

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

II B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018Subject: Object Oriented Programming through Java

Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. List the advantages of OOP.
2. Can parent class reference used as sub class object? Justify.
3. What is ArrayIndexOutOfBoundsException?
4. Differentiate notify() and notifyAll().
5. What are the advantages of java swings?

PART-B

Answer ALL questions of the following

5x 10 Marks= 50Marks

1. a. Explain about JVM. [3M]
b. Write a Java program to perform matrix multiplication. [7M]
OR
2. a) Differentiate C++ and Java features. [5M]
b) Write note on Java type conversion and type casting
3. a) Write a java program to create a constructor to store name and age of a person? [5M]
b) What is the importance of inheritance? Write a java program that describes inheritance with teacher and physics teacher as base and subclasses.
OR
4. a) What is Dynamic method dispatch? Explain with an example. [6M]
b) Why finalize() method used in java. [4M]
5. a) How to import a package in Java? [5M]
b) Explain nested try blocks in exception handling
OR
6. a) What is an interface? How to declare an interface explain with an example? [5M]
b) What is a File class in java? Explain the methods of File class?
7. a) What is MouseListener and MouseMotionListener interfaces in java? [3M]
b) How to handle mouse events? Explain [7M]
OR
8. a) What is meant by thread priority? Discuss its significance with a sample Java program.
b) Differentiate wait() and sleep() methods in java. [7M+3M]
9. a) Explain how parameters are passed to an applet. [6M]
b) Write a java program to draw rectangle and oval using applets [4M]
OR
10. a) What is the difference between grid layout and grid bag layout? [5M]
b) Write a java program to create login page using Swing components

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Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Solve $T(n)=8T(n/2)+cn^2$, if $n \geq 2$. $T(n)=c$, if $n=1$? Using back-substitution.
2. Define optimal solution
3. Differentiate between fractional knapsack and 0/1 knapsack problem.
4. Discuss about graph coloring problem.
5. Differentiate between NP-Hard and NP-Complete.

PART-B

Answer ALL questions of the following

5x 10 Marks= 50Marks

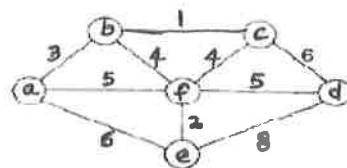
1. a) Explain how time complexity of algorithm is computed using standard method.
b) Explain asymptotic notations with examples.

OR

2. a) Write a recursive algorithm to solve factorial of a given number.
b) Explain connected components with an algorithm.
3. a) Explain the worst case analysis of quick sort with example.
b) Write the recursive algorithm for performing binary search.

OR

4. a) Write Kruskal's algorithm and apply on the following graph to compute a minimum cost spanning tree.



- b) Write greedy algorithm for single source shortest path problem.
5. b) Write an algorithm for all pairs shortest path and also solve the following adjacency matrix, using dynamic programming.

0	∞	∞	18
6	0	∞	∞
10	2	0	∞
∞	4	1	0

OR

6. a) Explain about 0/1 knapsack problem using Dynamic Programming technique
b) Solve the following 0/1 knapsack instance using dynamic programming when $n=5$, $m=6$, $P=\{25,20,15,40,15\}$ and $W=\{3,2,1,4,5\}$.

7. State Sum of Subsets problem. Let $w=\{5,7,10,12,15,18,20\}$ and $m=35$. Find all possible subsets of w that sum to m . Draw the portion of the state space tree that is generated.

OR

8. a) Define back tracking. List the applications of back tracking.
b) Write an algorithm to solve the knapsack problem with branch and bound. Also, give one example
9. a) Explain node cover decision problem with an example.
b) Explain Flow shop scheduling problem with an example.

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10. a) Explain job shop scheduling with example.
b) Explain a Non-deterministic algorithm to search for an element in the given array.

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II B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018Subject: Digital Logic Design

Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Convert the binary code $(11001)_2$ to gray code
2. Define essential prime implicants?
3. What is the truth table of Half-subtractor?
4. Write the differences between latches and flip flops?
5. What is race condition in S-R latch

PART-B

Answer ALL questions of the following

5x 10 Marks= 50Marks

1. a) What is number system? How do you convert the number system?
b) Explain 10's and 9's complement with an example.

