SET B

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JANUARY 2010 SESSION

SUBJECT CODE	:	FED 10302
SUBJECT TITLE	:	ELECTRICAL INSTALLATION
LEVEL	:	DIPLOMA
TIME / DURATION	:	9.00am – 11.00am (2 HOURS)
DATE	:	27 APRIL 2010

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.

2. This question paper is printed on both sides of the paper.

3. Please write your answer on the answer booklet provided.

4. Answer should be written in blue or black ink except for sketching, graphic and illustration.

5. This questions paper consists of TWO (2) sections. Sections A and B. Answer ALL questions in section A. For section B, answer TWO (2) questions only.

6. Answer all questions in English.

THERE ARE 6 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total:60 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

Figure 1, shows a power circuit for the control of a three phase induction motor. The graphic symbols and equipment identification references recommended for use comply with IEC standards.

(a)   Explain the importance of electrical standards important to industrial electrical automation equipment producer.

(8 marks)

(b)   Explain the importance of electrical and mechanical interlock between the two contactors to this circuit.

(4 marks)

(c)   Lists four main advantages of using D.O.L starter compare to Star Delta starter in contactor based control system.
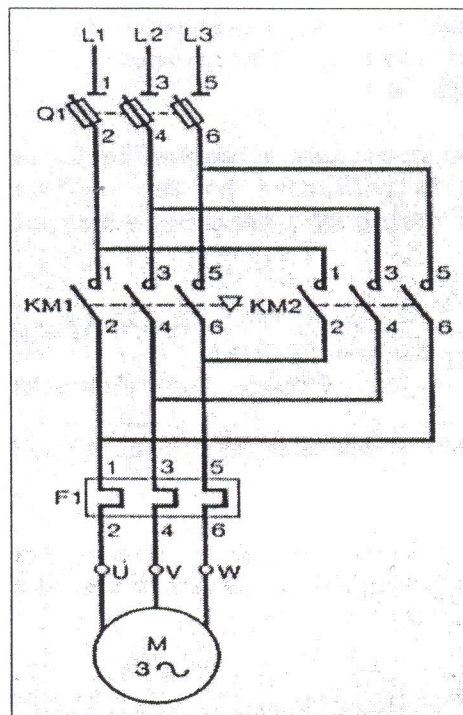
(8 marks)

Figure 1

Question 2

Figure 2, shows a control circuit of the building water pump system. KM1 is used to actuate Pump1, KM2 is used to actuate Pump 2 and KM3 is used to actuate the Booster Pump. Upgrade the system with the requirement as stated below:-

(a)   Re-design the Booster section and replace (S2) with Start Push-buttons (S4) and Stop Push-buttons (S5).

(6 marks)

(b)   Add one contactor (KM4) to actuate a Cooling Fan for the station. KM4 will energize 30s after the Booster Pump is actuated.

(5 marks)

