DAFTAR PENGADAAN PERALATAN LABORATORIUM
PRODI S1 PENDIDIKAN FISIKA-MIPA UNDIKSHA
TAHUN 2018

NO	NAMA ALAT	SPESIFIKASI	GAMBAR	JUMLAH	HARGA SARUAN (Rp.)	HARGA TOTAL (Rp).
1	**MR. 200 digital/analog Bread board**	*Magnetic connections, *Locking metal storage case, *Includes wide variety of digital component The MR Board is a reusable magnetic breadboard that eliminates the need to solder or strip wires when constructing an electronic ciscuit. **INCLUDE** : Locking Storage Case Magnetis Breadboard Pre-mountes Digital and Analog Components : Mounted DIP Sockets to Accept Costumers Components **Part list** : 12 holed connector, 10 2-pin free connector 4ea. LED, transistors 2ea.MR-TR (transistors), MR-PS1 switches, gates: AND, NAND, OR, NOR, NOT, XOR., buffers, MR-14PIN, MR-16PIN red jumper wires, black jumper wires, 74HC74N, HD74S76AP, resistors: 100Ω, 1KΩ, 10KΩ, 100KΩ 1ea. MR-CDS photo cell, MR-PS8 switch panel, MR-FND 7 segment display, 555timer, MR-20 PIN, MR-7447, power connector, 9V battery connector, MR Board, capacitors: 47μF, 1μF, 100μF, 1KPX G1205A. jumper wires, black jumper wires, 74HC74N, HD74S76AP, resistors: 100 Ω, 1KΩ, 10KΩ, 100KΩ 1ea. MR CDS photo cell, MR-PS8 switch panel, MR-FND 7 segment display, 555timer, MR-20 PIN, MR-7447, power connector, 9V battery connector, MR Board, capacitors: 47μF, 1μF, 100μF, 1KPX G1205A.		2	37.006.000	74.012.000

2	**Triple Output Power Supply**	Voltage Output : (0-30V), current output (0-3A) and two independent constant voltage outputs (5V and 12V), Digital disply of both current and voltage Digital meters : Voltage and Current Constant Voltage Mode: output Voltage: continuously variable; Line regulation: ≤0.05%± 10 mV Load regulation: ≤0.05% + 10 mV Ripple and noise: ≤0.05mV rms Constant Current Mode: output Voltage: continuously variable; Line regulation: ≤0.05%+ 10 mA Load regulation: ≤0.05% + 10 mA Ripple and noise: ≤ 3 mA rms Power Source: AC 110/220VAC,50/60Hz Dimensions:29 X 13 X 15 cm (5.5 Kg)		2	11.526.000	23.052.000
3	**Low Voltage AC/DC Power Supply**	DC-output voltage: 0 t0 24 VDC Current: from 0 to 12V, 10A maximum. From 12 to 24V, linierly decreasing from 10A to 6A, dependent on voltage setting Meter: digital disply (volts/amps); 1%±2 LSD; Ripple:< 25 mVpp AC-output Voltage: 0 to 24 V AC, continuously adjustable; current: 0 to 6 A; overload protection meter: digital display (volts/amps); 2% ± LSD Power source: AC 115/230VAC, 50/60AC Power use: 320 W Dimensions: 30 x 23 x 12 cm (12 x 9 x5 in)		5	43.876.000	219.380.000
4	**AC/DC Power Supply 12V/ 3A**	DC output voltage : 0-12 V (stabilized), continuously adjustab (stabilized), continuously adjustable Max DC output current 3 A, Max ripple 100 mV, Ac output voltage 2,4,6, 12 V, Max AC Output Current: 3A, Power consumption 110 W (Max.), Fuse: T 1A (slow), Dimention (WxDxH): 20,3 x 20,5 x 11, 7 cm		5	10.932.000	54.660.000

