NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI, ABUJA
FACULTY OF MANAGEMENT SCIENCES
2020_1 EXAMINATION

COURSE CODE: **BUS800** **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. 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. **20Marks**

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

1b. Which sets are finite and infinite? **5Marks**

i. The months of the year

ii. {1, 2, 3, ... 99, 100}

iii. The people living on the earth

iv. {x | x is even}

v. {1, 2, 3,.....}

1c. Suppose, in any given week, the probability of an assembly line failing is 0.03 and the probability of a raw material shortage is 0.1.

If these two events are independent of each other, then the probability of an assembly line failing and a raw material shortage is given by: **5Marks**

2a. A wholesaler stocks heavy (2B), medium (HB), fine (2H) and extra fine (3H) pencils which come in packs of 10. Currently in stock are 2 packs of 3H, 14 packs of 2H, 35 packs of HB and 8 packs of 2B. If a pack of pencil is chosen at random for inspection, what is the probability that they are:

(a) medium (b) heavy (c) not very fine (d) neither heavy nor medium? **15Marks**

2b. An ordinary six-sided die is to be rolled, the equally likely outcome set, U, is {1,2,3,4,5,6} and the event 'even number' has event set {2,4,6}. Therefore the theoretical probability of obtaining an even number is easily calculated as **5Marks**

3a. State, with simple examples, the four laws of probability. **10Marks**

3b. 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:

Departmental Orders

Type of Order	Department					
	Sales	Purchasing	Production	Accounts	Maintenance	Total
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:

i) came from maintenance? **2½Marks**

ii) came from production? **2½Marks**

iii) came from maintenance or production? **2½Marks**

iv) came from neither maintenance nor production? **2½Marks**

4a. A display of 15 T-shirts in a Sports shop contains three different sizes: small, medium and large. Out of the 15 T-shirts:

3 are small

6 are medium

6 are large.

If two T-shirts are randomly selected from the T-shirts, what is the probability of selecting both a small T-shirt and a large T-shirt, the first not being replaced before the second is selected?

5Marks

4b. Write short notes on the followings

i. Joint Probability Table **3Marks**

ii. Marginal Probabilities **3Marks**

iii. Conditional Probability **3Marks**

iv. Bayes theorem **3Marks**

v. Mutually exclusive events **3Marks**

5a. Let A ={1,2,3,4}, B={2,4,6,8} and C ={3,4,5,6} be the set.

Find i. (A∪B)∪C, ii. A∪(B∪ C). **10Marks**

5b. Explain the theoretical probability. **10Marks**