

Student Exam No. _____

GANPAT UNIVERSITY
B. Tech. 3RD SEMESTER (CIVIL) Engineering
Regular Examination November – December 2014-15

2CI306 Numerical methods & Computer programming

Time: 3:00 hours

Max. Marks: 70

Instruction: 1) Figures to the right indicate marks.

SECTION 1

Que.1 (A) Solve the following systems of equation by gauss Jordan method 04

$$2X_1 + 4X_2 + 2X_3 = 15$$

$$2X_1 + X_2 + 2X_3 = -5$$

$$4X_1 + X_2 - 2X_3 = 8$$

Que.1 (B) Given $Y' = Y - X$ where $y(0) = 2$. Find $y(0.1)$ and $y(0.2)$ by using runge kutta second order. 04

Que.1 (C) Apply Euler's method to find the value of $y(0.1)$, $y(0.2)$ 04

$$Y' = XY^{1/3} \quad Y(1) = 1$$

OR

Que.1 (A) Solve the following systems of equation by gauss Jordan method 04

$$10X_1 + X_2 - X_3 = 11.19$$

$$X_1 + 10X_2 + X_3 = 27.08$$

$$-2X_1 + X_2 + 10X_3 = 35.65$$

Que.1 (B) Fit a straight line to the following data by the method of least squares. 04

X	0	5	10	15	20	25	30
Y	10	14	19	25	31	36	39

Que.1 (C) Solve the following differential equation by Euler's method 04

$$Y' = X^2 + Y^2, \quad y(0) = 1 \text{ to find } y(0.2), y(0.4), y(0.6)$$

Que.2 (A) Find the first order and second order derivatives of $f(x)$ at $X=2.0$ 04

X	1.5	2.0	2.5	3.0	3.5	4.0
Y	3.375	7.000	13.625	24.000	38.875	59.000

Que.2 (B) Evaluate $\int_0^{10} dx/(1+x)$ by using Simpsons three eight rule take $h=1$ 04

Que.2 (C) Use Newton divided difference formula to find $f(1)$, $f(5)$ 04

X	0	2	3	4	7	8
Y	4	26	58	112	466	668

OR

Que.2 (A) Fit a second degree parabola curve to the following data 04

X	0.5	1	2	3	5
Y	3.1	6.0	11.2	14.8	20

Que.2 (B) Evaluate $\int_0^{10} dx/(1+3x)$ by using Simpsons one third rule take $h=1$ 04

Que.2 (C) Using mines predictor -corrector method to obtain the solution of the equation $Y^1=X-Y^2$ at $x=0.8$ $y(0)=0$, $y(0.2)=0.0200$, $y(0.4)=0.0795$, $y(0.6)=0.1762$ 04

Que.3 (A) What is difference between linear and nonlinear equation. 03

Que.3 (B) Use Lagrange's interpolation formula to find the value of $Y(X) = 20$ Using the following data. 04

X	1	8	27	64
Y	1	2	3	4

Que.3 (C) Evaluate $\int_0^2 dx/(2+2x)$ by using Simpsons three eighth rule take $h=1$ 04

SECTION 2

Que.4 (A) 1. Differentiate between C & C++. (Minimum 4 points) 02

2. Why we include iostream.h and conio.h as a header files? 02

- Que.4 (B) 1. Write a program to check the given number is divisible by 37 or not. 02
2. Rewrite the following program after removing the syntactical errors. Underline each correction. 02

```
#include<iostream.h>
#include<conio.h>
#include<string.h>
void main()
{
char a;
int b,c;
cin<<c<<b<<a;
b=c32;
cout<<a<<b<<C;
getch ();
}
```

- Que.4 (C) 1. What are the applications of object oriented programming? 02
2. Explain While loop & do - While loop along with their syntax. 02

OR

- Que.4 (A) 1. Differentiate between Object oriented programming & Procedure oriented programming. (Minimum 4 points) 02
2. What is the significance of providing getch() and clrscr()? 02

- Que.4 (B) 1. Write a program to calculate the value of x. 02

$$A = (B + CX)^{\frac{1}{D}}$$

2. Find the output of the following programs.*

(i)

(ii)

<pre>void main() { int a,b,c; a=121; b=6; c= (a%10)*b/4; cout<<c; getch(); }</pre>	<pre>void main() { float a,b,c; a=5; b=6; c=7; a=a-b*12-3*2+c; a*=2; cout<<a; getch(); }</pre>
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02

- Que.4 (C) 1. List out the various mathematical and logical operators. 02
2. Explain with an example, how combination of assignment operator and mathematical operator is done? 02

Que.5 (A) What is parameterized constructor? Describe its importance. 04

Que.5 (B) Write a program to print the odd number series up to 20. (with output) 04

Que.5 (C) What does inheritance mean in C++? What are the different forms of inheritance? 04

OR

Que.5(A) What is destructor? Describe its importance. 04

Que.5 (B) 1. Write a program to calculate shear force and bending moment of a simply supported beam having UDL all over its length. (answer must contain its unit) 04

2. Write a program to calculate the sum of numbers between 50 and 60.

Que.5(C) What is an operator overloading? Why it is necessary to overload an operator? 04

Que.6 (A) Define the following terms:- (any three) 06

1. Functions in C++
2. Conversion function
3. Abstract class
4. classes
5. Data abstraction

Que.6 (B) Write the equivalent C++ expression for the following mathematical expression. 05

1. $\log_{10} \left(\frac{\sin x}{2\cos y} + \frac{\sin^{-1}y}{2\cos x} \right)$	3. $\sqrt[8]{16a^2 + b^4 * c^6}$
2. $\frac{a}{8} = (\cos^{-1}x)^3 \sqrt{\left(\frac{x}{y}\right)^5}$	4. $e^{\left(\frac{\tan^{-1}y}{\log x}\right)}$
	5. e^{31x^4}