(OR)

2. Explain how subtraction is done in signed binary number system consider one example.
3. Simplify the Boolean expression using K-map and implement using NOR gates $F(A,B,C,D) = \sum m(0,2,3,8,10,11,12,14)$

(OR)

4. Convert the following to other canonical form

- a. $f(x,y,z) = \sum (1,3,7)$
- b. $f(A,B,C,D) = \prod (0,2,6,11,13,14)$
- c. $f(x,y,z) = \prod (0,2,6,11,13,14)$
- d. $f(A,B,C,D) = \sum (0,1,2,3,4,6,12)$

5. Explain PLA with an example.

(OR)

6. Explain how you design a combinational circuit. Show combinational circuit and working For a Binary multiplier.
7. a) Draw and explain the operation of D Flip-Flop?
b) Explain about Shift Registers?

(OR)

8. What is the basic difference between asynchronous and synchronous counters?
9. Design Asynchronous sequential logic with an example.

(OR)

10. Explain critical race conditions with an example.

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Answer ALL questions of the following

5x2Mark=10 Marks

1. Obtain the Taylor series expansion of e^x about $x = -1$
2. Evaluate $\int_0^1 \int_0^y xye^{-x^2} dx dy$
3. Find a unit normal to the surface $xy^3z^2 = 4$ at the point $(-1, -1, 2)$
4. Evaluate $\int_0^1 [ti + (t^2 - 2t)j + (3t^2 + 3t^3)k] dt$
5. Write the auxiliary equations of Charpit's Method

PART-B

Answer ALL questions of the following

5x 10 Marks= 50Marks

1. a) Determine the functions $u = xy + yz + zx$, $v = x^2 + y^2 + z^2$ and $w = x + y + z$ are functionally dependent or not? If so find the relation between them.
b) Find the extreme values of the function $f(x, y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$
OR
2. Verify Rolles theorem for $f(x) = x^{2m-1}(a-x)^{2n}$ in $[0, a]$ where $a > 0$.
3. a) Evaluate $\int_0^1 \int_0^{1-x} \int_0^{1-x-y} dz dy dx$
b) Using spherical polar co-ordinates find the volume of the sphere $x^2 + y^2 + z^2 = a^2$
OR
4. Change the order of integration and evaluate $\int_0^b \int_0^{\frac{a}{b}\sqrt{b^2-y^2}} xy dx dy$
5. a) Find the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point $P(1, 2, 3)$ in the direction of the line PQ where Q is the point $(5, 0, 4)$. Also calculate the magnitude of the maximum directional derivative.
b) Find the constant a so that the vector field is solenoidal. $\vec{f} = (x+3y)\vec{i} + (y-2z)\vec{j} + (x-az)\vec{k}$
OR
6. Show that the vector field $A = (x^2 + xy^2)\vec{i} + (y^2 + yx^2)\vec{j}$ is irrotational, and find scalar potential Function

7. Prove that $\vec{f} = (4xy - 3x^2z^2)\vec{i} + 2x^2\vec{j} - 2x^3z\vec{k}$ is a) conservative field b) find the scalar potential of \vec{f} c) find the work done in moving an object in this field from (0,0,0) to (1, 1, 1)

OR

8. Verify Greens theorem in the xy -plane for $\int_c e^x(\sin y dx + \cos y dy)$ where c is rectangle with vertices (0, 0), (1, 0), (1, $\pi/2$), (0, $\pi/2$)

9. (a) Form a partial differential equation by eliminating the arbitrary constants a, b from

$$(x-a)^2 + (y-b)^2 = r^2$$

$$(b) \text{ Solve } z^2(p^2 + q^2 + 1) = 1$$

OR

10. (a) Form the partial differential equations by eliminating the arbitrary function

$$z = f(\sin x + \cos y).$$

$$(b) \text{ Solve the partial differential equation } zpq = p+q$$

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II B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018Subject: Computer OrganizationBranch: **Common to CSE & IT****Time: 3 hours****Max. Marks: 60****PART – A****Answer ALL questions of the following****5x2Mark=10 Marks**

1. Explain selective set and selective complement operation.
2. Describe Instruction code with an example?
3. Differentiate the main memory and cache memory?
4. Discuss about peripheral devices.
5. Explain SISD.

PART-B**Answer ALL questions of the following****5x 10 Marks= 50Marks**

1. Design a 4 bit arithmetic circuit.

OR

2. a) Define bus, Explain about the bus structure with a block diagram?
b) Define a microoperation? Explain any four arithmetic microoperations with an example for each?
3. Explain the different types of addressing modes.

