**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM NO: \_\_\_\_\_\_\_\_\_\_\_\_CLASS:\_\_\_\_\_\_\_\_\_**

**DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SIGN: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_TARGET\_\_\_\_\_\_**

**FORM FOUR**

**MATHEMATICS**

**MID-TERM EXAM**

**TERM 1, 2024**

**INSTRUCTIONS: (ANSWER ALL THE QUESTIONS) TIME: (1 HOUR 30 MIN)**

1. The table below shows the marks scored by eighty form 4 students in a mathematics test.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 10≤X<20 | 20≤X<30 | 30≤X<40 | 40≤X<50 | 50≤X<60 | 60≤X<70 | 70≤X<80 | 80≤X<90 |
| Frequency | 2 | 5 | 9 | 17 | 22 | 15 | 8 | 2 |

1. Using assumed mean of 555, calculate
2. The mean (3mks)

ii. Standard deviation. (3mks)

iii. Median (2mks)

iv. Students who scored 74% and above. (2mks)

2. OABC is a parallelogram with vertices O(0,O), A(2,0), B(3,2), C(1,2). OIAIBICI is an image of OABC under transformation matrix $\left(\begin{matrix}1&0\\0&-2\end{matrix}\right)$

 a. Find the coordinator of OIAIBICi (2mks)

b. On the graph provided draw both OABC and OIAIBICI (3mks)

c. Draw OIIAIIBIICII the image of OIAIBIC under transformation $\left(\begin{matrix}1&0\\0&-2\end{matrix}\right)$ (3mks)

 d. Find a single transformation matrix that maps OIIAIIBIICI to OABC. (2mks)

3. An aircraft leaves town X(35Os, 20oE) and moves directly Northwards to Y(65ON, 20OE). It then moved at an average speed of 60km/hr for 8 hours westwards to town Z. Taking the radius of the to be 6370, determine to on decimal place

 a. The distance between Y and X (3mks)

1. The position of Z (4mks)
2. The total distance travelled from X to Z in nautical miles. (3mks)

4. A particle moves such that t seconds after passing a certain point o its distance s metres from O is given by s=s(t-2) (t-1). Find

 a) Its displacement when t=1seconds (1mk)

 B. Its velocity when t=2seconds (2mks)

1. Its maximum velocity. (3mks)
2. Time when the particle is momentarily at rest. (2mks)
3. Its acceleration when time =3second.

5. Using a ruler and a pair of compasses construct a triangle ABC such that AB=10cm, <ABC=30O and <BAC=45O. (3mks)

 b. Draw the locus of LI such that, LI is equidistant from line AB and AC. (2mks)

c. Draw the locus of L2 such that it’s equidistant from A and B. (2MKS)

d. Draw the locus of point p on the side as C such that APB=90o Let LI meet p at X and L2 meet at Y. Measure XY. (3mks)

6. In the figure below VA=VB=VC=VD=10cm. Plane ABCD is parallel to the base EFGH. Which is a square of 8cm.

V

10cm

20cm

C

D

A

B

8cm

8cm

8cm

H

E

8cm

G

P

1. Find the length of AB. (2mks)

B. Calculate in two decimal places

 i. Length of CA (2mks)

 ii. The perpendicular height of the pyramid VABCD. (2mks)

 iii. Find the volume of the frustum ABCDEFGH