QUESTION 4 (25 marks)

a. There are 7 equally qualified finalists in the Young Investors competition. The champion is to receive a RM 5000 cash prize, the first runner up receives RM 3000 and the second runner up receives RM 1000. If two of the finalists are from UUM, what is the probability that the RM 5000 and RM 3000 cash prizes are won by them?

   (2 marks)

b. The cycle time required to manufacture a complex engine part can vary depending on many factors. Three intervals of time are defined:

   A: Less than 10 hours
   B: More than 9 hours, but less than or equal to 9.5 hours
   C: More than 9.5 hours

   Records shows that \( P(A) = 0.85 \) \( P(B) = 0.25 \) and \( P(C) = 0.35 \).
   i. What is the probability that a part requires 10 or more hours to be manufactured?

      (1 mark)

   ii. What is the probability that a part requires 9.5 hours or less?

      (1 mark)

c. The expiry date on packages of bread is stamped at the end of the assembly line by one of four inspectors.

   Siti, who stamps 20% of the packages, fails to stamp once in every 200 packages.
   Rani, who stamps 60% of the packages, fails to stamp once in every 100 packages.
   Nora, who stamps 15% of the packages, fails to stamp once in every 90 packages.
   Liza, who stamps 5% of the packages, fails to stamp once in every 200 packages.

   i. Draw a tree diagram with the probabilities to portray the events.

      (3 marks)

   ii. Show that the probability a randomly chosen package does not have an expiry date is 0.009.

      (2 marks)

   iii. Find the probability that a randomly chosen package is stamped by Rani or does not have an expiry date.

      (2 marks)

   iv. If a customer complains that her package of bread does not show the expiry date, what is the probability it was inspected by Nora?

      (2 marks)

d. Among 150 persons interviewed as part of an urban mass transportation study, some live more than three miles from the city centre (A), some regularly drive their own car to work
QUESTION 5 (21 MARKS)

A box contains 45 marbles. 28 of the marbles are yellow and the rest are blue. 10 yellow marbles are swirled. 15 of the blue are swirled. One marble is randomly selected.

a. Draw a venn diagram for the event above. (4 marks)
b. Draw a complete tree diagram for the event. (3 marks)
c. Find the probability that the randomly selected marble is:
   i. Solid(non-swirled). (2 marks)
   ii. blue and it is swirled. (2 marks)
   iii. yellow or it is solid(non-swirled). (2 marks)
d. Let you are asked to draw 3 marbles one by one without replacement (not consider whether it non-swirled or swirled), and let X is the number of blue marble selected.
   i. Construct a probability distribution table for this event. (4 marks)
   ii. Find the probability that:
      ii(a). there are two blue marbles are selected. (1 marks)
      ii(b). not more than two yellow marbles are selected. (2 marks)
      ii(c). no yellow marbles is selected. (1 marks)