

*S475/1*

*Sub Mathematics*

*Paper 1*

*July/Aug 2016*

ACEITEKA MOCK EXAMINATIONS 2016

UGANDA ADVANCED CERTIFICATE OF EDUCATION

SUB MATHEMATICS

PAPER 1

TIME: 2 HOURS 40 MINUTES

***Instructions to candidates:***

* Answer all the eight questions in section A and any four in section B
* Any additional question(s) answered will not be marked
* All working must be shown clearly
* No paper should be given for rough work
* Graph paper is provided.
* Begin each question on a fresh page.
* Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

**SECTION A: (40 MARKS)**

1. Solve the simultaneous equations

 (5 marks)

1. Expand in ascending powers of

Hence find (0.995)4 (5 marks)

1. If where A and B are constants, show that (5 marks)
2. The letters of the word RESPONSIBILITIES are arranged in different ways such that the vowels are separated. Find the number of the different possible arrangements.
3. A discrete random variable Y has the probability distribution function given by

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| y  | 5 | 8 | 9 | 11 | 12 |
| P(y = y)  | A  | 0.1 | A  | 0.4 | 0.1 |

Find the

1. Value of a (3 marks)
2. E (5Y – 7) (2 marks)
3. Events A and B are independent such that P(A) = and P(A1 UB) =

Find the

1. P(B) (3 marks)
2. P(AUB) (2 marks)
3. A multiple choice exercise has 5 questions each with 5 possible answers. If an ignorant student guesses all the answers, find the probability that he got at least 2 answers correct.

(5 marks)

1. A cyclist is travelling at a steady speed of 5ms–1 up a slope inclined atθ to the horizontal where Sinθ

If the total mass of the cyclist and the bicycle is 80kg, and the resistance due to friction amounts to 1.2N peer kg of mass. Find the work done by the cyclist. (5 marks)

**SECTION B: (60 MARKS)**

1. The heights of 1500 students are normally distributed with mean 175cm and variance of 400cm2. Determine the number of students whose heights were
2. between 140 cm and 160cm (6 marks)
3. greater than 205cm (3 marks)
4. less than 215 cm (3 marks)
5. A car is travelling at a constant speed of 72kmh– 1 and passes a stationary police car, which immediately gives chase accelerating uniformly to reach a speed of 90kmh – 1 in 10 seconds and continues at this speed until it overtakes the other car. Find the
6. Time taken by the police to catch up with the car (13 marks)
7. Distance travelled by the police car when this happens (2 marks)
8. (a) If y = , find

Hence evaluate (8 marks)

(b) Given that ,

Find the approximate change in y if x is increased by 2% when it has a value of 0.75

 (7 marks)

1. A market stall holder sells clothes on three days a week – Tuesday (T), Friday (F), and Saturday (S) . Her takings over a five week period were as follows;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Week  | 1 | 2 | 3 | 4 | 5 |
| Day  | T | F  | S  | T | F | S | T | F | S | T | F | S | T | F | S  |
| Takings £ | 196 | 210 | 343 | 267 | 274 | 336 | 168 | 279 | 315 | 160 | 258 | 310 | 154 | 240 | 312 |

1. On the same axes represent the data and the three days moving averages
2. Closing the graph, suggest the day when a nearby clothes stall was closed.
3. Predict the takings on Tuesday of week 6.
4. A car manufacturer estimates that the rate at which the car depreciates is proportional to the value of the car. If a car which cost £4000 after 5 years. Find the cost after 10 years

(15 marks)

1. The times, correct to the nearest second, taken by 100 athletes to cover one lap of running a track on a sports day were recorded as shown below

|  |  |
| --- | --- |
| Time (sec) | Number of athletes  |
| 70 – 7475 – 7980 – 8485 – 8990 – 9495 – 99 | 820263097 |

Calculate the

1. Mean time (4 marks)
2. Standard deviation (4 marks)
3. Mean time (4 marks)
4. Modal time (3 marks)

***END***