

CODE: 22MCM1012
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

SET-1

I M.Tech II Semester Regular Examinations, July,2025
LOGISTICS AND SUPPLY CHAIN MANAGEMENT
(COMPUTER INTEGRATED MANUFACTURING)

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

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Define Logistics. Discuss the scope of Logistics management. 6M
b) Elaborate the functions and benefits of Transportation management system. 6M
2. a) Explain the role of Warehousing and Inventory Management in supply chain management. 6M
b) Distinguish between Inventory control and inventory optimization. 6M
3. a) Enumerate the objectives and operations of Warehouse management system. 6M
b) Discuss the components of supply chain management. 6M
4. a) Elaborate the different types of supply chain planning. 6M
b) Describe the factors influencing sourcing and procurement strategy. 6M
5. a) **Analyze how does** supply chain strategy is aligned with business strategy. 6M
b) What do you mean by supply chain optimization? Elaborate the steps for supply chain design and optimization. 6M
6. a) Explain the objectives and steps in Network Design Process. 6M
b) What is Supply chain segmentation? Explain the purpose of Supply chain segmentation. 6M
7. a) Discuss important supply chain strategies aligning with business strategies. 6M
b) What are the risks involved in SCM? How these are mitigated by Supply Chain Risk Management? 6M
8. a) Elaborate the role of IoT applications in supply chain management. 6M
b) Describe the techniques for predictive analytics and forecasting. 6M

AR22

CODE: 22MPE1015
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

SET-1

I M. Tech. II Semester Supplementary Examinations, July, 2025
NON-CONVENTIONAL ENERGY SOURCES AND APPLICATIONS
(POWER ELECTRONIC DRIVES)

Time: 3 Hours

Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Explain the principle of conversion of solar energy into heat. 6M
b) Describe briefly the different types of solar collectors. 6M
2. a) What are the advantages and disadvantages of wind energy. 6M
b) Differentiate between Horizontal axis and Vertical Axis wind Machines. 6M
3. a) What are the main types of OTEC power plants? Explain their working in Brief. 6M
b) What are the different types of geothermal resources? How does harnessing of geothermal energy work? Explain. 6M
4. a) List out the problems involved with biogas production. 6M
b) What is the difference between biomass and biogas? And how does biomass conversion take place. 6M
5. a) Describe briefly the types of MHD Generators. 6M
b) What are the applications of fuel cell and explain it. 6M
6. a) Explain in detail about the necessity of hybrid systems. 6M
b) Describe briefly about Wind- Photovoltaic Systems. 6M
7. a) Explain in detail about the solar tower concept. 6M
b) Discuss in detail about the Indirect Condensing Cycle. 6M
8. a) Describe briefly the types of tidal power plants. 6M
b) Explain in detail about the concept of biogas plant. 6M

AR22

CODE: 22MVL1015
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

SET-1

I M.Tech. II Semester Supplementary Examinations, July, 2025
CPLD AND FPGA ARCHITECTURE AND APPLICATIONS
(VLSID)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

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| 1. | a) | Write the difference between Programmable Logic Arrays & Programmable Array Logic | 6M |
| | b) | List out the applications of FPGAs. | 6M |
| 2. | a) | Explain about PROM and implement $f_1 = \sum (0, 1, 2, 3, 4, 6, 8)$ and $f_2 = \sum (0, 2, 3, 4, 5)$ | 6M |
| | b) | Implement a BCD to Excess-3 code converter by ROM. Calculate the cross point density of the implementation? | 6M |
| 3. | a) | Draw the logic diagram of MAX 7000 CPLD microcell and explain its functioning | 6M |
| | b) | Compare the salient features of AMD's CPLD Mach 1 to 5. | 6M |
| 4. | a) | Explain problems associated with designing with FPGAs and also discuss some common issues? | 6M |
| | b) | Draw and explain Simple SRAM-Programmable FPGA Architecture | 6M |
| 5. | a) | Explain about meta stability and synchronization. | 6M |
| | b) | Explain the Realization of state machine charts using PAL | 6M |
| 6. | a) | Discuss about One-hot design method. | 6M |
| | b) | Explain about Complex design using shift registers. | 6M |
| 7. | a) | Discuss a 4 bit parallel adder circuit. | 6M |
| | b) | Design a parallel adder sequential circuit. | 6M |
| 8. | a) | Explain the following (i) Controller, (ii) data path designing | 6M |
| | b) | Discuss the Design flow using CPLDs. | 6M |

