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Total No. of Pages : 2

T.Y.B. Tech. (Computer Science and Engineering) (CBCS) (Part-III)

(Semester - V) Examination, January - 2023

SYSTEM PROGRAMMING

Sub. Code : 80795

Day and Date : Tuesday, 17 - 01- 2023

Total Marks : 70

Time : 10.30 a.m. to 01.00 p.m.

Instructions :

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary.

Q1) Solve MCQs. (2 Marks Each)

- Which of the following grammar is not an operator grammar
 - $A \rightarrow AcDe$
 - $A \rightarrow CaDcf$
 - $A \rightarrow CACfED$
 - All the above
- MOVEM moves the values from _____ to _____
 - Memory to Register
 - Register to Memory
 - Register to Register
 - Memory to Memory
- In Variant-II of the intermediate code _____ are not processed
 - Register
 - Mnemonics
 - Symbols
 - Literals
- In Syntax of Assembly Language statement, <Operand Specification> can be written as
 - <Symbolic Name>
 - <Operand Name>
 - <Symbolic Name> [+<Displacement>]
 - <Symbolic Name> [+<Displacement>] [Index Register]
- Display is used to
 - De-allocate activation record
 - Access local variables
 - To improve the efficiency of local access
 - To improve the efficiency of non-local access

P.T.O.

- f) _____ is used to optimize the compiler
- i) Triple
 - ii) Postfix Notation
 - iii) Indirect Triples
 - iv) Quadruples
- g) _____ Parameter Passing Mechanism do not experience side effect
- i) Call by value
 - ii) Call by value-Result
 - iii) Call by Reference
 - iv) Call by Name

Q2) Solve any 2 of the following. (7 Marks Each)

- a) Explain Fundamentals of Language Specification
- b) Explain pass structure of assembler
- c) Explain Advanced Macro Facilities with example

Q3) Solve any 2 of the following. (7 Marks Each)

- a) Explain phases of language processor
- b) Compare Variant-I and Variant-II of intermediate code form
- c) Explain data structures of macro pre-processor.

Q4) Solve any 2 of the following. (7 Marks Each)

- a) Explain static and dynamic pointer with example
- b) Write an Algorithm of Program Relocation.
- c) Explain Software Tools for Program Development

Q5) Solve any 2 of the following. (7 Marks Each)

- a) What are Operand descriptors and Register descriptors explain with an example
- b) What is linking for overlays? Explain with an example
- c) Explain structure of user interface



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T.Y. B.Tech. (E & TC) (Part - III) (Semester - V) (CBCS)
Examination, January - 2023
SIGNALS AND SYSTEM
Sub. Code : 80807

Day and Date : Friday, 13 - 01 - 2023

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :
- 1) All Question are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve the objective type question.

[14]

- a) A system represented by equation $y(t) = tx(t)$ is _____
 - i) Linear system
 - ii) Non-linear system
 - iii) Neither linear nor non-linear system
 - iv) None of these
- b) Which among the following operations is not involved with the linear convolution of discrete time signal?
 - i) Folding Operation
 - ii) Shifting Operation
 - iii) Multiplication Operation
 - iv) Integration Operation
- c) The distributive property of convolution is _____
 - i) $x(t)*h(t)=h(t)*x(t)$
 - ii) $x(t)*[h_1(t)*h_2(t)]=[x(t)*h_1(t)]*h_2(t)$
 - iii) $x(t)*[h_1(t)+h_2(t)]=[x(t)*h_1(t)]+[x(t)*h_2(t)]$
 - iv) None of the above

P.T.O.

d) A signal $x(t)$ can be transformed to $x(at)$ by using which of the below operation?

- i) Time reversal
- ii) Time shifting
- iii) Time scaling
- iv) All of the above

e) The Fourier transform of a unit step function is given as

- i) $F(j\omega) = 1/j\omega$
- ii) $F(j\omega) = j\omega$
- iii) $F(j\omega) = j/\omega$
- iv) $F(j\omega) = \omega/j$

f) What is DTFT of sequence give $x(n) = a^n u(n)$

- i) $\frac{1}{1 - ae^{-j\omega}}$
- ii) $\frac{1}{1 - ae^{j\omega}}$
- iii) $\frac{1}{1 + ae^{j\omega}}$
- iv) $\frac{1}{1 + ae^{-j\omega}}$

g) What is the z-transform of the following finite duration signal?

