

AR19

CODE: 19MVL1011

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M.Tech II Semester Supplementary Examinations, July, 2025

LOW POWER VLSI DESIGN

(VLSI Design)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Explain the limitations of low voltage , low power design w.r.t. the following 6M
i) Power supply voltage ii) Threshold Voltage
- b) What are the considerations to be taken care while integrating BiCMOS process? Explain. 6M
2. a) What is the need for Low power circuit design? Explain the issues involved in low power VLSI Design. 6M
- b) Discuss briefly the n-well CMOS process. 6M
3. a) Explain the different Bi-CMOS isolation Techniques in brief. 6M
- b) Illustrate a $0.2\ \mu\text{m}$ SOI Bi-CMOS process flow and then explain each step of it. 6M
4. a) Explain the following in brief 6M
i) Wafer bonding ii) Smart cut process.
- b) What are the key steps involved in Deep submicron processes and explain each step of it. 6M
5. a) Draw the SPICE model for MOSFET and explain the parameters involved. 6M
- b) Explain the Ebers Moll model in brief. 6M
6. a) When MOSFET is considered as Short channel. 4M
- b) Explain the Hybrid mode operation of deep submicron LLD pMOSFET 8M
7. a) Design a conventional CMOS Full adder and discuss its performance 6M
- b) Design ESD free Bi-CMOS inverter and explain it briefly. 6M
8. a) Design and explain the Operation of SR Latch using CMOS. 6M
- b) Design and explain the Operation of JK Flipflop using CMOS. 6M

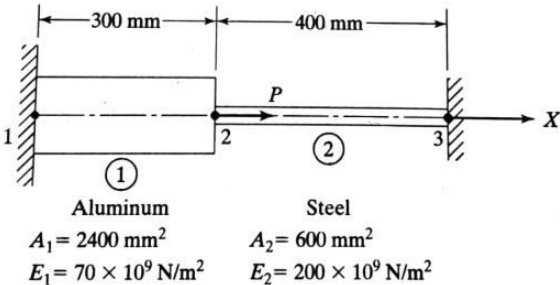
Time: 3 Hours

Max Marks:60

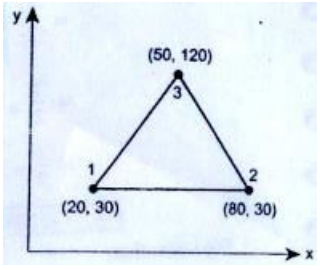
Answer any FIVE questions
All questions carry EQUAL marks

1. Write down the general procedure for solving an engineering problem using FEA 12M

 2. a) Discuss the Applications of FEA 6M
 b) Write the advantages of FEM over classical methods 6M

 3. Consider the bar shown in Fig. An axial load $P = 200 \times 10^3 \text{ N}$ is applied as shown. Using the penalty approach for handling boundary conditions, do the following:
 (a) Determine the nodal displacements.
 (b) Determine the stress in each material. 12M
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Aluminum Steel
 $A_1 = 2400 \text{ mm}^2$ $A_2 = 600 \text{ mm}^2$
 $E_1 = 70 \times 10^9 \text{ N/m}^2$ $E_2 = 200 \times 10^9 \text{ N/m}^2$
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4. Derive the displacement function and stiffness matrix for one dimensional linear bar element based on global co-ordinate approach. 12M

 5. Determine the stiffness matrix for the CST element shown in fig. the coordinates are given in units of millimeters. Assume plane stress conditions. Take $E=210 \text{ GPa}$, $\nu = 0.25$ and $t = 10 \text{ mm}$. 12M
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6. a) What are the conditions for a problem to be axisymmetric and give the stiffness matrix equation for an axisymmetric triangular element. 4M
 b) A square plate (1m x 1m) with simply supported edges is subjected to a uniform load of 1000 N/m^2 . Determine the maximum deflection using Kirchhoff's theory. 8M

 7. a) What is the importance the isoperimetric formulation in FEA. 6M
 b) Differentiate isoparametric, super parametric and sub parametric elements. 6M

 8. a) Write down the shape functions for 4 noded rectangular elements using natural coordinate system. 6M
 b) Explain the finite element formulation for dynamic problems 6M

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I M.Tech. II Semester Supplementary Examinations, July,2025****LOW POWER VLSI DESIGN
(VLSID)****Time: 3 Hours****Max Marks:60****Answer any FIVE questions
All questions carry EQUAL marks**

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|----|----|---|-----|
| 1. | a) | Explain low-voltage, low-power design limitations in detail. | 8M |
| | b) | How can the bipolar packing density be improved in the twin-well BiCMOS process? | 4M |
| 2. | | Draw the cross-sectional schematic views of the standard local oxidation of silicon process and discuss them in detail. | 12M |
| 3. | a) | Examine the typical analog/digital BiCMOS process. | 6M |
| | b) | Draw a lateral bipolar transistor using SOI technology and explain it. | 6M |
| 4. | a) | Describe the geometrical specification of the MOS transistor. | 6M |
| | b) | What are the limitations of MOS device characteristics? | 6M |
| 5. | a) | Draw a cross-sectional view of the hybrid-mode LDD pMOS device and describe it. | 6M |
| | b) | Identify the impact of short-channel effects on the classical threshold voltage model. | 6M |
| 6. | a) | Draw the conventional CMOS two-input NOR gate and explain. | 6M |
| | b) | Discuss the ESD-free BiCMOS digital circuit with an example. | 6M |
| 7. | a) | Discuss the pipelining theme in detail. | 6M |
| | b) | Describe the power dissipation measures for latches and flip-flops. | 6M |
| 8. | a) | Construct the conventional multi-drain complementary BiCMOS buffers. | 6M |
| | b) | Explain the optimization theme in detail. | 6M |

