

CBCS SCHEME

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BEC/BTE/BVL601

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Embedded System Design

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module - 1			M	L	C
Q.1	a.	What is Embedded System? List the applications of Embedded System.	06	L2	CO1
	b.	Give the difference between microcontroller and Microprocessor	06	L2	CO1
	c.	Explain about opto coupler and Push button switch with neat diagram	08	L2	CO1
OR					
Q.2	a.	Give the classification of Embedded System with examples.	06	L2	CO1
	b.	Give the difference between Von-Neumann and Harvard Architecture.	06	L2	CO1
	c.	Explain Piezo buzzer, sensor and actuators in embedded system with neat diagram.	08	L2	CO1
Module - 2					
Q.3	a.	Explain the characteristics and quality attributes of Embedded System.	06	L2	CO2
	b.	Explain the working of washing machine with a neat functional diagram	06	L2	CO2
	c.	Design and automatic tea/coffee vending machine based on FSM model.	08	L3	CO2
OR					
Q.4	a.	Explain operational and non operational attributes of embedded systems.	06	L2	CO2
	b.	Explain the hardware and software co-design in embedded system.	06	L2	CO3
	c.	With the help of FSM model, explain the system design and operation of automatic seat belt warning.	08	L2	CO3
Module - 3					
Q.5	a.	Explain monolithic and microkernel with suitable example for each.	06	L2	CO3
	b.	Explain different conditions that favour deadlock.	06	L2	CO3
	c.	Describe pre-emptive SIF scheduling and calculate all the performance factors.	08	L2	CO3
OR					
Q.6	a.	Explain task, process and threads in ARM processor.	06	L2	CO3
	b.	With a diagram explain the concept of counting semaphore with an example.	06	L2	CO3
	c.	Explain the IDE environment for embedded system design with a neat block diagram	08	L2	CO3
Module - 4					
Q.7	a.	Explain the functions of various units in ARM cortex M ₃ processor architecture in brief.	08	L2	CO4
	b.	Explain the various interrupts and exception along with the vector address	06	L2	CO4
	c.	Explain the ARM core data flow model with a neat diagram.	06	L2	CO4
OR					
Q.8	a.	Explain program status register in cortex M ₃ along with vector address	08	L2	CO4
	b.	Explain any five applications of ARM cortex M ₃ based on its features	06	L2	CO4
	c.	With a diagram, explain two operation modes and privilege levels in cortex M ₃	06	L2	CO4
			1 of 2		

Module – 5

Q.9	a.	Write an ALP to add the first 10 integer number using cortex M ₃ processor	06	L2	CO5
	b.	Explain shift and rotate instruction of CORTEX M ₃ with examples	06	L2	CO5
	c.	Describe CMSIS with diagram and its functions.	08	L2	CO5
OR					
Q.10	a.	Explain 16 – bit instructions with example. a) ADD b)CMP c)ASR	06	L2	CO5
	b.	Write an assembly language to determine the parity of 32 bit number.	06	L2	CO5
	c.	Explain 32 bit instruction with example a) ADC b)BFC c)LSL d) PUSH	08	L2	CO5

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BCO601

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025 Microcontrollers and Embedded Systems