$$x(n) = \{2, 4, 5, 7, 0, 1\}$$

↑

- i) $2 + 4z + 5z^2 + 7z^3 + z^4$
- ii) $2 + 4z + 5z^2 + 7z^3 + z^5$
- iii) $2 + 4z^{-1} + 5z^{-2} + 7z^{-3} + z^{-5}$
- iv) $2z^2 + 4z + 5 + 7z^{-1} + z^{-3}$

Q2) Solve Any two

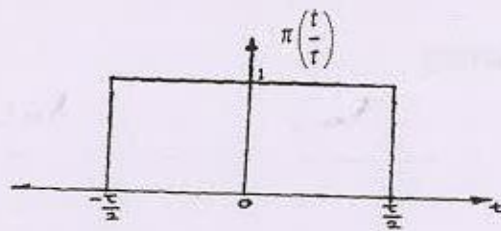
[14]

- a) Explain Classification of Signals.
- b) Find convolution of two sequences.

$$X[n] = \begin{cases} 1 & \text{for } 0 \leq n \leq 4 \\ 0 & \text{Elsewhere} \end{cases}$$

$$Y[n] = \begin{cases} 2^n & \text{for } 0 \leq n \leq 6 \\ 0 & \text{Elsewhere} \end{cases}$$

- c) Find the Fourier Transform of the Gate function.



Q3) Solve any two

[14]

- a) Determine even and odd part of following signals

i) $x[n] = \{-1, -1, -1, 1, 1, 1, 1\}$

ii) $x(t) = -2t \quad t < 0$ &
 $= t \quad t > 0$

- b) Convolve the sequences $x(n) : \{2, 3, 1, 4\}$ and $h(n) = \{-1, 2, 3\}$ using graphical method

- c) Explain properties of Fourier Transform

Q4) Solve any two

[14]

- a) Find DTFT of following

i) $x(n) = a^n u(n)$

ii) $x(n) = 2^n \quad \text{for } -2 \leq n \leq 2$
 $= 0 \quad \text{otherwise}$

- b) Find Z Transform of following

i) $x(n) = \left(\frac{1}{2}\right)^n u(-n)$

- c) Develop direct form I and II realization of difference equation.

i) $y(n) = b_0 x(n) + b_1 x(n-1) + b_2 x(n-2) + b_3 x(n-3) - a_1 y(n-1) - a_2 y(n-2) - a_3 y(n-3)$

Q5) Solve Any two

a) Find 4 point DFT of following

i) $x(n) = \{-1, 2, 5, 4\}$
 \uparrow

ii) $x(n) = \sin\left(\frac{\pi n}{2}\right)$

b) Find inverse Z transform using Long Division Method

i) $\frac{1}{1+3z^{-1}+2z^{-2}} \text{ ROC } |z| > 2$

c) Find inverse Z transform using Partial Fraction Method

i) $\frac{8z-9}{z^2+5z-6} \text{ ROC } |z| > 3$

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T.Y.B.Tech. (Electronic and Telecommunication Engineering)
(Semester- V) Examination, January - 2023
DIGITAL AND VLSI DESIGN
Sub. Code : 80809

Day and Date : Saturday, 21 - 01 - 2023
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :
- 1) All questions are compulsory.
 - 2) Use suitable assumptions if required.
 - 3) Draw necessary figures on right side of answer sheet.

Q1) All questions are compulsory.

[7×2=14]

- a) The operator '&' is called the_____operator.
 - i) Logical AND operator
 - ii) Bitwise AND operator
 - iii) Arithmetic addition operator
 - iv) Concatenation operator
- b) Which of the following statement can't be used inside a process?
 - i) WAIT
 - ii) IF ELSE
 - iii) Variable declaration
 - iv) PORT MAP
- c) Process is a_____statement.
 - i) Concurrent
 - ii) Sequential
 - iii) Delay
 - iv) Both concurrent and sequential
- d) How many flip flops are necessary to design a state machine with 25 states?
 - i) 2
 - ii) 5
 - iii) 25
 - iv) 32

P.T.O.

- e) Refer to the VHDL code given below, which is the legal assignment statement?