(c)   Add one pilot light (H4) that will light up when (KM4) energized and light off for 5s after it de-energized.
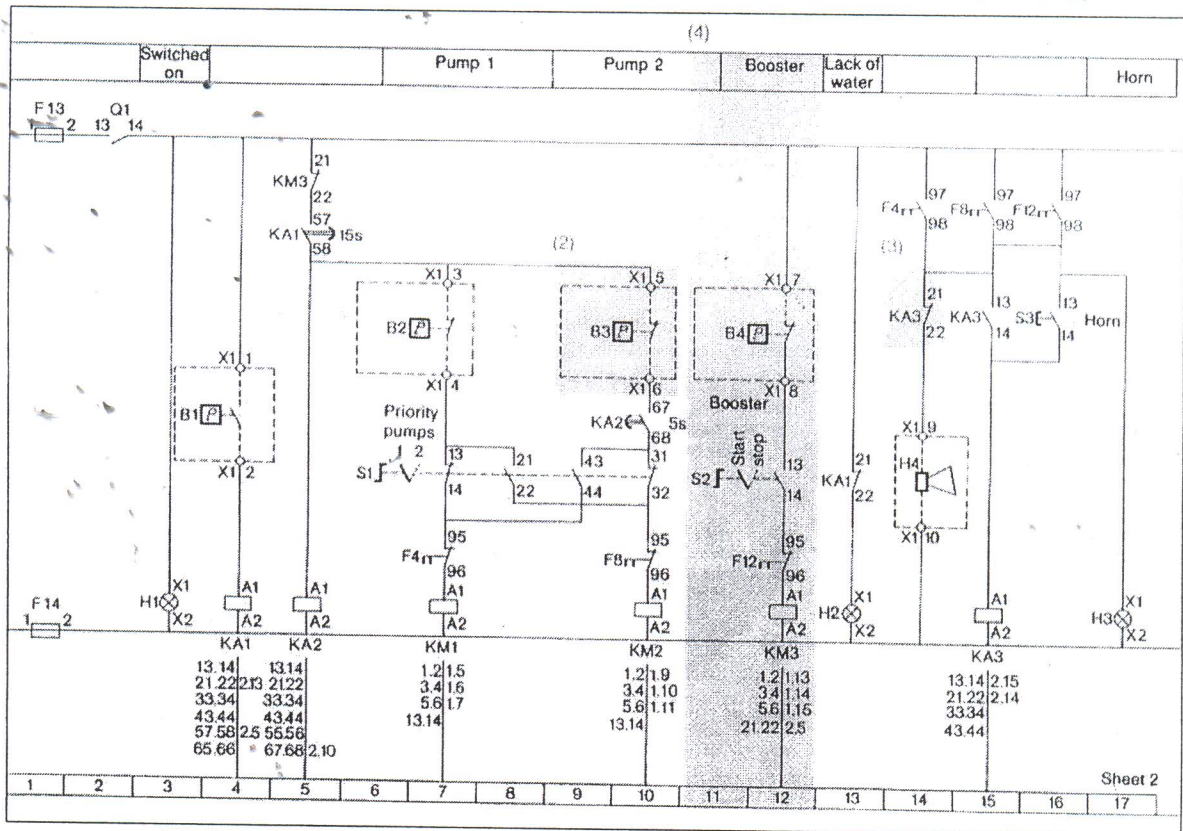
(9 marks)

Figure 2

Question 3

Figure 3, shows a manual start and manual stop drilling machine with Direct On Line starting method. The operation of the drilling machine as follows:-

- Switch "ON" the fuse isolator, the Indicator light (H1) will light up to show the machine in standby mode.
- Press Push Button S1 and S2, the motor will start to rotate in forward direction for drilling.
- Indicator light (H2) will light up to show the machine is in drilling process.
- Press push button S3 or S4, the motor will stop and indicator light (H2) will light off after 5s.
- In case of motor overloaded, the Thermal Overload Relay will trip and the indicator light (H3) will light up.

(a)   List the electrical components required for the machine.

(6 marks)

(b)   Design a Control Circuit for the machine with supply 48Vac.

(8 marks)

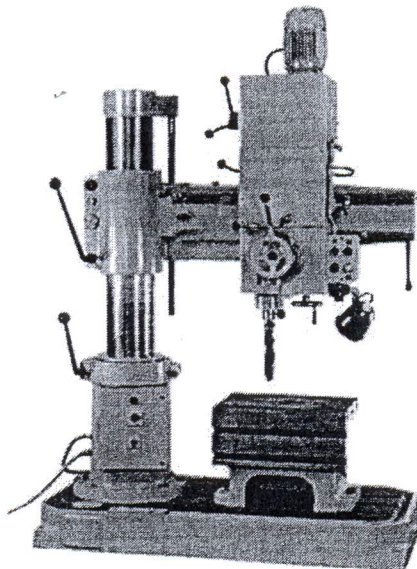(c)   Design the Power Circuit with supply 415Vac.

(6 marks)

Figure 3

SECTION B (Total: 40 marks)

INSTRUCTION : Anwer TWO (2) questions only

Please use the answer booklet provided.

Question 4

Figure 4 shows the designs of a system by using the control circuit in Figure 2.

(a)   Explain the function of :

        i.   Pressure switch B1

(3 marks)

        ii.   Pressure switches B2 and B3.

(6 marks)

        iii.   Explain the function of pressure switch B4.

