SY

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Semester Winter Examination – Nov - 2019

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

		Marks
Q.1.	a) Draw and explain the architecture of 8088 microprocessor.	(6)
	b) Explain in details of maximum mode operation of 8086 family.	(6)
Q.2.	a) Compare Procedure & Macro.	(4)
	b) Write an assembly program to add two numbers Program.	(4)
	c) Write an assembly program to multiply a number by 8 Program.	(4)
Q.3.	a) Draw and discuss the interrupt structure of 8086	(6)
	b) Compare memory mapped I/O and I/O mapped I/O.	(3)
	c) Distinguish between SRAM and DRAM.	(3)
Q.4.	a) Explain the concept of serial communication.	(6)
	b) List out data type supported by 8087.	(3)
	c) What are the addressing modes available in 8086?	(3)
Q.5.	a) Give detailed explanation for Intel 8051 microcontroller architecture with neat diagram.	(6)
	b) Explain the addressing modes of 8051?	(6)
Q.6.	a) Differentiate features of microprocessor and microcontroller.	(4)
	b) Write down the Overview / features of PIC18 MCU.	(4)
	c) What are the PIC18 Addressing Modes?	(4)

_____Paper End_____

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Semester Winter Examination:-Nov.- 2019

Branch: Information Technology
Subject:- Discrete Structures and Applications(BTITC403)
Date:- 30/11/2019

Sem.:- IV
Marks: 60
Time:- 3 Hr.

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Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately
   assume it and should mention it clearly

			(Marks)
Q.1.	**(a).**	Obtain the DNF of following by using truth table method. i) $(p \to q) \wedge (\sim p \wedge q)$ ii)$(p \to (q \to r)) \wedge (\sim p \to (\sim p \wedge \sim r))$	**(8)**
	(b).	Prove by indirect method. For all integers m and n, if m and n are odd integers, then m + n is an even integer.	**(4)**
Q.2.	**(a).**	Explain: i) Power set ii)The addition principal for disjoint set iii) Properties of set difference iv) Cardinality of set	**(2x4)**
	(b).	State pigeonhole principal with suitable example.	**(4)**
Q.3.	**(a).**	What is transitive closer of a relation? Find R* and draw its diagraph using Warshall algorithm, if A={a,b,c,d} and R={(a,b),(b,d),(a,c),(c,b)} Draw its diagraph.	**(8)**
	(b).	51 numbers are chosen from the integers between 1 and 100 inclusively. Prove that 2 of the chosen integers are consecutive.	**(4)**
Q.4.	**(a).**	Explain: i) Transitive relation ii)Surjection & Bijection iii) Inverse and injective iv) Equivalence relation	**(2x4)**
	(b).	State and explain rule of inference	**(4)**
Q.5.	**(a).**	Explain Handshaking lemma principal? A connected planar graph has nine vertices having degrees 2, 2, 2, 3, 3, 3, 4, 4, 4 & 5.how many edges are there? How many faces are there?	**(8)**
	(b).	For each binary operation * defined below, determine whether * is commutative or associative. (i) On Z, define a * b = a − b (ii) On Q, define a * b = ab + 1	**(2x2)**
Q.6.	**(a).**	Explain i) Complete graph ii)Regular graph iii)Bipartite graph iv) Degree and adjacency of vertex.	**(2x4)**
	(b).	Explain lattice and its operator with the help of example.	**(4)**

_____Paper End_____

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD - 402 103
Semester Winter Examination – December, 2019

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc. wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Q.1. A) Explain layers in the TCP/IP protocol suite.   06
     B) What is Gigabit Ethernet? Show its implementations.   06

Q.2. A) Distinguish between direct and limited broadcast special addresses
     with example networks.   06
     B) Explain the fields in IEEE 802.11 MAC frame.   06

Q.3. A) Explain the fields which are related to fragmentation and reassembly
     of an IP datagram.   06
     B) Illustrate with figure, four different cases which use the services of
     ARP (Address Resolution Protocol).   06

Q.4. A) How the *traceroute* program can be used to trace route of a packet
     from the source to the destination?   06
     B) Write and explain distance vector routing algorithm.   06

Q.5. A) Explain checksum calculation in UDP (User Datagram Protocol).   06
     B) Draw simplified UDP package diagram, showing its components and
     their interactions. Write Input Module.   06

Q.6. A) Explain three way handshaking in TCP (Transmission Control
     Protocol) connection establishment.   06
     B) What are the most common fields in TCP's Transmission Control   06
     Blocks (TCBs)?

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

End Semester Examination – Winter 2019

Course: B. Tech in
Sem: III

Subject Name: Engineering Mathematics-III (BTBSC301)
Marks: 60

Date: 10/12/2019
Duration: 3 Hr.

