JALPAIGURI GOVERNMENT ENGINEERING COLLEGE

PCC-CS302, SECOND CLASS TEST, DATA STRUCTURE & ALGORITHMS

Full Marks: 15

[Long Answer Type Question]

Answer any *three* questions:

1. Write the quick sort algorithm and derive the worst case time complexity in terms of Big Oh notation. [3+2]

2. Convert the following infix expression Q into equivalent postfix expression using Stack (Show all the steps)

Q: A + (B * C - (D / E ^ F) * G) * H

[5]

3. Define BST and AVL search tree. Construct BST and AVL search tree with the following dataset:

121, 189, 69, 26, 54, 41, 100, and 227

[1+4]

4. Write down efficient procedures/algorithms to insert a node at first position in circular linked list and also delete the first node from circular linked list.

[5]

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
JGEC/B.TECH./CSE /PCC-CS302/2024
FIRST CLASS TEST, DATA STRUCTURE & ALGORITHMS

Full Marks: 15 Time: 45 Minutes

[LONG ANSWER TYPE QUESTIONS]

Answer any *three* questions 3x5 =15

1. i) Write down efficient functions of insertion, deletion and display operations of static circular queue in C language. 4
   ii) Define ADT with suitable example. 1

2. i) Consider the following array in C language (Turbo C compiler): 3

   char a[10][5];

   Find out the address of the ***a[6][3]*** where the base address of the array **a** is 2005.
   ii) Derive the average case time complexity of linear search algorithm. 2

3. i) If $f(n) = 3n^3 + 6n^2 + 13$, then prove that $f(n)$is not $O(n^3)$ 2
   ii) Define five asymptotic notations, Big O, Big Omega, Theta , small o and small omega with geometrical interpretation and suitable examples. 3

4. i) Define the limitations of binary search algorithm. 1
   ii) Is it possible to apply the binary search algorithm to sorted link list? Justify your answer. 2
   iii) Prove that all *log* functions grows in the same fashion in terms of Big O notation. 2

5. i) Write down an efficient procedure/algorithm to delete the middle element from a linked list? 3
   ii) Which searching algorithm will you prefer among linear search and binary search? Explain your answer. 2

Computer Organization (PCC-CS301)

Date of Examination: 18.12.24 (Internal Exam-2) CSE Dept.

Full Marks: 15 Time: 45 Minutes

Attempt any *three. (Each question carries 5 marks)*

1. Consider a memory system that uses 32 bit address to address at the byte level, plus 128KB cache that uses a 128 Byte line size.
   c) Assume an associative cache. Find the size of tag, number of blocks in main memory, number of lines in cache.
   d) Assume a direct map cache. Determine the parameters tag, line (block) number, byte offset.
2. Explain the role of each field of the following Intel IA-32 instruction encoding system with suitable examples.

Opcode	ModR/M	SIB	Displacement	Immediate

3. Build 256MB RAM using 4MB basic chips as many as required. Use low order memory interleaving. Draw the circuit diagram.
4. A two-way set associative cache has lines of 32 bytes and a total size of 64K Bytes. The 64M Bytes main memory is byte-addressable. Show the format of main memory address.

RI GOVERNMENT ENGINEERING COLLEGE
GOVERNMENT AUTONOMOUS COLLEGE

Computer Organization (PCC-CS301) CSE, Internal-1 Date of Exam-26.09.24
Full Marks: 15 Time: 45 Minutes

Answer any three of the following (3 X 5 =15 Marks)

1. Consider a 7 bit floating point representation based on IEEE floating point format with 1 sign bit, 3 exponent bits, and 3 fraction bits. Show the representable range of normalized and de-normalized numbers (expressed in equivalent decimal values).

2. Using Booth's recoded form find decimal equivalent of the number (110010100).
   Multiply (-11), and (-6), using Booth's multiplication method.

