



Republic of the Philippines  
**PROCUREMENT DEPARTMENT**  
 Quezon City Government



PO Number **2212052**

**Purchase Order** Date: **DEC 23 2022**

Procuring Unit : **QUEZON CITY UNIVERSITY** Project Number : **QCU-22-ELTE-1322B**  
 Company Name : **HYTEC POWER INC.** Mode of Procurement : **Public Bidding**  
 Address : **No. 2 T. Cruz St., Cruzville Subd., Zabarte Road, Novaliches, Quezon City** Resolution No. : **22-PB-522**  
 Business Type : **Corporation Registration #CS200401804** TIN Number : **229-283-188-000**  
 Contact Number : **09158093937**

**Sir/Madam:**  
 Please furnish this office the following articles subject to the terms and conditions contained here:

**Place of Delivery :** CGSD Central Warehouse **Delivery Schedule :** Ninety (90) Calendar Days

**Payment Term :** Credit

Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	(1) Color Detection 21. CAN-BUS Module a. Receive data with check mode b. Receive data with interrupt mode c. Receive data with interrupt mode by specific the data frame of the ID  Accessories 1. Experiment manual x1 2. Software / Working Source Code CD x 1 3. AC Power Cord x 1 4. USB cable (Type-A to Type-B) x 1 5. IDC cable (5x2 pin) x 1 6. Dupont wire x 40 7. Carry Case  ***** Nothing Follows *****				

**Total Amount : 29,990,000.00**

**Total Amount In Words (Pesos):** Twenty-Nine Million Nine Hundred Ninety Thousand Pesos Only

**MA. JOSEFINA G. BELMONTE**  
 City Mayor



*Martin Villarta* 01-06-23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**Approved Budget for the Contract : 33,780,000.00**

OBR: 01. 2022-12-127  
 (20221050-01-07-023)

**TERMS AND CONDITIONS**

1. ALL PRICES INDICATED HEREIN ARE VALID, BINDING AND EFFECTIVE AT LEAST WITHIN THIRTY (30) CALENDAR DAYS FROM DATE OF RECEIPT.
2. AWARDEE shall be responsible for the source(s) of its supplies/materials/equipment and shall make deliveries in accordance with the schedule, quality and specification of the award and purchase order. Failure by the AWARDEE to comply with the same shall be a ground for cancellation of the award and purchase order issued to that AWARDEE and for re-awarding the item(s) to the ALTERNATE AWARDEE.
3. AWARDEE shall pick up purchase order(s) issued in its favor within three (3) days after receipt of notice to that effect. A telephone call, fax transmission or electronic mail (e-mail) shall constitute an official notice to the AWARDEE. Thereafter, if the purchase order(s) remains unclaimed, the said purchase order(s) shall be sent by mailing or courier, messengerial service to the AWARDEE. To avoid delay in the delivery of the requesting end-user's requirement, all DEFAULTING AWARDEES shall be precluded from proposing or submitting a substitute sample.
4. Subject to the provisions of the preceding paragraph, where AWARDEE has accepted a purchase order but fails to deliver the required product(s) within the time called for in the same order, the delivery period may be extended a maximum of fifteen (15) calendar days under liquidated damages to make good the delivery. Thereafter, if AWARDEE has not completed the
5. delivery within the extended period, the subject purchase order shall be cancelled and the award for the undelivered balance, withdrawn from that AWARDEE. The BAC-Goods and Services shall then purchase the required item(s) from such other source(s) as it may determine, with the difference in price to be charged against the DEFAULTING AWARDEE. Refusal by the DEFAULTING AWARDEE to shoulder the price difference shall be ground for its disqualification from future bids of the same items, without prejudice to the imposition of other sanction as prescribed under RA 9184 and its RIRR.
6. When the supplier fails to satisfactorily deliver goods/services under the contract within the specified delivery schedule, inclusive of duly granted time extensions, if any, the supplier shall be liable for damages for the delay and shall pay the procuring entity liquidated damages, not by way of penalty, an amount equal to one-tenth (1/10) of one percent (1%) of the cost of the delayed goods/services scheduled for delivery for everyday of delay until such goods/services are finally delivered and accepted by the procuring entity concerned.
7. Rejected deliveries shall be construed as non-delivery of product(s)/item(s) so ordered and shall be subject to liquidated damages, subject to the terms and conditions prescribed under paragraph 4 hereof.
8. Supplier shall guarantee its deliveries to be free from defects. Any defective item(s)/product(s), therefore that maybe discovered by the **Quezon City Government** within three (3) months after acceptance of the same, shall be replaced by the supplier within seven (7) calendar days upon receipt of a written notice to that effect.
9. All duties, excise and other taxes and revenue charges, if any, shall be for the supplier's account.
10. As a pre-condition to payment, IMPORTANT DOCUMENTS specifically showing the condition and serial numbers of the imported equipment purchased should be submitted by the supplier to the **Quezon City Government**.
11. All transactions are subject to applicable withholding taxes in accordance with existing BIR rules and regulations.
12. Supplier shall furnish the End-user through the City General Services Department stockroom, the articles, described above;
13. The **Quezon City Government** reserves the right to accept or reject delivered articles if found not in conformity to the specifications, terms and conditions stipulated.
14. Provisions contained in Title VI, Book IV of the Civil Code of the Philippines on Sales are hereby incorporated and made as an Integral part hereof.
15. This contract shall also serve as **Notice to Proceed**, to take effect on JAN 06 2023 and to expire on - APR 06 2023

