Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Online End Semester Examination, May 2020

MA Economics

Mathematical Economics II (Code: ECON 7021)

Instruction: In section A and B, all the questions are compulsory. However, section C has choice, candidate can choose any one of the two questions provided in this section.

SECTION A

1.In which of the following cases, we can use integration? (5x1)

- a. To calculate area under the curve.
- b. To calculate the rate of change in velocity.
- c. To find the roots of given equation.
- d. None of above.

2.In which of the following cases, we can use differentiation? (5x1)

- a. To calculate area under the curve.
- b. To calculate the rate of change in velocity.
- c. To find the roots of given equation.
- d. None of these.

3.What are the roots of $x^5 + 3\,x^3 - 4x$? (5x1)

- a. $x = 0, x = -1$
- b. $x = 0, x = -1, \mathrm{x} = \pm 2\mathrm{i}$
- c. $x = 0, x = 1, x = -1, \mathrm{x} = \pm 2\mathrm{i}.$
- d. None of these.

4.Which one of the following is complex number? (5x1)

- a. 1.
- b. 2i.
- c. $1 \pm 2.$
- d. None of these.

5.idenify the order and degree of following differential equation? (5x1)

$$\frac{dy}{dx} - cosx = 0$$

- a. order=1, degree=2.
- b. order=1, degree=0
- c. order=1, degree=1
- d. None of these.

6.idenify the events where circular function is not useful? (5x1)

- a. study of ocean waves.
- b. study of planets' motion
- c. Seasonal business cycles
- d. None of these.

SECTION B

7-Find the integration of following functions; **(10X1)**

1) $y = sinx$
2) $y = 3x^3$

8-Find solution of following differential equation; **(10x1)**

$x^2dy + y(x + y)dx = 0$

9-Solve the roots of equation: **(10x1)**

$x^3 + 10\,x^2 + 169x = 0$

10-Solve the following differential equation: **(10x1)**

$y''' + 2y'' - y' - 2y = 0$

11-Solve the following differential equation: **(10x1)**

$y''' + 2y'' - y' - 2y = 0$

SECTION C

Choose any one the following topics and provide detailed mathematical explanation for the same.

12-Explain about Solow Growth Model (20x1)

13- A Market Model with Price Expectations (20x1)