



MUEO

MOI UNIVERSITY

**OFFICE OF THE DEPUTY VICE CHANCELLOR, ACADEMIC
AFFAIRS, RESEARCH & EXTENSION**

**UNIVERSITY EXAMINATIONS
2014/2015 ACADEMIC YEAR**

THIRD YEAR END OF SEMESTER IV EXAMINATIONS

EXECUTIVE MBA PROGRAMME

EXAM CODE:- BBM 350

COURSE TITLE:- MANAGERIAL STATISTICS

DATE:- 23RD SEPTEMBER, 2014 TIME:- 9.00A.M. – 12.00 NOON.

INSTRUCTION TO CANDIDATES

➤ SEE INSIDE.

THIS PAPER CONSISTS OF (2) PRINTED PAGES

PLEASE TURN OVER

ANSWER QUESTION ONE AND ANY THREE OTHER QUESTIONS

QUESTION ONE (25 MARKS)

a) Two dice are thrown simultaneously and the experiment involves recording the sum of the outcome. Find the probability of getting.

- i. Exactly sum of 4
- ii. At least sum of 18
- iii. At most sum of 18

(6 marks)

b) The average age of a vehicle registered in the UK is 8years or 96months. Assume the standard deviation is 16 months. If a random sample of 36 vehicles is selected, find the probability that the mean of their age is:

- i. Between 96 and 100 months
- ii. Between 86 and 104 months
- iii. Below 89 months

(6 marks)

c) Approximately 10.3% of American high school students drop out of school before graduation. Choose 10 students entering high school at random. Find the probability that:

- i. No more than two drop out
- ii. At least 6 graduate

(5 marks)

d) Explain the meaning of the following methods of sampling

- i. Simple random sampling
- ii. Cluster sampling
- iii. Snow ball sampling

(6 marks)

e) Define the following terms

- i. Power of a test
- ii. Unbiased estimate

(2 marks)

QUESTION TWO (15 MARKS)

- a) State the conditions for poisson approximation to binomial (2 marks)
- b). It has been reported that 63% of adults aged 65 and over got their flu shots last year. In a random sample of 300 adults aged 65 and over, find the mean, variance and standard deviation for the number who got their flu shots (5 marks)
- c). Computer hot line receives on average 6 calls per hour asking for assistance. The distribution is poisson. For any randomly selected hour, find the probability that the company will receive
- At least 6 calls
 - 4 or more calls
 - At most 5 calls
 - Between 2 and 4 calls inclusive (8 Marks)

QUESTION THREE (15 MARKS)

- a). What are the characteristics of a normal distribution? (3 marks)
- b). Find the probabilities for each using the standard normal distribution
- $P(0 < Z < 1.96)$
 - $P(-1.23 < Z < 0)$
 - $P(-0.20 < Z < 1.56)$ (6 marks)
- c). In a certain normal distribution, 1.25% of the area lies to the left of 42 and 1.25% of the area lies to the right of 48. Find the μ and δ (6 marks)

QUESTION FOUR (15 MARKS)

- a) In a hospital unit there are 10 nurses and 6 physicians, 7 nurses and 3 physicians are females. If a staff person is selected, find the probability that the subject is:
- A nurse

- ii. A male nurse
- iii. A nurse or a male **(5 marks)**

b) A random sample of 49 shoppers showed that they spend an average of \$ 23.45 per visit at the university bookshop. The standard deviation of the population is \$2.80.

- i. Find a point estimate of the population mean
- ii. Find the 95% confidence interval of the true mean
- iii. Suppose estimation of population mean is to be within maximum error of \$0.8, determine the minimum sample size at 95% confidence level.

(6 marks)

c) Define the following terms

- i. Point estimate **(1 mark)**
- ii. Interval estimate **(1 mark)**
- iii. Central limit theorem **(2 marks)**

QUESTION FIVE (15 MARKS)

- a) (i). Distinguish between one tailed test and two tailed test in statistics **(2 marks)**
- (ii). Explain Type I and Type II errors in hypothesis testing **(2 marks)**
- b). State the conditions under which a student t-distribution is preferred to standard distribution Z **(3 marks)**
- c). (i). A survey of women and men asked what their favorite ice cream flavor was. The results are shown. At $\alpha = 0.05$, can it be concluded that the favorite flavor is independent of gender?

	Flavor			
	Vanilla	Chocolate	Strawberry	Other
Women	69	36	10	2
Men	49	37	5	9

(6marks)

- (ii) Explain any two applications of chi-square test **(2marks)**