CODE: 22MPE1013 **SET-1**
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
M.Tech. II Semester Supplementary Examinations, July, 2025
ADVANCED DIGITAL SIGNAL PROCESSING AND APPLICATIONS
(POWER ELECTRONIC DRIVES)

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

Answer any FIVE questions
All questions carry EQUAL marks

1. Find the DFT of the sequence $x(n) = \{2, 1, 2, 1, 2, 1, 2, 1\}$ using radix-2 DIF FFT and Radix-2 DIT FFT algorithm [12M]
2. Explain the Basic FIR Digital Filter Structures. [12M]
3. a) Convert the following analog filter with transfer function into a digital IIR filter by using bilinear transformation. The digital IIR filter is having a resonant frequency of $\omega_r = \pi/2$. [6M]
$$H_a(s) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$$

b) Explain about the Spectral Transformations of IIR filter [6M]
4. a) Illustrate the procedure to design a IIR high pass digital filter with an example. [6M]
b) Develop a MATLAB program for parallel realization of an IIR transfer function. [6M]
5. Design a digital FIR low-pass filter using rectangular window by taking 9 samples of $w(n)$ and with a cutoff frequency of 1.2 rad/sec. [12M]
6. a) Summarize the 'C24x assembly language instructions. [6M]
b) Explain 'C24x CPU Internal Bus Structure [6M]
7. Explain the Architecture of TMS320LF 2407A. [12M]
8. a) Discuss about General-Purpose (GP) Timers [6M]
b) Illustrate the concept of Event Manager (EV) Interrupts [6M]

Cloud Computing**(COMPUTER SCIENCE AND ENGINEERING)****Time: 3 Hours****Max Marks:60**

**Answer any FIVE questions
All questions carry EQUAL marks**

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|----|----|---|----|
| 1. | a) | Explain various advantages and Disadvantages of Cloud Computing | 6M |
| | b) | Explain various applications of Cloud Computing in recent market. | 6M |
| 2. | a) | Explain about virtualization of CPU, Memory and IO devices. | 6M |
| | b) | Explain Cloud computing deployment models. | 6M |
| 3. | a) | Can you describe in detail how cloud computing affects users? | 6M |
| | b) | Explain in detail about Governance in the Cloud | 6M |
| 4. | a) | What is task management?. Explain briefly about task management. | 6M |
| | b) | Explain various cloud services in the market | 6M |
| 5. | a) | Identify the usage of cloud security and explain Virtual Machine Security | 6M |
| | b) | Differentiate various security risks in cloud | 6M |
| 6. | a) | Describe about the evolution of storage technology. | 6M |
| | b) | Describe briefly about the NOSQL databases. | 6M |
| 7. | a) | Explain any two distributed file systems in cloud | 6M |
| | b) | Explain Parallel File System in Cloud Computing? | 6M |
| 8. | a) | Describe briefly about the auditing the cloud for compliance. | 6M |
| | b) | Describe Governance, Risk, and Compliance (GRC) triad | 6M |

AR22

CODE: 22MSE1012

SET-1

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

I M.Tech. II Semester Regular & Supplementary Examinations, July,2025

Design of Formwork

(STRUCTURAL ENGINEERING)

Time: 3 Hours

Max Marks:60

**Answer any FIVE questions
All questions carry EQUAL marks**

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|----|----|---|-----|
| 1. | a) | Explain factors affecting selection of formwork system. | 6M |
| | b) | Differentiate between form work and false work? | 6M |
| 2. | a) | What are the common challenges encountered during the erection of formwork? | 6M |
| | b) | Which materials are used for preparing formwork? Explain in detail. | 6M |
| 3. | a) | Explain formwork for RCC column with neat sketch | 6M |
| | b) | What is formwork? Discuss the formwork of RCC Beam and wall with neat sketches. | 6M |
| 4. | a) | What are the horizontal and vertical formworks, and where is it commonly applied? | 6M |
| | b) | Write the requirements of form work. | 6M |
| 5. | | Describe the formwork design considerations for overhead water tanks and natural draft cooling towers | 12M |
| 6. | | Explain the causes of formwork failure and illustrate your answer with relevant case studies | 12M |
| 7. | a) | What is flying formwork and how does it differ from conventional formwork systems? | 6M |
| | b) | What are the typical formwork requirements for precast concrete elements | 6M |
| 8. | a) | What is meant by formwork failure in construction? | 6M |
| | b) | What preventive measures should be taken to avoid formwork failures? | 6M |