TRINITY COLLEGE NABBINGO
BEGINNING OF TERM I EXAMINATIONS
S.6 APPLIED MATHEMATICS
TIME: 1½ HOURS

INSTRUCTIONS

- *Attempt **all** questions.*
- *All working must be clearly shown*
- *In Numerical work take $g=9.8ms^{-2}$*

SECTION A

1. A particle begins from a point $\begin{pmatrix}5\\4\end{pmatrix}$ metres with a constant velocity of $\begin{pmatrix}2\\-1\end{pmatrix} ms^{-1}$. Find its;
   (i) initial distance from the origin,
   (ii) distance from the origin after 5 seconds. *(5 marks)*

2. If A and B are independent events;
   (i) Show that the events A and B^1 are also independent.
   (ii) Find P (B) given that P (A) = 0.4 and $P(AUB) = 0.8$ *(5marks)*

3. A teacher gave two tests in chemistry. Five students were graded as follows.

	GRADES				
Test 1	A	B	C	D	E
Test 2	B	A	C	D	E

   Determine the rank correction coefficient between the two tests and comment on your results. *(5 marks)*

4. (a) Show that the final velocity of *V* of a body which starts with an initial velocity *u* and moves with uniform acceleration *a* consequently covering a distance *x* is given by.

$$V = \left[u^2 + 2ax\right]^{\frac{1}{2}}.$$

   (b) Find the value of x in (a) if $V = 30ms^{-1}$, u = $10ms^{-1}$ and $a = 5ms^{-1}$ *(5 marks)*

5. A light inextensible string passes over a smooth pulley fixed at the top of a smooth plane inclined at 30^0 to the horizontal. A mass of 4kg is attached to one end of the string and hangs freely. A mass, *m* is attached to the other end of the string and rests on the inclined plane. If the system is in equilibrium, find *m*. *(5 marks)*

6. The heights, in centimeters of children in a certain class were;

Heights (cm)	151 – 153	154 – 156	157 - 159	160 - 162	163 – 165	166 - 168
Frequency	2	14	13	13	2	1

Calculate the;
(i) Mean height
(ii) Standard deviation *(05 marks)*

7. The table below shows the expenditure (Ug.shs) of a student during the first and second terms.

ITEM	EXPENDITURE		WEIGHT
	1st term	2nd term	
Pocket money	55,200	57,500	3
Books	80,000	97,500	8
Clothings	46,500	49,350	5

Using first term expenditure as the base, calculate the average weighted price index to one decimal place. *(05 marks)*

8. A random variable *X* has the following probability distribution.
$P(x=0)=\frac{1}{8}$, $P(x=1)=P(x=2)=\frac{3}{8}$ and $P(x=3)=\frac{1}{8}$. Find the;
(a) Mean of x.
(b)Variance of x. *(5 marks)*

END

Happy New Year