UNIRAZAK
UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION

MARCH 2023

COURSE TITLE **DISCRETE MATHEMATICS**

COURSE CODE **EMAT3133**

DATE/DAY **22 JUNE 2023 / THURSDAY**

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*****

SECTION A **[50 MARKS]**

There are FIVE (5) questions in this question paper. You are required to answer ALL questions.

1. Derive the accurate justification and example for the equivalence function;

   a. Symmetric
   b. Transitive
   c. Reflexive

   (9 Marks)

2. By using the permutation counting techniques, justify how many different way can you arrange 3 books on a shelf from a group of 7? (9 Marks)

3. Derive the logical equivalences regarding statement formulas using truth table.

   $$[p \text{ A } (\neg p \text{ V } q)] \text{ V } [(\neg (p \text{ A } q)) \text{ A } (p \text{ V } q)]$$

   (10 Marks)

4. a) Determine the first 6 terms for the following function:

   $F(0) = 0$, and $F(n + 2) = 2F(n) + F(n + 1)$ for $n \geq 0$.

   $F(1) = 1$

   (12 Marks)

   b) Find the recursion formula for 10,13,16,19,22, ... (3 Marks)

5. Construct a graph degree sequence of 0,3,4,4,5,5,5. (3 Marks)

6. Draw a binary for the following algebraic expression.

   $$\frac{5(2-x)}{4+[7-(y+2)][y+y]}$$

   (10 Marks)

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