(3 marks)

(b)   Design a power circuit with supply of three phase 220V/50Hz for the 3 motors with Direct-On-Line starter.
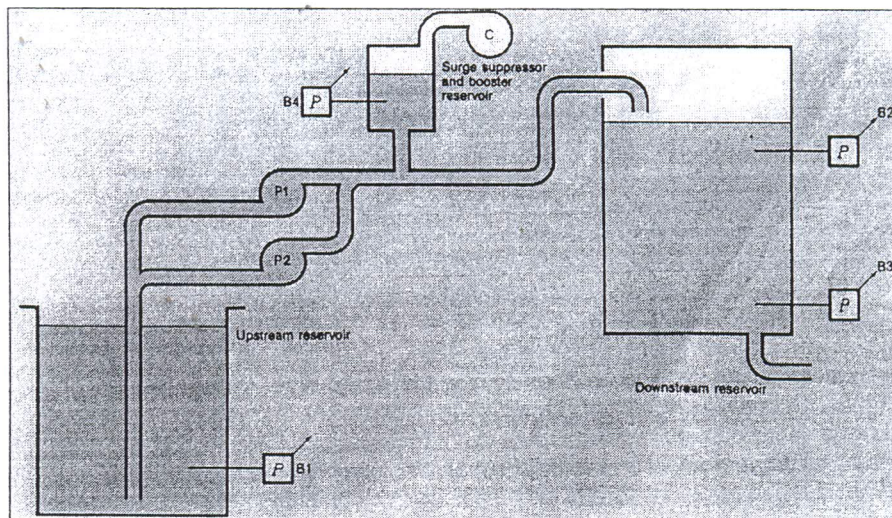
(8 marks)

Figure 4

Question 5

Figure 5 shows one section of control circuit from figure 2, water pump system. The control circuit is supply with 48Vac.

(a)   Name the components B1, KM1, Q1, S1, F4 and H1.

(6 marks)

(b)   Explain the functions of each component in question 5 (a).

(12 marks)

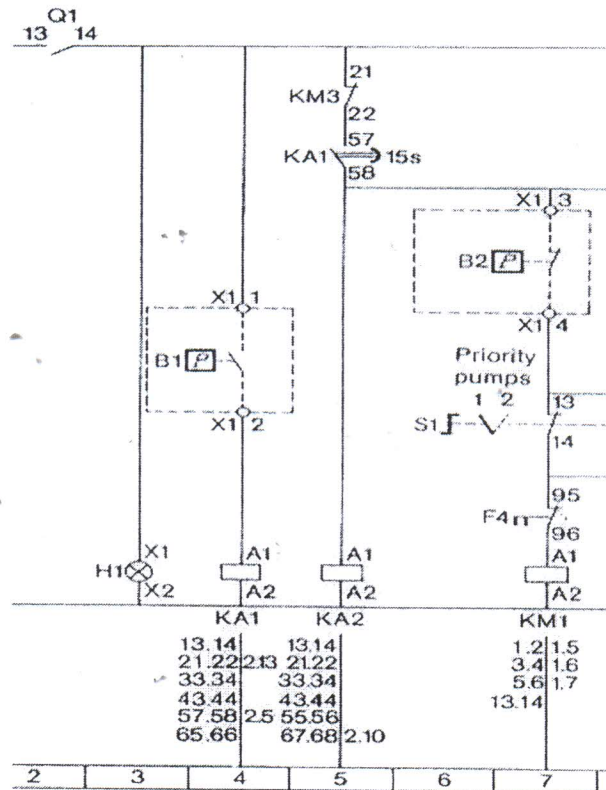(c)   Explain briefly the function of timer in this circuit?

(2 marks)

Figure 5

Question 6

Figure 6 shows a control circuit for the manual control of two contactors. It is control by spring return push-buttons and limits switches.

(a)   Explain briefly the four main features of the control circuit.

(4 marks)

(b)   Explain the operation of the control circuit.

(6 marks)

(c)   Redesign the control circuit with same features but using selector switch and explain the circuit operation.

(10 marks)

Figure 6

END OF QUESTION PAPER