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**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF MATHEMATICS AND ACTURIAL SCIENCE**

**UNIVERSITY EXAMINATION FOR DIPLOMA IN COMMUNITY HEAL / DIPLOMA IN CONSTRUCTION MANAGEMENT**

**1st YEAR 1st SEMESTER 2016/2017 ACADEMIC YEAR**

**MAIN REGULAR**

**COURSE CODE: SMA 2111**

**COURSE TITLE I: MATHEMATICS**

**EXAM VENUE STREAM: Diploma in community health and construction management**

DATE: EXAM SESSION: ONE

TIME: 2.00 HOURS

**Instructions:**

1. **Answer ONE and any other two questions only.**
2. **Candidates are advised not to write on the question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

**QUESTION ONE (30 marks) (COMPULSORY)**

1. Let be the universal set, ,  Find: (6 marks)

(i). AUB,

(ii). 

(iii). 

(iv). 

(V). Card (C)

(Vi). 

1. In a survey of 120 people, it was found that 65 read newsweek magazine, 42 read fortune and 45 read time. Out of the above population, it was realized that 20 people read both newsweek and time, 25 read both newsweek and fortune, 15 read time and fortune while 8 read all three magazines.
2. Represent the above information using Venn diagram. (2 marks)
3. Find the number of people who read atleast one of the three magazines (2 marks)
4. Fill in the correct number of people in each of the regions of the venn diagram where N,T and F denote the set of people who read newsweek, time and fortune respectively. (2 marks)
5. Convert radians to degrees. (2 marks)
6. Given find and  (3 marks)
7. Find the exact value of  (4 marks)
8. Given A and B are two events, so that ,and Find  (3 marks)
9. How many terms of geometric progression 1+3+9+… make a sum of more than 50,000.

(3 marks).

 **QUESTION TWO (20 MARKS)**

1. Differentiate between a sequence and series (2 marks)
2. Find the first term and the common difference of arithmetic sequence given that 8th term is 8 and 20th term is 44. Hence find the sum of the first ten terms of arithmetic progression.

(5 marks)

1. Given n-2, n, n+3 are three consecutive terms of geometric progression. Find **n** and the next one term. (3 marks)
2. Without using a calculator evaluate $\left(\genfrac{}{}{0pt}{}{5}{}C\genfrac{}{}{0pt}{}{}{3}\right)$and $\left(\genfrac{}{}{0pt}{}{8}{}P\genfrac{}{}{0pt}{}{}{5}\right)$ (2 marks)
3. Use binomial theorem to expand $(2+x)^{5}$ and hence evaluate$(2.01)^{5}$. (4 marks)
4. Find the coefficient of in the expansion of $(3+2y)^{8}$ (2 marks)
5. How many different committees of seven people can be chosen from a group of ten people

 (2 marks)

 **QUSTION THREE(20 MARKS)**

1. Solve the equation  (4 marks)
2. A total of Ksh. 18000 is invested. Some in stock and some in bonds. If the amount invested in bonds is half-that invested in stock. How much is invested in each category. (3 marks)
3. Find the real solution of  (3 marks)
4. Without using calculator, find the values of  (3 marks)
5. Solve for , .  (4 marks)
6. Simplify  (3 marks)

**QUSTION FOUR (20 MARKS)**

1. Use tree diagram to illustrate the sample space for the experiment of the sex of children in families consisting of three children. (3 marks)
2. Find the probability that the family has atleast one boy (2 marks)
3. Find the probability that the family has all children girls or boys (2 marks)
4. Find the probability that the family has atleast one boy and atleast one girl. (3 marks)
5. Ksh. 20,000 is deposited in an account which earns a compound interest at the annual rate of 20%. Find the amount after four years. (3 marks)
6. Write as sumand difference of logarithms. (4 marks)
7. Solve  for  (4 marks)

**QUESTION FIVE (20 MARKS)**

1. The data represents the masses of some containers sampled from a warehouse.

51, 32, 40, 41, 49, 52, 35, 38, 42, 44, 52, 56, 56, 61, 45, 46, 47, 46, 62, 51, 54, 53, 54, 53, 54, 57, 54, 64, 55, 56, 56, 59, 56, 63, 65, 67, 72

1. represent the above information on frequency distribution table

(use class interval 30-34, 35-39,…..) (5 marks)

1. Calculate the mean, mode, median, variance and standard deviation (15 marks)