GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 20 | Max Time: 50 Mins | Weightage:10% | **Set A**

MID TERM EXAMINATION

I Semester 2016-2017 | Course: **CE A 209 CAD for Civil Engineers** | 19 October 2016

Instructions: (i) Give suitable examples wherever required.

Part A

Answer the following questions (3 Q x 2 M= 6 Marks)

1) Define different types of errors and give examples.

2) What are MEX-files? Describe the advantage of using MEX-files.

3) Write syntax for the following expressions:
   i) Inverse tangent, result in radians
   ii) Polynomial multiplication
   iii) Identity Matrix
   iv) Polynomial evaluation
   v) Pie chart (3D)
   vi) Clear command window

Part B

Answer the following questions (2 Q x 4 M= 8 Marks)

1) Write the script for the following second-order differential equation given below with initial condition as $x(0) = -2$, $\dot{x}(0) = 8$ for $-1 < t < 11$, using *ode45* solver.

$$7\frac{d2y}{dt} - \frac{dy}{dx} + 5y = 4\cos^2(t) + \sin(t)$$

2) a) What is function file? Write syntax and give examples for function file with file names.

b) Write the function of the following commands and give examples:

i) poly ii) menu

Part C

Answer the following questions (1 Q x 6 M= 6 Marks)

1) Write a function file to evaluate f(x, y). Find the solution for (x, y) = (-2, 0), (2,-3).

$$f(x,y) = \begin{cases} x+xy^2 & x \geq 0 \text{ and } y \geq 0 \\ 3x^2+y^2 & x \geq 0 \text{ and } y < 0 \\ 7x+5y & x < 0 \text{ and } y \geq 0 \\ yx^2+y^2 & x < 0 \text{ and } y < 0 \end{cases}$$

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Max Marks: 30 Max Time: 75 Mins Weightage: 15 %

Set B

LAB TEST 1

I Semester 2016-2017 Course: **CE A 209 CAD for Civil Engineers** 04 October 2016

ID No_____ **Section**_____ **Marks Scored**_____ **Sign of Invi**_____

Answer the following questions: (2 Q x15 M= 30 Marks)

1) a) Write a script file for taking sum of squares of odd numbers between 50 - 150.

b) Use a while loop to determine how many terms in the series $5k^2+3\sqrt{k}$, k=1,2,3..are required for the sum of the terms to exceed 5000. What is the sum for this number of terms?

2) Plot the given data in 3-D graph using bar3h function. Prepare menu and select two states randomly.

a) Tamil Nadu GDP growth:

2001	2002	2003	2004	2005	2006	2007
10.1	9.2	5.9	3.5	7.8	15.1	12.8

b) Karnataka GDP growth:

2001	2002	2003	2004	2005	2006	2007
9	4.5	6.5	11.3	12	17.7	9.1

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Max Marks: 30 Max Time: 75 Mins Weightage: 15 %

Set C

LAB TEST 1

I Semester 2016-2017 Course: **CE A 209 CAD for Civil Engineers** 04 October 2015

ID No_____ **Section**_____ **Marks Scored**_____ **Sign of Invi**_____

Answer the following questions:

(2 Q x15 M= 30 Marks)

1) $A=\begin{bmatrix} 5 & 2 & 5 \\ -2 & 0 & 6 \\ 2 & -1 & -4 \end{bmatrix}$ $B=\begin{bmatrix} 0 & 3 & -3 \\ -1 & -2 & 9 \\ 2 & 0 & 3 \end{bmatrix}$

i) Find 2A-3BI

ii) Change the values of A & B matrices by using **Keyboard command** and find A*B.
[A(2,3)= -4, A(3,1)= -3, B(1,2)=-5, B(3,2)=7]

2) Plot the given functions in a same graph and illustrate y2 in dotted lines, y3 in circles.
$y1=\sin^2 t$, $y2= t \cos(2t)$, $y3 = t - \frac{t^3}{6} + \frac{t^5}{120}$ where $t = (0, 2\pi, 100)$.

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PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 30 Max Time: 75 Mins Weightage: 15 % **Set D**

LAB TEST 1

I Semester 2016-2017 Course: **CE A 209 CAD for Civil Engineers** 04 October 2015

ID No_____ **Section**_____ **Marks Scored**_____ **Sign of Invi**_____

Answer the following questions: (2 Q x15 M= 30 Marks)

1) Given an integer N, it is required to compute the following sum k=0 to k=N.

$S= \sum_{K=0}^{N}(k+1)2^k = (0+1)2^0 + (1+1)2^1 \ldots\ldots + (N+1)2^N$

Let N=15. Compute the sum by using (i) for loop, (ii) conventional while – loop.

