is the need for Compression?  
j) Define gradient of an image.

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

2. a) Explain the elements of an image processing system. 6  
b) Define an image. List out and explain the various areas of applications of image processing. 6

**(OR)**

3. a) Explain the terms Neighbourhood, Adjacency and Connectivity among the image pixels. 6  
b) Write about the various fundamental steps of digital image processing. 6

**UNIT-II**

4. a) Explain how Fourier transforms are useful in digital image processing and explain the properties of Fourier transform. 6  
b) What is Hadamard transform? Explain in detail and Write its properties. 6

**(OR)**

5. a) Derive the basis function of Walsh transform. 6  
b) Define 2D DFT. Prove the convolution property of 2D DFT. 6

**UNIT-III**

6. a) Explain about image smoothing using Ideal low pass filter. 6  
b) Discuss how the various filter masks are generated to sharpen images in spatial filters. 6

**(OR)**

7. a) Explain Spatial filtering in Image enhancement. 6  
b) Illustrate homomorphic filtering approach for image enhancement. 6

**UNIT-IV**

8. a) With relevant mathematical expressions, explain how a Wiener filter achieves restoration of a given degraded image. 6  
b) Write about the various available colour models. 6  
(OR)  
9. a) Explain parallel projection and fan beam projection-based methods for image restoration. 6  
b) Explain the operation of colour image smoothing and sharpening 6

**UNIT-V**

10. a) Draw and explain the general image compression system model. 6  
b) What is Hit-or-Miss transformation? Explain 6  
(OR)  
11. a) Explain the significance of thresholding in image segmentation. 6  
b) Describe Huffman coding with an example for compression of image. 6