S4 ADDITIONAL MATHS HOLIDAY WORK (PAPER 2 APPLIED), APRIL ,2015

INSTRUCTIONS; (1)Do all questions.

(2) Use ruled paper and graph papers

(3)Take g=9.8ms^{-2}

1)The table below shows the heights in cm of 140 students of a certain class;

Height	145-149	150-154	155-159	160-164	165-169	170-174	175-179	180-184
Frequency	8	15	25	40	33	12	5	2

(a) Plot a cumulative frequency curve. Use your curve to estimate the (i) median height, (ii)lower and upper quartiles, (iii) semi- inter quartile range.

(b) Calculate the mean and standard deviation.

2) A body of mass 5kg is released from rest at the top and on the surface of a rough plane inclined at 30^0 to the horizontal . It takes 2.5seconds to reach the bottom of the plane. If the coefficient of friction between the plane and the mass is 0.389, calculate the (a) normal reaction of the plane to the body, (b) acceleration of the mass, (c) speed at which the body reaches the bottom of the plane, (c) distance covered by the body to reach the bottom.(d) work done against friction.

3)The data below shows final examination scores which 12 students obtained in maths(x) and phyics (y);

x	35	56	65	78	49	82	20	90	77	35	52	90
y	57	75	62	75	53	100	38	82	82	20	43	79

(a)Plot a scatter diagram and comment on the relationship between x and y.

(b)Calc ulate the rank correlation coefficient between x and y. Comment on your result.

4) a train stops at stations R and T which are 2.1km apart in a straight line. It accelerates uniformly from R at 1ms^{-2} for 20seconds and maintains a constant speed for a time before decelerating uniformly to rest at T at 2ms^{-2}.

(a) Calculate the (i)constant speed , (ii) time taken during deceleration , (iii) time for which the train is at a constant speed, (iv) average speed of the train

(b) Draw a velocity -time graph for the motion of the train.

5)The table below shows the monthly tax revenue in billions of shillings collected by a certain revenue authority during a period of one year.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Revenue	2.2	2.8	2.6	2.6	2.7	3.4	2.5	3.9	3.7	3.6	4.6	4.6

(a)Calculate the three – point moving averages for the data, giving your answers correct to one decimal place.

(b)(i)On the same axes, draw graphs showing the three – point moving averages and the actual data.

(ii)comment on the trend.

6)In a rectangle ABCD, AB=3cm and AD= 1cm. Forces of 3N, 2N, 2N and 4N act along AB, CB, DC and AD respectively. Find the magnitude and direction of the resultant force.

7)A particle of mass 4kg lies on a plane inclined at 30^0 to the horizontal. It is connected by a light inextensible string, running over a fixed smooth pulley, to a body of mass 6kg which is hanging freely.

(a) Suppose there is no friction involved, find the acceleration of the body and the tension in the string.

(b)If there is a frictional force of 2N acting along the plane, what would be the new acceleration and tension ?

END