

G 1551

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering

CS 010 405—MICROPROCESSOR SYSTEMS (CS)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Explain the function of timing and control unit of UP 8085.
2. Explain the function of subroutine.
3. What is synchronous data transfer scheme ?
4. What are the various hardware interrupts of 8085 μ P ?
5. What are various operating modes of 8253 programmable interval Timer.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain arithmetic and logic group of instructions with example.
7. Explain memory mapped I/O scheme of μ P 8085.
8. Discuss the function of programmable interrupt controller.
9. Discuss interrupt driven data transfer scheme with example.
10. Discuss different applications of 8253 Programmable Interval Timer.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each full question carries 12 marks.

11. With a neat diagram, explain the architecture of 8085 μ P.

Or

Turn over

12. (a) Explain Data transfer and branch control group of instructions of μP 8085.
(b) Explain what operations are performed when following instructions are executed :—
(i) DAA ; (ii) CMP M ; (iii) CMA ; (iv) RAL ; (v) RAR.
13. Write a program to find larger of two numbers using 8085 μP .

Or

14. Draw and explain the timing diagram of memory read and memory write operation.
15. Explain enabling, disabling and masking of interrupts. Discuss with suitable examples how to transfer data using interrupts.

Or

16. Explain various hardware and software interrupts.
17. Explain programmed data transfer scheme of μP 8085.

Or

18. Discuss the various operating modes of 8255 programmable peripheral interface.
19. Discuss various operating mode of 8253 programmable interval timer.

Or

20. Explain the working principle of 8251 USART.

(5 × 12 = 60 marks)

G 1564

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering/Information Technology

CS 010 406 /IT 010 404—THEORY OF COMPUTATION (CS/IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

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

1. Define Diagonalization principle.
2. What are the components of Finite automation model ?
3. Write down the applications of PDA ?
4. What are the various representation of TM ?
5. What does mean TSP ?

(5 × 3 = 15 marks)

Part B

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

6. Write down the difference between computable and Non-computable functions.
7. List out the applications of finite automata.
8. Give examples of languages handled by PDA.
9. Give examples of total recursive functions.
10. Write notes on Tractable problems.

(5 × 5 = 25 marks)

Part C

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

11. Explain in detail Primitive and Partial recursive functions.

Or

12. Define Pigeonhole principle and prove.

Turn over

13. Conversion of NFA to DFA.

Or

14. What is Moore and Mealy machine, with an example ?

15. Conversion of PDA into CFL.

Or

16. Write notes on Chomsky Normal form and Greibach Normal form.

17. Briefly explain the different types of Turing machines.

Or

18. State and explain Rice theorem.

19. Explain in detail any two application of P and NP-complete problems.

Or

20. Explain in detail about NP Hard problems with an example.

(5 × 12 = 60 marks)

G 1540

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering

CS 010 404—SIGNALS AND COMMUNICATION SYSTEMS (CS)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. What is Sampling ?
2. Define external noise.
3. What are the needs of modulation ?
4. In what situation multiplexing is used ?
5. Why line coding is used ?

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Define and explain continuous time Fourier series.
7. Explain cross talk.
8. Define slope overload and granular noise.
9. What is the difference between frequency division multiplexing and wavelength division multiplexing ?
10. What is EBCDIC ?

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each question carries 12 marks.

11. Find the Fourier transform of the signal $x(t) = A \sin \omega t$.

Or

12. List and explain the properties of continuous time Fourier series.

Turn over

13. (a) State Shannon Harley theorem.
 (b) Explain what is signal propagation delay.

Or

14. Describe the Architecture of a Typical communication system.

15. Explain the generation of PPM and PWM signals.

Or

16. With the help of neat diagrams, explain the transmitter and receiver of a pulse code modulation.

17. Compare packet switching and circuit switching.

Or

18. Explain with neat sketches any *one* type of analog to digital converter.

19. Write the following error correction and detection code with example :—

(a) Block coding.

(b) Hamming code.

Or

20. Write short notes on : Bar coding and party coding.

(5 × 12 = 60 marks)

G 1528

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering / Information Technology

CS 010 403/IT 010 405—DATA STRUCTURES AND ALGORITHMS (CS, IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. What is hashing ?
2. Define Stack.
3. Briefly explain about garbage collection.
4. Define tree traversal and mention the type of traversals.
5. What is insertion sort ? How many passes are required for the elements to be sorted ?

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Define collision ? Explain collision-resolution techniques.
7. What is queue ? Write an algorithm to implement queue with example.
8. Write a routine to insert an element in a linked list.
9. Formulate an algorithm to search an element in a binary tree.
10. Discuss any one sorting method with example.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each question carries 12 marks.

11. How will you resolve the collisions while inserting elements into the hash table using separate chaining and linear probing ? Write the routines for inserting, searching and removing elements from the hash table using the above mentioned techniques.

