Student Exam No.

## **GANPAT UNIVERSITY**

## B. Tech. 3<sup>RD</sup> SEMESTER (CIVIL) Engineering Regular Examination November – December 2014-15

## 2CI306 Numerical methods & Computer programming.

Max. Marks: 70 Time: 3:00 hours Instruction: 1) Figures to the right indicate marks. **SECTION 1** Solve the following systems of equation by gauss Jordan method 04 Que.1 (A) 2X1+4X2+2X3=15  $2X_1+X_2+2X_3=-5$  $4X_1+X_2-2X_3=8$ 04 Given  $Y^1=Y-X$  where y (0) =2. Find y (0.1) and y (0.2) by using runge Que.1 (B) kutta second order. Apply Euler's method to find the value of y(0.1), y(0.2)04 Que.1 (C)  $Y^1 = XY^{1/3} Y(1) = 1$ OR 04 Que.1 (A) Solve the following systems of equation by gauss Jordan method  $10X_1 + X_2 - X_3 = 11.19$  $X_1+10X_2+X_3=27.08$  $-2X_1+X_2+10X_3=35.65$ 04 Fit a straight line to the following data by the method of least Que.1 (B) squares. 25 30 20 5 10 15 39 14 19 25 31 36 Y 10 Solve the following differential equation by Euler's method 04 Que.1 (C)  $Y^1 = X^2 + Y^2$ , y(0) = 1 to find y(0.2), y(0.4), y(0.6)04 Find the first order and second order derivatives of f(x) at X=2.0Que.2 (A) X 1.5 2.0 2.5 3.0 3.5 4.0 59.000 Y 38.875 3.375 7.000 13.625 24.000

Evaluate	$\int_0^{10} dx/(1$	+ x) by us	ing Simp	sons three	e eight rule	take h=1	04
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	
Fit a second degree parabola curve to the following data							
						20	
Y	3.1	6.0	BEEN IN	11.2	14.8	20	J
Evaluate	$\int_{0}^{10} dx/(1$	+3x) by 1	using Sin	psons on	e third rule	take h=1	. 04
							0.4
							04
	Y'=X-Y'a	t x = 0.8 y(	(U)=0, y(U	.2)=0.020	v, y(v.4)=v.∙ ▶	0795, y(0.0)-	
0.1/02				100			
What is	difference l	between lir	near and	nonlinear	equation.		03
				1710 (E.S.	1.77 (31 <b>9</b> ))		
Usc Lag	range's inte	erpolation	formula	to find the	e value of		04
X	1	70	8	27		64	
Y	1		2	3	and the	4	8) La=(1
•	C						
E-value 4	(2 day)(2	1 2 m) by n	sing Cim	neans thr	oo oiahth r	ula taka h=1	04
Evaluate	$e \int_0^\infty dx/(2$	+ 2x) by u	ising oun	psons tur	ee eightii 1	uic take ii—i	
1	•						
	The Fr		SECTI	ON 2			
					10 (1 × 10)	uty .	
1.	Differentia	ite betwee	en C & (	C++. (Mir	nimum 4 p	oints)	02
					nimum 4 p		02 02
	Use New  X Y  Fit a seccond X Y  Evaluate  Using many equation 0.1762  What is  Use Lag Y(X) = X Y	Use Newton divided $ \begin{array}{c cccc} X & 0 \\ Y & 4 \end{array} $ Fit a second degree $ \begin{array}{c cccc} X & 0.5 \\ Y & 3.1 \end{array} $ Evaluate $\int_0^{10} dx/(1)$ Using mines predict equation $Y^1 = X - Y^2$ a 0.1762  What is difference to the difference of the difference	Use Newton divided difference $X$ 0 2 $Y$ 4 26 $Y$ 0 $Y$ 4 0.5 $Y$ 0.5 $Y$ 3.1 6.0 $Y$ 2 $Y$ 3.1 6.0 $Y$ 3.1 6.0 $Y$ 3.1 6.0 $Y$ 3.1 6.0 $Y$ 4 $Y$ 6 $Y$ 6 $Y$ 8 $Y$ 9	Use Newton divided difference formula $ \begin{array}{c cccc} \hline X & 0 & 2 & 3 \\ \hline Y & 4 & 26 & 58 \\ \hline OR $ Fit a second degree parabola curve to to $ \begin{array}{c ccccc} \hline X & 0.5 & 1 & 2 \\ \hline Y & 3.1 & 6.0 & 1 \end{array} $ Evaluate $\int_0^{10} dx/(1+3x)$ by using Simulating mines predictor—corrector method equation $Y^1=X-Y^2$ at $x=0.8$ $y(0)=0$ , $y(0)=0.1762$ What is difference between linear and Use Lagrange's interpolation formula $Y(X)=20$ Using the following data. $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Use Newton divided difference formula to find f( $\frac{X}{X}$ $\frac{0}{Y}$ $\frac{2}{4}$ $\frac{3}{26}$ $\frac{4}{58}$ $\frac{4}{112}$ OR  Fit a second degree parabola curve to the following $\frac{X}{X}$ $\frac{0.5}{0.5}$ $\frac{1}{1}$ $\frac{2}{Y}$ $\frac{1}{3.1}$ $\frac{1}{6.0}$ $\frac{2}{11.2}$ Evaluate $\int_0^{10} dx/(1+3x)$ by using Simpsons on Using mines predictor –corrector method to obtain equation $Y^1=X-Y^2$ at $x=0.8$ $y(0)=0$ , $y(0.2)=0.020$ 0.1762  What is difference between linear and nonlinear Use Lagrange's interpolation formula to find the $Y(X)=20$ Using the following data. $ X $	Use Newton divided difference formula to find $f(1)$ , $f(5)$ $ \begin{array}{c cccc} \hline X & 0 & 2 & 3 & 4 & 7 \\ \hline Y & 4 & 26 & 58 & 112 & 466 \end{array} $ OR  Fit a second degree parabola curve to the following data $ \begin{array}{c ccccc} \hline X & 0.5 & 1 & 2 & 3 \\ \hline Y & 3.1 & 6.0 & 11.2 & 14.8 \end{array} $ Evaluate $\int_0^{10} dx/(1+3x)$ by using Simpsons one third rule  Using mines predictor –corrector method to obtain the solute equation $Y^1 = X - Y^2$ at $x = 0.8$ $y(0) = 0$ , $y(0.2) = 0.0200$ , $y(0.4) = 0.01762$ What is difference between linear and nonlinear equation.  Usc Lagrange's interpolation formula to find the value of $Y(X) = 20$ Using the following data. $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{ c c c c c c }\hline X & 0 & 2 & 3 & 4 & 7 & 8\\\hline Y & 4 & 26 & 58 & 112 & 466 & 668\\\hline \hline OR\\\hline Fit a second degree parabola curve to the following data \\\hline X & 0.5 & 1 & 2 & 3\\\hline Y & 3.1 & 6.0 & 11.2 & 14.8 & 20\\\hline Evaluate \int_0^{10} dx/(1+3x) by using Simpsons one third rule take h=1 Using mines predictor –corrector method to obtain the solution of the equation Y^1=X-Y^2 at X=0.8 Y=0.8 $

