G 6746 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Third Semester

Branch : Computer Science and Engineering

MICROPROCESSOR SYSTEMS (R)

(2002 admission onwards)

[Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 4 *marks.*

1. Explain the function of the following pins of 8085 : —
   (i) TRAP.
   (ii) HLDA.
   (iii) $\overline{\text{INTA}}$.
   (iv) SOD.
2. State the general purpose and special purpose registers in 8085 and their uses.
3. What are the differences between the SUBTRACT and COMPARE instructions ? Explain with examples.
4. Let (2000) = 06 H and (2001) = 04 H. What are the contents of H and L registers after the execution of LHLD 2000 ?
5. Write a delay subroutine for 10 m sec using the instructions of 8085 having clock frequency 3 MHz.
6. What do you understand by an instruction cycle ? How it differs from the machine cycle ?
7. Discuss the following sections of 8085 : —
   (i) interrupt control.
   (ii) serial input/output control.
8. Explain the purpose and features of RST instructions ?

Turn over

9. What are the various schemes of I/O data transfer from CPU to I/O devices and vice versa ? Explain any *one* scheme in detail.

10. What do you mean by memory mapping ? Discuss with an example.

(10 × 4 = 40 marks)

Part B

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module 1

11. (a) (i) Explain how the data lines and address lines of 8085 are multiplexed and demultiplied ?

(6 marks)

(ii) With the help of neat diagram show how the locations in the main memory are addressed by the processor ?

(6 marks)

Or

(b) Draw a simple circuit to generate power ON and Reset IN signals of 8085 and explain the function of various registers, flip-flops and interrupts ?

Module 2

12. (a) What are the various types of instruction formats of 8085 ? Give example for each format.

Or

(b) Describe all the addition operators used in 8085 with suitable examples. Show their addressing modes.

Module 3

13. (a) Describe the situations when the machine cycle of 8085 are neither READ nor WRITE cycles. Draw and explain the timing diagram of Bus Idle machine cycle for RST 7.5 ?

Or

(b) Explain with necessary timing diagrams, how the memory read machine cycle differs from opcode fetch machine cycle of 8085 ? Describe the status signals and control signals for the above clearly.

Module 4

14. (a) Describe in detail all the hardware and software interrupts available in 8085 ?

Or

(b) Draw the internal architecture of 8259. Explain each block. Give the significance of priority of interrupt.

Module 5

15. (a) How can you select 8 blocks of address each of 4 kB area using a decoder IC ? Draw and explain the arrangement showing all signals.

Or

(b) (i) What are the basic functions, which a DMA controller is supposed to perform for DMA data transfer ?

(6 marks)

(ii) Compose 256 × 8 ROM into 2 K × 8 ROM ? Draw the circuit. (6 marks)

[5 × 12 = 60 marks]

G 6754 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Third Semester

Branch : Computer Science/Information Technology

SOLID STATE ELECTRONICS (R T)

(2002 admission onwards—Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Name the different operating regions of a transistor amplifier. Define how it is biased on these regions.
2. What is a Darlington pair ? List its important properties.
3. Explain with a neat diagram how JFET can be used as an analog switch.
4. Give at least four differences between JFET and MOSFET.
5. Why LC oscillators are usually preferred at high frequencies and RC oscillators at low frequencies ?
6. Determine the oscillation frequency of a Colpitts oscillator if R_1 = 18 K, R_2 = 100 K, R_E = 1 K, C_E = 0.1 μF, C_{c_1} = 0.001 μF, C_{c_2} = 0.001 μF, L = 1 mH, C_1 = 10 pF and C_2 = 22 pF.
7. What are the two important conditions to be maintained in a good clamping circuit ?
8. List the various applications of an astable multivibrator.
9. What is a seven segment display ? Describe its connection diagram.
10. Define intrinsic stand-off ratio ? What is its significance and range of value ?

(10 × 4 = 40 marks)

Part B

Answer **either** *section (a)* **or** *(b) of each module.*
Each full question carries 12 *marks.*

Module I

11. (a) Draw the circuit of a two-stage RC coupled BJT amplifier and explain what happens to its (i) current gain ; (ii) voltage gain ; (iii) input resistance with cascading.

(12 marks)

Or

Turn over

(b) (i) Sketch the frequency response of a RC coupled amplifier and label the important regions. Account for the shape of the curve.

(8 marks)

(ii) Define the three stability factors. Which one is considered in practical design ? Why ?