Or

Turn over

12. Given the input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function of $h(x) = x \pmod{10}$ show the resulting : (a) Separate chaining hash table ; (b) Open addressing hash table using linear probing.
13. How a queue does work ? Explain the algorithm for inserting and deleting from a queue.

Or

14. Write a C program to perform the following stack operations. Declare a structure with one integer data type. Add necessary variables to ensure that you can create a linked representation. (a) Write a function called 'pop' that takes two parameters: an integer pointer and a stack from which we need to pop this element. (b) A display function that would print the contents of stack. Add necessary functions to check for emptiness or fullness of the stack ?
15. Formulate an algorithm to insert an element in a doubly linked list.

Or

16. Write algorithm to delete an element from anywhere in a doubly linked list. An element is a structure variable that contains an integer data field and a string data field.
17. Write the routines to insert and remove a node from Binary Search Tree.

Or

18. Write the procedures to implement single and double rotations while inserting nodes in an AVL tree.
19. Write down the complete quicksort algorithm and illustrate its working to sort the list (45, 23, 11, 35, 62, 87, 24, 66) ?

Or

20. Write down the complete heap sort algorithm and illustrate its working to sort the list (25, 73, 10, 95, 68, 82, 22, 60) ?

(5 × 12 = 60 marks)

G 1521

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering

CS 010 402—OBJECT ORIENTED PROGRAMMING (CS)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Give any *four* advantages of OOPs.
2. When to use the Inheritance concept ?
3. What is meant by Polymorphism ?
4. What does mean inline function ?
5. What are C++ streams ?

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. What are Enumeration types and Explain.
7. Explain code reuse with an example.
8. Write down the applications of abstract classes.
9. Write short notes on Virtual Base Classes.
10. What are the differences between sequential and random access file ?

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each question carries 12 marks.

11. Explain in detail about the Programming Elements.

Or

12. Define Member function and explain in detail about function outside the class body with example program.

Turn over

13. In detail explain single, Hierarchical and hybrid inheritance.

Or

14. In detail explain public, private and protected inheritance.

15. Discuss about the Overload Operators.

Or

16. Explain in detail about Friend function with example program.

17. Explain Overloaded function templates, with suitable example program.

Or

18. What is a class template ? Explain the syntax of a class template with suitable program.

19. What are the different types of error that might pop-up while processing file ?

Or

20. Write down the notes on Object Oriented system development.

(5 × 12 = 60 marks)

G 1614

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering

ADVANCED MICROPROCESSORS AND PERIPHERALS (R)

(Old Scheme – Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. Explain different keyboard modes of 8279.
2. Explain the bidirectional data transfer mode of 8251.
3. Give the control word for 8255 to set up ports A and B as output ports and port C as input in mode 1.
4. Explain the register banks and show how to switch it during a program in a microcontroller.
5. Explain stack memory addressing modes of 8086.
6. What do you mean by segmentation and segmentation registers? Give rules for segmentation.
7. Explain the flag register of 8086.
8. Describe how the real mode operation of an 80286 is different from protected modes operation.
9. Explain the concept of paging with reference to 80386.
10. What do you mean by MMX?

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each full question carries 12 marks.

11. Design a multiplexed display scheme to display seconds, minutes and hours counter using 8255 ports.

Or

12. Draw the internal architecture of 8252 and explain its operating modes along with the control word formats.

Turn over

13. Design the hardware and software for interfacing ADC to 8085 so that the data may be transferred between the two using interrupts.

Or

14. Draw a circuit diagram which interfaces 3-bit-seven segment display with 8085 microprocessor.
15. Explain the various addressing modes of 8086 with the help of examples.

Or

16. (a) Explain different machine language instruction formats in 8086.
(b) Describe the maximum mode configuration and timing diagram of 8086 system.
17. Write an assembly language 8086 program to move a block of 100 numbers from one memory location to another location in the same data segment.

Or

18. (a) What do you mean by a descriptor? Discuss the structure of a 80286 descriptor.
(b) Describe the real mode and protected mode of operation of 80286.
19. Explain the procedure for converting a linear address into a physical address in 80386 when programmed in protected mode.

Or

20. (a) Explain the non-pipelined read cycle system timing for Pentium processor with neat circuit diagram and timing diagram.
(b) Show how the Pentium physical memory is organized.

(5 × 12 = 60 marks)

G 1606

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering

DATA STRUCTURES AND PROGRAMMING METHODOLOGIES (R)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. What is recursive algorithm ? Give *one* example.
2. What do you mean by complexity of an algorithm ? Give various notations used and define each.
3. What is non-linear data structure ? Give various non-linear data structures with example.
4. What is linear data structure ? Give example which data structure belong to non-linear data structure.
5. What is stack ? Explain PUSH and POP operations ?
6. What are the merits and limitations of linked lists over arrays ?
7. Explain the internal memory representations of graphs.
8. Show that a tree with n vertices has $(n - 1)$ edges.
9. Sort the test 'ANSWER' in alphabetical order using bubble sort.
10. What is a heap ? Explain the properties of heap.