SIGNAL x : SRD_LOGIC;

SIGNAL y : STD_LOGIC_VECTOR (3 DOWNT0 0);

- i) $y \leq (1 \Rightarrow '1', \text{OTHERS} \Rightarrow '0');$
 - ii) $y := "0100";$
 - iii) $y \Rightarrow "0100";$
 - iv) $y \Rightarrow x;$
- f) Which of the following is more volatile?
- i) SRAM
 - ii) DRAM
 - iii) ROM
 - iv) RAM
- g) PLA is used to implement _____
- i) A complex sequential circuit
 - ii) A simple sequential circuit
 - iii) A complex combinational circuit
 - iv) A simple combinational circuit

Q2) Solve any two.

[2×7=14]

- a) Find out by using Quine Mc-Cluskey Minimization technique,
 $F(A, B, C, D) = \sum m(0, 5, 8, 9, 10, 11, 14, 15).$
- b) Write a VHDL program for full Adder?
- c) Explain need of VHDL

Q3) Solve any two.

[2×7=14]

- a) Write a VHDL program for BCD to Excess-3 Code
- b) Write VHDL program for 2:4 Decoder
- c) Short in short 4 bit ALU

[2×7=14]

Q4) Solve any two.

- a) Write a VHDL program for T Latch
- b) Write short note on DRAM/NVRAM
- c) Explain & convert SR to D flip flop

Q5) Solve any two.

[2×7=14]

- a) What is FSM?
- b) Write a VHDL code for Mealy Machine
- c) Explain in detail PLA



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[2×7=14]

Q4) Solve any two

- Explain edge emitting LED.
- Write note on light source linearity.
- Give comparison of various photodetectors.

Q5) Solve any two

[2×7=14]

- Explain 2×2 waveguide coupler.
- Explain in detail transmission formats and speeds in SONET?
- Write note on Tunable filters, tunable sources.

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T.Y.B Tech. (E&TC) (Semester - V) (CBCS)
Examination, January - 2023
PCC-ETC-504 : OPTICAL COMMUNICATION
Sub. Code : 80810

Day and Date : Tuesday, 24 - 01 - 2023

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :
- All questions are compulsory.
 - Figure to the right indicate full marks.
 - Assume suitable data if necessary.

Q1) All questions are compulsory.

[14]

- The light sources used in fiber optics communication are _____
 - LED's and Lasers
 - Phototransistors
 - Xenon lights
 - Incandescent
- What is the numerical aperture of the fiber if the angle of acceptance is 16 degree?
 - 0.50
 - 0.36
 - 0.20
 - 0.27
- A multimode step index fiber has a normalized frequency of 72. Estimate the number of guided modes.
 - 2846
 - 2592
 - 2432
 - 2136
- Skew rays follow a _____
 - Hyperbolic path along the axis
 - Parabolic path along the axis
 - Helical path
 - Path where rays changes angles at core-cladding interface

- e) A decibel may be defined as the ratio of input and output optical power for a particular optical wavelength
- i) True ii) False
- f) The effects of intrinsic absorption can be minimized by _____
- i) Ionization
ii) Radiation
iii) Suitable choice of core and cladding components
iv) Melting
- g) Dominant intrinsic loss mechanism in low absorption window between ultraviolet and infrared absorption tails is _____
- i) Mie scattering ii) Rayleigh scattering
iii) Stimulated Raman scattering iv) Stimulated Brillouin scattering
- h) Mie scattering has inhomogeneities mainly in _____
- i) Forward direction ii) Backward direction
iii) All direction iv) Core-cladding interface
- i) What does ISI stand for in optical fiber communication?
- i) Invisible size interference ii) Infrared size interference
iii) Inter-symbol interference iv) Inter-shape interference
- j) Practical pulse broadening value for graded index fiber lies in the range of _____
- i) 0.9 to 1.2 ns/km ii) 0.2 to 1 ns/km
iii) 0.23 to 5 ns/km iv) 0.45 to 8 ns/km

- k) The modal noise can be reduced by _____
- i) Decreasing width of signal longitudinal mode
ii) increasing coherence time
iii) Decreasing number of longitudinal modes
iv) Using fiber with large numerical aperture
- l) Optical fibers for communication use are mostly fabricated from _____
- i) Plastic ii) silica or multicomponent glass
iii) Ceramics iv) Copper
- m) The recombination in indirect band-gap semiconductors is slow
- i) True ii) False
- n) A particular laser structure is designed so that the active region extends the edges of devices.
- i) True ii) False

Q2) Solve any two

[2×7=14]

- a) Write down the definition of critical and acceptance angle and explain acceptance cone.
- b) With the help of neat diagram explain step index and graded index glass fiber? Give their comparison.
- c) Explain different indoor and outdoor fiber optic cables

Q3) Solve any two

[2×7=14]

- a) Explain in detail bending losses in optical fiber.
- b) Explain polarization mode dispersion.
- c) Explain in detail with block diagram the nonlinear effects in optical fiber.