(4 marks)

Module 2

12. (a) In an experimental set up, the following readings were observed :

$V_{GS} = 0$, and $V_{DS} = 7.0\ V \rightarrow I_D = 10\ mA$

$V_{GS} = 0$, and $V_{DS} = 15.0\ V \rightarrow I_D = 10.25\ mA$

$V_{GS} = -0.2\ V$ and $V_{DS} = 15.0\ V \rightarrow I_D = 9.65\ mA$

Plot the characteristics. Also determine :

(i) the type of the JFET ; (ii) its dynamic drain resistance ; (iii) amplification factor ; (iv) transconductance.

Or

(b) Draw the constructional diagram of an enhancement type MOSFET ? Explain its working with the help of the drain and transconductance characteristics.

(12 marks)

Module 3

13. (a) With a neat circuit diagram, describe the working of a transistorised RC phase-shift oscillator. Explain its conditions for sustained oscillation.

Or

(b) What is a Hartley oscillator ? Draw its circuit and explain its working.

(12 marks)

Module 4

14. (a) Draw the circuit diagram of a transistorised monostable multivibrator and design it to generate a delay of 20 msec. Use base trigger.

Or

(b) Draw the circuit of a limiter to pass voltages beween + 6V and – 4 V only, using (i) external bias batteries ; (ii) Zener diodes. Explain their working.

(12 marks)

Module 5

15. (a) (i) Using 7805 and 7905 draw the circuit diagram of a ± 5 V dual power supply. (6 marks)

(ii) Draw the constructional details of a TRIAC and describe its working. (6 marks)

Or

(b) (i) Compare and contrast LED and LCD. (6 marks)

(ii) What is an optocoupler ? Explain its principle and applications. (6 marks)

[5 × 12 = 60 marks]

G 6762 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Third Semester

Branch : Computer Science and Engineering/Information Technology

PROBLEM SOLVING AND COMPUTER PROGRAMMING (R, T)

(2002 admission onwards—Supplementary)

Time : Three Hours Maximum : 100 Marks

Write neat and efficient C programs wherever necessary.

Part A

Answer **all** *questions briefly.*
Each question carries 4 *marks.*

1. With an example, explain what is meant by a flow chart.
2. Discuss the bottom up design approach with an example.
3. How do variables and symbolic names differ ? Explain with suitable examples.
4. Describe the precedence and associativity of operators in C.
5. Explain the use of break and continue with examples.
6. What is recursion ? Write a recursive function to find the n^{th} power of x.
7. How does array definition differ from that of an ordinary variable ? How are individual array elements identified ?
8. Can structure declarations appear inside functions. Explain with an example.
9. How do we check for errors upon opening a file and output the correct error message ?
10. What are the command line arguments ? Explain.

(10 × 4 = 40 marks)

Part B

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module 1

11. (a) Write an algorithm and draw a neat flow chart to find the sum $S = 1 - \frac{x^2}{2} + \frac{x^4}{\lfloor 4} - \frac{x^6}{\lfloor 6} + \ldots$

Or

(b) (i) What is a pseudocode ? What are the advantages and limitations of pseudocode ?

(6 marks)

(ii) Explain (1) procedure oriented programming (2) object oriented programming. Compare and contrast them.

(6 marks)

Turn over

Module 2

12. (a) (i) For the printf ( ) function, what are the format specifiers for specifying the types of argument, the position and the precision of the output ? Illustrate with suitable examples.

(8 marks)

(ii) What are the differences between scanf ( ) and gets ( ), with respect to data input with embedded white space characters ?

(4 marks)

Or

(b) Write a C program to compute the real and complex roots of a quadratic equation.

Module 3

13. (a) Write a C program to input a number and print the digits in the number in words.

Or

(b) Explain with program examples the different methods of passing arguments to a function.

Module 4

14. (a) Write a C program which reads a matrix and checks whether it is orthogonal or not.

Or

(b) Write a C program to read details of 300 students using structures with fields (regno, name, branch, semester, mark 1, mark 2, mark 3, mark 4, mark 5, mark 6) and display the total marks and average.

Module 5

15. (a) Write a program that will receive a file name and a line of test as command line arguments and write the test to the file.

Or

(b) Write a C program to copy a string in reverse order to another string variable using pointers. For example st = "RAMA" is copied as rst = "AMAR".

(5 × 12 = 60 marks)

G 6769 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Third Semester

Branch : Computer Science and Engineering/Information Technology

HUMANITIES (R,T)

(2002 admission onwards)

[Supplementary]

Time : Three Hours Maximum : 100 Marks

Answer Part A and Part B in **separate** *answer books.*
Part A and Part B each carries 50 *marks.*
All full questions carry equal marks.

