Department of Computer Science and Engineering

Begum Rokeya University, Rangpur.

2nd Year 2nd Semester Final Examination, 2017 (Session: 2015-16)

Course Code: **CSE 2201** Course Title: **Object Oriented Programming**

Time: 3.00 Hours | Full Marks: 50

Answer Any Five from the Given Questions

(Note: Answer the question sequentially. Numbers in the right margin indicate marks for each question.)

1. (a) Why **JAVA** is called platform independent language? Why **C/C++** language is not? 2
   (b) What are the benefits of Object Oriented Programing/ over Structured/procedural programming? 3
   (c) Describe the scope of all visibility modifiers used in **JAVA**. 3
   (d) How can you ensure data field encapsulation? 2

2. (a) What is the default value of an object reference declared as an instance variable? Can a top level class be private or protected? 2
   (b) What is **autoboxing** and **autounboxing**? Are the following statement correct? If yes/not, then why? 4

   i. Integer x = 3+ Integer (5);
   ii. Integer x = 3;
   iii. Double x = 3.0;
   iv. int x= new Integer (3);

   (c) Does any method in the String class change the contents of the string? What is the output of the following program? Show reason behind your answer. 4

```
public class Test {
String text;
public void Test(String s) {
text = s; }
public static void main(String[] args) {
Test test = newTest("ABC");
System.out.println(test);}}
```

3. (a) What is a round-off error? Can integer and floating point operations cause round-off errors? Why?
   (b) What is the difference between Comparable and Comparator?
   (c) What is meant by Method Overriding? Explain with example.

4. (a) What is the uses/necessity of using abstract class/interface in **JAVA**? Describe with proper code segment.
   (b) With example describe the scope of and uses of instance and static variable/method.
   (c) Describe the role of ***this*** keyword. What is wrong in the following code? Give reasons to your answer and correct it if any error?

```
public class C {
private int p;
public C( ) {
System.out.println("C's no-arg constructor invoked");
this(0);}
public C(int p) {
p = p; }
public void set P(int p) {
p = p; }}
```

5. a) Define Java thread. Explain the Java thread model. 3

b) How to create a Java thread? Explain how different ways help in implementing the Java thread. 4

c) Write about network programming in java with proper example. 3

6. (a) What is Exception handling in java? Why is it used? Write a java code to simulate the way a stack mechanisms works with exception handling, throwing and dealing with exceptions such as stack is full (if you want to add more elements into the stack)or Stack is empty(you want to pop elements from the stack). 4

(b) What is the advantage of using exception handling? Does the following code throw any exception? 2
long value = long.Max_VALUE+1; System.out.println(value);

(c) What is checked and unchecked exception? What RuntimeException will the following code show, if any? 4

i). ***public classTest {***
public static void main(String[ ] args)
{System.out.println(1/ 0);} }

ii) ***public classTest {***
public static voidmain(String[ ] args)
{int[] list = new int[5];
System.out.println(list[5]);} }

7. (a) What is the difference between a Window and a Frame? Which package has light weight components? What is the difference between **Swing** and **AWT** components? 3

(b) What is the relationship between clipping and repainting under **AWT**? Which method of the Component class is used to set the position and size of a component? How? 3

(c) What are benefits of using Generic types in **JAVA**? How do you declare a generic type in a class? 2

(d) Can you create an instance using new **E()** for a generic type **E**? Why? 2

Begum Rokeya University, Rangpur
Department of Computer Science and Engineering
2nd Year 2nd Semester, B. Sc. (Engg.) Examination- 2017
Course Code: CSE 2203 Course Title: Operating System and Systems Programming

Time: 3 hours Full Marks: 50

N.B.
a) Answer any **FIVE** of the following questions.
b) The figures at right side indicate full marks of the question.

1. a) List five services provided by an operating system and explain how each creates convenience for users. 3
   b) Describe some of the challenges of designing operating systems for mobile devices compared with designing operating systems for traditional PCs. 3
   c) How are iOS and Android similar? How are they different? 2
   d) What are the purposes of system programming? 2

2. a) What is Process Control Block (PCB)? 1
   b) What are the advantages and disadvantage of FIFO, Optimal and LRU page replacement algorithm? 4
   c) What do you mean by process? Briefly discuss different state of process. 5

3. a) How do you define a Critical –Section in OS? Discuss about the problems arose in Critical-Section. 3
   b) Why do we need to synchronize a Process? How efficiently can we do it? What are the approaches? 4
   c) How can you solve the classical Readers-Writers problem through synchronization of processes? 3

