Hall Ticket Number : ☐☐☐☐☐☐☐☐☐☐

Code: 20A363T

III B.Tech. II Semester Regular Examinations June 2023

CAD/CAM

(Mechanical Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

			CO	BL
1. Answer *all* the following short answer questions	(5 X 2 = 10M)			
a) What do you understand by the CPU?			CO1	BL1
b) Write the parametric form of plane surface?			CO2	BL2
c) State the meaning of M and G functions?			CO3	BL2
d) Quote the difference between FMS and FMC.			CO4	BL2
e) What is CAQC?			CO5	BL2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL

UNIT–I

		Marks	CO	BL
2. a)	Discuss about different display devices	6M	CO1	BL2
b)	What is the most commonly used graphic terminal? Explain its working.	6M	CO1	BL2

OR

		Marks	CO	BL
3. a)	Compare the traditional and CAD/CAM of product cycle.	6M	CO1	BL2
b)	Identify the applications of computer in design?	6M	CO1	BL2

UNIT–II

		Marks	CO	BL
4. a)	Describe the various surface entities that are needed to construct a surface model.	6M	CO2	BL3
b)	Summarize the importance of surface modeling in computer aided graphics and design.	6M	CO2	BL3

OR

		Marks	CO	BL
5. a)	What is solid modeling? Compare Bezier representation with CSG representation scheme.	6M	CO2	BL3
b)	Paraphrase the parametric equation of a composite surface.	6M	CO2	BL3

UNIT–III

6. a) How NC machines are are classified? Explain them with neat sketches.   6M   CO3   BL2

   b) With neat sketches, write down the neat procedure for manual part programming.   6M   CO3   BL2

OR

7. a) Interpret linear and circular interpolations in CNC systems.   6M   CO3   BL2

   b) Discuss the basic feedback control systems used in CNC machines.   6M   CO3   BL3

UNIT–IV

8. a) Write the advantages and disadvantages of OPITZ code system.   6M   CO4   BL2

   b) What is a production Flow Analysis? Discuss various steps involved in PFA.   6M   CO4   BL3

OR

9. Analyze the following types of layouts in the design of FMS.
   a) Circular layer b) Linear layers c) Loop layers d) Free layout.   12M   CO4   BL3

UNIT–V

10. a) Describe about different noncontact optical inspection methods.   6M   CO5   BL2

   b) Illustrate in detail the scanning laser system used in computer aided quality control.   6M   CO5   BL2

OR

11. Show the application and advantages of integration of CAQC with CAD/CAM systems.   12M   CO5   BL2

*** End ***

Code: 20A461T

R-20

III B.Tech. II Semester Regular Examinations June 2023

Embedded Systems

(Electronics and Communication Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		CO	BL
1. Answer *all* the following short answer questions (5 X 2 = 10M)			
a) What are the interrupts available in 8051?		1	1
b) Define LED		2	1
c) List the design challenges of Embedded systems		3	1
d) Define USB.		4	1
e) What is RTOS? Explain how to choose an RTOS?		5	2

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

	Marks	CO	BL

UNIT–I

	Marks	CO	BL
2. a) With the functional block diagram, explain the architecture of 8051 microcontroller.	6M	1	4
b) Describe briefly the register set of 8051 microcontroller.	6M	1	2

OR

	Marks	CO	BL
3. a) Draw the Pin diagram of 8051 Microcontroller and explain the functions of each pin	6M	1	4
b) Explain the importance of data transfer type instructions of 8051.	6M	1	2

UNIT–II

	Marks	CO	BL
4. a) Explain the seven segment display interfacing with 8051 microcontroller.	6M	2	2
b) Describe the 8051 connection to the sensor interfacing.	6M	2	2

OR

	Marks	CO	BL
5. a) Describe the 8051 interfacing to the Stepper motor.	6M	2	2
b) Describe the D/A conversion with 8051 microcontroller.	6M	2	2

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UNIT–III

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6.   Discuss about hardware architecture of embedded systems.   12M   3   4

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OR

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7. a) Compare processor technology with IC technology of embedded systems.   6M   3   5

   b) Illustrate various Embedded systems design challenges.   6M   3   3

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UNIT–IV

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8. a) Describe the differences between RS 422 and RS 485   6M   4   2

   b) How do IEEE 802.11 stations test for a free channel?   6M   4   1

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OR

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9. a) What is the difference between WIFI and Bluetooth with example?   6M   4   1

   b) Write a short note on Controller Area Network.   6M   4   1

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UNIT–V

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10. a) Briefly discuss about Tasks and Task Scheduler   6M   5   2

    b) Compare Off the Shelf Operating Systems with Embedded Operating Systems.   6M   5   5

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OR

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11.   Discus about Inter process Communication Semaphores   12M   5   4

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Hall Ticket Number :

Code: 20A462T

III B.Tech. II Semester Regular Examinations June 2023
Microwave Engineering
(Electronics and Communication Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
      2. In Part-A, each question carries **Two marks.**
      3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

1. Answer *all* the following short answer questions   (5 X 2 = 10M)   CO BL

a) How is the TE_{10} mode launched or initiated in rectangular wave guide using an open-ended coaxial cable?   CO1 L2

b) Which are the degenerate modes in a circular waveguide?   CO1 L1

c) Define Coupling factor and Directivity?   CO2 L1

d) What is transit time effect? What is the importance of this transit time in microwave tubes?   CO2 L2

e) Estimate the f_r of an IMPATT diode whose drift velocity is 102 m/sec and Drift space is 20 µm.   CO3 L3

