



**MASENO UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2015/2016**

**FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE  
DEGREE OF BACHELOR OF BUSINESS ADMINISTRATION WITH  
INFORMATION TECHNOLOGY**

**CITY CAMPUS**

**AEC 417: RESOURCE ECONOMICS**

Date: 26<sup>th</sup> April, 2016

Time: 9.00 - 11.00am

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**INSTRUCTIONS:**

- **Answer ANY THREE Questions.**



## QUESTION ONE

- a) Highlight on the central subject in the field of resource economics?  
(2mks)
- b) Clearly distinguish between renewable and nonrenewable resources?  
(3mks)
- c) Define the term user cost and explain what happens to the level of harvest or extraction today if user cost increases  
(8mks)
- d) In some resource allocation problems, time is treated as a continuous variable, where the future horizon becomes the interval  $T \geq t \geq 0$ . Suppose  $A$  dollars is put in the bank at an interest rate  $\delta$ , and compounded  $m$  times over a horizon of length  $T$ , then show how the value at the end of the horizon will be given.  
(12mks)

## QUESTION TWO

- a) Explain the four traditional policies of fishery management which have been used to avoid stock depletion.  
(16mks)
- b) The continued decline in commercial fish stocks worldwide has raised serious questions about the long-run effectiveness of any combination of the traditional policies. This has ushered in user cost into the decision calculus of individual fishers. Describe the two policies which have the potential to approximate user cost.  
(9mks)

## QUESTION THREE

- a) Demonstrate the maximization of discounted utility subject to the exhaustion constraint of nonrenewable resources by the Lagrangian approach. (12mks)
- b) Using the Hotelling's rule, explain the concept of maximizing the present value of the initial reserves of competitive mine owners.  
(13mks)

#### QUESTION FOUR

Indicate whether each of the following statements is true or false and briefly explain why.

- (a) In the simple model of a nonrenewable resource, discounted marginal utility should be equated for all periods when extraction is positive. \_\_\_\_\_
- (b) If price equals marginal utility, then, in the simple model, price should rise at the rate of discount. \_\_\_\_\_
- (c) A monopolist would deplete a nonrenewable resource faster than a competitive industry. \_\_\_\_\_
- (d) The choke-off price is a price that is so low that it causes the competitive mining industry to shut down before exhaustion. \_\_\_\_\_
- (e) With reserve-dependent costs, price less marginal cost is rising at less than the rate of discount in the competitive mining industry. \_\_\_\_\_
- (f) An increase in the current (spot) price for oil will cause an increase in exploration. \_\_\_\_\_
- (g) An increase in extraction cost will reduce extraction and exploration. \_\_\_\_\_
- (h) An increase in the discount rate will increase the current rate of extraction and reduce exploration. \_\_\_\_\_
- (i) If, as a resource is being physically depleted, its price does not increase, it is becoming less scarce economically. \_\_\_\_\_
- (j) If the price of a resource increases, substitution, conservation, and exploration might cause the price to fall in the future. \_\_\_\_\_ (25mks)

#### QUESTION FIVE

- a) Non-native settlers of the Pacific Northwest found a vast inventory of old-growth forest. Explain some of the conservation and rotational problems confronting a forest-based economy from inheriting such an old-growth inventory? (8mks)
- b) Briefly explain the following concepts as used in forestry management: mean annual increment, the optimal single rotation, and the Faustmann rotation. (12mks)
- c) Describe how increases in the discount rate would affect the optimal inventory of old-growth forest which a forest economy would choose to preserve. (5mks)