16CP012

Birla Vishvakarma Mahavidyalaya (Engineering College)

(An Autonomous Institution)

3rd Year, B. Tech. (Computer Engineering), 2nd Mid Semester Examination

Course Code: CP303 **Course Title: Object Oriented Programming using JAVA**

Date: 03.10.2018 **Time: 02 pm to 03 pm** **Maximum Marks: 30**

Instructions:

Make suitable assumptions wherever necessary by clearly mentioning them.
Figures to the right indicate maximum marks.

Q. 1 Answer any **three**: [06]

1 Wrapper classes are needed in Java. Justify.

2 How do you select one of the two approaches for giving a class characteristics of Thread?

3 Explain default access specifier in context of package. Also mention accessibility of members having default access specifier in sub-classes.

4 Why and where do you use keyword volatile in a multi-threaded program?

Q.2 Write a complete program incorporating multi-threading for computing prime numbers up to n given by a user. Meet following requirements: [06]

- There are **3** child-threads each of them is designated to find prime numbers in **multiple ranges** e.g.
- thread_0 – 3 to 100, thread_1 – 101 to 200, thread_2 – 201 to 300. thread_0 – 301 to 400, thread_1 – 401 to 500, thread_2 – 501 to 600 and so on

All prime numbers are to be printed in ascending order without using an array for storing them.

Q.3 Declare a user defined exception class which supports printing of a message specified at the point of throwing of an exception which describes the cause. Show usage of this class for stack underflow. [03]

Q.4 1 Give the limitations of AWT and explain how Swing overcome them. [03]

2 Explain how ToggleButton are different from normal Button with suitable example [03]

Q.5 1 Explain MVC architecture [02]

2 What is window pane in swing? List out different window pane. [02]

Q.6 What is pluggable look and feel? What is its importance? Assume that an application contains a textfield and a button. Show that how to apply PLAF of your choice to them. [05]

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Birla Vishvakarma Mahavidyalaya (Engineering College)
(An Autonomous Institutes)
Third Year B. Tech – 2nd Mid Semester Examination
A.Y. 2018-19 Semester 1

Course Code : CP302 **Course Title: Design and Analysis of Algorithms**
Date: 01/10/2018 **Time: 2:00 PM to 3:00 PM** **Max. Marks: 30**

Q.1 [A] Apply NP-Reduction to convert following SAT formula in to clique problem and find at least two cliques which satisfy SAT problem. [05]
CNF: $(x' + y + z') \cdot (x + z) \cdot (y' + z) \cdot (x' + y + z) \cdot (x + y')$
Do not convert it in to pure 3-SAT problem.

[B] Applying the backtracking algorithm to the given instance of 2-SAT.: Φ = [05]
$\{(x1 \vee x2) \wedge (x1 \vee x3) \wedge (x1 \vee x4) \wedge (x1' \vee x4') \wedge (x2' \vee x3') \wedge (x2 \vee x4') \wedge (x3 \vee x5')\}$
Find whether 2-SAT is satisfiable.
Show all the steps in executing algorithm, show data Structure modification also.

Q.2 Answer the following question in short.

1. What are tractable problem and intractable problem? Give one example of each. [10]
2. What is decision problem? Give one example of converting optimization problem into decision problem.
3. Is 3SAT formula polynomial time reducible to SAT? Justify your answer.
4. Suppose $T(n) = 2T(n/2) + n$, $T(0) = T(1) = 1$
   Which one of the following is false. (justify)
   a. a) $T(n) = O(n^2)$
      b) $T(n) = \Omega(nLogn)$
      c) $T(n) = \Theta(n^2)$
      d) $T(n) = O(nLogn)$
5. What is the time complexity of the below function? (justify)

```
void fun(int n, int arr[])
{
  int i = 0, j = 0;
  for(; i < n; ++i)
    while(j < n && arr[i] < arr[j])
      j++;
}
```

Q.3 [A] Explain N Queen Problem, and how back tracking can effectively solve the problem. [05]

OR

Explain time complexity of converting SAT in to 3-SAT problem.

[B] Explain Branch and Bound algorithm design technique with example. [05]

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Birla Vishvakarma Mahavidyalaya (Engineering College)

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Third Year B. Tech. -2nd Mid Semester Examination

A.Y. 2018-19 Semester-I

Course Code: CP301 Course Title: Web Technologies

Date: 29.09.2018 Time: 02.00 pm to 03.00 pm Maximum Marks: 30

Q:1 (a) What are the major strengths of schema over DTD? [03]

OR

(a) Explain the following terms in XSL (XML stylesheet elements). [03]

(i) value-of (ii) for-each (iii) sort

(b) Consider the following XML document fragment.

i. The root element is "Employee_Info"

ii. As the content for "Employee_Info," "Employee" occurs 0 or more times

iii. As content of "Employee," "Name," "Department," "Telephone," and "Email" elements occur once in respective order

iv. "Name," "Department," "Telephone," and "Email" content are text strings

v. "Employee" has an attribute called "Employee_Number"

vi. "Employee_Number" content must be int type

1. Write an xml (EMP.XML) File for above description. [03]
2. Write a document type definition (EMP.DTD) file to validate above XML file. [03]
3. Write an xml schema EMP.xsd file to validate above XML file. [03]
4. Write an xml style sheet file (EMP.xsl) file to print above XML data in table format. [03]

Q:2 (a) List out the responsibility of web server. [03]

OR

(a) Differentiate GET and POST method. [03]