5	**20 MHz dual Trace Oscilloscope + Audio Generator**	Vertical Deflection Deflection Factor: 5 mV/div to 5 V/div in 10 calibrated steps (1-2-5 sequence) with variable control Magnification: 5x increase in sensitivity of selected range (provides 1 mV to 1V/div) Accuracy :± 3% at CAL'D position; ± 5% at CAL'D position for 5x gain bandwidth (refrenced to 5 division at 50 kHz)-DC to 25 MHz (at -3 dB);DC to 10 MHz (at -3dB) on 1 mV/div range Rise time: approximately 18 ns Input impedence: 1 M Ω shunted by 25 pF ± 10 pF Max. input voltage: 400 VDC+AC peak Operating Modes :CHA, CHB, DUAL (ALT or CHOP) and ADD Chop Frequency-approx. 500 kHz Channel B polarity-waveform inversion selectable Horizontal Deflection Triggered Operation: Sweep time: 0.2 s to 0.1 ms/div; 20 steps in 1-2-5 sequence with variable control Magnification: 10x (provides sweep expansion to 10 ns/div) Accuracy: ± 3% at CAL'D position except ± 6% on 0.2 s and ± 20% on 0.1 ms (add± 3% when using 10x magnifiter) Frequency response: DC to 1 MHz (- 3 dB) Phase shift: less than 30 at DC to ~ 100 kHz Trigger Source: CHA, CHB, LINE and EXT Coupling/ Sensitivity: AUTO-100 Hz-30MHz: 1.5 div(int.); ≥0.1Vp-p(ext.)NORM-DC-30MHz: 1.5div(int.); .); ≥0.1Vp-p(ext.) TV-V-20Hz-1kHz:0.5div (int.); 0.5 div(int.); .); ≥0.05Vp-p(ext.) Slope-normally "+"; pull TRIG LEVEL control For "-" External Input Input impedence: 1M Ω, 30 pF Maximum Input Voltage: 300V (DC+AC peak)		5	35.071.000	175.355.000

6	**Digital Function Generator**	Input power: 15V @ 1.6A Voltage output:± 10V @ 1 A Frequency range: DC to 100kHz. Sine wave retains x form to 150 kHz. Frequency Resolution: 0.001 Hz over entire range. Offset Voltage:± 10V. Waveforms: sine, trigger, square, positive ramp, negative Ramp, DC. External voltage input:± 10V maximum. Trigger Output: TTL compatible; BNC jack and black off unit Display: LCD graphics monochrome display 128x64, with two-level Backlight Displays: frequency, waveform, valtage, current, offset voltage. Amplitude modulation:maodulate the signal of one function generator using another.		2	37.841.000	75.682.000
7	**Microwave optics basic system**	**INCLUDE** : Gun diode transmitter with mounting stand, receiver with built min in amplifier and mounting stand, goniometer with fixed and rotatable, arm and degree scala, fixed min arm assembly for interferometer experiment, component holders : standard, one rotating table. Reflectors : to full reflectors (metal), to partial reflector (wood). Polarizer (2). Diffraction slit hardware. Prism : ethafoam with styrene peletts, AC adapter. Laboratory manual with 12 experimen Microwave transmitter Microwave receiver Microwave mouting stand (two needed) a polyethylene panel for measuring brewsters angle and a simulated crystal for Bragg diffraction experiments. The cristal is a cubic lattice of 100 metal spheres in a 5 x 5 x4 array, mounted inplastic foam	 	2	92.747.000	185.494.000

8	**Millikan Oil Drop Apparatus**	The Milikan Oil Drop Experiment is one of the most popular experiments in undergraduate physics for several reason: • The experimental principle is straightforward and easy to understand • It measure a fundamental atomic sconstant using a method that won its originator, Robert Milikan, the Nobel Prize • The observation of the effect of one or more electrons upon oil drops in an electric field provides a striking demonstration of the quantized nature of electricit **Specification** Maximum plate voltage: 500 VDC Light source: Cool LED Reticle line separation: 0.5 mm major divisions 0.1 mm minor divisions Plate spacing : 7.62 mm Plate diameter : 60 mm **INCLUDE**: Millikan Oil Drop Apparatus with switch, Non-volatile Oil and Atomizer, 12VAC Lamp Power Adapter. **Complete with** : Basic digital multimeter (2) High Voltage Power Supply Large Rod Base 45 cm steel rod (2)	  	2	187.559.000	375.118.000
9	**Materials Stress Strain**	Stress-strain apparatus, Force sensor, Rotary motion sensor, Calipers, included test coupons, apparatus contain : steel, annealed steel Al, two thick nesses of brass and for different types of plastic. Ten test coupons of each material come with the unit **INCLUDE** : 850 Universal Interface Capstone software, single user		2	82.063.000	164.126.000