CONFORME:

Martin Villarta  
SIGNATURE OVER PRINTED NAME

Authorized Representative  
IN THE CAPACITY OF

01-06-23  
DATE

Duly authorized to sign this Purchase Order for and on behalf of HYTEC POWER INC.  
COMPANY NAME

SUBSCRIBED AND SWORN to before me this JAN 06 2023 day of JANUARY at QUEZON CITY Philippines. Affiant personally known to me and were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiants exhibited to me his/her Passport with his/her photograph and signature appearing thereon with No. P8375936B

Doc. No. 209  
Page No. 01  
Book No. XV-A  
Series of 2023

ATTY. EMILIO S. GALMA, JR.  
Quezon City Notary Public  
Until December 31, 2023  
Roll No. 50123  
PTR No. 4007170-7/01/03/2023  
IBP No. 257225/01/01/2023  
UCLP Case No. VII-000692, April 14, 2023  
ADM. Matter No. NP-007 2023-0073

\*\*\*This Purchase Order shall be deemed invalid without Notary Seal (for project amounting to PHP 2,500,000.00 and above only)



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Business Type : <b>Corporation Registration #CS200401804</b>	TIN Number : <b>229-283-188-000</b>
	Contact Number : <b>09158093937</b>

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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
1	<b>AM / FM / ASK / FSK Transmitter &amp; Receiver System - KL-900C</b>  Features: • AM transmitter and Receiver modules • FM transmitter and Receiver modules • ASK/AM Transmitter and Receiver modules • FSK/FM Transmitter and Receiver modules • Comprehensive and self-contained system carrying out AM/ASK and FM/FSK transmission • The Modules equipped with 8-bit DIP switch for fault-finding experiment • Provided with comprehensive experimental manual. • An Actual mini broadcasting Station  Specification: 1) AM/DSB Transmitter a. With perfect AM Transmitter for producing 1MHz b. Equipped with 8-bit DIP switch for circuits fault simulations 2) AM Transistorize Radio a. AM Receiver frequency range: 535KHz – 1605KHz b. Intermediate frequency: 455KHz c. Equipped with 8-bit DIP switch for circuits fault simulations 3) FM Transmitter a. With perfect FM Transmitter for producing 10.7MHz intermediate frequency b. Equipped with 8-bit DIP switch for circuits fault simulations c. Digital probe: 1Hz~89999999Hz 4) FM Stereo Radio a. FM Receiver frequency range: 88MHz-108MHz b. Frequency shown by 7 segment LED display	unit	2	1,462,000.00	2,924,000.00

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*Marvin Villarta*  
 Signature Over Printed Name of Supplier / Date **01-26-23**

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**Approved Budget for the Contract : 33,780,000.00**

OBR : 101.2022.12.187

2/PDS



Republic of the Philippines  
**PROCUREMENT DEPARTMENT**  
 Quezon City Government