(b) Explain Scope of the variable in PHP. [02]

(c) Write a PHP script to print first N Fibonacci numbers using function. [05]

(d) Write HTML and PHP program to display the details of the user i.e.name, city, pin-code and email which are entered from HTML form using GET method. [05]

Second Internal Test

CP304 – Processor Architecture

Date: 04/10/18 Time: 2.00 pm to 3.00 pm Max Marks: 30

Q.1 Assume that 8 on-off keys are connected on port A of 8255 and eight LEDs are connected on Port B of 8255. Interface 8255 with 8086 such that Port A address is FF00H, PORT B address is FF02H, Port C address is FF04H and Control word register address is FF06H. Write an 8086 program which read port A and status of key is displayed on eight LEDs. [05]

OR

Q 1 Interface 8 bit DAC with 8086 using 8255 and write an 8086 program to generate square wave of frequency 4KHZ. Peak voltage is 5 volt. Interface 8255 as an even port with starting address 8000H [05]

Q 2 1 Briefly explain the steps carried out by 8086 on response to interrupt INTR. Draw block diagram to show multiple devices interrupt on INTR pin of 8086 [05]

2 How does 8086 detect and respond to an overflow error in a program [03]

Q 3 Show the interfacing of 8087 with 8086. Also discuss communication between 8086 and 8087 [05]

Q 4 Represent 10110010.101 in Short Real format of 8087 [03]

OR

Briefly explain different methods to resolve simultaneous bus request in multiprocessor system (loosely coupled) by establishing priority [03]

Q 5 1 Draw pipeline execution diagram during the execution of the following instructions [07]

MUL R1,R2,R3 C(R3)=C(R1) * C(R2)
ADD R2,R3,R4 C(R4)=C(R2) + C(R3)
INC R4 C(R4)=C(R4) + 1
SUB R6,R3,R7 C(R7)=C(R6) - C(R3)

Assume 5 stages of pipeline (FI, DE, EX, MEM, SR). Assume all stage take equal amount of time. Which instructions have data dependency? Find out delay because of data dependency. Briefly explain the solutions used to minimize the effect of data dependency

2 A processor takes 12 cycles to complete an instruction I. The corresponding pipelined processor uses 6 stages with the execution times of 3, 2, 5, 4, 6 and 2 cycles respectively. What is the asymptotic speedup assuming that a very large number of instructions are to be executed? [02]

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Second Internal Test
CP305 – Operating Systems

Date: 05/10/18 Time: 2.00 pm to 3.00 pm Max Marks: 30

Q.1 (A) Answer the following questions. [05]

1 We wish to schedule three processes P1, P2 and P3 on a uniprocessor system. The priorities, CPU time requirements and arrival times of the processes are as shown below.

Process	Priority	CPU Time Required (sec)	Arrival Time (sec)
P1	10(highest)	20	5
P2	9	10	3
P3	8 (lowest)	15	0

We have a choice of preemptive or non-preemptive scheduling. In preemptive scheduling, a late-arriving higher priority process can preempt a currently running process with lower priority. In non-preemptive scheduling, a late-arriving higher priority process must wait for the currently executing process to complete before it can be scheduled on the processor. Find out the waiting and turnaround times of Three processes using preemptive and non-preemptive scheduling respectively. Draw Gantt chart

OR

(A) Consider a uniprocessor system executing three tasks T1, T2 and T3, each of which is composed of an infinite sequence of jobs (or instances) which arrive periodically at intervals of 3, 7 and 18 milliseconds, respectively. The priority of each task is the inverse of its period, and the available tasks are scheduled in order of priority, with the highest priority task scheduled first. Each instance of T1, T2 and T3 requires an execution time of 1, 3 and 4 milliseconds, respectively. Given that all tasks initially arrive at the beginning of the 1st millisecond and task preemptions are allowed. Find out the time when the first instance of T1, T2 and T3 completes its execution. Draw Gantt chart [05]

Q 2 Consider the 3 processes, P1, P2 and P3 shown in the table. [03]

Process	Arrival Time	Time Units Required
P1	0	5
P2	1	7
P3	3	4

Find out the completion order and average waiting time of three processes if Round robin scheduling algorithm with quantum 2 is used. Draw Gantt Chart

Q 3 1 Consider a system with 80% hit ratio, 60nsecs time to search the associative registers, 800nsecs to access memory. What is the effective memory access time to get one byte from memory? [02]

2 A computer with a 32 bit address uses a two level page table. Virtual address are split into a 9 bit top level page table field, an 11 bit second level page table field and an offset. How large the pages and how many are there in the address space? If process is 16MB, how much space is required by page table if two level paging is used? How much space is required if single level page table is used? Each page table entry required 32 bits [05]

Q 4 How multiprogramming operating system solve the problem of relocation and protection? [04]

OR

Briefly explain different allocation and deallocation polices of memory at run time in case of variable partition method of memory management with their advantages and disadvantages [04]

Q 5 1 Calculate best seek time for following algorithm: FCFS, SSTF and Elevator algorithm under given situation: Current position of Disk head: at Cylinder# 11; Pending requests: 1, 36, 16, 34, 9, 12. A seek takes 6 msec per cylinder moved [05]

2 List out different optimization techniques to improve File System performance. Among them, discuss the one which is mainly used when files are sequentially accessed [03]

3 What happens when user program tries to read a block from a file? Answer the question in context of the I/O software layers. [03]

OR

3 Summarize the disk transfer operation when DMA is used [03]

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