Tribhuvan University

Faculty of Humanities & Social Sciences

OFFICE OF THE DEAN

2019

Bachelor in Computer Applications
Course Title: Operating System
Code No: CACS 251
Semester: IV

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. What is an operating system? Explain the functions of operating system.
3. Define the term semaphore. How does semaphore help in dining philosopher problem?
4. A system has two process and three resources. Each process needs a maximum of two resources. Is deadlock possible? Explain with answer.
5. Suppose a new process in a system arrives at an average of six processes per minute and each such process requires an average of 8 seconds of service time. Estimate the fraction of time the CPU is busy in a system with a single processor.

6. Given references to the following pages by a program,

   0, 9, 0, 1, 8, 1, 8, 7, 8, 7, 1, 2, 8, 2, 7, 8, 2, 3, 8, 3

   How many page faults will occur if the program has three page frames for each of the following algorithms?

   a) FIFO

   b) LRU

7. What is file? Explain how access control matrix provides resource protection that may access process.

8. What do you mean by one-time password in authentication? How worms are differing from virus.

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2019

Bachelor in Computer Applications
Course Title: Numerical Methods
Code No: CACS 252
Semester: IV

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. Why is the study of errors important to a computational scientist? Differentiate between inherent and numerical errors.

3. Find the root of equation $x^2 - 4x - 10 = 0$ using bisection method where root lies between 5 and 6.
4. Find the square root of 3.5 using second order Lagrange interpolation polynomial using the following data table.

x	1	2	3	4	5
f(x)	1	1.4142	1.7321	2	2.2361

1.8549

5. Write a program to calculate the integral using Trapezoidal Rule.
6. Solve the following set of equations using Gauss-Jordan Method.

$$3x - 5y + 2z = 15$$
$$4x - y + z = 2$$
$$x - 3y + 7z = 22$$

0.708

7. Use classical Runge-Kutta method to estimate y(0.2) when $y'(x) = x^2 + y^2$ with $y(0) = 0$ and $h = 0.2$.
8. Solve the Poisson equation $\nabla^2 f = 2x^2y^2$ over the square domain $0 \le x \le 3$ and $0 \le y \le 3$ with $f = 0$ on the boundary and $h = 1$.

Group C

Attempt any TWO questions. **[2×10 = 20]**

9.

a) Factorize the matrix

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 8 & 22 \\ 3 & 22 & 82 \end{bmatrix}$$ Using Cholesky's method.

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2019

Bachelor in Computer Applications
Course Title: Software Engineering
Code No: CACS 253
Semester: IV

Full Marks: 60
Pass Marks: 24
Time: 3 Hrs.

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. What are the attributes of good software? What are the key challenges that software engineering face during software development? Explain.
3. What is software process model? List the types of software model. Explain agile methods and software prototyping.
4. What are the types of software requirements? Explain functional, non-functional, domain and user requirements.
5. Define software design concept and modularization? Differentiate cohesion and coupling.
6. Why User Interface design is so important? How UI design visualized? Discuss.
7. Why software maintenance is considered as major component in SDLC? Explain software maintenance types.
8. What do you mean by configuration management? Why it is important? Explain.

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. What are the skills necessary to handle software project? Explain different software projects management activities.
10. What are ISO quality standards? Discuss ISO9000 and ISO9001. Explain Black box testing and white box testing techniques.
11. What are the techniques that are used to elicit and analysis of requirements during software requirements analysis and specification? Explain all.