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**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS**

**MARCH/APRIL 2016 EXAMINATION**

 **SCHOOL OF SCIENCE AND TECHNOLOGY**

**COURSE CODE: FMT313**

**COURSE TITLE: Introduction to Mathematical Modelling in Finance**

**TIME ALLOWED (3 HRS)**

**INSTRUCTION: Answer any 3 questions.**

1. a) Explain the term risk/return trade off. Of what significance is the financial system to any developing country’s economy? 9marks

b) Given an investor’s marginal cost function $MC=Q^{2}+2Q+4,$ find the total cost function if the fixed costs are 100. 14marks

1. The following table is a demand schedule for XYZ shares. It gives a correspondence between the price (p) of a unit and the quantity (q) that investors are willing to purchase at that price.
2. If P=$f(q)$, list the numbers in the domain of f, find *f (2900) and*$f(3000)$.
3. If $q=g(p)$, list the numbers in the domain of g, find $g\left(10\right)and g(17)$.

Price/Unit (P)N Quantity Demanded / week (q)

10 3,000

12 2,900

17 2,300

1. 2,000 23marks
2. a).List and explain the types of models that are useful to operations managers.

 9marks

b).Given that P=N3, AVC (Average Variable Cost) = N1.80 and the TFC (Total Fixed Cost) = N60,000, (i) What is the breakeven level of output? (ii) Graphically illustrate your answer. 13marks

1. Given the function $y=4x^{2}+9$
2. Find the derivative $\frac{dy}{dx}$ 7marks
3. Find $f'(3)$ and $f'(4)$ 8marks
4. Find $f"(2)$ and $f"(3)$ 8marks
5. Given the total cost incurred by an investor for putting up shares for subscription as: TC = 120q – q2 + 0.02q3 and the volume of subscriptions as: P = 114 – 0.25q,
6. Obtain the marginal cost and marginal revenue (return) functions. 9marks
7. At what levels of volume is MC = MR? 13marks