Instructions to the Students:
1. *Solve ANY FIVE questions out of the following.*
2. *The level question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Attempt the following.**		12
A)	Find $L\left\{cosht \int_0^t e^u \, coshu \, du\right\}$	Analysis	4
B)	If $f(t) = \begin{cases} t, & 0 < t < \pi \\ \pi - t, & \pi < t < 2\pi \end{cases}$ is a periodic function with period 2π. Find $L\{f(t)\}$.	Analysis	4
C)	Using Laplace transform evaluate $\int_0^\infty e^{-at} \frac{sin^2 t}{t} \, dt$.	Evaluation	4
Q. 2	**Attempt any three of the following.**		12
A)	Using convolution theorem find $L^{-1}\left\{\frac{1}{(s+1)(s+2)}\right\}$	Application	4
B)	Find $L^{-1}\{\bar{f}(s)\}$, where $\bar{f}(s) = \log\left(\frac{s^2+1}{s(s+1)}\right)$	Analysis	4
C)	Using Laplace transform solve $y'' + 2y' + 5y = e^{-t} \sin t$; $y(0) = 0$, $y'(0) = 1$	Application	4
D)	Find $L^{-1}\left\{\frac{s^2+2s-4}{(s-5)(s^2+9)}\right\}$	Analysis	4
Q. 3	**Attempt any three of the following.**		12

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Q.			Type	Marks
A)	Express the function $f(x) = \begin{cases} \sin x, & 0 \leq x \leq \pi \\ 0, & x > \pi \end{cases}$ as a Fourier sine integral and hence evaluate that $\int_0^\infty \frac{\sin \lambda x \sin \lambda \pi}{1 - \lambda^2} \, d\lambda$.		Evaluation	4
B)	Using Parseval's identity for cosine transform, evaluate $\int_0^\infty \frac{dx}{(x^2 + a^2)(x^2 + b^2)}$.		Application	4
C)	Find the Fourier sine transform of $f(x) = \begin{cases} x, & 0 \leq x \leq 1 \\ 2 - x, & 1 \leq x \leq 2. \\ 0, & x > 2 \end{cases}$		Analysis	4
D)	If $F_s\{f(x)\} = \frac{e^{-as}}{s}$, then find $f(x)$. Hence obtain the inverse Fourier sine transform of $\frac{1}{s}$.		Analysis	4
Q. 4	**Attempt any three of the following:**			**12**
A)	Form the partial differential equation by eliminating arbitrary function f from $f(x^2 + y^2 + z^2, 3x + 5y + 7z) = 0$		Synthesis	4
B)	Solve $pz - qz = z^2 + (x + y)^2$		Application	4
C)	Determine the solution of one dimensional heat equation $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$ where the boundary conditions are $u(0, t) = 0$, $u(l, t) = 0$ $(t > 0)$ and the initial condition $u(x, 0) = x$; l being the length of the bar.		Analysis	4
D	Use the method of separation of variables to solve the equation $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$, given that $u(x, 0) = 6e^{-3x}$		Application	4
Q. 5	**Attempt the following.**			**12**
A)	Determine the analytic function $f(z)$ in terms of z whose real part is $\frac{\sin 2x}{\cosh 2y - \cos 2x}$		Analysis	4
B)	Prove that $u = x^2 - y^2 - 2xy - 2x + 3y$ is harmonic. Find a function v such that $f(z) = u + iv$ is analytic.		Analysis	4
C)	Find the bilinear transformation which maps the points $z = 0, -1, -i$ onto the points $w = i, 0, \infty$. Also, find the image of the unit circle $|z| = 1$.		Analysis	4
Q. 6	**Attempt the following.**			**12**
A)	Use Cauchy's integral formula to evaluate $\oint_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)} \, dz$, where C is the circle $|z| = 3$.		Evaluation	4
B)	Find the poles of function $\frac{z^2 - 2z}{(z+1)^2(z^2+4)}$. Also find the residue at each pole.		Analysis	4
C)	Evaluate $\oint_C \frac{e^z}{\cos \pi z} \, dz$, where C is the unit circle $|z| = 1$.		Evaluation	4

*** Paper End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Winter Semester Examination – Dec - 2019

Branch: Information Technology   Sem:- III

Subject: - Switching Theory and Logic Design (BTITC302)   Marks: 60

Date:- 12 / 12 /2019   Time:- 3 Hr.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. Attempt all questions.
    (a) Convert the following   (6)
        (i) $(3000.45)_{10} = (?)_8$ (ii) $(1076)_8 = (?)_{16}$ (iii) $(85.63)_{10} = (?)_2$
    (b) If the Hamming code receiver receives a sequence 1110110 is (6) determine whether it contains error or not, if there is any error correct it and determine the message bits transmitted.