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module - 1			M	L	C
Q.1	a.	Explain the RISC design philosophy and how it differs from CISC architecture and List out its advantage with data flow.	10	L2	CO1
	b.	Discuss the concept of pipelining, in ARM processors. How do interrupts effects the pipeline execution explain with one example.	10	L2	CO1
OR					
Q.2	a.	With the help of neat supporting Block diagram explain ARM Cox dataflow model.	10	L2	CO1
	b.	Explain the role of registers and also explain 4 fields of Current Program Status Register (CPSR).	10	L2	CO1
Module - 2					
Q.3	a.	List out all types of data processing institutions in ARM instruction set. Provide examples to illustrate the explanation.	10	L3	CO2
	b.	i) Write a program to add an array of 16-bit numbers and store the 32 bit result in internal RAM. ii) Write a program to find the largest / smallest number in an array of 32 numbers.	10	L3	CO2
OR					
Q.4	a.	Write a C program to find square of the number between (1 - 10) and convert the same using assembly level program.	10	L3	CO2
	b.	i) Write assembly level program to interface a stepper motor and rotate it in clockwise and anticlockwise direction. ii) Write a assemble level program to find factorial of number.	10	L3	CO2
Module - 3					
Q.5	a.	Explain the different purpose of Embedded system with examples.	10	L2	CO3
	b.	Write a assembly level code and structural representation to display hex digits 0 to F on a 7 segment LED interface with an appropriate delay M in between.	10	L3	CO3
OR					
Q.6	a.	Explain different communication interface for embedded system with neat diagram.	10	L2	CO3
	b.	With the help of interfacing diagram write a assembly level program to interface a 4 x 4 keyboard and display the key code on an LCD.	10	L3	CO3
Module - 4					
Q.7	a.	Explain the quality attributes of embedded system with different types.	10	L2	CO4
	b.	Explain state machine model with two example : i) FSM model for Automatic Tea / Coffee vending machine. ii) FSM model for coin operated telephone system.	10	L2	CO4
1 of 2					

OR

Q.8	a.	Explain : i) Sequential Program model ii) Concurrent / Communicating Process model	10	L2	CO4
	b.	Explain automotive communication buses and key players of automotive embedded market concepts.	10	L2	CO4
Module – 5					
Q.9	a.	Explain the concept of task process threads with the help of neat diagram.	10	L2	CO5
	b.	Explain the concept of Dead lock and Dining Philosopher's problem.	10	L2	CO5
OR					
Q.10	a.	Explain message passing concept with neat diagram.	10	L2	CO5
	b.	What is semaphore explain binary semaphore concept with supporting diagram.	10	L2	CO5

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BEC602

Sixth Semester B.E/B.Tech. Degree Examination, June/July 2025 VLSI Design and Testing

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level, C: Course outcomes.

Module - 1			M	L	C
1	a.	Compare CMOS and NMOS logic.	5	L3	CO1
	b.	With neat diagram, explain the physical representation of transmission gate.	5	L2	CO1
	c.	Design CMOS compound gate for the functions: i) $Y = A(B+C)+DE$ ii) $Y = \overline{AB} + \overline{AB}$.	10	L3	CO1
OR					
2	a.	Design D-flip-flop using transmission gates and explain its operation with necessary conditions on LD input.	7	L3	CO1
	b.	Illustrate different alternate circuit representations used in digital circuit designs with an example for each.	6	L2	CO1
	c.	With a neat diagram, explain the physical representation of CMOS inverter.	7	L2	CO1
Module - 2					
3	a.	With neat diagram, explain the working of nMOS enhancement mode transistor under various voltage conditions.	6	L2	CO2
	b.	How does body effect influences threshold voltage? What are the design strategies to minimize body effect?	6	L2	CO2
	c.	For an nMOSFET, derive the equation for drain current in linear and saturation region.	8	L3	CO2
OR					
4	a.	Explain the working of pseudo nMOS inverter. Find the output voltage equation for pseudo nMOS inverter.	6	L3	CO2
	b.	Find the expression for V_{out} in region C of CMOS inverter transfer characteristics.	8	L3	CO2
	c.	Illustrate with suitable sketch, latch phenomenon in CMOS circuits and also explain its prevention.	6	L2	CO2
Module - 3					
5	a.	Illustrate with neat diagram wafer processing and selective diffusion.	6	L2	CO3
	b.	Derive the equation for rise time, fall time and delay time.	8	L3	CO3
	c.	Explain with neat diagram, the process flow of fabricating inverter (CMOS) using Twin-tub process.	6	L2	CO3
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BEC/BTE613A

