

# AR19

**CODE: 19MTE1009** **SET-1**  
**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**  
**(AUTONOMOUS)**  
**I M.Tech II Semester Regular & Supplementary Examinations, January-2022**  
**THERMAL AND NUCLEAR POWER PLANTS**  
**(Thermal Engineering)**

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions  
All questions carry EQUAL marks

1. a) What are different direct energy conversion systems? Explain working of any one direct energy conversion system with a diagram. 6 M  
b) Write the basic ingredients in coal. How they affect its selection for a thermal power plant? 6 M
2. a) Explain the operation of any one type of over feed stocker with help of a neat sketch. 6 M  
b) What are different boiler accessories? Describe with a neat sketch about the functioning of any one type of boiler accessory. 6 M
3. a) Why are steam turbines compounded? Explain pressure compounding of steam turbines? 6 M  
b) Describe the working of a forced draught cooling tower with neat diagram. 6 M
4. a) Illustrate method of reheating to improve overall efficiency of a gas turbine power plant. Represent the same on a T-s and h-s diagrams. 6 M  
b) What are the advantages and disadvantages of fluidized bed combustion? 6 M
5. a) Draw neat diagram of the construction and working of nuclear power plant. 6 M  
b) What do you mean by breeding of a nuclear reactor? List out the merits and demerits of fast breeder reactors. 6 M
6. a) A power station has to supply load as follows: 6 M  

Time (hours)	0-6	6-12	12-14	14-18	18-24
Load (MW)	45	135	90	150	75

(i) Draw the load curve  
(ii) Draw the load duration curve  
(iii) Calculate load factor and plant capacity factor

b) What are the considerations to be made while selecting a suitable site for a thermal power plant? 6 M
7. a) Explain briefly various methods of reducing thermal pollution. 6 M  
b) List down some safety measures for nuclear power plants. 6 M
8. a) List various ash handling equipment. Discuss their relative merits and demerits. 6 M  
b) What are different types of nuclear wastes? Which are more dangerous and why? 6 M

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**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)****I M.Tech II Semester Regular & Supplementary Examinations, January-2022****ADVANCED DIGITAL SIGNAL PROCESSING AND ITS APPLICATIONS  
(PED)****Time: 3 Hours****Max Marks:60****Answer any FIVE questions  
All questions carry EQUAL marks**

1. a) Determine the eight-point DFT of the signal  $x(n) = \{1,1,1,1,1,0,0\}$  and sketch its magnitude and phase. 6M  
b) Obtain the DFT of the following sequence using 8-point FFT algorithm. Give all intermediate results.  $X(u) = \{0,1,-1,0,0,-1,1,0\}$  6M
2. Explain how an analog signal is converted into digital signal with neat diagram. 12M
3. Determine if the system is described by the following input output equations are linear or nonlinear. i)  $Y(n) = x(n) + 1/x(n-1)$  ii)  $y(n) = x^2(n)$ . 12M
4. Design a High Pass FIR filter whose cut-off frequency is 1.2 radians/sec and  $N=9$  Using Hamming Window. 12M
5. With neat sketch explain the Architecture of TMS320LF 2407A. 12M
6. Discuss about the following: 12M  
(i) Event manager register address  
(ii) General Purpose Timers  
(iii) Event Manager Interrupts
7. a) What are the effects of finite word length in digital filters explain? 6M  
b) Compare FIR and IIR filters. 6M
8. a) Discuss the design steps involved in designing FIR filters using windowing techniques 6M  
b) List the advantages and disadvantages of digital signal process. 6M

# AR19

CODE: 19MCS1013

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

I M.Tech II Semester Regular & Supplementary Examinations, January-2022

## COMPUTER VISION AND IMAGE PROCESSING

(Computer Science Engineering)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions  
All questions carry EQUAL marks

1. a) What is the role of forward model in computer vision? List any three real world applications that involves computer vision. 6M  
b) Explain with proper diagram that how sampling and aliasing can be performed for a given two-dimensional signal? 6M
2. a) Find the transformation of a triangle A(1, 0) B(0, 1) and C(1, 1)  
i) Rotating 45 degrees about the origin and translating in x and y direction by one unit each 8M  
ii) Translating each unit in x and y direction and then rotating 45 degrees about origin  
b) Write and explain about any 2 properties of 2D-DCT. 4M
3. a) Write the conditions for histogram equalization transformation. 6M  
b) What is the process involved in smoothing linear filters? Explain with proper diagram. 6M
4. a) Explain any three basic enhanced transformation techniques. 6M  
b) Explain the process of using the Second Derivative for Image Sharpening using Laplacian transform. 6M
5. a) Explain bit-plane coding compression technique. 6M  
b) Explain JPEG standards for Image Compression. 6M
6. a) How the Dilation and Erosion functions can be implemented for the morphological operations for an Image? Explain with an example. 6M  
b) Explain the following:  
i) Boundary Extraction 6M  
ii) Skeletons
7. a) Explain the opening and closing operations with suitable example. 6M  
b) Explain, how Image morphology can be achieved through region filling? 6M
8. a) Briefly explain, how to achieve Image Segmentation using Line Detectors. 6M  
b) What is multivariable thresholding? Explain in detail. 6M