PO Number **2212052**

**Purchase Order** Date: **DEC 23 2022**

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	c. Equipped with 8-bit DIP switch for circuits fault simulations 5) ASK/AM Transmitter a. Amplitude-shift keying (ASK) transmitter 1) Carrier frequency: 1.0 MHz & 1.6 MHz b. Data transmission format: 1) Start bit 2) 64-bit encoded data: 8-bit data encoded by 8-bit spread spectrum set 3) Stop bit c. Data transmission: 1) Direct modulation 2) Manchester encoding d. Data rate: 1) 100 / 62.5 Hz 2) 160 / 100 Hz 3) 1.6K / 1K Hz e. AM audio modulation signal: 1) Audio input: mono microphone input 6) ASK/AM Receiver a. AM receiver frequency range: 535 KHz ~ 1605 KHz b. Intermediate frequency: 455Khz c. Data receive mode: 1) Direct demodulation 2) Manchester decoding d. Data rate: 1) 100 / 62.5 Hz 2) 160 / 100 Hz 3) 1.6K / 1K Hz e. AM audio demodulation signal: 1) Audio output: 0.2W 8Ω speaker 7) FSK/FM Transmitter				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*Marvin Villarta*  
**Marvin Villarta** 11-06-23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**  
 Approved Budget for the Contract : 33,780,000.00

2 P 8



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	a. Frequency-shift keying (FSK) transmitter, which is able to produce 10.7 MHz intermediate frequency b. Data transmission format: 1) Start bit 2) 64-bit encoded data: 8-bit data encoded by 8-bit spread spectrum setting 3) Stop bit c. Data transmission: 1) Direct modulation 2) Manchester encoding d. Data rate: 1) 100 / 62.5 Hz 2) 160 / 100 Hz e. FM audio modulation signal: 1) Audio input: Mono microphone input f. Digital probe: 1Hz~89999999Hz 8) FSK/ AM Receiver a. FM receiver frequency: 10.7 MHz b. Data receive mode: 1) Direct demodulation 2) Manchester decoding c. Data rate: 1) 100 / 62.5 Hz 2) 160 / 100 Hz d. FM Audio demodulation signal: 1) Audio output: 0.2W 8Ω speaker  LIST OF EXPERIMENTS: AM Experiments 1. Sine wave / Voice Modulator 2. Modulator Measurement				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*Martin Villarta*  
**Martin Villarta**  
 Signature Over Printed Name of Supplier / Date **12/23/22**

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**

**Approved Budget for the Contract : 33,780,000.00**

*2/11/23*



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	3. DSBS / Sine wave Pattern 4. Modulator percentage 5. Trapezoid Pattern 6. Voice / Antenna Adjust 7. First IF Amplifier 8. Secson IF Amplifier 9. Frequency Transmitter / Receiver & Modulator / Demodulator 10. Music Transmitter & Receiver FM Experiments 1. Voltage Measurements of Varactor Diode 2. Crystal Oscillator Measurements 3. Frequency Multiplier Adjustments (For Second Harmonic) 4. RF Amplifier Tuning Circuit Adjustments (For Second Harmonic) 5. Frequency Multiplier Adjustments (For Third Harmonic) 6. RF Amplifier Tuning Circuit Adjustments (For Third Harmonic) 7. Audio Amplifier Measurements 8. Reference Oscillator Measurements 9. FM IF Amplifier 10. Counter 11. Music Transmitter & Receiver ASK/AM Experiments 1. RF Amplifier Adjustment (underlined data are reference values) 2. Digital data coding (CDMA & Manchester encoding) 3. Calibration of Transmitter and Receiver 4. Transmitter and Receiver Communication Experiment 5. Analog transmission of digital signals 6. Analog signal transmitted by analog transmission 7. Music signal transmission FSK/FM Experiments 1. Voltage Measurement of Varactor Diode 2. Crystal Oscillator Frequency Measurement				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*M. Villarza*  
**MARUM VILARZA** 01/06/23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**  
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2/4/23