Que.4 (B)	1. Write a program to check the given number is divisible by 37
	or not.
	2. Rewrite the following program after removing the
	syntactical errors. Underline each correction.
	#include <iostream.h></iostream.h>
	#include <conio.h></conio.h>
	#include <string.h></string.h>
	void main()
	char a;
	int b,c;
	cin< <c<b<>a;</c<b<>
	b=c32;
	cout< <a<<b<<c;< td=""></a<<b<<c;<>
	getch ();
	guntered o ladigot bus testements a porrey off for tell. 1
Oue 4 (C)	others to make stating as the state of the s
Que.4 (C)	1. What are the applications of object oriented programming? 02
	2. Explain While loop & do - While loop along with their 02
	syntax.
Que.4 (A)	OR the part of the
Que.4 (A)	1. Differentiate between Object oriented programming & 02
	Procedure oriented programming. (Minimum 4 points)
	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
4	02
	$A = (B + CX)^{\frac{1}{D}}$

2. Find the output of the following programs.

(i) (ii)

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

- Que.4 (C) 1. List
  - 1. List out the various mathematical and logical operators.
  - Explain with an example, how combination of assignment operator and mathematical operator is done?
- 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)
- Que.5 (C) What does inheritance mean in C++? What are the different forms 04 of inheritance?

## OR

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

04

02

- Que.5 (B)

  1. Write a program to calculate shear force and bending 04 moment of a simply supported beam having UDL all over its length. (answer must contain its unit)
  - 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 04 an operator?
- 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 05 expression.

1. 
$$\operatorname{Log_{10}}\left(\frac{\sin x}{2\cos y} + \frac{\sin^{-1}y}{2\cos x}\right)$$

3. 
$$\sqrt[8]{16a^2+b^4*c^6}$$

2. 
$$\frac{a}{8} = (\cos^{-1}x) \sqrt[3]{\left(\frac{x}{y}\right)^5}$$

$$4. \ e^{\left(\frac{\tan^{-1}y}{\log x}\right)}$$

5. 
$$e^{31x}$$