Part A (Principles of Management)

Answer **either** (a) **or** (b) *section of each question.*

Module 1

1. (a) Define span of control. Differentiate between narrow and wide spans of control. Explain the major factors determining span of control.

Or

(b) (i) Explain matrix organisation. Compare with the other structures.

(ii) Define job evaluation. Explain the stages and methods of job evaluation.

Module 2

2. (a) (i) Explain the role of leadership in TQM.

(ii) What is Big 'Q' concept of quality ? Explain the significance of feedback in this approach.

Or

(b) (i) Discuss the benefits of ISO 9000 certification.

(ii) Explain the three important quality concepts : quality control, quality assurance and quality management.

Part B (Engineering Economics)

Answer **either** (a) **or** (b) *section of each question.*

Module 3

3. (a) (i) How does a Reserve Bank regulate the volume of credit with the help of Bank-Rate and Open-Market operations ?

(ii) Describe the role of public and private insurance agencies in India.

Or

Turn over

(b) (i) State and explain in brief the major financial institutions in India providing finance to industries.

(ii) Describe the aims and objectives of I.C.I.C.I.

Module 4

4. (a) Discuss the need for industrialisation. Critically evaluate the development of various Industries since independence. What is the future ?

Or

(b) (i) Discuss the role of small scale industries to the development of the country.

(ii) Critically evaluate the influence of trade unions in Indian Industries.

Module 5

5. (a) (i) Distinguish between progressive tax and a regressive tax. Which of the two is better and why ?

(ii) Explain incidence of a tax. Distinguish it from the effect of the tax.

Or

(b) (i) What is the difference between a tax on income and a tax on a commodity ? Why is a tax on income preferred in modern times ?

(ii) Explain the problems associated with deficit financing.

G 6776 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Third Semester

Branch : Computer Science and Engineering

LOGIC SYSTEM DESIGN (R)

(2002 admission onwards—Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 4 *marks.*

1. (a) Add 17_{10} and 95_{10} in binary ; (b) substract 1100101_2 from 11110111_2 using 1's complement method.
2. What is Gray code ? What is its use ? Convert the binary number 10110 to Gray code.
3. Simplify $f(a,b,c,d) = \sum m\,(0,1,2,4,5,6,8,14)$ using K-map.
4. Prove the universality of NAND and NOR gates.
5. With truth tables and logic circuit, explain the working of SR and JK flip flops.
6. Explain a mode-7 ripple upcounter.
7. Implement half adder using basic gates and show the implementation of full adder using half adders.
8. Describe the principle of a carry save adder.
9. What is a ring counter ? What are its applications ?
10. Describe how shift registers can be used to perform binary arithmetic operations.

(10 × 4 = 40 marks)

Part B

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module 1

11. (a) (i) Convert the following hexadecimal numbers to the binary :

(1) 671.176 (2) IF1.90 A (3) 20D.CA1. **(6 marks)**

(ii) Explain ASCII and EBCDIC codes. **(6 marks)**

Or

Turn over

(b) (i) Perform the following subtractions using 2's complement method.

(1) 01000 – 01001 ; (2) 01100 – 00011 ; (3) 0011.1001 – 0001.1110.

(ii) Encode the following decimal numbers into BCD codes :

(1) 327.09 ; (2) 200.009 ; (3) 110.901. (6 marks)

Module 2

12. (a) Minimise using K-map and draw the logical minimal circuit using basic logic gates :

(i) $f_1 = \Sigma m\,(2,8,9,10-12) + \phi\,\Sigma\,(3,6,13-15)$. (6 marks)

(ii) $f_2 = (a+\bar{b})\,(a+c+d)\,(\bar{a}+\bar{b}+\bar{d})\,(a+\bar{c}+d)$. (6 marks)

Or

(b) Find all the prime implicants of the function using Quine McCluskey algorithm

$f = \pi M\,(0,2,3,4,5,12,13) + dc\,(8,10)$.

Module 3

13. (a) Design a synchronous mod-9 counter using negative edge triggered JK flip-flop using excitation tables. Explain the working of the circuit using its timing diagram.

Or

(b) Design a seqeunce generator having the following repeated binary sequence using JK flip-flops :

$0 \rightarrow 1 \rightarrow 4 \rightarrow 6 \rightarrow 7 \rightarrow 5 \rightarrow 0$.

Module 4

14. (a) Draw the truth table of full substractor. Using K-maps, design the minimal logic, circuit using only NAND gates.

Or

(b) Draw the circuit of a 4-bit carry look ahead adder and explain its performance.

Module 5

15. (a) Draw circuit diagram of a 4-bit bidirectional shift register. Explain its working with timing diagram.