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2	3. Frequency Multiplier Adjustment (Doublers) 4. Frequency Multiplier Adjustment (Tripler) 5. RF Amplifier Tuned Circuit Adjustment 6. Digital Data Transmission (Direct Sequence & Manchester Encoding) 7. Audio Amplifier Adjustment 8. Calibration of RF Amplifier 9. Receiver Frequency Detector Adjustment 10. Decoding Sequence Adjustment 11. Digital Data Transmission and Receiving (Direct Sequence & Manchester Encoding) 12. Digital Data Transmission and Receiving Example 13. Analog transmission of digital signals 14. Analog signal transmitted by analog transmission 15. Music signal transmission ACCESSORIES 1. CI -18001 Power Supply x 2 (1) Output: ±5V, 0.5A; ±12V, 0.5A (2) Input: AC 110/220V 2. Connection leads and plugs x 1 set 3. Telescope antenna x 3 pcs 4. Mini-microphone x 2 pcs 5. Experiment manual 6. Digital logic probe x 1 set 7. Storage Cabinet 8. Rack Frame 9. Digital Storage Oscilloscope with FFT Analog and Digital Communications Trainer (Basic Communication System) - KL-900A  Features:	unit	2	1,991,800.00	3,983,600.00

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*Marvin Villarza*  
**Marvin Villarza**      01/06/23,  
 Signature Over Printed Name of Supplier / Date

Funds Available:

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

OBR :  
 Approved Budget for the Contract : 33,780,000.00

*2/11/23*



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	<p>*It offers the beginner complete courses of basic analog and digital communication.            *Familiarization with the operative aspects of the work in telecommunication laboratory            *The building block and components symbols of the circuits are printed on the surface of each module</p> <p>List of Modules            1. Analog Communication Modules            (1) Oscillator/Second Order LPF &amp; HPF            (2) AM Modulator/Demodulator            (3) DSB-SC &amp; SSB Modulator/Demodulator            (4) FM Modulator/Demodulator            (5) PLL Frequency Synthesizer            (6) TDM &amp; PAM-TDM Multiplexer/Demultiplexer            (7) FDM Multiplexer/Demultiplexer            (8) Signal Converter/ Recovery/ Regeneration            2. Digital Communication Modules            (1) A/D, D/A Converter Applications            (2) PWM Modulator/Demodulator            (3) FSK Modulator/Demodulator            (4) CVSD Modulator/Demodulator, Manchester Code Encode/Decode            (5) ASK Modulator/Demodulator            (6) PSK/QPSK Modulator            (7) PSK/QPSK Demodulator            3. Power Supply &amp; Signal Generator Unit            (1) Main Unit</p> <p>List of Experiments            Analog Communication</p>				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*Harvin Villaneta*  
**Harvin Villaneta** 01-06-23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**  
 Approved Budget for the Contract : 33,780,000.00

*Handwritten initials*





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	1. RF oscillator experiment 2. Second order LPF & HPF experiment 3. AM modulator experiment 4. AM demodulator experiment 5. DSB-SC and SSB modulator experiment 6. DSB-SC and SSB demodulator experiment 7. FM modulator experiment 8. FM demodulator experiment 9. Frequency synthesizer 10. TDM multiplexer experiments 11. TDM demultiplexer experiments 12. FDM multiplexer experiments 13. FDM demultiplexer experiments 14. Frequency converter experiment 15. Carrier frequency recovery experiment 16. Manchester clock regeneration experiment Digital Communication 1. Analog to digital experiment 2. Digital to analog experiment 3. PWM modulator experiment 4. PWM demodulator experiment 5. FSK modulator experiment 6. FSK demodulator experiment 7. CVSD modulators & demodulators 8. Manchester code encode/decode 9. ASK modulator/demodulator 10. PSK/QPSK modulator/demodulator Accessories: 1. Connector Leads 2. Experiment Manual 3. Teacher's Guide				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*Marvin Vilalta*  
**Marvin Vilalta** 01-26-23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**  
 Approved Budget for the Contract : 33,780,000.00