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T.Y. B.Tech. (E & TC) (Part - II) (Semester - IV) (CBCS)
Examination, January - 2023
PCC-ETC503 : ELECTROMAGNETIC ENGINEERING
Sub. Code : 80808

Day and Date : Thursday, 19 - 01 - 2023
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :**
- 1) All questions are Compulsory.
 - 2) Figure to the right indicates full Marks.
 - 3) Assume Suitable data if necessary.

Q1) Solve the all Questions (Rewrite the statement by correct option) [14]

- a) According to Biot- Savart's law, which parameter is inversely proportional to the differential magnetic field intensity (dH)?
 - i) current
 - ii) magnitude of differential length
 - iii) sine of angle between filament & line connecting differential length to point
 - iv) square of the distance from differential element to point
- b) Electromagnetic waves travelling in a medium having relative permeability $\mu_r = 1.3$ and relative permittivity $\epsilon_r = 2.14$. The speed of electromagnetic waves in medium must be

i) $1.8 \times 10^8 \text{ ms}^{-1}$	ii) $1.8 \times 10^4 \text{ ms}^{-1}$
iii) $1.8 \times 10^6 \text{ ms}^{-1}$	iv) $1.8 \times 10^2 \text{ ms}^{-1}$
- c) The Cartesian system is also called as

i) Circular coordinate system	ii) Rectangular coordinate system
iii) Spherical coordinate system	iv) Space coordinate system

P.T.O.

- 2) Solve any two

- [14]

[14]

Q3) Solve any two

- c) State & prove Divergence theorem

Q4) Solve any two

- iii) Group Velocity

Q5) Solve any two

- ### iii) Reflection Coefficient

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[14]

Q4) Solve any 2 of the following (7 Marks Each)

- a) Explain 5 services of PGP?
- b) Explain SSL Handshake Protocol?
- c) Explain Pharming Attacks?

Q5) Solve any 2 of the following (7 Marks Each)

[14]

- a) Explain antireplay service?
- b) What is SET? Explain SET Participants and Requirements?
- c) Explain DOS and DDOS attack?

0303 0000

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T.Y. B.Tech. (Computer Science and Engineering) (Part - II)
(CBCS) (Semester - V) Examination, January - 2023
INFORMATION SECURITY
Sub. Code : 80798

Day and Date : Friday, 13 - 01 - 2023

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :
- 1) All Questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs (1Mark Each)

[14]

- a) Protection of all user data in single data block is done by which service.
 - i) Repudiation
 - ii) Integrity
 - iii) Connectionless confidentiality
 - iv) Both (i) & (ii)
- b) The Vernam Cipher is also called as _____.
 - i) Polyalphabetic
 - ii) Caesar
 - iii) Hill cipher
 - iv) One time Pad
- c) In pervasive mechanism _____ is referred to data collected and potentially used to facilitate a security audit.
 - i) Security recovery
 - ii) Event detection
 - iii) Security audit trail
 - iv) All the above
- d) MAC stands for _____.
 - i) Message authentication code
 - ii) Message authentication connection
 - iii) Message authentication control
 - iv) Message authentication cipher

P.T.O.

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- e) If any participant can send his or her public key to any other participant or broadcast the key to the community at large then this technique of key distribution is called as ____.
- i) Publicly available directory ii) Public announcement
iii) Public-key authority iv) Public-key certificates
- f) Hash function is a ____.
- i) A function that maps a message of any length into a variable-length hash value, which serves as the authenticator
ii) A function that maps a message of any length into a fixed-length hash value, which serves as the authenticator
iii) Both (i) & (ii)
iv) None of the above
- g) Digital signature provides ____.
- i) Authentication ii) Nonrepudiation
iii) Both (i) & (ii) iv) Neither (i) & (ii)
- h) In Kerberos, AS referred as ____.
- i) Authorization Service ii) Authentication Service
iii) Authentication Server iv) None of the above
- i) Which e-mail standard relies on "Web of Trust"?
- i) Pretty Good Privacy (PGP)
ii) Privacy Enhanced Mail (PEM)
iii) MIME Object Security Services (MOSS)
iv) Secure Multipurpose Internet Mail Extensions (S/MIME)
- j) ____ uniquely identifies the MIME entities uniquely with reference to multiple contexts.
- i) Content description ii) Content - id
iii) Content type iv) Content transfer encoding

