

LAGOS CITY POLYTECHNIC, IKEJA
SCHOOL OF MANAGEMENT AND BUSINESS STUDIES
DEPARTMENT OF GENERAL STUDIES
2015/2016 SEMESTER EXAMINATION

COURSE TITLE:	QUANTITATIVE TECHNIQUES	NO OF QUESTION :	5
COURSE CODE:	ACC 315/BAM 313	TIME ALLOWED:	2 HRS
FOR WHOM:	HND YR I AC, BS, AC	INSTRUCTIONS:	ANSWER
ANY FOUR			

QUESTIONS

1. (a) Find the adjoint and inverse of $\begin{bmatrix} 3 & 5 & 2 \\ & 3 & 1 & 2 \\ & & 1 & 1 \end{bmatrix}$

(b) Solve the following system of linear equations

$$x + 2y + 3z = 5$$

$$x + 4y + 2z = 6$$

$$2x + y + z = 8$$

2. What is Linear programming? State its assumptions with graphically illustrations

3. Consider the following problem where the value of c_1 and c_2 have not yet been ascertained

$$\text{Maximize } Z = C_1x_1 + C_2x_2$$

Subject to

$$2x_1 + x_2 \leq 11$$

$$x_1 + 2x_2 \leq 2$$

and

$$x_1 > 0, x_2 > 0$$

Use the graphical analysis to determine the optimal solution(s) for (x_1, x_2) for various possible values of C_1 and C_2 .

4. Jobs arrive randomly at a particular assembly plant, assume that the arrival rate is five jobs

per hour service time (in minutes per job) do not follow the exponential probability distribution. Two proposed designs for the plants assembly operation are shown.

Design	Service Time	
	Mean	Standard Deviation
A	6.0	3.0
B	6.25	0.6

(a) What is the service rate in jobs per hour for each design?

(b) For the service rate in part (a) What design appears to provide the best or fastest service rate?

(c) What are the standard deviations of the service time in hours?

(d) Use the M/GI/1 model to compute the operating characteristics for first design.

5. (a) From (4d) above using the M/GI/1 model to compute the operating characteristics for

the second design?

(b) Which design provides the best operating characteristics?