4. a) What are the criteria to measure the performance of any CPU scheduling algorithm? 3
   b) Write down some properties of CPU scheduling algorithm. 4
   c) What is the virtual memory? What are the advantages of virtual memory? 3

5. a) When a Deadlock is occurred in OS? Discuss with resource allocation graph. 3
   b) Define key terms: (i) Deadlock prevention (ii) Deadlock avoidance and (iii) Deadlock detection. 3
   c) Consider the following snapshot of a system: 4

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P_0	0 0 1 2	0 0 1 2	1 5 2 0
P_1	1 0 0 0	1 7 5 0	
P_2	1 3 5 4	2 3 5 6	
P_3	0 6 3 2	0 6 5 2	
P_4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm:
i) What is the content of the matrix Need?
ii) Is the system in a safe state?
iii) If a request from process P_1 arrives for (0, 4, 2, 0) can the request be granted immediately?

6. a) What is paging and segmentation in OS? 2
   b) Discuss the address translation process of a CPU with proper diagram. Hence, mention about additional hardware/software (if any) required to enhance the performance. 4
   c) Consider a logical address space of 256 pages with a 4-KBpage size, mapped onto a physical 4

memory of 64 frames.

i) How many bits are required in the logical address?

ii) How many bits are required in the physical address?

7. a) What is demand paging and page fault? 1

b) How can we handle page fault? Discuss with proper diagram. 3

c) Consider the following page reference string: 6

7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2 3, 0, 1

Assuming demand paging with three frames, how many page faults would occur for the following page replacement algorithms?

i) LRU replacement

ii) FIFO replacement

iii) Optimal replacement

Begum Rokeya University, Rangpur
Department of Computer Science and Engineering
2nd Year 2nd Semester, B. Sc. (Engg.) Examination- 2017
Course: MAT 2221 (Numerical Methods)

Time: 3 hours | Full Marks: 50

N.B.: Answer any **FIVE** of the following questions. The figures at right side indicate full marks of the question.

1. a) Discuss about numerical errors with examples. 5
   b) i) Define significant figures. How many significant figures are in the number 0.050? 2.5
   ii) Let p = 0.54617 and q = 0.54601. Use four-digit arithmetic to approximate p – q and determine the absolute and relative errors using rounding and chopping. 2.5

2. a) Write an algorithm of Bisection method to find a solution to f(x) = 0, give the function f is continuous on [a, b] where f(a) and f(b) have opposite signs. 5
   b) Use the Newton-Raphson method to find a root of the equation x^4-x-10 = 0 up to three decimal places. 5

3. a) Use the Newton forward difference formula to construct interpolating polynomials of degree two and three. Approximate f(0.43) for both cases if f(0) = 1, f(0.25) = 1.64872, f(0.5) = 2.71828 and f(0.7) = 4.48169. 5
   b) The table gives the square roots for integers 5

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

   Construct the 3rd degree Lagrange interpolation polynomial. Determine the square root of 2.4 using this polynomial.

4. a) Find the derivative of f(x) at x = 0.4 from the following table: 5

x	0.1	0.2	0.3	0.4
f(x)	1.10517	1.22140	1.34986	1.49182

   b) Establish general quadrature formula for equidistance ordinates and derive Simpson's one-third rule. 5

5. a) Using the trapezoidal rule evaluate $\int_{-2}^{2} \frac{t\,dt}{5+2t}$ 5
   b) Find an error bound in exercise 5(a) using the error formula and compare this to the actual error. 5

6. a) Using Gaussian elimination with backward substitution and two- digit rounding arithmetic to solve 5

$$4x_1 + x_2 + 2x_3 = 9$$
$$2x_1 + 4x_2 - x_3 = -5$$
$$x_1 + x_2 - 3x_3 = -9$$

   b) Reduce the matrix 5

$$\begin{bmatrix} 1 & 2 & -3 & 0 \\ 1 & 2 & -3 & 0 \\ 1 & 2 & -3 & 0 \\ 1 & 2 & -3 & 0 \end{bmatrix}$$

7. a) Derive second order Runge – Kutta method for solving IVP. 5
   b) Use Runge-Kutta fourth order method to estimate y at x = 0.2, 0.4 when $\frac{dy}{dx} = 1 + y^2$ with y(0) = 0 and assume h = 0.2. 5

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B.Sc. (Engg.) 2nd year 2nd Semester Final Examination, 2017. (Session: 2015-16)