*JRS*



Republic of the Philippines  
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3	4. Storage Cabinet x 2 5. Rack Frame 6. Digital Storage Oscilloscope 7. Hand-held Digital Multimeter Electric Circuit Lab Fundamentals - KL-100  Features: 1. Ideal for electric circuit experiments and design exercises and Integrated trainer with complete curriculum 2. Complete with power supplies and test systems for easy and efficient experimentation 3. With Universal breadboard (1680 tie points) for circuit design and prototyping 4. All modules equipped with an 8-bit DIP switch for circuits fault simulations or fault insertion  Technical Specification: Main Unit 1. DC Power Supply 1) Fixed DC power supply a. Voltage range: +5DCV to -5DCV, +12DCV to -12DCV b. With output overload protection 2) Dual DC power supply a. ±3V to ±18 DCV, continuously adjustable b. With output overload protection 2. AC Power Supply : 9ACV - 0ACV - 9ACV 2 With output overload protection 3. Function Generator : Sine, square and triangle : 10 Hertz to 100 Kilohertz, 4 settings, continuously adjustable	unit	2	2,229,500.00	4,459,000.00

*[Signature]*  
**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*[Signature]*  
**Marvin Villarta** 01-06-23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*[Signature]*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**

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*[Handwritten marks]*



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	: ±5 percent of scale value : 50 Ohms : ≥18Vpeak to peak (open loop) ≥9Vpeak to peak (with 50Ω load) 4. 3 1/2-Digit Digital Voltmeter /Ammeter : 2DCV to 200DCV : ±0.3% of reading + 1 digit : 200μA, to 2000mA : ±0.5% of reading + 1 digit 5. Analog Meters : 0 to 100mA up to 1A : 0 to 15V : 0 to 100mA up to 1A : 0 to 20V 6. Speaker 1) 8Ω, 0.25W speaker with driver amplifier circuit 7. Variable Resistors 1) 1KΩ, 0.25W variable resistor with 3 terminals (A,B,C) 2) 10KΩ, 0.25W variable resistor with 3 terminals (A,B,C) 3) 100KΩ, 0.25W variable resistor with 3 terminals (A,B,C) 4) 1MΩ, 0.25W variable resistor with 3 terminals (A,B,C) 8. Solderless Breadboard 1) 1680 tie-point breadboard on top panel can be easily put into and taken off  The Equipment must have the following Experiment Modules: · Basic Electricity Experiments and Magnetism Element Introduction Module · Magnetic Field, Ampere's Rule, Fleming's Rule Module · Electromagnetic Induction Module · Electronic Circuit Fundamental Experiments Module · Basic Electronic Circuit Experiments (1 and 2) Module				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*M. Villarta*  
**Mary Villarta** 01-06-23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

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*JKP 8*

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	<ul style="list-style-type: none"> <li>· Special Electronic Components Experiments Module</li> <li>· Oscillator Experiments and Applications Module</li> </ul> The package equipment must have the following list of Experiment <ol style="list-style-type: none"> <li>1. Experiments for Basic Electricity               <ol style="list-style-type: none"> <li>a. DC voltage measurement, Using an ohmmeter, Resistor characteristics, DC current measurement</li> <li>b. AC voltage and AC Current measurement</li> <li>c. AC RC, RL, and RLC circuit</li> <li>d. Power in AC circuit</li> <li>e. Transformer characteristics</li> <li>f. Series-resonant and Parallel-resonant circuit</li> <li>g. LC filter</li> </ol> </li> <li>2. Experiments for Magnetism               <ol style="list-style-type: none"> <li>a. Magnetic devices and Magnetic field</li> <li>b. Drawing magnetic curves and Magnetic field strength</li> <li>c. Lenz's and Faraday's laws</li> <li>d. Ampere's rule, Fleming's rule and Self-Induction</li> <li>e. Mutual Induction and Magnetic flux detection</li> </ol> </li> <li>3. Experiments for Basic Electronic Circuits               <ol style="list-style-type: none"> <li>a. Diode characteristics, Rectifier circuit, Filter circuit,</li> <li>b. Zener diode, LED, Transistor characteristics</li> <li>c. Multimeter functions</li> <li>d. FET, SCR, UJT characteristics</li> </ol> </li> <li>4. Experiments for Simple Electronic Circuits               <ol style="list-style-type: none"> <li>a. Simple, Complementary, Push-pull and Multistage cascading amplifier</li> <li>b. Voltage regulator</li> <li>c. Wheatstone bridge</li> <li>d. Dimmer circuit</li> <li>e. Relay characteristics</li> <li>f. Touch-controlled switch</li> </ol> </li> </ol>				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*Morin Villora*  
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**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**  
 Approved Budget for the Contract : 33,780,000.00