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

            Marks CO BL

UNIT–I

2. a) Derive the expression of wave impedance for TE and TM waves guided along rectangular waveguide.   6M CO1 L2

   b) The cut-off wavelengths of a rectangular waveguide are measured to be 6cm and 3.6 cm for TE_{10} and TE_{11} mode respectively. Determine waveguide dimensions.   6M CO1 L3

OR

3. Deduce the expressions for the field components of TM waves guided along a rectangular wave guide.   12M CO1 L4

UNIT–II

4. a) A circular air filed copper cavity is excited in the TM_{010} mode at 9.375GHz. The cavity has ratio length radius = 1.5. Find the Q-factor.   6M CO1 L2

   b) What are cavity resonators? Derive the equations for resonant frequencies for a circular cavity resonator.   6M CO1 L3

OR

5. Derive the propagation of TE waves in circular wave guide.   12M CO1 L4

UNIT–III

6. a) Write a short note on tuning screws and posts? 6M CO2 L1

   b) A 10dB directional coupler gives 3 dBm in output power through coupled port. If the Isolation specified as 60 dB, find the power available at the Isolated Port. 6M CO2 L3

OR

7. a) What is Faraday rotation? Explain the working of a ferrite circulator with neat sketch? How can it be used as an isolator? 6M CO2 L2

   b) Derive the S matrix for E plane tee. 6M CO2 L3

UNIT–IV

8. a) What are slow wave structures? Explain how a helical TWT achieve amplification. 7M CO2 L1

   b) A reflex klystron operates at the peak of the n = 1 or 3/4 mode. The DC power input is 30 mW and the ratio of V1 over V0 is 0.278 (a) Determine the efficiency of the reflex klystron. (b) Find the total output power in mW. (c) If 20% of the power delivered by the electron beam is dissipated in the cavity walls, find the power delivered to the load. 5M CO2 L3

OR

9. a) Describe the mechanism of velocity modulation in a two cavity Klystron? 6M CO2 L1

   b) With the help of Applegate diagram, explain the operation of a reflex klystron; show that the theoretical efficiency of reflex klystron is 27.78%. 6M CO2 L3

UNIT–V

10. a) How the domain formation is taking place in Gunn devices and what are its various modes of operation? 6M CO3 L2

    b) Explain the measurement of microwave power using bolometer method. 6M CO3 L1

OR

11. a) How avalanche effect is utilized to generate microwave signals? Explain the operation of IMPATT diode? 6M CO3 L2

    b) A slotted line is used to measure VSWR of the load at 9 GHz by double minima method. If the distance between the positions of twice minimum power is 0.4 cm. Find the value of VSWR on the line and magnitude of the voltage reflection coefficient. 6M CO3 L3

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Code: 20A46CT

III B.Tech. II Semester Regular Examinations June 2023

Radar Engineering

(Electronics and Communication Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

			CO	BL
1. Answer *all* the following short answer questions	(5 X 2 = 10M)			
a)	Define false alarm		CO1	L1
b)	List the limitations of CW Radar		CO2	L1
c)	Define blind speed		CO3	L1
d)	Identify the types of tracking Radars		CO4	L2
e)	Compare Circulators and Duplexers		CO5	L3

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL

UNIT–I

2. a)	Derive the Radar range equation which is influenced by integration of Radar pulses	8M	CO1	L3
b)	List the applications of Radar	4M	CO1	L1

OR

3.	For the given transmitted power is 150 KW, cross sectional area of the target is 20 sq. m, the minimum power received is 1mw, power gain of the antenna 975, operating frequency of 1.5GHz, find the maximum range.	12M	CO1	L3

UNIT–II

4. a)	Explain the operation of FMCW radar with block diagram.	6M	CO2	L2
b)	Compare CW and FMCW radar systems	6M	CO2	L4

OR

5. a)	Interpret the operation of CW Doppler radar in a sideband super heterodyne receiver with block diagram,	6M	CO2	L3
b)	Enumerate the operation of CW radar with non-zero IF in the receiver with block diagram.	6M	CO2	L3

UNIT–III

6. a) Describe the principle of Staggered PRF in MTI radar. 8M CO3 L1

   b) List the factors limiting the performance of an MTI system 4M CO3 L1

OR

7. a) Develop the block diagram of range gated Doppler filters and explain. 6M CO3 L3

   b) Construct the MTI Radar with Power amplifier transmitter. 6M CO3 L4

UNIT–IV

8. a) Distinguish between Monopulse tracker and Conical scan tracker. 6M CO4 L4

   b) Describe the operation of Phase comparison monopulse. 6M CO4 L2

OR

9. a) List the limitations of tracking accuracy. 3M CO4 L1

   b) Illustrate the block diagram of conical-scan tracking radar and explain its operation. 9M CO4 L3

UNIT–V

10. a) Interpret principle and characteristics of a matched filter. 6M CO5 L4

    b) Three network units each of 4 dB noise figure and 9dB, 5dB and 2 dB gains respectively are cascaded, calculate the overall noise figure of the system. 6M CO5 L3

OR

11. a) Derive the expression for frequency response function of matched filter 8M CO5 L2

    b) List the types of Radar displays. 4M CO5 L1

*** End ***