



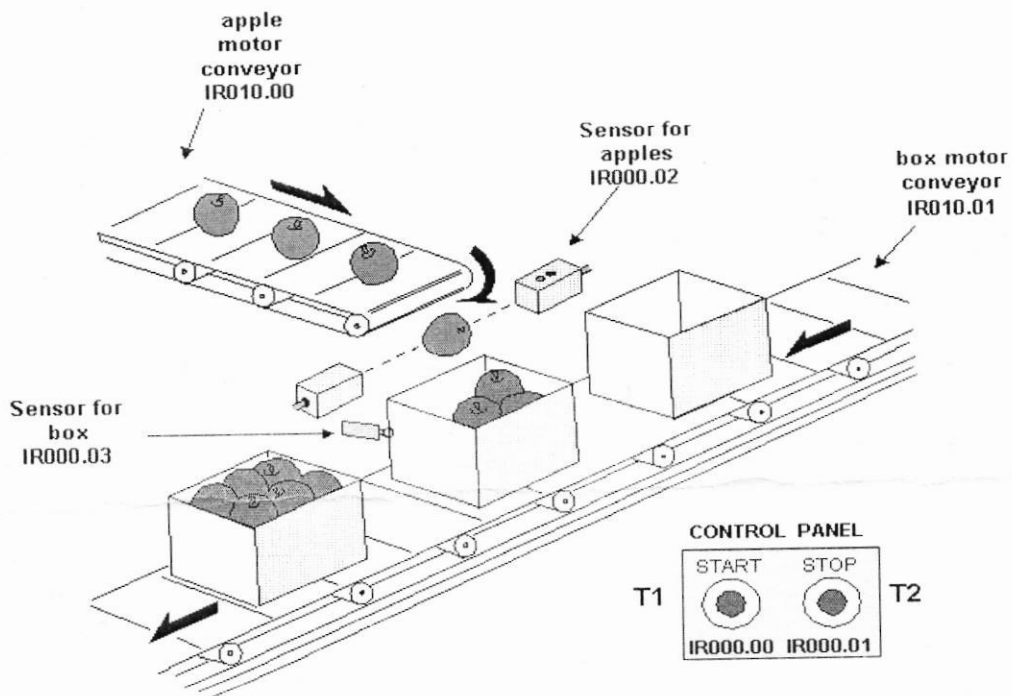
Final Exam 2018/2019 - Model no. (2) / 2<sup>nd</sup> Attempt

Q1/ (Answer two only): (20 Mark)

- A: Write the logic and ladder program to implement positive triggered JK flip-flop.
- B: Write the logic and ladder program to implement an exclusive OR gate function.
- C: Write the logic and ladder program to implement T flip-flop.

Q2/ (20 Mark)

A: Write the PLC ladder program to implement Product packaging. By pushing START key you activate the program. When started, motor of a conveyor for boxes is activated. The conveyor takes a box up to the limit switch, and a motor stops then. Condition for starting a conveyor with apples is actually a limit switch for a box. When a box is detected, a conveyor with apples starts moving. Presence of the box allows counter to count 10 apples through a sensor used for apples and to generate. When the conveyor with boxes has been activated, limit switch resets counter which is again ready to count 10 apples. Operations repeat until STOP key is pressed.



B: Write the PLC ladder program for (ON and OFF) delay Motor starter.

10/10/10

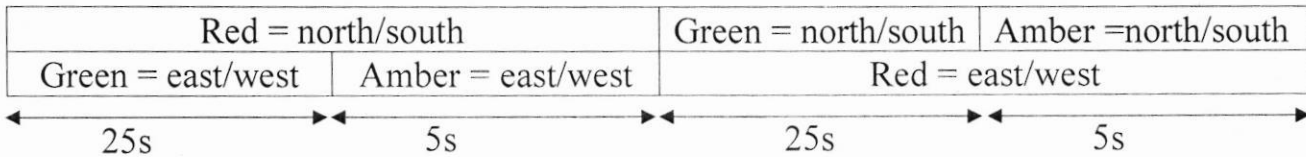
**Q3/ (20 Mark)**

**A:** Write the PLC ladder program to implement an Automatic liquid mixing machine.

**B:** Write the PLC ladder program to implement a three-phase induction motor bidirectional star/delta starter (using TON).