(10 × 4 = 40 marks)

Part B

Answer any one full questions.

Each full question carries 12 marks.

11. (a) Define space and time complexity of a program. Discuss various components of time complexity.
(9 marks)
- (b) Find the Big-O notation for the following $\log n + \sqrt{n}$, $n + n \log n$, $8n + 3n^4 + 5n^5$.

Or

Turn over

12. Give the general plan for analysing the recursive algorithms. Mathematically analyse the factorial problem, clearly indicating the steps and comment on its complexity.
13. (a) Write a note on queues ? Write all operations performed with suitable algorithm for both stack and queue.

(8 marks)

- (b) Describe priority queues and their applications.

(4 marks)

Or

14. What is a circular queue ? Write functions to perform the following operations insertion, deletion display.

15. Write algorithms for performing the following :—

- (i) to find the sum of all the elements in a singly linked list.

(6 marks)

- (ii) to append a new element to the end of the linked list.

(6 marks)

Or

16. (a) Write a function to concatenate two singly linked list and them to sort the resultant list.

(6 marks)

- (b) Write a algorithm to delete an element after a given node in a linked list.

(6 marks)

17. (a) Explain the different methods of binary tree representation.

(6 marks)

- (b) Discuss any *three* methods of representing graph.

(6 marks)

Or

18. Give DFS and BFS algorithm. Clearly bring out the differences and comment on the complexity.

19. Write a procedure to sort a list of N elements of integer using quick sort. Discuss time complexity of quick sort mechanism for sorting N numbers. Also illustrate the quick sort for the following data :—

61, 16, 15, 51, 33, 22, 10, 75.

Or

20. Write an algorithm to sort an array of integers using the heap sort method. Given 28, 82, 30, 11, 65, 78, 87, 99 are the elements on the array. Show the different stages of sorting.

[5 × 12 = 60 marks]

G 1596

(Pages : 3)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering

INTEGRATED CIRCUITS (R)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. What is a Schottky junction ? What are the advantages of Schottky TTL ?
2. Define : (i) noise margin ; (ii) fan-in ; (iii) fan-out ; and (iv) sinking current.
3. Why refreshing is required in dynamic RAMs ? Is it required in static RAM ? Why ?
4. What are the applications of FPGA ?
5. What are the advantages and limitations of weighted resistor DAC compared to ladder type ?
6. What are the sources of analog error in an ADC ?
7. List any *four* op-amp parameters and give their practical values.
8. The common mode input to a certain differential amplifier, having differential gain of 100 is $4 \sin(200\pi t)$ Volt. Calculate the common mode output if CMRR is 60 db.
9. Draw the circuit of a practical integrator using op-amp ? What are the functions of the two resistors in the circuit ?
10. Explain the circuit of an op-amp comparator with sine wave input ?

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each full question carries 12 marks.

11. (a) Explain the working of TTL NAND gate with tristate logic. (7 marks)
- (b) Compare the logic families ECL, IIL, CMOS, NMOS, and PMOS. (5 marks)

Or

12. Explain the circuit diagram and working of CMOS : (i) Inverter ; and (ii) two-input NAND gate.

Turn over

13. Explain the principle of operation of a multiplexer with the help of its function table. Implement the function $f = \sum m(4, 5, 7, 8, 10, 12, 15)$ using multiplexer.

Or

14. Explain the principle of PLA. A combinational circuit is defined by the function :

$$F_1 = \sum m(1, 5, 7), F_2 = \sum m(5, 6, 7).$$

15. With neat diagram, explain the working of a successive approximation type ADC. Illustrate its working with an example.

Or

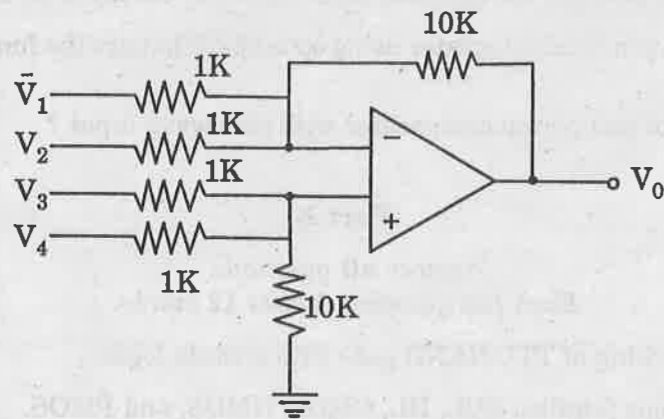
16. Draw and design a weighted resistor 4 bit DAC. Explain its working and derive the equations used.