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- k) At the lower layer of SSL, a protocol for transferring data using a variety of predefined cipher and authentication combinations called the ____.
- i) SSL handshake protocol
ii) SSL authentication protocol
iii) SSL record protocol
iv) SSL cipher protocol
- l) Which of the following is/are the types of firewall?
- i) Packet Filtering router ii) Application level gateway
iii) Circuit level gateway iv) All of the above
- m) When people send you phone emails, pop-up messages, social media messages, texts, calls, or links to fake websites in order to hook you into giving out your personal and financial information.
- i) Plagiarizing ii) Skimming
iii) Phishing iv) Identity Theft
- n) What is one of the most common and simplest attacks on a system?
- i) Denial of service
ii) Buffer overflow
iii) Session hacking
iv) Password cracking

Q2) Solve any 2 of the following (7 Marks Each)

[14]

- a) Explain different types of attacks with example?
b) Write and explain Diffie-Hellman Key exchange algorithm?
c) Explain Difference between Kerberos 4 and kerberos 5?

Q3) Solve any 2 of the following (7 Marks Each)

[14]

- a) Explain Transposition Techniques with Examples?
b) What is message authentication code? What are basics of MAC?
c) Explain X.509 certification formats?

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T.Y. B.Tech. (Computer Science) (Part - III) (Semester - V)
(CBCS) Examination, January - 2023
OBJECT ORIENTED MODELING AND DESIGN
Sub. Code : 80796

Day and Date : Thursday, 19 - 01 - 2023
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :**
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Solve MCQs (1 marks each)

- a) Object model describes _____ structure of the object in system.
 - i) static
 - ii) dynamic
 - iii) detailed
 - iv) overall
- b) A _____ is a name that uniquely identifies one end of and association.
 - i) Ordering
 - ii) Role name
 - iii) Qualification
 - iv) None of these
- c) Aggregation is the _____ relation.
 - i) Whole
 - ii) Part
 - iii) Part-whole or a-part-of
 - iv) None of these
- d) In data flow diagram, data store is drawn as _____
 - i) Rectangle containing name of data store
 - ii) Cylinder containing name of data store
 - iii) Ellipse containing name of data store
 - iv) A pair of parallel lines containing name of data store
- e) A _____ has initial and final states.
 - i) Continuous loops
 - ii) Scenario
 - iii) Event trace diagram
 - iv) One-shot state diagram
- f) A _____ is a sequence of events that occurs during one particular execution of a system.
 - i) State diagram
 - ii) Information transfer
 - iii) Scenario
 - iv) Sequence diagram

P.T.O.

- g) The classes having ill-defined boundaries or too broad in scope are called as.
- Vague classes
 - Identical
 - Irrelevant
 - None of these
- h) If a class has little or nothing to do with a problem, then they are called as.
- Identical
 - Redundant
 - Associate
 - Irrelevant
- i) A _____ extends the properties of a UML building block, allowing you to create new information in that element's specification.
- Note
 - Tagged Values
 - Constraints
 - Stereotypes
- j) _____ is an interaction diagram that emphasizes the time ordering of messages.
- Activity diagram
 - Interaction diagram
 - Sequence diagram
 - Collaboration diagram
- k) _____ constraint specifies that instance or link is created during execution of the enclosing interaction but is destroyed before completion of execution.
- Destroyed
 - New
 - Transient
 - None of these
- l) A call event represents
- Passage of time
 - The dispatch of an operation
 - A change in state
 - The occurrence of a signal
- m) A set of objects or components that are allocated to a node as a group is called a _____.
- Distribution unit
 - Contribution unit
 - Components unit
 - Collection
- n) A _____ diagram shows a set of components and their relationships.
- Deployment
 - Interaction
 - Activity
 - Component

Q2) Solve any 2 of the following : (7 marks each)

- Explain how generalization can be used as extension and restriction
- Write note on :
 - Events
 - States
- Explain the several phases of the OMT Methodology.

