

**THE NATIONAL OPEN UNIVERSITY OF NIGERIA**

**FACULTY OF SOCIAL SCIENCES**

**DEPARTMENT OF ECONOMICS**

**JUNE/JULY 2017 FIRST SEMESTER EXAMINATION**

**COURSE TITLE:OPERATIONS RESEARCH**

**COURSE CODE: ECO 314**

**UNITS: 2**

**TIME ALLOWED: 2 HOURS**

**INSTRUCTIONS: ANSWER THREE QUESTIONS. QUESTION ONE IS COMPULSORY. MARK WOULD BE AWARDED FOR CLARITY AND NEATNESS.**

**QUESTION 1**

A company has two grades of inspectors, I and II to undertake quality control inspection. At least 1,500 pieces must be inspected in an 8-hour day. Grade I inspector can check 20 pieces in an hour with an accuracy of 96%. Grade II inspector checks 14 pieces an hour with an accuracy of 92%. Wages of grade I inspector are #5 per hour while those of grade II inspector are #4 per hour. Any error made by inspector costs #3 to the company. If there are, in all, 10 grade I inspectors and 15 grade II inspectors in the company, find the optimal assignment of inspectors that minimizes the daily inspection cost.**(Total = 25mark**).

**QUESTION 2**

List and explain the assumptions of linear programming model.**(Total = 22.5 mark).**

**QUESTION 3**

1. Who is a decision maker? (**6.5mark**)
2. List the components of decision making.(**8mark**)
3. What are the phases of decision analysis? (**8mark**)

**(Total = 22.5 mark).**

**QUESTION 4**

Investigate if a saddle point solution exists in this matrix:

 2 1 -4

 -3 6 2

**(Total = 22.5 mark).**

**QUESTION 5**

Mr. L.J. Savage pointed out that the decision maker might experience regret after the decision has been made and the states of nature i.e. events have occurred. What are the steps used to solve problems using the criterion advocated by him? **(Total= 22.5 mark).**