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Multimedia Communication

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C
Q.1	a.	Explain broadcast television network and ISDN.	10	L2	CO1
	b.	Explain Interactive television application for both cable and satellite network.	10	L2	CO1
OR					
Q.2	a.	With a neat diagram, explain the modes of communication.	10	L2	CO1
	b.	Determine the propagation delay associated with the following communication channel: i) Connection through private telephone network of 1km. ii) Connection through a PSTN of 200 km iii) Connection over a satellite channel 5000km. Assume velocity of propagation of a signal in case of: (i) and (ii) 2×10^8 m/Sec (iii) 3×10^8 m/sec.	10	L3	CO1
Module – 2					
Q.3	a.	With an example, explain different types of text representation in multimedia.	10	L2	CO2
	b.	Explain Raster Scan principle with neat schematic diagram for both television and computer.	10	L3	CO2
OR					
Q.4	a.	Derive the time to transmit the following digitized image at both 64 kbps and 1.5 Mbps: i) $640 \times 480 \times 8$ – VGA compatible image ii) $1024 \times 768 \times 24$ – SVGA compatible image.	10	L2	CO2
	b.	Explain the detailed block diagram of Digital Camera and Scanner.	10	L2	CO2
Module – 3					
Q.5	a.	How the Coding Operation takes place in arithmetic Coding? Consider the transmission of a message comprising string of characters with probabilities. $e = 0.3, n = 0.3, t = 0.2, w = 0.1, \bullet = 0.1$ the word needed to be transmitted is Went.	10	L2	CO3
	b.	Explain JPEG encoding technique.	10	L2	CO3
OR					
Q.6	a.	Explain the concept of run-length coding and statistical coding.	10	L2	CO3
	b.	Explain GIF and TIFF format.	10	L2	CO3
1 of 2					

Module – 4

Q.7	a.	Explain the working principle of DPCM.	10	L2	C04
	b.	With example frame sequences. Explain the meaning of the following type compressed frame and the reasons for their use: i) I – frame ii) P – frame iii) B – frame	10	L2	C04

OR

Q.8	a.	With a neat diagram, explain H.261 video encoder principle.	10	L2	C04
	b.	Explain the coding principles of MPEG – 4.	10	L2	C04

Module – 5

Q.9	a.	Explain the principles of Hub Configuration.	10	L2	C05
	b.	Explain the frame format and operation parameters of Ethernet/IEEE 802.3.	10	L2	C05

OR

Q.10	a.	Explain token Ring principle.	10	L2	C05
	b.	Write a short note on FDDI network components.	10	L2	C05

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BEC/BTE/BVL654B

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Consumer Electronics

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	What is Microphone? Explain the desirable characteristics of a microphone.	10	L2	CO1
	b.	What is loudspeaker? Explain in detail the cone type loudspeaker.	10	L2	CO1
OR					
Q.2	a.	Explain moving coil type microphone. List out the importance features of moving coil type microphone.	10	L2	CO1
	b.	Explain high fidelity system. List out the ideal characteristics of ideal speaker.	10	L2	CO1
Module – 2					
Q.3	a.	Explain the details of compact disc	10	L2	CO2
	b.	Explain playback process with necessary diagram.	10	L2	CO2
OR					
Q.4	a.	Explain D/A converter. What are the care to be taken while handling CD?	10	L2	CO2
	b.	Explain geometry of audio disc. Explain the main differences between CD and magnetic tape.	10	L2	CO2
Module – 3					
Q.5	a.	With the help of diagram demonstrate trichromatic coefficients and colour triangle.	10	L3	CO3
	b.	Explain recent advances in TV technology.	10	L2	CO3
OR					
Q.6	a.	With the help of example demonstrate chromaticity diagram.	10	L2	CO3
	b.	Explain mixing of colours with necessary diagram.	10	L2	CO3
Module – 4					
Q.7	a.	With a neat block diagram, explain the working of CCTV.	10	L2	CO4
	b.	With a neat block diagram, explain the working of electronic guessing game.	10	L2	CO4
			1 of 2		

OR

Q.8	a.	With a block diagram, explain the functioning of cable network.	10	L2	CO4
	b.	With a block diagram, explain the working of a calculator.	10	L2	CO4
Module – 5					
Q.9	a.	Explain the working of UPS and inverter.	10	L2	CO5
	b.	Explain the working of ignition system for automobiles.	10	L2	CO5
OR					
Q.10	a.	Explain the working of microwave oven.	10	L2	CO5
	b.	With example explain recent advances in consumer electronics.	10	L2	CO5

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