G 1271 (Pages : 2) Reg. No.....ECE.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Seventh Semester

Branch : Electronics and Communication Engineering/Applied Electronics and Instrumentation

MICROCONTROLLER BASED SYSTEM DESIGN (LA)

(Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Differentiate between PLA and PAL.
2. Explain a dual port RAM.
3. Why interrupts are important in an embedded system OS?
4. Explain a 7 segment display with diagrams.
5. Discuss the use of ADC's and DAC's.
6. Explain the different steps of Analog to Digital conversion.
7. Discuss the RS 232 standard.
8. Discuss the centronics PC parallel port interface.
9. Explain DS 1232 watch dog timer.
10. Explain the steps in interfacing a stepper motor to a microcontroller.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Explain the different logic families and make comparison of their features.

Or

12. Explain realization of PAL arrays with Flip Flops.
13. Discuss the features of embedded C compiler. Mention their advantages.

Or

Turn over

14. Discuss how relays can be interfaced to a microcontroller, with the help of necessary diagrams.

15. Explain the working of successive approximation analog to digital converter.

Or

16. Explain a weighted resistance type digital to analog converter.

17. What is I^2C Bus? Compare it with SPI bus.

Or

18. Discuss the advantages of Low voltage differential signaling. Explain the working.

19. Explain with a diagram how a 4 × 4 matrix keyboard can be interfaced to a microcontroller.

Or

20. Draw and explain a typical D.C. motor speed control scheme using a microcontroller.

(5 × 12 = 60 marks]

G 1280 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Seventh Semester

Branch : Electronics and Communication Engineering/Applied Electronics and Instrumentation

VLSI TECHNOLOGY (LA)

(Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Explain the process of epitaxial growth.
2. Discuss how ion implantation is done.
3. Explain how isolation is achieved in FET structures.
4. Discuss a construction of Schottky diodes and transistors.
5. Discuss the delay effect due to capacitance of layers.
6. Write a brief note on scaling of MOS structures.
7. Using a diagram show the CMOS logic implementation using NOR.
8. Explain how power dissipation problems are handled in CMOS.
9. Discuss the principles specific to GaAs fabrication.
10. Explain the crystal structure of GaAs using diagrams.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Explain in detail the diffusion process. Discuss the physical mechanism and laws governing this process.

Or

12. Discuss the various ways in which lithography can be performed.

Turn over

13. Explain the PMOS and NMOS fabrication techniques.

Or

14. Discuss the fabrication of resistors in a region grown on a substrata.

15. Explain the Twin well process.

Or

16. Discuss the BiCMOS fabrication steps and the circuit design process.

17. Show the fabrication of an inverter using CMOS technology.

Or

18. Explain the working of a serial shifter and discuss its design.

19. Explain the doping process in Gallium Arsenide technology.

Or

20. Explain the channelling effect and how it affects the fabrication process.

(5 × 12 = 60 marks)

G 1334 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Seventh Semester

Branch : Electronics and Communication Engineering/Applied Electronics and Instrumentation/ Electronics and Instrumentation Engineering

OBJECT ORIENTED PROGRAMMING IN C++ (Elective I) (LAS)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. List any *three* applications of object oriented programming.
2. What is the need of an object?
3. Explain the concept of inheritance.
4. What are building classes?
5. Define Polymorphism with example.
6. What is a abstract class?
7. What are overloading functions?
8. What are member functions?
9. Create one inline function.
10. How will you declare a function outside the class?

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Discuss about the evolution of object oriented programming language.

Or

12. Explain about Need of objects.
13. Discuss about the building classes.

Or

14. With examples, explain constructors and destructors.

Turn over

15. What is polymorphism? Explain using examples.

Or

16. Define a virtual function. Discuss its usage.

17. Using examples, explain the concept of operator overloading.

Or

18. Explain in detail about the overloading functions.

19. What are different types of function declarations? Explain.

Or

20. What are the main applications of friend functions?

(5 × 12 = 60 marks)

G 1335 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Seventh Semester

Branch : Electronics and Communication Engineering

NEURAL NETWORKS (Elective I) (L)

(Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Give the applications of single layer and multi-layer networks.
2. Differentiate between learning and training processes.
3. What are the advantages of back propagation algorithm?
4. What is meant by network paralysis?
5. What are the characteristics of counter propagation networks?
6. Discuss the statistical properties of the Grossberg networks.
7. Compare Boltzmann and Cauchy networks.
8. What is simulated annealing?
9. Describe the applications of associative memory.
10. Briefly describe Adaptive Resonant Theory.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Explain with an architectural diagram the principle of a multilayer perceptron.