Or

(b) (i) With a neat circuit diagram and timing waveforms, describe the working of a 4-bit twisted ring counter. (8 marks)

(ii) Draw and explain the working of a 4-bit serial shift register. (4 marks)

[5 × 12 = 60 marks]

G 6784 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Third Semester

Branch : Computer Science/Information Technology

ENGINEERING MATHEMATICS—II (R,T)

(2002 Admission onwards—Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **one** *full question from each module.*
Each full question carries 20 *marks.*

Module 1

1. (a) Determine the truth value of each of the following statements :
   (i) Copenhagen is in Denmark or $1 + 5 = 8$ and $3 + 3 = 6$.
   (ii) Goa is in India, and $3 + 4 = 7$ or $2 + 6 = 8$.

   (b) Let p be "It is cold" and let q be "It is raining". Give a simple verbal sentence which describes each of the following statements :
   (i) $\sim p$. (ii) $p \wedge q$.
   (iii) $p \vee q$. (iv) $q \vee -p$.

   (*Or*)

   (c) Find the truth tables of (i) $p \vee \sim q$. (ii) $\sim p \wedge \sim q$.

   (d) Verify that the proposition $(p \wedge q) \wedge \sim (p \vee q)$ is a contradiction.

Module 2

2. (a) Let $S = \{(a,b)/a,b, \in N\}$ and define $(a,b) \sim (c,d)$ if and only if $ad = bc$. Prove that $\sim$ is an equivalence relation on S.

   (b) Let $S = \{1, 2, 3, 4, 5\}$ have a partition consisting of the sets $\{1, 3, 5\}$ and $\{2, 4\}$. Show that this partition determines an equivalence relation.

   (*Or*)

   (c) State and explain Euclidean algorithm. Use it to find the *gcd* of 1575 and 728.

   (d) Given $f : A \to B$ and $g : B \to C$. Show that if *gof* is one-to-one, then *f* is one-to-one.

Module 3

3. (a) Suppose N is ordered by divisibility. Determine whether or not A is an ordered subset of N where
   (i) $N = \{2, 3, 4, 5, 6\}$ with the usual order and
   (ii) $A = \{2, 4, 8, 32\}$ with the usual order.

   (b) Suppose $A = \{2, 3, 6, 8, 9, 18\}$ is ordered by divisibility. Identify the noncomparable pairs of elements of A.

Or

(c) Let L be a lattice. Then prove $a \wedge b = a$ if and only if $a \vee b = b$.

(d) Consider the lattice L shown in fig. 1. Determine whether or not each of the following is a sublattice of L.

$L_1 = \{x, a, b, y\}$. $L_2 = \{x, a, e, y\}$.

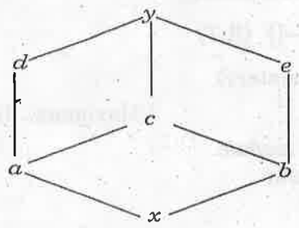

Fig 1.

Module 4

4. (a) Determine the discrete numeric function corresponding to the generating function $A(Z) = \frac{1}{1-Z^3}$.

(b) Find the particular solution for the difference equation $a_r + 5a_{r-1} + 6a_{r-2} = 3r^2 - 2r + 1$.

Or

(c) The solution of the recurrence relation $C_0 a_r + C_1 a_{r-1} + C_2 a_{r-2} = f(r)$ is $3^r + 4^r + 2$. If $f(r) = 6$ for all r, find C_0, C_1, and C_2.

Module 5

5. (a) Draw the diagram of the following multigraphs $G(V,E)$ where $V = \{P_1, P_2, P_3, P_4, P_5\}$ and

(i) $E = [\{P_1,P_5\}, \{P_3,P_4\}, \{P_2,P_3\}, \{P_2,P_5\}, \{P_1,P_5\}]$.

(ii) $E = [\{P_2,P_4\}, \{P_2,P_3\}, \{P_5,P_1\}]$.

(b) Find the connected components of G where V (G) = {A, B, C, X, Y, Z} and E (G) = [{A, Y}, {B, C}, {Z, Y}, {X, Z}].

Or

(c) The labelled graph G in Fig. 2 has three spanning trees. (i) Find the spanning trees of G and their lengths. (ii) Which is the minimum spanning tree of G ?

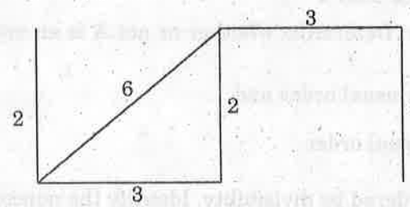

Fig. 2

(5 × 20 = 100 marks)