UNIVERSITY OF PETROLEUM & ENERGY STUDIES
End Semester Examination (Online) – July, 2020

Program: BA (Hons.) Economics   **Semester: II**
Subject/Course: Mathematical Economics II   **Max. Marks: 100**
Course Code: ECON1018   **Duration : 3 Hours**

IMPORTANT INSTRUCTIONS

1. *The student must write his/her name and enrolment no. in the space designated above.*
2. *The questions have to be answered in this MS Word document.*
3. *After attempting the questions in this document, the student has to upload this MS Word document on Blackboard.*

	Answer all the questions.	Marks	COs
Q.1	Assume that the demand function is $P_d = 25 - Q^2$ and the supply function is $P_s = 2Q + 1$. Compare the consumer surplus and producer surplus under perfect competition and monopoly market structure.	20	3
Q.2	Let the marginal cost function is given as $MC = \frac{dTC}{dQ} = 25 + 30Q - 9Q^2$, where TC is total cost and Q is output. Fixed cost is 65. Find total cost, average cost and variable cost functions.	20	3
Q.3	The rate at which population (P) of a country is growing is given by the equation $\frac{dP}{dt} = 0.02(400 - P)$, given that $P = 100$ at $t = 0$ (t is time in years). (a) Find the expression for P in terms of t. (b) How many years it will take for the population to reach 1000.	20	4
Q.4	Given $I(t) = 9t^{1/2}$, (a) find the amount of capital formation in 8 years, (b) find the amount of capital formation during fifth through the eighth years.	20	4
Q.5	Let the consumption and investment functions are given as Consumption function: $C_t = 200 + 0.75Y_{t-1}$ Investment functions: $I_t = 500 + 0.15Y_{t-1}$ and $Y_0 = 3000$ Assume that $Y_t = C_t + I_t$ (a) Find the time path of national income Y_t (b) Find the value of Y_t at $t = 1$ (c) Comment on the nature and stability of the time path of Y_t.	20	4

ANSWERS