

F 6759

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

Seventh Semester

Branch : Electronics and Communication Engineering

EC 010 701—VLSI DESIGN (EC)

(New Scheme—2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all the questions.

Each question carries 3 marks.

1. Give an account on oxidation process.
2. Mention the importance of schottky diodes.
3. Draw the structure of NOR gate using Complementary pass transistor logic.
4. Write short notes on substrate doping.
5. Compare silicon and GaAs technologies.

(5 × 3 = 15 marks)

Part B

Answer all the questions.

Each question carries 5 marks.

6. Discuss the steps involved in IC fabrication.
7. Explain the operation of silicon gate technology.
8. Illustrate the basic principle of stick diagram.
9. Draw and explain the CMOS logic circuit for JK flip flop.
10. Give a description on PLA and FPGA.

(5 × 5 = 25 marks)

Turn over

Part C

Answer all the questions.

Each question carries 12 marks.

11. Explain the process involved in chemical vapour deposition.

Or

12. Elaborate the various types of lithography techniques in detail.

13. Explain about the design of monolithic capacitors with suitable diagram.

Or

14. Derive the threshold voltage for an nMOS transistor without body effect. Also discuss the factors affecting it.

15. Give a description on Latch up in CMOS circuits with circuit model, p-well and n-well structure.

Or

16. Devise the operation of 4-bit shifter circuit using CMOS with suitable stick diagram.

17. Enumerate about the scaling factors of MOS circuits with suitable expressions.

Or

18. Discuss about BICMOS technology and its structure in detail.

19. Draw the side view diagram and circuit symbols of basic MESFET and explain its operation.

Or

20. Explain the GaAs crystal structure in detail.

(5 × 12 = 60 marks)

F 6803

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

Seventh Semester

Branch : Electronic and Communication Engineering
EC 010 704—ELECTRONIC INSTRUMENTATION (EC)
(New Scheme—2010 Admission onwards)
[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer all questions.
Each question carries 3 marks.*

1. What is Drift ?
2. What is loading effect ?
3. What are Opto-couplers ?
4. What is the basic principle of PLC ?
5. Give *three* examples for a temperature measurement devices.

(5 × 3 = 15 marks)

Part B

*Answer all questions.
Each question carries 5 marks.*

6. Define seven base units of S.I. system.
7. Explain the working principle of LVDT.
8. Draw the block diagram of telemetry system.
9. What is a distortion amplifier ?
10. Explain any *one* PH measurement device.

(5 × 5 = 25 marks)

Part C

*Answer all questions.
Each question carries 12 marks.*

11. Explain about the standard techniques used for error measurement and analysis.
- Or*
12. What do you mean by Instrument Calibration ? Explain with the help of an example.

Turn over

13. Explain in detail about any one electro mechanical transducer.

Or

14. What are the criterias for choosing a right transducer ?

15. Write short notes on (i) Instrumentation amplifier ; (ii) Isolation amplifier.

(4 + 8 = 12 marks)

Or

16. Write technical notes on (i) FDM ; (ii) TDM.

(4 + 8 = 12 marks)

17. What are the commonly found recording devices ? Explain in detail.

Or

18. With the help of a block diagram, explain the principle of PLC.

19. What are the techniques used for measuring resistance ? Explain any *two* in detail.

Or

20. Explain about the inductance and capacitance measurement technique.

[5 × 12 = 60 marks]

F 6816

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

Seventh Semester

Branch : Electronics and Communication Engineering

EC 010 705—EMBEDDED SYSTEMS (EC)

(New Scheme—2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. List any five embedded systems in consumer electronics.
2. When is a program said to be re-entrant ?
3. Define the terms process, task and thread.
4. What is the watch-dog timer ? Why is it useful ?
5. Explain the L293 motor driver.

(3 × 5 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Distinguish between high level language and assembly level language. Give an example for each.
7. What are the different types of I/O devices ? Give an example for each.
8. What are Embedded Systems on a Chip ? Name any four applications of ESoCs.
9. Differentiate between synchronous and asynchronous communication with an example.
10. What are macros ? Why are they required ?

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.

Each question carries 12 marks.

11. What are the branching operations supported by the 8051 micro-controller? Explain with examples.

Or

12. Discuss in detail the various challenges in embedded system design.

13. Explain in detail the SPI communication protocol and its interfacing techniques.

Or

14. Write a note on the embedded hardware architecture and system development process.

15. With all necessary sketches, explain in detail the process of intra-communication among peripherals using the I²C bus.

Or

16. Write a note on the different types of advanced I/O serial high speed buses used in Embedded communication systems.

17. Briefly discuss the process of designing a position control system, with neat diagrams.

Or

18. Write a note on the process of interfacing embedded systems with other devices like displays etc.

19. Explain in detail the inter-process communication mechanism used in embedded system design.

Or

20. Discuss the various memory management techniques employed in embedded systems.

(5 × 12 = 60 marks)

F 6850

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

Seventh Semester

Branch : Electronics and Communication Engineering

EC 010 706 L03—DIGITAL IMAGE PROCESSING (Elective II) [EC]

(New Scheme—2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Define an image.
2. What are the properties of DFT ?
3. What is a neighbourhood operation ?
4. What is the need for segmentation ?
5. What is redundancy in images ?

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. What is resolution ? What are the factors determining it ?
7. Define Walsh transform. How is it used in image processing ?
8. Explain image enhancement.
9. What is active contour ? Explain its significance in image segmentation.
10. What is the need for compression ?

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.

Each question carries 12 marks.

11. Explain how images are classified. What are the different image formats? Explain their significance with example for each.

Or

12. Explain image sampling and quantization.
13. Explain any three 2D transforms with illustrations and applications.

Or

14. Find the KL transform of the following matrix $X = \begin{bmatrix} 3 & -2 \\ -4 & 4 \end{bmatrix}$.

15. Explain :

- (i) Spatial domain method of image enhancement.
(ii) Image sharpening by differentiations.

Or

16. What is histogram manipulation? Explain how it is used in image enhancement with an example.
17. Explain thresholding based segmentation and edge based segmentation. Distinguish the two methods.

Or

18. Write a note on : (i) Hough transform. (ii) edge detection.
19. Use Huffman coding to compress the following image and compute the degree of compression. (Assume 2 bits for pixel value) :

$$\begin{bmatrix} 3 & 2 & 1 & 3 \\ 0 & 2 & 2 & 3 \\ 3 & 3 & 3 & 1 \\ 2 & 3 & 3 & 0 \end{bmatrix}$$

Or

20. Explain wavelet based image compression with an illustration.

(5 × 12 = 60 marks)