3. Show the steps with explanation for a non-restoring division method while dividing 63 by 6.

4. a) Subtract 15 from 32 in binary form and with the help of 2's complement method.
   b) Set Exponent = 1-Bias rather than simply (-Bias) for de-normalized values of floating point numbers--explain the reason.

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ODD SEM 2024

Paper Name: Digital Electronics
Full Marks: 15
Answer any three questions.

Paper code: ESC-301
Class Test: 1ST

Time: 40 minutes
Date: 27/09/2024

1. What is Don't Care condition? Using k-map, simplify the following expressions a) F(A,B,C,D) = Σm(1,3,4,6,9,11,13,15)+d(0,2,14); b) F(A,B,C,D)=Σ(0,1,2,4,5,7,11,15). (1 + 2 + 2)
2. State DeMorgan's theorems. Simplify the expression $\{(M + N')(M' + N)\}'$ using DeMorgan's theorems. Derive the canonical SOP form of F(ABCD)=AB+(AC)'+C+AD. (1 + 2 + 2)
3. Design aa adder-subtractor composite unit and describe its functionality (5)
4. Design a binary multiplier using combinational ckt. that multiplies a 4 bit number $B=b_3b_2b_1b_0$ by a 3 bit number $A=a_2a_1a_0$ to form a product $C=c_6c_5c_4c_3c_2c_1c_0$. (5)

Digital Electronics (Class Test II/ ESC-301)
Department of Computer Science and Engineering
2024

Full marks: 15 **Time: 45 min**

1) What is race around condition? How can we overcome it? Draw a logic circuit diagram of JK Master-Slave flip flop using NAND Gate only and explain its working principle. 1+1+5=7
2) Convert a JK flip flop into SR flip flop. State the conversion table, conversion logical expression and circuit diagram. (5)
3) Draw a diagram of D Flip flop and show the truth table. (3)

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
[A GOVERNMENT AUTONOMOUS COLLEGE]
JGEC/B.TECH/ CSE/HSMC -301/ 2024-25
2024

Full Marks: 15

ECONOMICS FOR ENGINEERS

The figures in the margin indicate full marks.

Candidates are instructed to write the answers in their own words as far as practicable.

any ***One*** questions 1 X 15 =15

What is fixed cost and variable cost ?What are the objectives of accountancy ? What problems arise in economic decision making process ? 3+4+4+4

Write steps in economic decision making process ?

Write brief on stock turnover ratio, fixed asset turnover ratio ,operating ratio ,net profit ratio ,quick ratio ? Discuss per unit cost and revenue

10+5

...MENT ENGINEERING COLLEGE

JGEC/CSE/1ST INTERNAL EXAMINATION 2024

SUBJECT CODE- BSCH301

Total Marks- 15 **Time-45 min.**

1. Define the first and second laws of thermodynamics. (2+2=4)
2. Describe the ultrastructure of bacterial cells with a suitable diagram. (6)
3. Describe Mendel's Mendel's monohybrid cross experiment. (3)
4. What is a locus? (1)
5. What is phenotype? (1)

Time: 45 min

1. What is economic decision making ?Write role of engineers in economic decision making process. Write problems in economic decision making process. *3+6+6*

JGEC/B.TECH./CSE /HSMC-301/2024-25
ECONOMICS FOR ENGINEERS

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
Department of Computer Science and Engineering
First Class Test Examination, 2024
ESSENCE OF TRADITIONAL KNOWLEDGE (MC 301)

Full Marks: 15

Times: 45 Minutes

Answer any one question:

1. Explain the scope and importance of Traditional Knowledge.
2. Write about the significance of Traditional Knowledge protection.

1x15 = 15

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE

DEPARTMENT OF ENGINEERING ,2nd INTERNAL EXAMINATION

SUBJECT CODE- BS-CE301,Total Marks- 15

1.Write about four different types of protein structure. (4)

2.Describe the classification of lipids. (6)

3.Describe about the formation of peptide bond with suitable diagram. (3)

4.What is chiral carbon? (1)

5.What is hydrolase? (1)