*g r s*



Republic of the Philippines  
**PROCUREMENT DEPARTMENT**  
 Quezon City Government



PO Number **2212052**

Purchase Order Date: **DEC 23 2022**

Procuring Unit	: QUEZON CITY UNIVERSITY	Project Number	: QCU-22-ELTE-1322B
Company Name	: HYTEC POWER INC.	Mode of Procurement	: Public Bidding
Address	: No. 2 T. Cruz St., Cruzville Subd., Zabarte Road, Novaliches, Quezon City	Resolution No.	: 22-PB-522
Business Type	: Corporation Registration #CS200401804	TIN Number	: 229-283-188-000
		Contact Number	: 09158093937

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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
4	5. Experiments for Industrial Control Applications a. CDS and Thermistor characteristics b. Light-controlled, Temperature-controlled and Sound controlled circuit 6. Experiments for Oscillator Characteristics and Applications a. Blocking oscillator b. Electronic birdcall, LC resonant and LED flasher circuit c. Astable multivibrator  The Equipment must package with the following standard accessories: · Experiment manual and instructor's manual · Connection leads and plugs: 1set · Inductors: 0.1H, 0.5H each 1pc · Magnet: 1pc · Key (Allen Wrench): 1pc · Handheld Digital Multi Meter · Digital Oscilloscope  Digital Electronics Fundamentals Module - KL-300  Features:  *at least 13modules cover a large variety of essential topics for digital logic *Suitable for combination logic, sequential logic and microprocessor circuits design and experiments *Experiments are expandable and flexible with universal breadboard *Capable of processing TTL, CMOS, NMOS, PMOS and ECL circuit *All supply units are equipped with overload protection for safety purpose *All modules equipped with 8-bit DIP switch for fault simulations	unit	2	1,217,600.00	2,435,200.00

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*Marvin Villata*  
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**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**  
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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	Specification: 1. Dual DC Power Supply (1) Voltage Range (2) With output overload protection 2. Adjustable DC Power Supply (1) Voltage range: +1.5V~+15V (2) Maximum current output: 0.5A (3) With output overload protection 3. Standard Frequency (1) Frequency: 1MHz, 60Hz, 1Hz (2) Accuracy: ±0.01% (1MHz) (3) Fan out: 10 TTL load 4. Clock Signal Generator (1) Frequency: 1Hz-1MHz (6 ranges) a. 1Hz ~ 10Hz b. 10Hz ~ 100Hz c. 100Hz ~ 1KHz d. 1KHz~10KHz e. 10KHz~100KHz f. 100KHz~1MHz (2) Fan out: 10 TTL load 5. Data Switch (1) 8-bit DIP switchx2, 16-bit TTL level output (2) Toggle switchx4, each with DEBOUNCE circuit (3) Fan out: 10 TTL load 6. Pulser Switch (1) 2 sets of independent control output (2) Each set with Q, /Q output, pulse width > 5ms (3) Each set of switch with DEBOUNCE circuit (4) Fanout: 10 TTL load 7. Line Signal Generator				

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*M. Aron Villarta*  
**M. Aron Villarta** 01-05-23  
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*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

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PO Number **2212052**

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Procuring Unit : QUEZON CITY UNIVERSITY	Project Number : QCU-22-ELTE-1322B
Company Name : HYTEC POWER INC.	Mode of Procurement : Public Bidding
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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	(1) Frequency: 50 /60Hz (2) Output voltage: 6Vrms (3) With overload protection 8. Thumbwheel Switch (1) 2-digit, BCD code output and common point input 9. Logic Indicator (1) 16 sets of independent LED indicates high and low logic state (2) Input Impedance: 100KΩ 10. Logic Indicator (1) 4 sets of independent 7-segment LED display (2) With BCD, 7-segment decoder /driver and DP input (3) Input with 8-4-2-1 code 11. Logic Probe (1) TTL and CMOS level (2) 5mm LED displays (3) "Lo" and "Hi" LED display low and high logic state respectively 12. Speaker (1) One 8Ω, 0.25W speaker with driver circuit 13. Breadboard Modules (1) 1680 tie-point breadboard on top panel can be easily put into and taken off  Experiment Modules Specification: 1. All modules are equipped with an 8-bit DIP switch for fault simulation. Users learn how to solve various problems by setting the DIP switch to different positions 2. Solutions for all fault test are listed in the experiment manual for user's reference. 3. 2mm plugs and sockets are used throughout the main unit and all modules. 4. Comprehensive experiment manual and instructor's manual				

