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

**SCHOOL OF BUSINESS**

**UNIVERSITY EXAMINATION FOR THE CERTIFICATE IN COMMUNITTY DEVELOPMENT**

**1ST YEAR 2ND SEMESTER 2016/2017 ACADEMIC YEAR**

**KISII CAMPUS-PART TIME**

**COURSE CODE: SMA 1111**

**COURSE TITLE: MATHEMATICS 1**

**EXAM VENUE: STREAM: (Cert in Community Health Development)**

**DATE: EXAM SESSION:**

**TIME: 2 HOURS**

**Instructions:**

1. **Answer Question ONE (COMPULSORY) and ANY other 2 questions**
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**

1. A campaign manager must assign 15 campaigners to three matatus: 6 in the first matatu, 5 in the second, and 4 in the third. In how many ways can this be done (3 Marks)
2. Find the 10th term of the sequence 3, 5, 7, 9, ... (2 Marks)
3. In a class there are 8 students who play football and hockey, 7 students who do not play football or hockey, 13 students who play hockey and 19 students who play football. Use a Venn diagram to determine how many students are there in the class? (4 Marks)
4. If X = {a, e, i, o, u} and Y = {a, b, c, d, e}, then what is Y - X? (2 Marks)
5. Use the binomial theorem to expand (2*x*2 - 3)4 (4 Marks)
6. The table below shows time to travel to work

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Time to travel | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 |
| Frequency |  9 | 14 | 12 | 9 | 7 |

1. Find the mean
2. Find the median
3. Find the mode (9 Marks)
4. Simplify each of the following trigonometric expressions
5. Sin2x – cos2x sin2x
6. (6 Marks)

**QUESTION TWO**

1. How many combinations are there of 9 identical umbrellas on a rack of 15 coat hooks ( 3 marks)
2. If A = {1, 3, 5, 7, 9} and B = {2, 3, 5, 7}, what is A ∩ B? (1 Mark)
3. If the present value of my investment is ksh. 1,000 and the rate of interest is 10% compounded annually, what will the value be after 6 years? (4 Marks)
4. Let A, B and C be sets. Prove that A × (B ∪ C) = (A × B) ∪ (A × C) (3 Marks)
5. Prove that sin x + cos x cot x = csc x (4 Marks)

**QUESTION THREE**

1. After 6 matches the mean number of goals scored by Shabana FC per match is 1.5. If they score 4 goals in their 7th match, what is the mean after the 7th match? (3 Marks)
2. How many distinguishable arrangements are there of the word SUCCESS? (2 Marks)
3. Solve the following Quadratic equations
4. x 2 – x – 6 = 0
5. 2x2 +7x + 3 = 0 (6 Marks)
6. Simplify the following trigonometric expression

 (4 Mks)

**QUESTION FOUR**

1. The mean number of a set of 5 numbers is 12.8. What extra number must be added to bring the mean up to 13.4? (2Mks)
2. How many different arrangements can be made using two of the letters of the word TEXAS if no letter is to be used more than once (3Mks)
3. Safaricom surveyed 400 of its customers to determine the way they learned about the new PostPay tariff. The survey shows that 180 learned about the tariff from radio, 190 from television, 190 from newspapers, 80 from radio and television, 90 from radio and newspapers, 50 from television and newspapers, and 30 from all three forms of media. Draw a Venn diagram to represent this information ( 3 Mks)
4. Using your Venn diagram, determine the number of customers who learned of the tariff from at least two of the three media (3 Mks)
5. Determine the number of customers who learned of the tariff from exactly one of the three media (2 Mks)
6. Determine the number of customers who did not learn of the tariff from any of the three media (2 Mks)

**QUESTION FIVE**

1. If the present value of my investment is Ksh. 9,000 and the rate of interest is 3½% compounded annually, what will the value be after 4 years? (4 Marks)
2. In how many ways can a class of 20 children be split into two groups of 8 and 12 respectively if there are two twins in the class who must not be separated? (5 Marks)
3. The 6th term of an arithmetic sequence is 27 and the 10th term is 43. Find
4. The 1st term
5. Common difference
6. The 16th term (6 Marks)