Q.2. Attempt all questions.
    (a) Simplify using K-Map $f(a,b,c,d) = \Sigma m (0,1,3,5,9,12) + \Sigma d (2,4,6,7)$ (6)
    (b) Using QM method simplify $f(W,X,Y,Z) = \Sigma m (0,3,5,6,7,10,12,13)$ (6) $+ \Sigma d(2,9,15)$

Q.3. Attempt all questions.
    (a) With suitable diagram explain the working of TTL-NAND gate. (6) Also explain the use of multi-emitter transistor.
    (b) Draw the circuit diagram for CMOS-NOR gate and explain its (6) working using Truth-Table.

Q.4. Attempt all questions.
    (a)   Implement a Full Adder using 4:1 Mux. Discuss its working   (6)
    (b)   Design BCD to Excess-3 code converter.   (6)

Q.5. Attempt all questions.
    (a)   Compare Moore and Mealy State Machines   (6)
    (b)   Describe in brief working of J-K Flip-Flop. Draw the suitable   (6)
            diagram for explanation.

Q.6. Attempt all questions.
    (a)   Design a combinational circuit using a ROM. The circuit accepts a   (6)
            3-bit number and generates an output binary number equal to the
            square of the input number.

    (b)   Implement the following two Boolean functions with a PLA: (6)
            $F_1(A, B, C) = \sum(0, 1, 2, 4)$
            $F_2(A, B, C) = \sum(0, 5, 6, 7)$

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD - 402 103
Winter Semester Examination – December, 2019

Branch: B. Tech in Information Technology   Sem.:- III
Subject with Subject Code: - Object Oriented Paradigm with C++ (BTITC303)   Marks: 60
Date:-14/12/2019   Time:- 3 Hrs.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc. wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Q.1. A)   i. Briefly explain the steps involved in object oriented design.   06
         ii. Explain the need of flowchart? Which are the basic symbols used for drawing a flowchart? Illustrate your answer with an example.

    B)   i. What do you mean by dynamic initialization of a variable?   06
         Give suitable example.
         ii. Write a program to read an array of size n demonstrating the use of new and delete operators for dynamic allocation and deallocation of memory.

Q.2. A)   Illustrate how friend function can be invoked in main ().   06
         Explain the mechanism by which it can access the class members in which it has been declared with suitable example.

    B)   i. What is constructor?   06
         Explain the concept of parameterized constructor with suitable example.
         ii. Describe the importance of destructor.
         Explain its use with the help of an example.

Q.3. A)   A book shop maintains the inventory of books that are being sold at the   06
shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays it is available or not. If it is not, an appropriate message is displayed. If it is, then the system displays the book details and requests for the number of copies required. If the requested copies are available, the total cost of the requested copies is displayed; otherwise the message "required copies not in stock" is displayed. Design a system using a class called Books with suitable member functions and constructors.

    B)   i. What is object oriented programming? How it is different from   06
procedure oriented programming?
         ii. Explain the necessity of class diagram and its components in object oriented programming with suitable example.

Q.4. A)   The class master derives information from both account and admin   06

classes which in turn derive information from the class person. Define all the four classes and write a program to create, update and display the information contained in master objects using concept of virtual base class.
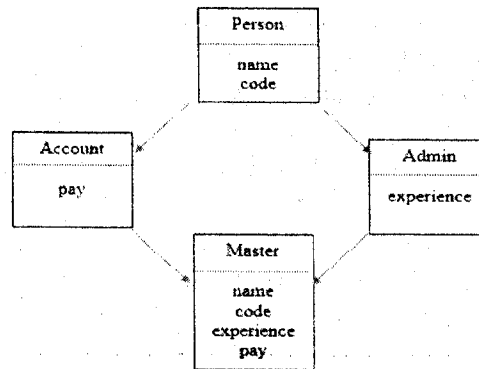
B) i. The class result inherits properties from test class with data members marks1, marks2 and marks3 and sports class with data member score. A test class in turn inherits the properties of student class with data member rollno. Write a program to create an object in main class and invoke all necessary methods, implementing the concept of hybrid inheritance.   06

ii. We know that a private member of a base class is not inheritable. Is there any way possible for the objects of the derived class to access the private members of base class? If yes, how?

Q.5. A) How are operators overloaded? Define a class to represent a complex number having real part and imaginary part as data members. Write a program to add two complex numbers using operator overloading (Overload '+' operator).   06

B) Two files named 'Source1' and 'Source2' contain sorted list of integers. Write a program that reads the contents of both the files and stores the merged list in sorted form in a new file named 'Target'.   06

Q.6. A) i. How is polymorphism achieved at   06
        (a) compile time
        (b) run time
    ii. What is an exception? Can we throw class types as exceptions? Explain with the help of example.