OR

4. What do you mean by Stack Frame? Explain how a stack frame is created & destroy during subroutine call with an example program
5. Explain micro programmed control unit. What are the advantages and Disadvantages of it?

OR

6. a) How address sequencing is achieved when the instructions are executing, explain with a diagram?
b) Explain about main memory, show how their hardware chips designed?
7. a) Explain addition and subtraction algorithms, show its hardware diagram?
b) Explain how I/O interface can be done?

OR

8. a) Explain about BCD adder with diagram.
b) What are the modes of data transfer, explain any one in detail?
9. Explain about arithmetic pipeline with an example.

OR

10. a) Explain the process of instruction pipeline?
b) Write short notes on Attached array processor with their diagrams?

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II B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018Subject: Mathematical Foundation for Computer Science

Branch: Common to CSE & IT

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Write the converse of the statement “If I work hard then I get the grade A”.
2. Define an equivalence relation.
3. If $f(x) = \frac{x-4}{x-7}$ then find f^{-1}
4. Explain the principle of inclusion & exclusion.
5. Find the generating function of the sequence $\{1, 3, 3^2, 3^3, \dots\}$.

PART-B

Answer ALL questions of the following

5x 10 Marks= 50Marks

1. a) Prove that $(\exists x) (P(x) \wedge Q(x)) \Rightarrow (\exists x) P(x) \wedge (\exists x) Q(x)$. [5M+5M]
b) Prove $P \rightarrow (Q \rightarrow R) \Leftrightarrow (P \wedge Q) \rightarrow R$.

OR

2. (a) Construct the truth table of $\neg(P \vee (Q \wedge R)) \leftrightarrow (P \vee Q) \wedge (P \vee R)$. (5M)
(b) Obtain the PCNF of the formula $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$.
3. (a) Prove that the following premises are inconsistent: (5M+5M)
 $P \rightarrow Q, Q \rightarrow R, S \rightarrow \neg R, P \wedge S$.
(b) Draw the Hasse diagram for the divisibility relation on the set $A = \{3, 6, 12, 36, 72\}$.

OR

4. a) Verify the validity of the following arguments: (5M+5M)
1. “Every living thing is a plant or an animal”.
2. “Logu’s dog is alive and it is not a plant”.
3. “All animals have heart”.
Therefore “Logu’s dog has a heart.”
b) Let (L, \leq) be a lattice and $a, b, c \in L$. Then prove that $a \vee b = b$ iff $a \leq b$

5. a) Let \mathbb{R} be the set of real numbers and $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = x^2$. Is f is invertible? Justify it. [5M+5M]

- b) Let $A = \{1, 2, 3, 4\}$, $B = \{a, b, c\}$ and $C = \{w, x, y, z\}$ with $f: A \rightarrow B$ and $g: B \rightarrow C$ given by $f = \{(1,a), (2,a), (3,b), (4,c)\}$ and $g = \{(a,x), (b,y), (c,z)\}$. Find gof .

OR

6. a) Show that a function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = 2x + 3$ is a bijection. (5M)
b) Prove that a group G is abelian if and only if $(a * b)^2 = a^2 * b^2$. (5M)

7. (a) Among 200 people, how many of them were born on the same month. (5M+5M)
(b) Suppose that 200 faculty members can speak English and 50 can speak Hindi, while only 20 can speak both. How many faculty members can speak either English or Hindi?

OR

8. a) What are the applications of Binomial and Multinomial coefficients? (5M+5M)
b) In how many ways can you select at least one king, if you choose five cards from a Deck of 52 cards?
9. (a) Solve $a_n = a_{n-1} + 2$, for $n \geq 1$, given that $a_0 = 3$ by substitution method. (5M+5M)
(b) Find the closed form expression for the generating function of Fibonacci numbers.

OR

10. a) If the person invests Rs.10, 000 at 10% annual interest compounded quarterly, in how Many months the money will become 15000. (5M+5M)
b) Find a recursive relation for the following:
- The number of strings of length n over the lower-case Roman alphabet $\{a,b,c,\dots,z\}$ containing two consecutive vowels.
 - The number of strings of length n over the lower-case Roman alphabet $\{a,b,c,\dots,z\}$ not containing two consecutive consonants.