AMMAN ARAB UNIVERSITY جامعة عمان العربية

Item #	Required specifications	Quantity
1.	**DC Servo Control System Trainer**	**2**
	Objective: These Equipment are used to enable the students to learn: -DC servo motor experiment -P, I, D, PI, PD, PID controllers in DC servo motor speed/ position control -First order system experiment. -Second order system experiment. -transient response experiment. -Effect of zeros on first order experiment -Dominant pole of second order system experiment. -phase lead/ lag compensator experiments frequency domain design and root locus technique -Pole-zero cancellation experiment -State feedback pole assignment experiment -Position/ speed/ torque control using MATLAB -Laplace transform experiment	

	Technical Specifications:	
	A) Including Summing Junction: 2 sets of analog signal summation **b) Including P-Controller, I-Controller, D-Controller:** Continuous 0~10 constant, with range selector: x1, x10, x50 **c)SUM/DIF Amplifier** 3 positive inputs and 3 negative inputs for the sum of analog signals, Continuous 0~10 amplifier gain **d) Integrator** Initial value: -10~+10, with synchronous control function. T constant setting: 1, 10, 100 **e) Inverting Amplifier** One inverting buffer and one inverting amplifier With gain K of 0~10. **f) Second Order Plant** Used for first/second order plant simulation a and b parameters: 0~10 T parameter: 1, 10, 100	

	g) Lead/Lag Compensator z and p parameters: 0~10 T parameters: 1, 10, 100 **h) Test Signal Generator** Provide input signals to control systems. STEP generator with positive and negative outputs RAMP and PARABOLIC generators with positive output Amplitude associated with Offset: -10V~+10V Frequency Range x1: 0.05Hz~100Hz **i) Analog Power Driver** Analog input voltage up to +/-4V Analog output voltage up to +/-12V; Max output current: 1A Input amplitude limitation: +/-12V **j) Function Generator** Output waves: Sinusoid, Triangle, Square, Step, DC Frequency: 0.1Hz~10KHz continuously adjustable **K) DC Servo PWM Driver** Analog input voltage: 0~+/-12V PWM output: 0~+12V, Bridge PWM drive, Max output current: 1A including Current-Limiting protection	

	L) DC servo Motor Voltage: 12VDC (b) No-load speed around 3750 rpm With shaft Tachometer Gear ratio: 64:1 **m) Waveform Generator** Frequency Range: 0.1Hz to 3MHz Frequency Resolution: 0.1Hz Output Amplitude: +/-3V Waveforms: Sine, Square, Triangle, Ramp and other **n) Digital I/O:** Output: 8 bits, o) Min PC specs (intel core i5, processor speed: 4.5GHz, DDR memory: 4GB, hard disk: 1T, OS: windows 10) or higher *each pc must have a Mat lab version that is compatible and works with required devices.	

2.	**Magnetic Levitation**	**Quantity**
	1) **Technical specification:** -	**2**
	a) Sensors installed on-board b) Control Circuits Installed c) Drivers Installed d) Protection Circuits Installed e) Coil Dia: 20mm f) Coil Length: 94mm g) Control Precision: 0.1mm h) Control Range: min= 1mm, max= 20mm with mass 22g i) Control Range: min=1mm, max= 15mm with mass 120g j) LED Source: +12 Volt k) Sampling Frequency around 30KHz l) Maximum Load not less than 200g m) A/D Resolution at least 12-Bit n) Sampling Rate at least 100KS/s o) PID control module p) Digital Encoder module q) DC power supply module	

	Desktop Computer	Quantity
3.	Min PC specs: (intel core i7, processor speed: 16GHz, DDR memory: 1TB, hard disk: 1T, OS: windows 10) or higher. 20 inches Monitor	**2**