

**SENIOR FIVE MATHEMATICS PAPER TWO REVISION QUESTIONS**

**APPLIED MATHEMATICS P425/2**

1. Ten schools in Wakiso district which attract a similar number and type of students are ranked in terms of quality of education and nature of buildings. The results are given as below where rank 1 indicates the best education and buildings respectively.

School	Quality of education	Nature of building
Q	3	3
R	7	5
S	4	10
T	6	7
U	8	2
V	2	1
W	5	8
X	9	6
Y	10	4
Z	1	9

Is there any evidence that the nature of buildings influences the quality of education?  
(05 marks)

2. A body of mass 250g is initially at rest at a point O on a smooth horizontal surface. A horizontal force F acts on the body and causes it to move in a straight line across the surface. If the magnitude of F is given by  $F = \left(\frac{1}{4x+5}\right)N$  where x is the displacement of the body from O at any instant, find the velocity of the body where  $x = 8m$ .  
(05 marks)
3. A force of magnitude 3N acts along the line  $x + y = 5$  and a force of magnitude 4N acts along the line  $y = x$ . Find the magnitude of the resultant force and the equation of its line of action.  
(05 marks)
4. A school can either do Resourceful mock (R) or Internal mock (I) papers to prepare candidates for final exams. The mocks are chosen according to the choice made by the candidates. The probability that mock R is chosen is  $\frac{1}{4}$ . The probability that if mock R is

chosen, candidates will pass final exams is  $\frac{2}{3}$  and the corresponding probability that the candidates pass final exams if they chose mock I is  $\frac{1}{3}$ .

- (a) What is the probability that the candidates will pass the final exams?
- (b) Given that candidates did the final exam and indeed passed, find the probability that they chose to do mock R.

(05 marks)

5. Mukasa travelled by bus from Town A towards Town B which is 120km from A. The bus took off from A at 8.00 a.m and after 20 minutes he realized that they still had 80km to reach B. After a further 20 minutes, he realized that they had covered 80km.
- (a) At what time did the bus reach town B.
  - (b) If Mukasa dozed off before reaching B and the bus reached Town C at 9.05 a.m, find the distance between B and C.

(05 marks)

6. The numbers  $x = 30.452$ ,  $y = 4.25$  and  $z = 2.325$  are all rounded off to the nearest decimal places. Find the range with in which the value  $\frac{x + y}{z}$  lies.

(05 marks)

7. A particle of mass 2kg falls vertically passing through two points A and B. The speeds of the particles as it passes A and b are 1m/s and 4m/s respectively. The resistance against which the particle falls is 9.6N. Determine the distance AB.

(5marks)

8. Three events A, B and C are such that A and B are independent, A and C are mutually exclusive. Given that  $P(A) = 0.4$

$$P(B) = 0.2$$

$$P(C) = 0.3$$

$$P(A \cap C) = 0.1$$

Determine; i)  $P(A \cup C)$

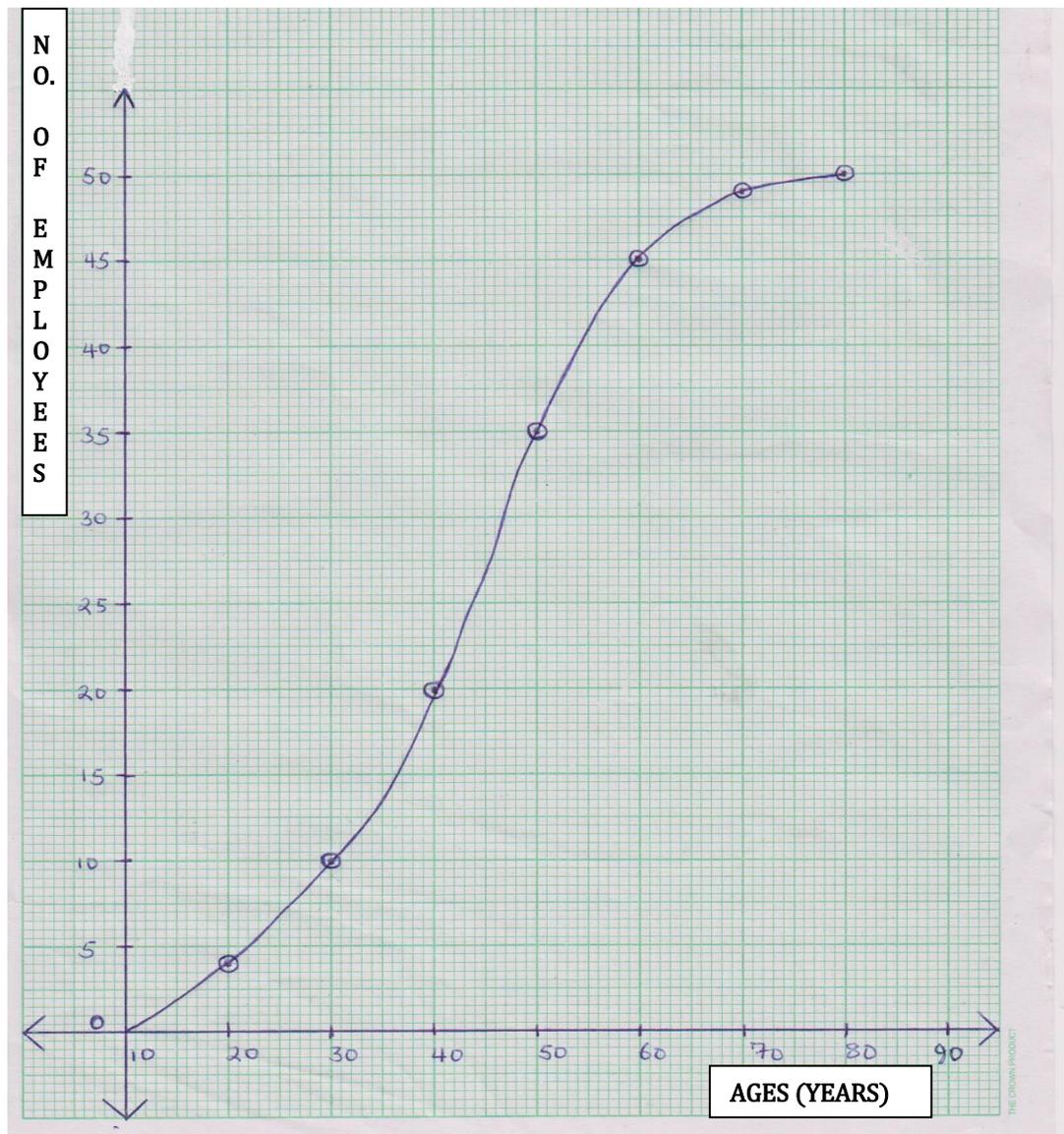
$$\text{ii) } P\left(\frac{B}{A \cup C}\right)$$

