Reg. No.															

Question Paper Code	13385

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Eighth Semester

Electronics and Communication Engineering

20ECEL804 - EMBEDDED PRODUCT DEVELOPMENT

Regulations - 2020

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	In design thinking, which phase follows 'Ideation'? (a) Define (b) Test (c) Prototype (d) Empathize	1	K1	CO1
2.	Physical decomposition is a _____ approach. (a) Bottom-up (b) Top-down (c) Lateral (d) Random	1	K1	CO1
3.	Brainstorming is a _____ to generate _____. (a) Group activity, a smaller number of ideas (b) Individual activity, large number of ideas (c) Group activity, large number of ideas (d) None of the above	1	K1	CO2
4.	What is the first step in the conceptual design stage? (a) Concept generation (b) Opportunity identification (c) Concept evaluation (d) Solution selection	1	K1	CO2
5.	A key challenge in recycling real-time embedded software is (a) Finding reusable code (b) Hardware and software dependencies (c) Understanding the original design (d)Licensing issues	1	K1	CO3
6.	Which of the following is a potential benefit of software reuse? (a) Reduced development time (b) Lower development costs (c) Improved software reliability (d) All of the above	1	K2	CO3
7.	Which testing phase involves ensuring the actual system fulfills the software and product specifications? (a) System testing (b) Module testing (c) Acceptance (d) Sub-system testing	1	K2	CO4
8.	Which type of document focuses more on the "why?" part of a design? (a)Technical documentation (b) Design documentation (c) Marketing documentation (d) End-user documentation	1	K2	CO4
9.	The number of comparators required in a 3-bit comparator type ADC is _____. (a) 2 (b) 3 (c) 7 (d) 8	1	K1	CO5
10.	Which of the following is NOT a characteristic of an IDE? (a) Code Editor (b) GUI Builder (c) Firewall Protection (d) Debugger	1	K2	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Name the factors to be considered for pipeline management.	2	K1	CO1
12.	What are the characteristics of successful product development?	2	K1	CO1
13.	Differentiate lead users from extreme users.	2	K1	CO2
14.	Show the physical decomposition of a bicycle.	2	K1	CO2
15.	List the chunks.	2	K1	CO3
16.	List some of the motives for product change.	2	K1	CO3

17.	List the key challenge in identifying reusable software.		*2*	*K1*	*CO4*
18.	Define the embedded product design.		*2*	*K1*	*CO4*
19.	Which factor plays an important role in PCB classification?		*2*	*K2*	*CO5*
20.	Draw the linear sequential model.		*2*	*K2*	*CO5*
21.	A LED circuit is also a powerful analysis tool. How is it so?		*2*	*K2*	*CO6*
22.	List some serial communication standards.		*2*	*K1*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the five-step concept generation method in embedded product development.	*11*	*K3*	*CO1*
		OR			
	b)	Explain the phases of generic product development process and point out the tasks and responsibilities of the organization.	*11*	*K3*	*CO1*
24.	a)	Explain the various creative thinking methods.	*11*	*K2*	*CO2*
		OR			
	b)	Explain the steps to create a physical decomposition of a product, with an example.	*11*	*K2*	*CO2*
25.	a)	Explain the four-step method for establishing the product architecture.	*11*	*K3*	*CO3*
		OR			
	b)	Examine how the industrial design process contributes to a product's user experience and brand image? Give examples of how specific design choices (e.g., form, materials, color) can influence user perception and product success.	*11*	*K3*	*CO3*
26.	a)	Explain the basics of reverse engineering and its strategies in detail.	*11*	*K2*	*CO4*
		OR			
	b)	Explain the key benefits of integrating CAE, CAD, and CAM tools in industrial design workflows, with examples.	*11*	*K2*	*CO4*
27.	a)	Explain the grounding and noise elimination methods in detail with diagrams.	*11*	*K3*	*CO5*
		OR			
	b)	Discuss the importance of selection of sensor, voltage supply and power supply.	*11*	*K3*	*CO5*
28.	a)	Discuss the importance of A/D & D/A Converter with a neat diagram.	*11*	*K4*	*CO6*
		OR			
	b)	Analyze the importance of bus communication standards in embedded product development.	*11*	*K4*	*CO6*