10	**Photoelectric Effect System**	*Find Planck ‘’s Coctant to Within 5% *Verify the Stopping Voltage Is Independent of Intesity *This Apparatus uses the conventional method of determineing Planck’s Constant. Specifications Current Amplifier Measuring range: 10-8 to 10-13A, in six range, Voltage output for photoelectric tube Voltage adjustment: -4,5 to 0V and -4,5V to + 30 V (two range), 4 digit display Photoelectric tube Spectral response range: 300-700 nm Anode: nickel ring Five filters with central wavelengths: 365.0, 404.7, 435.8,546.1, and 578.0 nm		2	61.980.000	123.960.000
11	**Student Spectrometer**	Student spectrometer • Wide aperture optics • Precision vernier : resolves one minum of arc • Durable and precise Features • Resolution to 1 minute of arc : the 127 mm diameter,precision-engraved degree plate is complemented by two precision-engraved venires, one on each side of instrument for convenient reading. • Wider aperture optics : 32 mm wide apertures on the telescope and collimator provide more light for brighter, and sharper images • Rack and pinion focusing: On both the telescope an the collimator . Focusing is easier and more precise. • Rotating Table: for greater flexibility in measurements. Turn the table by hand for coarse adjustment. Use the fine lead screw for delicate adjustments. **INCLUDE** Spectral Tube Powe Suplly and Mount, Spectral Tubes: Argon, Carbon Dioxide, Helium, Hydrogen, Krypton, Neon, Water Vapor,	 	2	90.731.000	181.462.000

12	**Materials Testing Machine**	UJI TARIK COMPREHENSIVE MATERIALS TESTING SYSTEM WITH THIS ONE SYSTEM, YOUR STUDENTS CAN INVESTIGATE: - Compression and tensile testing - Column buckling - Three and four-point bending - Shear testing - Stress lines with photoelasticity Load cell capasity: 7100 N (1600 lbs) Machine weight: 20 lbs (9 kg) Footprint: 24 wide x 25 depth x 51 cm height Lead screw length: 38 cm Sturdy base: cast aluminum Mounting holes: for bolting to table **INCLUDE**: •Testing Machine (with safety shields and calibration rod) • Tensile sample (10 of each): Aluminum, Brass, Annealed Steel, Steel, Acrylic, Polyethylene , Bending Accessory, Four-point bending load Anvil, Photoelasticity accessory (with photoelastic beams), Shear Acessory (with shear samples), Storage base, Structures beam fixture, Thin beams, Cast spares, Compression accessory (with compression samples), flat coupon fixture, Plastic flat coupons, Metal flat coupons, Clevis grip, Adapter, USB Link,, Capstone software single user license		1	328.907.000	328.907.000

13	**Sound Level Meter**	Ukur akustik Sound level meter Sound level sensor Range : sound level intensity 30 dB to 70 dB; 10-3 µW/m2 to 10 µW /m2 50 dB to 90 dB; 1 µW /m2 to 1000 µW /m2 70 dB to 110 dB; 10 µW /m2 to 10,000 µW /m2 Max sample rate: 20 Hz Accurary: + 2 dB at 94 dB (1000 Hz) Resolution: 0,1 dB Complete with portable datalogger • 9,6” full-color capacitive touchscreen (1280x800 pixels) • 1.2 GHz quad-core processor • 1.5 GB RAM, 16 GB memory • Android operating system • Wi-fi, buetooth, and USB connections • Can export data to third-party apps • Suitable for wet and dry labs • Operates online or offline • SPARKvue® in-app proximity pairing • Lab manager classroom lab management application **INLUDE**: - Front and back cameras - Accelerometer - Microphone - Speaker - GPS2 pasport ports Simultaneously connects up to 5 wireless sensors		1	33.777.000	33.777.000
14	**Scanning Electrone Microscope (SEM) Complete Comnputer with Printer**	**TERLAMPIR**		1	3.500.000.000	3.500.000.000

TOTAL	**5.514.985.000**

Singaraja,
Koordinator Laboratorium Prodi
Pendidikan Fisika,

Dewi OktofaRachmawati, S.Si, M.Si
NIP. 19701210 199501 2 001

Mengetahui
Ketua Laboratorium Fakultas MIPA

Dr. I Gusti Agung Nyoman Setiawan, M.Si.
NIP. 196107171986011003