9. Given the numbers A and B with  $A = 7.35$   $B = 9.214$  measured to the nearest decimal places indicated,

- i) Determine the absolute error in  $\frac{A}{B}$ .

- ii) Find the limits within which the quotient  $\frac{A}{B}$  lies correct to 3 decimal places.  
(5marks)

10. CUMULATIVE FREQUENCY CURVE FOR THE AGES OF EMPLOYEES OF A CERTAIN SCHOOL.



- (a) Use the curve above to estimate the;  
 (i) variance.  
 (ii) age exceeded by 50% of the school employees.

(iii) age range for the central 70% of the distribution. (07 marks)

(b) Hence or otherwise obtain the;  
 (i) mean age.  
 (ii) modal age. (05 marks)

11. a) Show that the equation  $x^3 + 3x^2 - 1 = 0$  has a real root between  $x = -3$  and  $x = -2$  (3marks)

b) Using linear interpolation, find the first approximation for this root. (3marks)

12 . In a particular year 80 children enter a certain large infant’s school. The ages of the children on the day they first attend the school are given in the table below.

Age in years	4 ¼ -	4 ½ -	4 ¾ -	5-	5 ¼ -	6-	7 ¾ -
Number of children	0	10	35	18	10	5	2

a) Represent the entries on a Histogram.

b) Estimate the expected age of joining infantry.

c) Find the probability that a child in the catchment area joins school when still under 5years of age.

13. Two forces  $F_1$  and  $F_2$  have magnitudes  $\alpha$  and  $\beta$  and act in the directions  $\hat{i} - 2\hat{j}$  and  $4\hat{i} + 3\hat{j}$  respectively. Given that the resultant is  $F = 3\hat{i} + 4\hat{j}$  find  $\alpha$  and  $\beta$ . (5marks)

14. A particle of mass 2kg hangs freely and is connected by a light inextensible string that passes over a smooth pulley at the top of an incline to a particle of mass 4kg resting on the rough surface of this incline at  $60^\circ$  to the horizontal. If the coefficient of friction between the surfaces is 0.25 and when the system was released from rest, the 4kg mass slid down the plane, find the acceleration of the system and the tension in the string.

(05arks)

15. Mukono and Jinja are 66km apart. At 8:00a.m, Paul starts cycling towards Mukono from Mbikko town which is 2km away from Jinja. If at 8:00p.m, he has only covered 36km, use linear estimation to find;

(a) when he reaches Mukono,

(b) his distance from Mukono at 1:00p.m.

(05 marks)

16. Two particles P and Q are moving along a straight path. When Q is ahead of P by 14m the speed of Q is  $16 \text{ m s}^{-1}$  and that of P is  $25 \text{ m s}^{-1}$ . Given that P and Q have a constant retardation of  $6 \text{ m s}^{-2}$  and  $4 \text{ m s}^{-2}$  respectively, find the distance Q has travelled when it is first overtaken by P.

17. A particle is projected from a point P with an initial speed of  $78.4 \text{ m s}^{-1}$  at an angle of  $30^\circ$  with the horizontal. Calculate the;

(i) velocity of the particle  $\frac{1}{2}$  second after leaving P. (ii) greatest height reached.

18. Forces of 2N, 4N, 3N and 2N act along the sides PQ, QR, RS, SP, of a square PQRS of side 3m. A force of  $\sqrt{5} \text{ N}$  acts along QM where M is the mid-point of PS. The line of action of their resultant cuts PQ produced at K. Calculate

a) The magnitude of this resultant

b) The angle this resultant makes with PQ.

19. Triangle ABC has side  $AB = 3.7 \text{ cm}$ ,  $BC = 5.7 \text{ cm}$  both values have been measured to 2 significant figures and angle at B is  $120^\circ \pm 0.50^\circ$ . Find the limits within which the area of the triangle lies.

20. A small pulley is fixed at a height of 3m vertically above a point K of a horizontal rough table. A body of mass 6.5kg rests on the table at a distance 4m from K. A string, with one end fastened to the body, passes over the pulley and has a mass of 2.5kg hanging from the other end. Given that the body is on the point of slipping, calculate the coefficient of friction between the body and the table.