# AR19

**CODE: 19MVL1011**

**SET-1**

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

**I M.Tech II Semester Regular & Supplementary Examinations, January-2022**

**LOW POWER VLSI DESIGN  
(VLSI System Design)**

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions  
All questions carry EQUAL marks

1. a) Explain in detail about silicon on insulator technology along with its advantages? 6M  
b) Explain about the threshold limitation for low voltage, low power design. Describe how the scaling of threshold voltage affects other MOSFET parameters? 6M
2. a) Explain step by step process of deep trench isolation with neat sketches? 6M  
b) Describe in detail about smart cut process and wafer bonding isolation techniques? 6M
3. a) How to fabricate Low-voltage/Low-power SOI CMOS devices? 6M  
b) Elaborate an advanced isolation techniques in BICMOS isolation. 6M
4. a) Discuss in detail about the features of HICUM model? 6M  
b) Explain how LEVEL2 MOSFET models deals with short channel effects? 6M
5. a) Explain the impact of short channel effects on Hybrid-mode device threshold voltage model? 6M  
b) Discuss in detail about Space charge current and Bipolar current of MOSFET device? 6M
6. a) Explain the working of Complementary Feedback BICMOS digital gates? 6M  
b) Explain the importance of ESD-free BiCMOS gates and design an inverter circuit using ESD-free BiCMOS logic? 6M
7. With the neat diagrams explain the working of conventional multi drain complimentary BICMOS buffers. 12M
8. Explain in detail the evaluation process latches and flip-flops. 12M

# AR19

CODE: 19MSE1027

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

I M.Tech II Semester Regular & Supplementary Examinations, January-2022

DESIGN OF HIGH RISE STRUCTURES

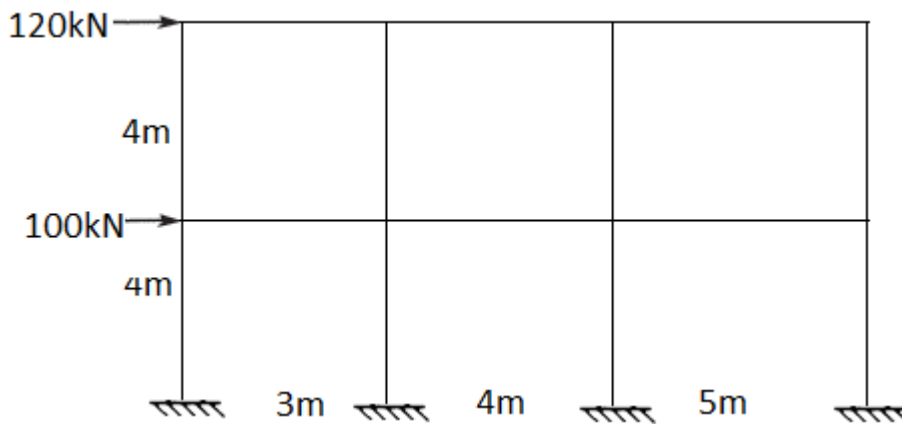
(Structural Engineering)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions  
All questions carry EQUAL marks

1. Determine design wind force by using force coefficient method for framed building of plan 24mtr x 15mtr for 10 number of storeys each of 3m height for 50year design life having up wind slope  $\Theta < 3^\circ$  located at Vadodara. 12M
2. Analyze the frame shown in figure by Cantilever method and drw BMD. Assume c/s area of columns is same. 12M



3. What is shear wall and discuss about types and placement of shear walls in multistoried buildings 12M
4. A four storeyed building frame has four equal bays each of 4mtr and height between floors is 4m. The wind loads acting at roof level and various floor levels are,  $H_1 = 5\text{kN}$ ,  $H_2 = 10\text{kN}$ ,  $H_3 = 20\text{kN}$  and  $H_4 = 40\text{kN}$ . The columns have the same cross section. Estimate the moments in the columns and beams using portal method. 12M
5. Design a self supporting chimney is of effective height 40m having diameter at top is 2m. Take the wind pressure intensity as  $2.0\text{kN/m}^2$  throughout the height. Assume uniform values of permissible tensile and compressive stresses as  $120\text{ N/mm}^2$  and  $100\text{ N/mm}^2$ . 12M
6. Design a circular cylindrical bunker of capacity 350 kN to store coal using M25 concrete and Fe: 415 Steel unit weight of coal is  $8.0\text{kN/m}^3$ , angle of repose of coal is  $25^\circ$ . 12M
7. Design a circular silo of 10m height and 5m internal diameter to store cement of unit weight  $16\text{ kN/m}^3$  and  $\phi = 30^\circ$  12M
8. Explain the substitute frame method for the analysis of multistoried frames 12M