LAGOS CITY POLYTECHNIC, IKEJA

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

DEPARTMENT OF ELECTRICAL/ELECTRONICS ENGINEERING

2016/2017 SEMESTER EXAMINATION

COURSE TITLE: TESTING METHOD & RELIABILITY **NO OF QUESTION: 6**

COURSE CODE: EEC 324/EEC 328 **TIME ALLOWED: 2HRS**

FOR WHOM: HND YR I EE, CE PT **INSTRUCTIONS: ANY 4 Questions**

Answer

1. (a) Derive the expression for the reliability of a system in terms of exponential model.

(b) Derive the expression for the failure rate of a
(i) Series system (ii) Parallel system

2. (a) Explain the following:
(i) MTTF (ii) MTTR (iii) Bath tube curve
(iv) Specification (v) Availability (vi) Maintenibility
(vii) Mentiainance

(b) In order to determine the MTBF of a certain component, 50 were tested for a period lasting 200 hours. The times to failure of the components are shown in the table below:

Failure	0	1	1	1	1
Time (x100hrs)	$t_0 = 0$	$t_1 = 2$	$t_2 = 4$	$t_3 = 8$	$t_4 = 10$	$t_5 = 15$
	$t_6 = 35$					

Assuming the use or out failure can be ignored. Calculate
(i) The total tested hours before failure
(ii) Total tested hours without failure
(iii) Total survival hours
(iv) MTBF

3. (a) (i) Life testing is made on six (non-repairable) electrical lamps and the following results were obtained.

Failure	0	1	1	1	1
Time (100Hrs)	$t_0 = 0$	$t_1 = 4$	$t_2 = 10$	$t_3 = 16$	$t_4 = 20$	$t_5 = 23$

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(i) The total tested hours before failure
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(iv) MTBF

(ii) Explain the classification of failure

(b) Explain the five factors that courses system failure.

4. (a) R(t) R1 R2 R3 R4 R5 R6 R7 R8 R9 R10

Reliability Values 0.97 0.87 0.87 0.87 0.98 0.98 0.99 0.96 0.96 0.99

(i) Determine the total reliability of the system.
(ii) What type of system in this
(iii) Sketch the system block diagram

(b) A complex communication satellite has an in built microwave repeater unit having a mean

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