



**NATIONAL OPEN UNIVERSITY OF NIGERIA  
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY,  
JABI, ABUJA FACULTY OF MANAGEMENT SCIENCES  
2019\_2 EXAMINATION QUESTIONS**

**COURSE CODE:** BUS 800 **CREDIT UNIT:** 2

**COURSE TITLE:** Quantitative Analysis

**TIME ALLOWED:** 2Hrs

- INSTRUCTION:**
1. Attempt question number one (1) and any other (2) questions.
  2. Question number 1 carries 30 marks, while the other two (2) questions carry 20 marks each.
  3. Present all your points in coherent and orderly manner.

**1a.** Briefly trace the development of OR. **5marks**

**b.** A businessman has constructed the payoff matrix below. Using the EMV criterion, analyse the situation and advise the businessman on the kind of property to invest on. **15marks**

Decision to invest	Good economic condition (#)	Poor economic condition (#)	Turbulent economic condition (#)
Apartment Building $d_1$	50,000	30,000	15,000
Office Building $d_2$	100,000	40,000	10,000
Warehouse $d_3$	30,000	10,000	-20,000
Probabilities	0.5	0.3	0.2

**c.** Discuss any five limitations for Linear Programming **10marks**

**2a.** Let  $C = \{1,3,5\}$  is a subset of  $D = \{5,4,3,2,1\}$ . Find the subset of C and D. **7marks**

**b.** Find the equality of sets A & B also set F & G

**i.** Let  $A = \{1, 2, 3, 4\}$  and  $B = \{3, 1, 4, 2\}$ . **7marks**

c. Find the power of set of the following;

i. Let  $M = \{a,b\}$ , then  $2^M$  equal ..... **3marks**

ii. Let  $T = \{4,7,8\}$ , then  $2^T$  equal ..... **3marks**

3. The purchasing department of a big company has analysed the number of orders placed by each of the 5 departments in the company by type as follows:

Types of Order	Department					Total
	Sales	Purchasing	Production	Account	Maintenance	
Consumables	10	12	4	8	4	38
Equipment	1	3	9	1	1	15
Special	0	0	4	1	2	7
Total	11	15	17	10	7	60

An error has been found in one of these orders. What is the probability that the incorrect order:

a) came from maintenance? **2½marks**

b) came from production? **2½marks**

c) came from maintenance or production? **2½marks**

d) came from neither maintenance nor production? **2½marks**

**b. Outline five (5) advantages and application of simulation 2marks each @ 10marks**

**4a.** Assume there is a drug store with 10 antibiotic capsules of which 6 capsules are effective and 4 are defective. What is the probability of purchasing the effective capsules from the drug store?  
**10marks**

**b. Discuss decisions that are made under conditions of certainty and Uncertainty. 10marks**

**5a.** A firm produces an alloy having the following specifications:

(i) specific gravity  $\leq 0.98$ ,

(ii) chromium  $\geq 8\%$ ,

(iii) melting point  $\geq 450^\circ\text{C}$ .

Raw materials A, B and C having the properties shown in the table can be used to make the alloy.

<b>Property</b>	<b>A</b>	<b>B</b>	<b>C</b>
Specific Gravity	0.92	0.97	1.04
Chromium	7%	13%	16%
Melting Point	440 <sup>0</sup>	490 <sup>0</sup>	480 <sup>0</sup>

Costs of the various raw materials per ton are: #90 for A, #280 for B and #40 for C. Formulate the L.P model to find the proportions in which A, B and C be used to obtain an alloy of desired properties while the cost of raw materials is minimum.

**b.** Explain what scheduling involves and the nature of scheduling. **10marks**