INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER- II

M.Tech I- Semester End Examinations, January - 2020
Regulation: IARE-R18
PRINCIPLES OF DISTRIBUTED EMBEDDED SYSTEMS
(Electronics and Communication Engineering)

Time: 3 Hours   **Max Marks: 70**

Answer any ONE question from each Unit
All questions carry equal marks
All parts of the question must be answered in one place only

UNIT – I

I.	a)	What makes a computer system a real-time computer system?	[7M]
	b)	Explain the temporal obligations of clients and servers at a client-server interface in a real-time System.	[7M]
II.	a)	Discuss about Global time, Internal and External clock synchronization	[7M]
	b)	Explain Power and energy awareness and real time communications	[7M]

UNIT – II

III.	a)	Discuss the advantages of introducing structure into a design.	[7M]
	b)	Explain the system architect is then free to use as many nodes as necessary to implement the given application requirements within a clean functional structure.	[7M]
IV.	a)	What are the Real time operating system agreement protocols and error detection.	[7M]
	b)	Explain simplest application program interface (API) is the API of a time-triggered S-task.	[7M]

UNIT – III

V.	a)	Discuss the advantages of grand design versus incremental development	[7M]
	b)	Explain TTA a hardware node is considered a unit of failure with single external failure mode fail-silence.	[7M]
VI.	a)	Explain System design procedures with scheduling problem	[7M]
	b)	Discuss & Explain Static and dynamic scheduling with examples	[7M]

UNIT – IV

VII.	a)	How CAN Bus do Communicate? Need for CAN	[7M]
	b)	Discuss & Explain Controller Area Network with CAN and without CAN	[7M]
VIII.	a)	Explain CAN open standard and object directory	[7M]
	b)	Discuss Controller Area Network with real time examples	[7M]

UNIT – V

IX.	a)	Discuss & Explain Controller Area Network with CAN and without CAN	[7M]
	b)	Explain Layered Structure of a CAN node OSI Reference model	[7M]

X   a)   Discuss Configuration files and service data objectives.   [7M]

     b)   Explain Network management CAN open messages and device profile encoder   [7M]

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COURSE OBJECTIVES :

	The course should enable the students to:
I	Understand the design principles of distributed embedded systems.
II	Design CAN network based systems.
III	Understand RTOS to design embedded system.

COURSE OUTCOMES (COs):

CO 1	Understand Real Time Computer Systems requirements Real Time Systems and Real Time Communication.
CO 2	Understand and remember Operating System, Real Time Operating Systems Inter component communication
CO 3	Understand and remember state and dynamic scheduling, system design and validation time – triggered architecture.
CO 4	Understand and remember Can open CAN open standard object directory.
CO 5	Analyze to understand CAN and Design CAN network based systems with examples.

COURSE LEARNING OUTCOMES

Students who complete the course will have demonstrated the ability to do the following.

BESB06.01	Understand Real Time Computer Systems requirements, Real Time Systems and Real Time Communication.
BESB06.02	Understand global time, Internal , external clock synchronization and Real Time Model.
BESB06.03	Understand Real Time Communication, temporal relations and dependability.
BESB06.04	Understand Power energy awareness, event triggered, rate constrained and time triggered.
BESB06.05	Understand and remember Operating System, Real Time Operating Systems Inter component communication .
BESB06.06	Understand and remember task management, dual role of time, inter task interactions process input/output and agreement protocols.
BESB06.07	Understand and remember error detection and importance of RTOS.
BESB06.08	Understand and remember state and dynamic scheduling, system design and validation time - triggered architecture.
BESB06.09	Understand and remember Can open CAN open standard object directory.
BESB06.10	Understand and remember Electronic data sheets ,devices ,analyze CAN Standards.
BESB06.11	Understand and remember CAN Standards and configuration files ,service data objectives and network management CAN open messages.
BESB06.12	Understand and remember CAN Standards and device profile encoder, real time environment RTOS with examples of Real Time Communication.
BESB06.13	Analyze to understand real time system design with CAN Standards.

BESB06.14	Analyze to understand RTOS to design Embedded Systems with examples.
BESB06.15	Analyze to understand CAN and Design CAN network based systems with examples.

MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES:

SEE Question No.		CLO Code	Course learning Outcomes	CO code	Blooms Taxonomy Level
1	a	BESB06.01	Understand Real Time Computer Systems requirements, Real Time Systems and Real Time Communication.	CO 1	Understand
	b	BESB06.02	Understand global time, Internal , external clock synchronization and Real Time Model	CO 1	Understand
2	a	BESB06.03	Understand Real Time Communication, temporal relations and dependability	CO 1	Understand
	b	BESB06.03	Understand Real Time Communication, temporal relations and dependability	CO 1	Understand
3	a	BESB06.05	Understand and remember Operating System, Real Time Operating Systems Inter component communication.	CO 2	Remember
	b	BESB06.06	Understand and remember task management, dual role of time, inter task interactions process input/output and agreement protocols.	CO 2	Understand
4	a	BESB06.06	Understand and remember task management, dual role of time, inter task interactions process input/output and agreement protocols.	CO 2	Understand
	b	BESB06.07	Understand and remember error detection and importance of RTOS.	CO 2	Understand
5	a	BESB06.08	Understand and remember state and dynamic scheduling, system design and validation time -triggered architecture	CO 3	Remember
	b	BESB06.08	Understand and remember state and dynamic scheduling, system design and validation time -triggered architecture	CO 3	Understand
6	a	BESB06.08	Understand and remember state and dynamic scheduling, system design and validation time -triggered architecture	CO 3	Remember
	b	BESB06.08	Understand and remember state and dynamic scheduling, system design and validation time -triggered architecture	CO 3	Understand
7	a	BESB06.09	Understand and remember Can open CAN open standard object directory	CO 4	Understand
	b	BESB06.10	Understand and remember Electronic data sheets, devices ,analyze CAN Standards	CO 4	Remember
8	a	BESB06.11	Understand and remember CAN Standards and configuration files ,service data objectives and network management CAN open messages.	CO 4	Understand
	b	BESB06.12	Understand and remember CAN Standards and device profile encoder, real time environment RTOS with examples of Real Time Communication.	CO 4	Remember
9	a	BESB06.13	Analyze to understand real time system design with CAN Standards	CO 5	Understand
	b	BESB06.13	Analyze to understand real time system design with CAN Standards	CO 5	Understand

10	a	BESB06.14	Analyze to understand RTOS to design Embedded Systems with example	CO 5	Understand
	b	BESB06.15	Analyze to understand CAN and Design CAN network based systems with examples	CO 5	Understand

Prepared by:
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