MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS STATISTICS AND ACTUARIAL SCIENCE

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN FASHION, DESIGN AND MARKETING

2803/101: MATHEMATICS

DATE: 16/4/2019   **TIME: 8:30 – 11:30 AM**

INSTRUCTIONS:

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Answer question one and any other two.

Illustrate your answers with suitable diagrams wherever necessary

1. a) Show that $0.\overline{03}$ is a rational number   (3 marks)

    b) Three countries A ,B and C in a certain region shared revenue in the ratio 3:2:1. If sh 7000000 was allocated to them during a certain period , how much money did each county get?   (5 marks)

    c) Y varies inversely as the square of X.The difference between the value of y when x=6 and x=10 is 16. Find the law connecting x and y. Hence find x if y=4

                                                                                   (10 marks)

    d) In 2008,the number of student in drama club were 63. In the following year , the number of students in the club were 72.   (10 marks)

        i)   In what ratio did the number increase
        ii) If in 2010 the number of students in the club were 54.In what ratio did the number decrease from 2009.

    e) If the ratio x:y=2:3 and ratio y:z =5:6, find the ratio x:y:z   (2 marks)

2.

i) The sum of the 1ˢᵗ eight terms of an arithmetic progression (AP) is 220. If the 3ʳᵈ term is 17, find the sum of the 1ˢᵗ six terms. (5 marks)

ii) The 4ᵗʰ term of a geometric sequence is 16. If the 1ˢᵗ term is 2. Find , common ratio and 7ᵗʰ term (8 marks)

iii) Given the geometric sequence 4,12,36………….Find the 4ᵗʰ, 5ᵗʰ and the general law (7 marks)

3.

i) A frustrum has a rectangular base measuring 8cm by 6cm and a rectangular top measuring 4cm by 3cm. The frustrum is melted and cast into a cone. The height of the frustrum is 3cm. if the cone has a height of 9cm, find the slanting height of the cone. (10 marks)

ii) A frustrum of a rectangular base measuring 12cm by 10cm, and rectangular top measuring 6cm by 5cm and has a slant length of 8cm and a vertical height is 6cm. Calculate the total surface area of the frustrum. (10 marks)

4.

i) Given that x varies jointly as y and the square of z. If x=18,when y =9 and z=15,find z when x=32 and y=81 (7 marks)

ii) Given that c varies as the square of x and inversely as the cube of y and c=18 when x =3 and y =2. Find the value of c when x =2 and y =4 and the value of x when c=48 and y=x (8 marks)

iii) 45 men can sew 210 dresses in 60 days . how many dresses can be sewed by 72 men in 50 days, assuming all the work is done at the same rate (5 marks)

5.

i) A sum of money sh 28000 borrowed for four years amounts to sh 38640. Find the rate petr cent p.a. simple interest. (5 marks)

ii) A man borrows ksh 2500 at 10% p.a compound interest. At the end of each year, he pays back ksh 1000. How much does he owe at the beginning of the third year? (5 marks)

iii) Find the compound interest on sh.5000 at 12 p.a. in 5 years, if interest is added quarterly. (5 marks)

iv) A sewing machine is sold under a higher purchase at a deposit of sh 2030 and 12 monthly instalments of sh 1650 each. If the higher purchase price is 18% higher than the cash price, determine the cash price. (5 marks)