Or

12. Discuss the training algorithms used for ANN.
13. Explain the back propagation algorithm.

Or

14. Discuss on the applications of BPN.

Turn over

15. Draw and explain the architecture of a forward only CPN.

Or

16. State the training algorithm used for a full counter propagation network.

17. Draw and explain the architecture of Cauchy's net.

Or

18. Explain the statistical methods of solving non-linear optimization problems.

19. Discuss on the stability of recurrent nets.

Or

20. Explain the implementation of ART nets.

(5 × 12 = 60 marks)

G 1336 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Seventh Semester

Branch : Electronics and Communication Engineering

BIOMEDICAL ENGINEERING (Elective I) (L)

(Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 4 *marks.*

1. Draw the action potential waveform and explain.
2. Describe with diagram the electrodes used for EMG measurement.
3. Explain with figure the servo recorder.
4. What are the different types of Blood cells?
5. What are the applications of ultrasound? Explain any *one.*
6. What are the characteristics of ultrasound?
7. List the different method of visualization of X-rays and explain any *one.*
8. What is meant by Computed Tomography? What are the system components?
9. Briefly explain the micro shock hazards.
10. Describe the principle of operation of artificial heart.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*

Each question carries 12 *marks.*

11. (a) Draw the block diagram of a Man-Instrument system and explain each component in detail.

    (b) Explain with figure any *one* transducer used for the measurement of temperature.

(8 + 4 = 12 marks)

Or

12. Explain with figure the respiratory system and the physiology of respiration. Also explain how the blood is purified.

(12 marks)

Turn over

13. Explain with figure the Sphygmomanometer method and any *two* types of direct pressure measurement.

(12 marks)

Or

14. Draw the schematic of a continuous flow analyzer and explain each component in detail.

(12 marks)

15. Explain with the schematic the Linear Array Scanners with the applications.

(12 marks)

Or

16. Explain the principle of M-mode display. Also draw the block diagram of an echocardiograph circuit and explain.

(12 marks)

17. Draw the block diagram of a C arm machine and explain.

(12 marks)

Or

18. (a) Briefly explain the Gantry Geometry.

    (b) Explain the principle of generation of X-rays.

(4 + 8 = 12 marks)

19. Describe with schematic any *three* types of dialyzers. Compare their performance.

(12 marks)

Or

20. (a) Explain with diagram the components of a biotelemetry system.

    (b) Explain in detail any *three* applications of biotelemetry.

(4 + 8 = 12 marks)

[5 × 12 = 60 marks]

G 1288 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Seventh Semester

Branch : Electronics and Communication Engineering

MICROWAVE AND RADAR ENGINEERING (L)

(Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *the questions.*

Part A

Each question carries 4 *marks.*

1. Explain in detail the advantages and applications of microwaves.
2. Obtain the S matrix of an ideal, matched, lossless isolator.
3. Explain the high frequency limitations of microwaves.
4. Explain the basic principle of microwave link with a neat sketch.
5. State and explain GUNN effect.
6. Explain in detail any *one* potential application of tunned diode with a neat diagram.
7. Draw a simple CW radar and explain its principle.
8. Give an account on Doppler effect.
9. Explain the principle of GCA with a neat diagram.
10. What are primary and secondary radiators ? Give examples and explain.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. State and derive all the properties of S parameters.

Or

12. Explain the construction and principle of operation of (i) Circulator ; (ii) Hybrid junction ; (iii) Phase changer ; (iv) Attenuator.

(4 × 3 = 12 marks)

13. Draw a neat schematic diagram of reflex klystron oscillator and explain its principle of operation. Derive an expression for its exit velocity.

Or

14. Explain the procedure for measuring microwave frequency and wavelength with a neat block diagram.

Turn over

15. Explain the principle of GUNN diode as an oscillator and an amplifier. Obtain the condition for negative resistance.

Or

16. Explain the construction and principle of operation of IMPATT diode with a neat diagram.

17. Derive Radar Range equation. Explain the limitations of this equation.

Or

18. Explain in detail the principle of operation of :

    (i) FM CW altimeter. (6 marks)

    (ii) MTI Radar. (6 marks)

19. Explain the construction and principle of working of any two microwave antennas with neat diagrams.

Or

20. Write technical notes on :

    (a) Global positioning system. (4 marks)

    (b) Satellite navigation. (4 marks)

    (c) LORAN. (4 marks)

[5 × 12 = 60 marks]

G 1298 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Seventh Semester

Branch : Electronics and Communication Engineering

OPTICAL FIBRE COMMUNICATION SYSTEMS (L)

(Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Define acceptance angle and acceptance cone.
2. Define index profile.
3. Describe a GI fibre cable.
4. Why is single mode propagation impossible in GI fibre?
5. Compare the characteristics of LED and ILD as sources of FOC.
6. What is a photo multiplier tube?
7. What are the requirements of a transceiver?
8. Discuss the requirements of optical amplifiers.
9. Explain the measurement of refractive index of a fibre.
10. Why measurements are essential in FOC systems?