Course Code: **MAT 2222** Time: **3.00 hours**

Course Title: **Complex variable Laplace Transformation & Fourier Analysis** Total Marks: **50**

*[N B: **Answer any five (5) questions and figures in the right margin indicate full marks**]*

1. a) Define complex number system. If $z_1=2+i$, $z_2=3-2i$ and $z_3=-\frac{1}{2}+\frac{\sqrt{3}}{2}i$ then find the value of (i) $|3z_1-4z_2|$ (ii) $(\bar{z}_3)^4$ 5

   b) Define single valued and multiple valued functions. Show that $ln(z)$ has a branch points at $z=0$. 5

2. a) Define analytic function. State and prove necessary condition for a function to be analytic. 5

   b) Prove that the function $f(z)=\frac{x^3(1+i)-y^3(1-i)}{x^2+y^2}$ $when\ z\neq 0$ 5

   $=0\ when\ z=0$

   Is not analytic at origin although the Cauchy Riemann equations are satisfied there.

3. a) Prove that an analytic function with constant modules is constant. 5

   b) Define harmonic function. Prove that $u=e^{-x}(x\,siny-y\,cosy)$is harmonic. Find v such that $f(z)=u+iv$ is analytic. 5

4. a) Define Pole, Removable singularity, Essential singularity, Isolated singularity, and singularity at infinity. 5

   b) Prove the Cauchy theorem for the case of a triangle. 5

5. a) Define Fourier transformation and complex Fourier transform. Find the Fourier transform of $F(x)$ where $F(x)=\begin{cases}1 & when\ -a<x<a\\ 0 & when\ -a>x>a\end{cases}$ 5

   b) Find the finite sine and cosine transform of $\frac{\partial^2 u}{\partial x^2}$, $where\ u$ is a function of x and t for $0<x<l$, $t>0$. 3

6. a) State and prove convolution theorem for Fourier transformation. 4

   b) Use finite Fourier transformation to solve 6

$$\frac{\partial U}{\partial t}=\frac{\partial^2 U}{\partial x^2}$$
$$U(0,t)=0$$
$$U(\pi,t)=0$$
$$U(x,0)=2x\ where\ 0<x<\pi, t>0$$

7. a) Find (i) $\mathcal{L}^{-1}\{\frac{a^3}{s(s+a)^3}\}$ 2.5+2.5

   (ii) Find laplace transformation of $sinkx$

   b) Using Laplace transformation solve the equation $y''(t)+y(t)=2e^t$ where $y(0)=y'(0)=2$ 5

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2nd Year 2nd Semester Final Examination, 2017 (Session: 2015-16)

Course Code: **CSE 2225** Course Title: **Introduction to Business**

Time: 3.00 Hours Full Marks: 50

Answer Any Five from the Given Questions

(Note: Answer the question sequentially. Numbers in the right margin indicate marks for each question.)

1.	*a)*	Suppose you are a business consultant, how do you identify a successful businessman? Mention all prerequisites of a successful businessman.	5
	b)	What are the elements of business environment?	3
	c)	Mention the objectives of business.	2
2.	*a)*	What is scientific management?	2
	b)	What types of role should be played by a manager? Discuss.	4
	c)	Identify and elaborate the core functions of management process.	4
3.	*a)*	What is meant by motivation?	2
	b)	Discuss the Need Hierarchy theory of motivation.	5
	c)	What are the sources of motivation? Discuss.	3
4.	*a)*	What do you mean by recruitment?	2
	b)	Briefly describe the basic components of recruitment process.	4
	c)	Illustrate the functions of Human resource Management in an organization.	4
5.	*a)*	Define conflict.	2
	b)	What types of Intra-individual goal conflict arise among human being and why?	4
	c)	Analyze tools to reduce organizational conflict.	4
6.	*a)*	Define accounting equation. Explain the classification of financial statement with appropriate example.	6
	b)	State the golden rules of debit and credit.	4

7. Bop sample opened the Campus Laundromat on September 1, 2015. During the first month of operations following transactions occurred.

Sept.1 Bop invested $20000 cash in business.

2 The company paid $1000 cash for store rent for September.

3 Purchased washers and dryer s for $25000, paying $10000 in cash and signing a $15000, 6 months, 12% note payable

4 Paid $1200 for a one year accident insurance policy.

10 Received a bill from The Daily news for advertising the opening of the Laundromat $200

20 Bob withdrew $700 cash for personal use.

30 The company determined that cash receipts for laundry services for the month were $6,200.

Required:

a)	Journalize the September transactions.	5
b)	Open ledger accounts and post the September transactions.	5