**Q4/ (20 Mark)**

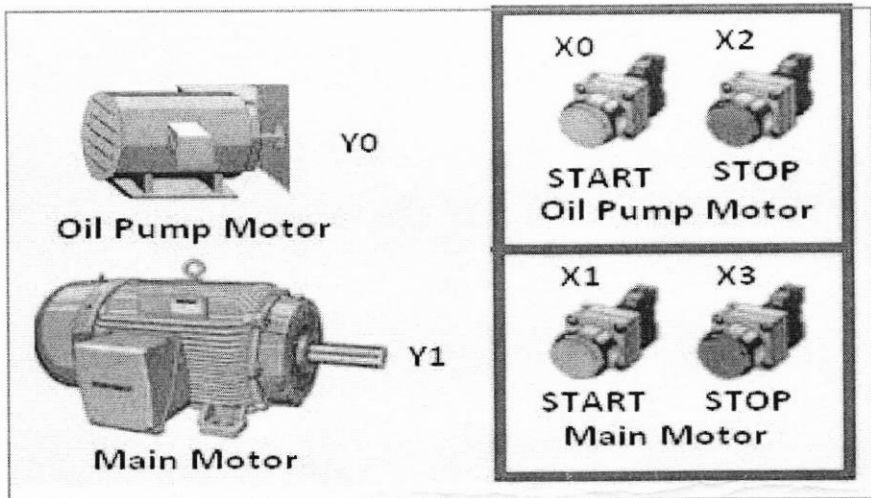
**A:** The time chart for two direction control traffic lights is shown below, write a PLC ladder program to achieve that. Use any type of timer instructions.



**B:** Design the logic and ladder program to implement full adder function.

**Q5/ (20 Mark)**

**A:** Write the PLC ladder program for Providing lubricant for the gear box before the lathe spindle starts to run which aims to ensure that the oil pump motor starts first and the main motor starts subsequently.