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Explain how optical fibre act as a waveguide.

Or

12. What is V number? Derive V-numbers for different types of optical fibres.
13. Discuss on the factors affecting attenuation in optical fibres.

Or

14. Explain the splicing techniques and compare their characteristics.

Turn ov

15. Explain with diagrams the construction, principle of operation and characteristics of LED.

Or

16. Draw and explain the modulation circuits used for LASER source.

17. Explain with a block diagram, the principle of an optical communication system.

Or

18. Write a note on optical fibre networks.

19. Explain with diagrams the measurements of (a) Refractive index profile ; and (b) NA.

Or

20. Discuss on the applications of Fibre optic systems.

(5 × 12 = 60 marks)

G 1309 (Pages : 3) Reg. No.....

Name.....

B.TECH DEGREE EXAMINATION, MAY 2012

Seventh Semester

Electronics and Communication Engineering

INFORMATION THEORY AND CODING (L)

(Improvement / Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Relate the amount of information provided and probability of occurrence of events.
2. Show that the joint entropy is related to conditional entropy by :

$$H(X, Y) = H(X) + H(Y/X).$$

3. State and explain Shannon's source coding theorem.
4. Sketch the transition diagram of a binary symmetric channel and explain.
5. Differentiate between efficiency and redundancy of a code.
6. What are instantaneous codes. Explain its advantages and applications ?
7. Define G and H matrix and show that G. $H^T = O$.
8. Describe burst error correcting capabilities of channel codes.
9. Explain the interleaving techniques used in convolution codes. What is its need ?
10. List different ARQ methods and explain any one in detail.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Show that $H(X) \leq \log_2 k$ for equiprobable events. (5 marks)

(b) Prove that mutual information is symmetric. (7 marks)

Or

12. Consider a binary symmetric channel with $p(x_i) = \infty$. Then

(a) Show that the mutual information is given by :

$$I(X, Y) = H(Y) + p \log_2 p + (1-p) \log_2 (1-p).$$

(6 marks)

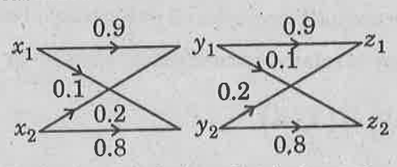
(b) Calculate I (X, Y) for :

(i) $\infty = 0.5$ and $p = 0.1$.

(ii) $\infty = 0.5$ and $p = 0.5$.

(6 marks)

13. Two binary channels are cascaded as shown below :



(a) Find overall channel matrix of the resultant channel, and draw the resultant equivalent channel diagram.

(b) Find $p(z_1)$ and $p(z_2)$ when $p(x_1) = p(x_2) = 0.5$.

(12 marks)

Or

14. (a) Describe the relation between bandwidth and signal to noise ratio. (4 marks)

(b) A channel has the following channel matrix $p[Y/X] = \begin{bmatrix} 1-p & p & 0 \\ 0 & p & 1-p \end{bmatrix}$

(i) Draw the channel diagram.

(ii) If the source has equally likely outputs, compute the probabilities associated with channel outputs for $p = 0.2$.

(8 marks)

15. (a) Write the Shannon-Fano coding algorithm. (4 marks)

(b) Consider source alphabet A, B, C, D, E, F, G, H having probabilities $p(x_i) = \frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{16}, \frac{1}{32}, \frac{1}{32}, \frac{1}{32}, \frac{1}{32}$. Make a source code using Shannon - Fano Coding method.

(8 marks)

Or

16. (a) Give the Huffman coding algorithm. (4 marks)

(b) Make a source code using Huffman coding method for the above question [ie. 15 (b)]. Use minimum variance method. Find efficiency of code.

(8 marks)

17. Consider (6, 3) linear block code generated by $G = \begin{bmatrix} 0 & 11 & 100 \\ 1 & 01 & 010 \\ 1 & 10 & 001 \end{bmatrix}$

Construct

(i) Encoder circuit.

(ii) Syndrome circuit and

(iii) Decoder block diagram.

(12 marks)

Or

18. (a) Describe the different steps involved in making a systematic (n, k) cyclic code. (4 marks)

(b) Given that generator matrix $g(x) = 1 + X + X^3$. Draw the encoder block diagram of (7, 4) cyclic code. (4 marks)

(c) Draw the block diagram of a Meggit decoder. (4 marks)

19. (a) Describe coding and inter leaving in CD digital audio system. (4 marks)

(b) Describe the encoding principle of convolution codes, with an example. (8 marks)

Or

20. Explain the following decoding methods used in convolution decoder.

(a) Maximum likelihood decoding.

(b) Sequential decoding.

(12 marks)

[5 × 12 = 60 marks]