UNIRAZAK
UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION

MARCH 2024

COURSE TITLE	**MODERN GEOMETRICS**
COURSE CODE	**EMAT3143**
DATE/DAY	**23 JUNE 2024 / SUNDAY**
TIME/DURATION	**09:00 AM - 11:00 AM / 02 Hour(s) 00 Minute(s)**

INSTRUCTIONS TO CANDIDATES :

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of 2 Printed Pages including front page)

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

There are FOUR (4) questions in this section. Answer ALL questions in the answer booklet.
[50 MARKS]

SECTION A

1. If $z = 3 + 5i$ express $\frac{z+3i}{5+2i-z}$ in the form of a + *bi*. Hence find $\left|\frac{z+3i}{5+2i-z}\right|$.

(10 marks)

2. Find the vertex, focus, directrix and sketch the graph for each parabola using Geogebra.

i) $(y-3)^2 = 4(x+2)$ (10 marks)

ii) $(y-2)^2 = -16(x+1)$ (10 marks)

3. Find the equation of the circle that pass through the point A (4, 6) and B (4, -2) and the equation of the diameter is $x - 4y + 2 = 0$

(10 marks)

4. The bridge at Kampung Lemang was collapsed during the recent flash flood. The lack fund had forced the local government to build a suspension bridge with the shape of parabola. At each of the end of the bridge is supported by two towers which are placed 150 meter apart. The distance between the highest point of the bridge and water surface is 30 meter. If the bridge touches the river surface midway between towers, what is the height of the bridge at a point 25 meter from the middle of the bridge?

(10 marks)

***** END OF QUESTION PAPER *****