SL.NO:2262 **SUBJECT CODE:43521C01**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
M.E./ M.TECH DEGREE EXAMINATIONS- APRIL -2022
EMBEDDED SYSTEM TECHNOLOGY
FIRST SEMESTER
MODERN DIGITAL PRINCIPLES AND DESIGN

(Candidates admitted under 2021 Regulations-SCBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Identify the basic elements of ASM chart.
2 Tell what do you mean by maximal compatible group.
3 Define Merging.
4 List the advantages of Random-Access Scan.
5 Tell how the memories are classified?
6 Give example of a volatile memory.
7 Write the application of FPGA.
8 List register data types.
9 Tell what is a master-slave flip-flop?
10 Draw the structure of a static RAM cell.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Analyze the Mealy model of a clocked synchronous sequential network

OR

b. Illustrate State Reduction and State Assignment in detail.

12 a. Design and explain the procedure of a Hazard free circuits with an example.

OR

b. With a neat diagram explain the concept of Correcting a Rule Violation.

13 a. With a neat diagram the Xilinx Logic block.

OR

b. With a flowchart explain the “Add and Shift algorithm using Moore Model.

14 a. Describe the steps involved in the design of sequential circuit.

OR

(P.T.O)

b. Discuss the relationship between state diagrams and ASM charts.

15 a. Explain the block diagram of Asynchronous Sequential Circuit.

OR

b. Discuss how the essential hazard differs from static and dynamic hazards

16 a. Write notes on
i) Critical race
ii) Non-Critical race

OR

b. Explain the procedure of the D-algorithm.

17 a. Write notes on
i)Partial Scan
ii)Boundary Scan

OR

b. Explain the advantages and applications of Programmable Logic Devices.

18 a. Differentiate High Level and Low-Level Design.

OR

b. Discuss in detail about the FPGA with suitable diagrams

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Explain the design procedure of synchronous sequential logic circuits.

OR

b. Illustrate in detail on programmable routing structures and programmable logic structures

20 a. Explain about the various components of ASM chart.

OR

b. Describe in detail the architecture of XC 4000.

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SL.NO:2268 **SUBJECT CODE:43521C02**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
M.E./ M.TECH DEGREE EXAMINATIONS- APRIL -2022
EMBEDDED SYSTEM TECHNOLOGY
FIRST SEMESTER
DESIGN OF EMBEDDED SYSTEMS

(candidates admitted under 2021 Regulations)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 List some merits of Hardware/Software partitioning.
2 Define product specification of embedded design cycle.
3 What are the approaches involved in bench marking?
4 What is meant by interleaved memory?
5 How to change the configuration of remote debugger?
6 Define statistical profiling.
7 How break points work?
8 Define usage issues.
9 What is ARM architecture?
10 ARM processor is in the Family of RISC Architecture? Comment on this.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Differentiate the i) CVPD analysis ii) Hardware and Software Debugging Tools

OR

b. Relate the various Programming Modes in ARM Architecture

12 a. Interpret about the product specification involved in embedded design.

OR

b. Demonstrate in detail about system startup.

13 a. Demonstrate the basic technique involved in time constrains.

OR

b. Write notes on
i. HW partitioning.
ii. SW partitioning.

14 a. With an example discuss about the issues in selection processes in designing an embedded system.

(P.T.O)

OR

b. Discuss in detail about the product testing.

15 a. Discuss about improving code density using compression technique.

OR

b. Write notes on hardware trends involved in embedded design.

16 a. Discuss caches with relevant diagram.

OR

b. Explain re-entrancy in detail, with an example,

17 a. Enlighten the usage of triggers in in-circuit emulators

OR

b. Discuss about overlay memory.

18 a. Draw and Discuss the various elements of AMBA Bus System

OR

b. What is SPSR and represent its bits?

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Compare and state how Realtimetrace is a better way to debug Embedded System

OR

b. What is arm advanced microcontroller bus architecture? Explain with Neat Sketch.

20 a. Explain in detail the features, bus structure, function and applications of AMBA Architecture.

OR

b. Explain in detail about various design methodologies

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SL.NO:2276 **SUBJECT CODE:43521C03**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
M.E./ M.TECH DEGREE EXAMINATIONS- APRIL -2022
EMBEDDED SYSTEMS TECHNOLOGY
FIRST SEMESTER
WIRELESS SENSORS AND NETWORKING DEVICES

(Candidates admitted under 2021 Regulations-SCBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Mention the role of WSN in precision agriculture.
2 Recall on the event detection interaction in a WSN.
3 Draw the structure of types of sinks.
4 What is energy efficient routing?
5 What is outbound neighbor?
6 What is geographic addressing?
7 What are advantages of clustering?
8 What is sensor node hardware?
9 What is PIECES?
10 Mention the classification of code in TinyOS.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Examine the characteristic requirements of Wireless Sensor Networks

OR

b. Compare how interrupts differ from polling and under what condition polling is better than interrupt?

12 a. Demonstratethe mechanism required of a Wireless Sensor Network

OR

b. With a neat diagram, explain the low duty cycle protocols and wake up concepts.

13 a. Interpret about positioning in multihop environments.