17. Define and explain slew rate. What is its cause? Derive equation to measure the same and describe a procedure, with necessary circuit diagram to measure slew rate.

Or

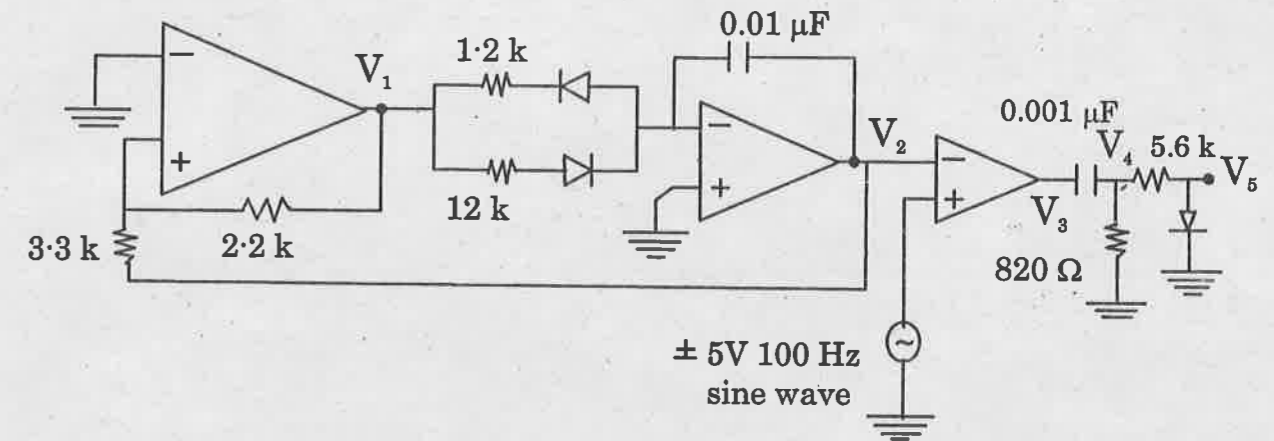
18. Draw the circuit of a non-inverting operational amplifier. Derive expressions for its A_v , R_i and R_o . Identify its type of feedback and derive the feedback factor.

19. Find the expression for the output voltage of the following :-



Or

20. Plot the waveforms at V_1 , V_2 , V_3 , V_4 , and V_5 . Calculate their amplitude and time intervals.



(5 × 12 = 60 marks)

G 1586

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Fourth Semester

Branch : Computer Science and Engineering

OBJECT ORIENTED PROGRAMMING (R)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours

Maximum : 100 Marks

Write neat and efficient programs wherever needed.

Part A

Answer all questions.

Each question carries 4 marks.

1. Explain the differences between function declaration and function definition.
2. Define and briefly explain the terms : data hiding, data encapsulation and data obstruction.
3. What are the differences between direct and indirect base classes ? Explain with examples.
4. What are the differences between public, private and protected derivation ? Give examples.
5. How virtual functions can be inline substituted ? Does it affect the execution of program containing it ?
6. What are virtual base classes ? How they are different from virtual functions ?
7. What is a destructor function ? What is its use ?
8. What is class template ? Why do you need it ?
9. Explain the use of constructors in JAVA.
10. Discuss the interfaces in JAVA.

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each full question carries 12 marks.

11. Write an OOP to determine whether a string is palindrome or not. If not, print the string in the reverse order.

Or

12. Write an OOP to read a matrix and calculate and display its transpose.

Turn over

13. (a) With an example, explain how will you use multiple inheritance. (6 marks)
(b) Explain the differences between hierarchical and hybrid inheritance. Give examples. (6 marks)

Or

14. Write a program which designs two classes and then calculates the product of first class private data with second class private data. For solving the above problem, use the concept of friend function.
15. Using function overloading concept, write a program to calculate the product of two integer numbers and also calculate the product of two complex numbers.

Or

16. Write a program in C++ which reads the numbers a and b then performs the following operations :—
(a) $a + b$. (ii) $a - b$.
(c) $a * b$. (iv) a / b .

Design the function $(a + b)$ and $(a - b)$ in the base class and design function $(a * b)$ and (a / b) in a derived class.

17. Write a program to declare and define a function template to find the minimum of two data items of type int, float, char and double.

Or

18. Write a program which generates a template class, by which we can perform integer type data addition and float type data addition.
19. Explain the input and output streams in Java. Give examples.

Or

20. (a) What is an Applet ? Explain Applet skeleton. (6 marks)
(b) What is method overriding in Java ? How it is different from method overloading ? Explain with example. (6 marks)

[5 × 12 = 60 marks]