



Answer the following three questions:

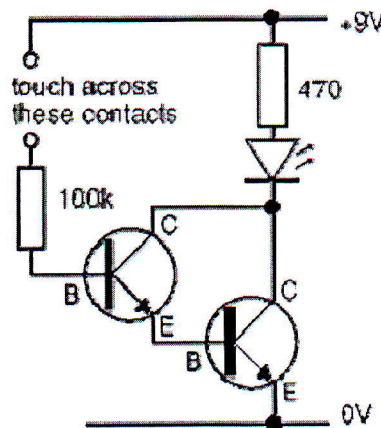
**(Q.1) [48 marks]:**

Write about the following (with discussing the usage and function of each one in addition to mentioning advantages and disadvantages of their types, also include the needed sketches):-

- (1) Transistors.
- (2) Diodes.
- (3) Binary systems.
- (4) Thyristors.
- (5) Micro-processors.
- (6) Strain gauges.
- (7) Relays and overload relays.
- (8) Electromechanical controllers.

**(Q.2) [30 marks]:**

- (1) Discuss the architectural construction of a processor (include the needed sketches).
- (2) Write a short report about numbers and recorders in the processor chip.
- (3) Write about the commands (ADD, SUB, SBC, ADC & INC) in Processor Z80.
- (4) Write a short report about programming of Processor Z80.
- (5) Explain the following figure;



**(Q.3) [22 marks]:**

Suggest a suitable design using needed electrical and mechanical control components to improve the performance of shaper machine for affording a controlled and programmed process of this machine (include the needed flowchart).

*With our best wishes DR/ Khaled Khader*

This exam measures the following ILOs													
Question Number	Q1-a	Q1-b	Q1-a	Q1-b	Q2-a	Q2-b	Q2-c	Q2-b	Q2-a	Q2-b	Q3	Q3	Q3
Skills	a1-1	a3-1	a4-1		b2-1	b3-1	b8-1		c2-1	c3-1	c4-1	d1-1	d2-1
	Knowledge & Understand Skills				Intellectual Skills				Professional Skills			General S.	