Q3) Solve any 2 of the following : (7 marks each)

- What is class and object? Explain with appropriate example
- Explain the following elements of data flow diagrams:
 - Data Stores
 - Control Flows
 - Nested Data Flow Diagrams
- List and explain the steps involved in designing the algorithms

Q4) Solve any 2 of the following : (7 marks each)

- Explain the architecture of UML.
- Explain the following terms with respect to Activity diagram :
 - Action states
 - Transitions
 - Branching
- What is component? Give difference between components and classes.

Q5) Solve any 2 of the following : (7 marks each)

- Explain four kinds of relationships in the UML
- Explain Activity diagram with example.
- Explain the following terms with respect to architecture modelling:
 - Node
 - Collaboration
 - Pattern



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T.Y.B.Tech.(Computer Science and Engineering) (Part-III)
(Semester - V) (CBCS) Examination, January - 2023
COMPUTER ALGORITHMS

Sub. Code: 80797

Day and Date: Saturday, 21 - 01 - 2023

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Figures to right indicate full marks.
 - 3) Assume suitable data wherever necessary.

Q1) Solve MCQs. (2 Marks Each)

[14]

- a) Consider the problem of computing min-max in an unsorted array where min and max are minimum and maximum elements of array. Algorithm A1 can compute min-max in a_1 comparisons without divide and conquer. Algorithm A2 can compute min-max in a_2 comparisons by scanning the array linearly. What could be the relation between a_1 and a_2 considering the worst case scenarios?
- i) $a_1 < a_2$
 - ii) $a_1 > a_2$
 - iii) $a_1 = a_2$
 - iv) Depends on the input
- b) What is the time complexity of Huffman Coding?
- i) $O(N)$
 - ii) $O(N \log N)$
 - iii) $O(N(\log N)^2)$
 - iv) $O(N^2)$
- c) We use dynamic programming approach when
- i) We need an optimal solution
 - ii) The solution has optimal substructure
 - iii) The given problem can be reduced to the 3-SAT problem
 - iv) It's faster than Greedy

P.T.O.

- d) The inorder and preorder traversal of a binary tree are d b e a f c g and a b d e c f g, respectively. The postorder traversal of the binary tree is:
- d e b f g c a
 - e d b g f c a
 - e d b f g c a
 - d e f g b c a
- e) Let S be an NP-complete problem and Q and R be two other problems not known to be in NP. Q is polynomial time reducible to S and S is polynomial-time reducible to R. Which one of the following statements is true?
- R is NP-complete
 - R is NP-hard
 - Q is NP-complete
 - Q is NP-hard
- f) Which is not a constraints enforced on PRAM model
- EREW
 - ERCW
 - CRCW
 - None
- g) Which of the following algorithms can be used to most efficiently determine the presence of a cycle in a given graph?
- Depth First Search
 - Breadth First Search
 - Prim's Minimum Spanning Tree Algorithm
 - Kruskal's Minimum Spanning Tree Algorithm

[14]

2) Solve any 2 of the following. (7 Marks Each)

- Explain with example Big-oh, Big-omega and Theta, also plot a graph for few functions.
- Compare Prim's and Kruskal's algorithm to find minimum cost spanning tree (MST)
- Generate the sets S^i , $0 \leq i \leq 4$, when $(w_1, w_2, w_3, w_4) = (10, 15, 6, 9)$ and $(p_1, p_2, p_3, p_4) = (2, 5, 8, 1)$.

[14]

3) Solve any 2 of the following (7 Marks Each)

- Solve job sequencing problem with deadlines using greedy approach for following instance $n=7$. $(p_1, p_2, \dots, p_7) = (50, 15, 18, 16, 8, 25, 60)$
 $(d_1, d_2, \dots, d_7) = (1, 3, 4, 3, 2, 1, 2)$
- What is Difference between priori and posteriori analysis
- Explain dynamic programming solution to 0/1 knapsack problem

4) Solve any 2 of the following (7 Marks Each)

[14]

- Explain techniques for binary tree traversal.
- What is backtracking? Explain sum of subset problem and algorithm with suitable example.
- List and explain Variants of PRAM

5) Solve any 2 of the following (7 Marks Each).

[14]

- Discuss Algorithm and conditions of 8 Queens problem
- List and explain NP-Hard graph problems
- Write an algorithm for prefix computation on mesh.