**Design of Advanced Concrete Structures
(STRUCTURAL ENGINEERING)****Time: 3 Hours****Max Marks:60****Answer any FIVE questions
All questions carry EQUAL marks**

1. a) Discuss key factors affecting wind load on a structure. 6M
b) Derive the expression for wind pressure as per IS 875 (Part 3) and explain the steps to compute wind load on a structure. 6M
2. a) What are the IS 456 provisions for controlling deflection in beams? 6M
b) Explain the mechanism of flexural cracking in beams. 6M
3. a) Two simply supported concrete beams A and B have the same span of 5 m and cross-section of 300 mm × 500 mm. Beam A is reinforced with 1.2% tension steel. Beam B is reinforced with 0.6% tension steel. Using IS 456 guidelines, which beam will have more deflection and why? 6M
b) Compare the behavior of under-reinforced and over-reinforced beams in terms of cracking and deflection. 6M
4. a) Explain why moment redistribution is allowed in continuous beams and what benefits it provides in design. 6M
b) A fixed beam with span $L=8\text{m}$ has fixed end moments of 48 kNm (each end) and mid-span moment of 24 kNm. If moments are redistributed by 20%, find the new position of the point of contraflexure from the left support. 6M
5. a) Explain the strut-and-tie model used for designing RC deep beams and corbels. 6M
b) Explain why local failure checks (like bearing failure) are important at the support in deep beams. 6M
6. a) Explain the role of shear walls in seismic-resistant design. 6M
b) Define a shear wall. Why are shear walls used in buildings? 6M
7. a) A building has a rectangular RC shear wall (height = 3.0 m, width = 4.0 m, thickness = 250 mm). Factored lateral load = 200 Kn. Factored overturning moment = 180 kNm. $f_{ck} = 25 \text{ MPa}$, $f_y = 500 \text{ MPa}$. Design longitudinal reinforcement (ignore axial load for simplicity). 8M
b) Explain the difference between bearing walls and shear walls. Give examples of structures where each is preferred. 4M
8. a) What challenges are involved in analyzing irregular-shaped slabs using yield line theory? 6M
b) What are the differences between yield line theory and elastic theory of slabs? 6M

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I M.Tech. II Semester Regular & supplementary Examinations, July,2025****Sensor Networks and Internet of Things
(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) | Describe the three major advantages of sensor networks | 6M |
| | b) | Evaluate the effectiveness and limitations of using sensor networks in environmental monitoring. | 6M |
| 2. | a) | Explain the concept of energy advantage in sensor networks | 6M |
| | b) | Evaluate the diverse application areas of sensor networks | 6M |
| 3. | a) | Explain the working of the S-MAC protocol and how it conserves energy in wireless sensor networks. | 6M |
| | b) | Evaluate the effectiveness of energy minimization broadcasting in a sensor network. Discuss its strengths and limitations. | 6M |
| 4. | a) | Apply IEEE 802.15.4 and ZigBee protocols in designing a low-power wireless communication system for home automation. How do these protocols support energy efficiency and scalability? | 6M |
| | b) | Explain a high-level organization of a sensor network database. | 6M |
| 5. | a) | Explain the concept of Distributed Hierarchical Aggregation in sensor networks. | 6M |
| | b) | Discuss the techniques used to store, process, and query temporal data, along with their advantages and limitations. | 6M |
| 6. | a) | Explain the concept of the Internet of Things (IoT) | 6M |
| | b) | What are the major sources of data in an IoT environment? List and explain briefly. | 6M |
| 7. | | Explain IoT conceptual framework with a neat diagram | 12M |
| 8. | a) | Explain in detail Vulnerabilities Security Requirements and Threat Analysis | 6M |
| | b) | Discuss Internet Based Communication | 6M |