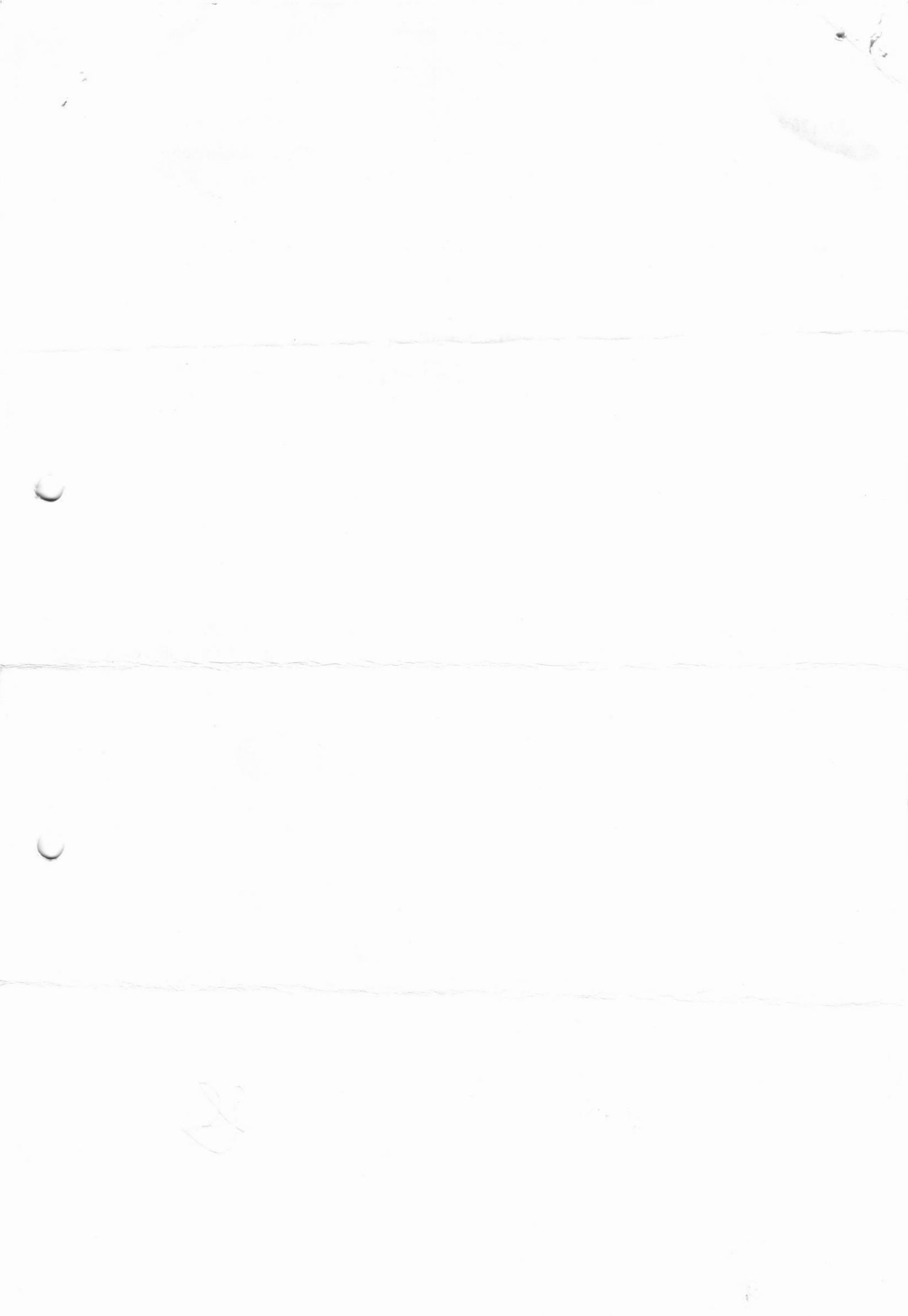


**B:** Write the PLC ladder program for starting Four Motors (every one rotates alone 10 min).

Lecturer *Saif M. R.*  
**Saif Muneam Ramadham**

**BEST OF LUCK**

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 Head of department  
**Karar Salim Abbas**



المادة: الرياضيات  
الصف: الأول / صباحي  
الزمن: ثلاث ساعات  
التاريخ: ٢٠١٩ / ٩ / ١٤



وزارة التعليم العالي والبحث العلمي  
الجامعة التقنية الجنوبية  
المعهد التقني / القرنة  
قسم التقنيات الكهربائية

اسئلة الامتحان النهائي للعام الدراسي ٢٠١٨/٢٠١٩ نموذج رقم (٣) الدور الثاني

ملاحظة: أجب عن خمسة اسئلة

درجة (٢٠)

السؤال الأول: جد قيمة التكاملات التالية

(1)  $\int \frac{(x-3)^2}{3x-9} dx$

(3)  $\int \tan^2 6x dx$

(2)  $\int \cos^3 2x dx$

(4)  $\int (x-1)(2x-x^2)^3 dx$

درجة (١٠)

السؤال الثاني:  
أ) جد حاصل جمع المصفوفات التالية

$A = \begin{bmatrix} -2 & 4 & 0.2 \\ -3 & 1 & 0.09 \end{bmatrix}$   
درجة (١٠)

$B = \begin{bmatrix} -2 & -3 & 2 \\ 5 & 0.98 & 0.01 \end{bmatrix}$

ب) جد قيمة كل من المتغيرات التالية

$\frac{2}{3}x - \frac{5}{3}yi = \frac{7}{2}i - 9$

درجة (٢٠)

السؤال الثالث: جد مشتقة الدوال التالية :

(1)  $y = 3x \cos 4x + x^2$

(2)  $4y = 3yx - x^2 + 1$

درجة (٢٠)

السؤال الرابع: جد معكوس المصفوفة التالية

$\begin{bmatrix} 2 & 4 & 0 \\ -3 & -0.5 & 12 \\ 9 & 0 & 4 \end{bmatrix}$