B) i. Explain try-catch block with suitable example.   06
    When do we use multiple catch handlers?
    ii. Explain the following statements:
        (a) throw   (b) throw()

-------------------------------------Paper End-------------------------------------

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – Dec - 2019

Branch: B.Tech. (Computer Engineering)	Sem: III
Subject with Subject Code: Computer Architecture & Organization[BTCOC304]	Marks:60
Date:- 17-12-2019	Time: 3 Hrs

Instructions to the Students:
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Q.1	Solve any following questions.	
(A)	What, in general terms, is the distinction between computer organization and computer architecture?	06
(B)	Explain the computer: the top level structure with structural component with neat sketch diagram.	06
Q. 2	Attempt the following questions.	
(A)	Enlist and explain any two addressing modes. Given the following memory values and a one-address machine with an accumulator, what values do the following instructions load into the accumulator? • Word 20 contains 40. • Word 30 contains 50. • Word 40 contains 60 • Word 50 contains 70. a. LOAD IMMEDIATE 20 b. LOAD DIRECT 20 c. LOAD INDIRECT 20 d. LOAD IMMEDIATE 30	06
(B)		
I.	Convert the following instruction into Accumulator based CPU, Register based CPU. Instruction:(A*B)-(R+Z)/T	03
II.	Is RISC better than CISC? Illustrate your answer with example of processor.	03
Q.3	Attempt the following questions.	
(A)	Given x = 1011 and y = 1001 in twos complement notation (i.e., x = -5, y = - 7), draw and compute the product p = x * y with Booth's algorithm flowchart.	06
(B)	Show how the following floating-point additions are performed (where significants are	06

	truncated to 4 decimal digits). Show the results in normalized form. a. $5.566 \times 10^2 \times 7.777 \times 10^3$ b. $3.344 \times 10^1 + 8.877 \times 10^{-2}$ c. $6.21 \times 10^5 \div 8.877 \times 10^1$	
Q.4	Attempt the following questions.	
(A)	What are the differences among direct mapping, associative mapping, and set-associative mapping? A set-associative cache consists of 64 lines, or slots, divided into four-line sets. Main memory contains 4K blocks of 128 words each. Show the format of main memory addresses.	06
(B)	Elaborate the concept of SRAM and DRAM memory with typical memory cell structure.	06
Q.5	Attempt the following questions.	
(A)	What is the overall function of a processor's control unit? A stack is implemented.show the sequence of micro-operations for a. popping b. pushing the stack PUSH 10 PUSH 70 PUSH 8 ADD PUSH 20 SUB MUL	06
(B)	What is the difference between a hardwired implementation and a microprogrammed implementation of a control unit?	06
Q.6	Attempt any two questions.	
(A)	In virtually all systems that include DMA modules, DMA access to main memory is given priority than CPU access to main memory. Why?	06
(B)	What is the meaning of each of the four states in the MESI protocol? Can you foresee any problem with the write-once cache approach on bus-based multiprocessors? If so, suggest a solution.	06
(c)	How does instruction pipelining enhance system performance? Elaborate your answer using RISC instruction stages.	06

**************************End of Paper**********************

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE - RAIGAD -402 103
Winter Semester Examination - Dec.- 2019

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Branch: Information Technology   Sem.:- V
Subject with Subject Code: - Programming in Java (BTITE305B)   Marks: 60
Date: -19/12/2019   Time: - 3 Hr.

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Instructions to the Students

     1. Each question carries 12 marks.
     2. Attempt **any five** questions of the following.
     3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
     4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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                                          (Marks)

Q.1 Solve any two   6*2=12
a) With neat diagram and example explain Java program structure.
b) Explain different data types supported by Java.
c) Design the program in java that uses different methods of Vector class.

Q.2 Solve the following   (12)
a) What is constructor? Tell how it is used to initialize the object.
b) Define Interface. Design the program that uses interface to achieve multiple inheritance.

Q.3 Solve the following   (12)
a) Define package. Develop the program that consist of two packages, one package is used to calculate factorial of given number and other will display Fibonacci Series up to given number.
b) What is applet? How it is differ from application program? Also design small applet.

Q.4 Solve any two   6*2=12
a) With neat sketch explain the life cycle of thread.
b) What is Exception? Design the program that uses try, catch and finally block to handle the exception.
c) Write a program in Java to demonstrate the use of multiple catch.

Q.5 Solve the following   (12)
a) What is the use of Graphics class? Enlist and explain different methods and its use provided in Graphics class.
b) Design an applet to display the front view of bus.

Q.6 Solve the following   (12)
a) Draw and explain hierarchy of writer stream classes.
b) Design the Java program to display the content of input file in terminal using byte stream classes.