OR

b. Interpretand discuss in detail about Berkley mote architecture

14 a. With an example discuss about the influencing factors of sensor nodes.

(P.T.O)

OR

b. Discuss in detail about hardware components of wireless sensor node.

15 a. Discuss about Transceiver tasks and Characteristics.

OR

b. Elaborate on the design principles of WSNs

16 a. Elaborate on the fundamentals of wireless MAC protocols.

OR

b. Explain in detail about Topology Control.

17 a. Explain in detail about range based localization algorithms.

OR

b. Write notes on task driven sensing and roles of sensor nodes and utilities.

18 a. Explain sensor network programming challenges

OR

b. Explain the security considerations in wireless sensor networks

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Determine in detail about Geographic routing in WSN

OR

b. Case study: Enumerate two different applications of WSN with appropriate examples and its related diagrams.

20 a. Discuss about IEEE 802.15.4 standard used for Wireless Personal Area Network and its correlation with Zigbee.

OR

b. Discuss about Sensor Tasking and Control

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SL.NO:2276

SL.NO:2288 **SUBJECT CODE:43521C04**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
M.E./ M.TECH DEGREE EXAMINATIONS- APRIL -2022
EMBEDDED SYSTEM TECHNOLOGY
FIRST SEMESTER
INTERNET OF THINGS FOR EMBEDDED SYSTEMS

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define MQTT topics.
2 What are the different approaches for the design and implementation of embedded firmware?
3 List out the parts of UDP datagrams.
4 Draw the characteristics of embedded system.
5 Give an example of round robin architecture.
6 What are the functions of Node-Red in Raspberry pi?
7 Define medication dispensers.
8 What are the IoT enabling technologies ?
9 When you are designing embedded software what architecture will be the most appropriate for a given system?
10 What is meant by Assembler?

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Sketch IOT functional block and explain in detail.

OR

b. List out the types of embedded system with brief explanation

12 a. Interpret IOT communication model with neat sketch.

OR

b. Compare IOT and IIOT

13 a. How digital multimeter works? Explain with neat sketch.

OR

b. Demonstrate round robin with interrupts.

14 a. Implement super loop embedded design architecture

OR

b. Implement the types of structures.

15 a. Demonstrate data type and type checking.

(P.T.O)

OR

b. How to use MQTT in home automation with example?

16 a. How face can be recognized?

OR

b. What is meant by IIOT connectivity? How it works?

17 a. Explain in detail about C Programming elements.

OR

b. Explain the concepts of MQTT messages and topics.

18 a. Explain in detail about UDP datagrams.

OR

b. Explain in detail about ROI and barriers in IIOT.

Answer ALL questions
PART-C (2 x 15 = 30)

19 a. Explain in detail about NFV. Differentiate SDN & NFV

OR

b. Demonstrate various IOT tools.

20 a. How source file can be converted in to hex file translation in high level language? Mention advantages and disadvantages of high level language.

OR

b. Explain in detail any two of IOT protocols with examples.

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SL.NO:2288

SL.NO:2281 **SUBJECT CODE:43521P01**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
M.E./ M.TECH DEGREE EXAMINATIONS- APRIL -2022
EMBEDDED SYSTEM TECHNOLOGY
FIRST SEMESTER
ELECTIVE - MEMS TECHNOLOGY

(Candidates admitted under 2021 Regulations-SCBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is a miller indices?
2 Mention some features of 3-D packaging of MEMS.
3 Mention the need for stress analysis in MEMS systems.
4 Define Micro Motor.
5 What are the commonly used actuating motions of micro devices?
6 Define magneto resistive sensor.
7 What are the design parameters of microfluidic systems?
8 Give some mechanisms for the fundamental mechanism used for micro fluid actuation.
9 Define NovaSensor.
10 Define quality factor of the acceleration system.

Answer **Any FIVE** questions

Part-B (5 x10 =50 Marks)

11 a. Elaborate about Czochralskyi method of growing single crystals.

OR

b. Discuss about plasma etching techniques.

12 a. With illustration detail about Silicon Piezoresistors with neat diagram.

OR

b. Brief about static bending of thin plates.

13 a. Discuss with necessary representation about Micro accelerometers.

OR

b. Write about damping coefficients of micro mechanical systems.

14 a. Illustrate Actuation using Thermal forces.

(P.T.O)

OR

b. Illustrate Actuation using Piezoelectric crystals

15 a. Summarize magnetic sensing and detection with necessary block diagram.

OR

b. Briefly explain about magnet diodes.

16 a. Discuss about the selection of material for microsystem design.

OR

b. Discuss in detail about the single transduction in microsystems.

17 a. Derive the analytical expression for liquid flow in a channel.

OR

b. Discuss the design consideration of MEMS sensors.

18 a. Explain the primary concerns for anyone interested in developing a MEMS product.

OR

b. Explain in detail about the fabrication process of neuron probes with integrated fluid transport channels.

Answer ALL questions

PART-C (2 x 15 = 30)

19 a. Explain in detail about bidirectional micro actuator.

OR

b. Explain in detail about resonant micro sensors.

20 a. Explain in detail about the design of silicon die for a micro pressure sensor.

OR

b. Explain the design considerations and functioning of NovaSensor BP Sensor applications.

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