2) Obtain the numerical solution of the following second-order differential equation given below with initial condition as x (0) = 0, ẋ (0) =7 for -2 < t <10, using ode 45 solver.

$$5\frac{d^2y}{dt^2} + 3\frac{dy}{dt} + 9y = (\sin t - \cos t)$$

GAIN MORE KNOWLEDGE
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PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 30 Max Time: 75 Mins Weightage: 15 %

Set C

TEST 1

I Semester 2016-2017 Course: **CE A 209 CAD for Civil Engineers** 04 October 2015

ID No_____ **Section**_____ **Marks Scored**_____ **Sign of Invi**_____

Questions:

1) $A=\begin{bmatrix} 5 & 2 & 5 \\ -2 & 0 & 6 \\ 2 & -1 & -4 \end{bmatrix}$ $B=\begin{bmatrix} 0 & 3 & -3 \\ -1 & -2 & 9 \\ 2 & 0 & 3 \end{bmatrix}$

i) Find 2A pause and find 2A-3BI **(5 M)**

ii) Change the values of A & B matrices by using **Keyboard command** and find A*B.
[A(2,3)= -4, A(3,1)= -3, B(1,2)=-5, B(3,2)=7] **(10 M)**

2) Plot the given functions in a same graph and illustrate y2 in dotted lines, y3 in circles.
$y1=\sin^2 t$, $y2= t\cos(2t)$, $y3 = t - \frac{t^3}{6} + \frac{t^5}{120}$ where t = (0, 2π, 100). **(15 M)**

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Max Marks: 30 Max Time: 75 Mins Weightage: 15 %

Set D

TEST 1

I Semester 2016-2017 Course: **CE A 209 CAD for Civil Engineers** 04 October 2015

ID No_____ **Section**_____ **Marks Scored**_____ **Sign of Invi**_____

Questions:

1) Given an integer N, it is required to compute the following sum k=0 to k=N.

$$S= \sum_{K=0}^{N}(k+1)2^k = (0+1)2^0 + (1+1)2^1 \ldots\ldots + (N+1)2^N$$

Let N=15. Compute the sum by using (i) for loop, (ii) conventional while – loop. **(7.5 M +7.5 M)**

2) Obtain the numerical solution of the following second-order differential equation given below with initial condition as x (0) = 0, ẋ (0) =7 for -2 < t <10, using ode 45 solver. **(15 M)**

$$5\frac{d^2y}{dt^2} + 3\frac{dy}{dt} + 9y = (\sin t - \cos t)$$

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Max Marks: 30 Max Time: 75 Mins Weightage: 15 % **Set A**

TEST 1

I Semester 2016-2017 Course: **CE A 209 CAD for Civil Engineers** 04 October 2015

ID No_____ **Section**_____ **Marks Scored**_____ **Sign of Invi**_____

Questions:

1) Obtain the numerical solution of the following second-order differential equation given below with initial condition as x(0) = 0, ẋ=10 for 2 < t <10, using *ode45* solver. **(15 M)**

$$3\frac{d2y}{dt} + 5\frac{dy}{dx} + 9y = -12\tan(t)$$

2) a) write a program to find the lowest of the three numbers using if-elseif-if statement. Check the program by considering any three values randomly. **(7.5 M)**

b) Obtain the numerical solution for the following fourth-order differential equation with initial conditions as y(0) = -2, y'(0) = 1, y''(0) = -3 in Simulink. **(7.5 M)**

$$\frac{d^4y}{dt^4} - 8\frac{d^2y}{dt^2} + 5\frac{dy}{dt} + 4y = -7$$

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Max Marks: 30 Max Time: 75 Mins Weightage: 15 % **Set B**

TEST 1

I Semester 2016-2017 Course: **CE A 209 CAD for Civil Engineers** 04 October 2015

ID No_____ **Section**_____ **Marks Scored**_____ **Sign of Invi**_____

Questions:

1) a) Write a script file for taking sum of squares of odd numbers between 50 - 150. **(5M)**

b) Use a while loop to determine how many terms in the series $5k^2+3\sqrt{k}$, k=1,2,3..are required for the sum of the terms to exceed 5000. What is the sum for this number of terms? **(10 M)**

2) Plot the given data in 3-D graph using bar3h function. Prepare menu and select two states randomly.

a) Tamil Nadu GDP growth. **(15 M)**

2001	2002	2003	2004	2005	2006	2007
10.1	9.2	5.9	3.5	7.8	15.1	12.8

b) Karnataka GDP growth.

2001	2002	2003	2004	2005	2006	2007
9	4.5	6.5	11.3	12	17.7	9.1