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*M. Vilbata*  
**Marvin Vilbata** 01-06-23  
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*Ruby G. Manangu*  
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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
5	5. Module dimension: at least 255x165x30mm 6. Connection plugs are used on the modules to prevent accidental damages. 7. Individual keeping case for each module <b>Electronics Fundamentals Module - KL-200</b>  <b>Features:</b> 1. All modules must be equipped with an 8-bit DIP switch for fault insertion/simulation 2. Individual keeping case for easy carrying and Storage. 3. With universal breadboard for designing own circuits. 4. Uses 2mm connecting plug for the socket  <b>Technical Specification:</b> <b>Main Unit</b> 1. DC Power Supply 1) Fixed DC power supply a. Voltage range: +5DCV to -5DCV, +12DCV to - 12DCV b. With output overload protection 2) Dual DC power supply a. ±3V to ±18 DCV, continuously adjustable b. With output overload protection 2. AC Power Supply : 9ACV - 0ACV - 9ACV 2 With output overload protection 3. Function Generator : Sine, square and triangle : 10 Hertz to 100 Kilohertz, 4 settings, continuously adjustable : ±5 percent of scale value : 50 Ohms : ≥18Vpeak to peak (open loop) ≥9Vpeak to peak (with 50Ω load)	unit	2	1,284,200.00	2,568,400.00

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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	4 3 1/2-Digit Digital Voltmeter /Ammeter : 2DCV to 200DCV : ±0.3% of reading + 1 digit : 200µA, to 2000mA : ±0.5% of reading + 1 digit 5. Analog Meters : 0 to 100mA up to 1A : 0 to 15V : 0 to 100mA up to 1A : 0 to 20V 6. Speaker 1) 8Ω, 0.25W speaker with driver amplifier circuit 7. Variable Resistors 1) 1KΩ, 0.25W variable resistor with 3 terminals (A, B, C) 2) 10KΩ, 0.25W variable resistor with 3 terminals (A, B, C) 3) 100KΩ, 0.25W variable resistor with 3 terminals (A, B, C) 4) 1MΩ, 0.25W variable resistor with 3 terminals (A, B, C) 8. Solderless Breadboard 1) 1680 tie-point breadboard on top panel can be easily put into and taken off  The equipment modules shall have the following specification: 1. Each module is secured in a solid-body plastic housing and each module shall equipped with DIP switch (8-bit) for fault insertion/simulations. Students can practice trouble shooting by setting the DIP switch to different positions 2. Detailed solutions for the fault simulation are included in the instructor's manual  The equipment shall be able to perform the following experiments: 1. Characteristics of Diodes				

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*M. VILLANCA*  
**Marvin Villanca**  
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*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	2. Clipping and Clamping Circuits with Diodes 3. Rectifier Circuits 4. Differential and Integrator Circuits 5. Transistors 6. Transistor Amplification Circuits 7. Field Effect Transistors (FET) 8. FET Amplification Circuits 9. Multi - Stage Amplification Circuits 10. Transistor Negative Feedback Circuits 11. Transistor Positive Feedback Circuits 12. Regulated Voltage /Constant Current Circuits 13. Modulation and Demodulation 14. Op Amp 15. Basic Characteristics of OP Amplifier 16. Basic Characteristics of OP Amplifier (1 and 2)-Negative Feedback 17. Basic Characteristics of OP Amplifier - Positive Feedback  The set shall come with the following accessories: 1. Experiment manual and instructor's manual 2. Connection leads and plugs (2mm): 1set 3. Allen wrench Key: 1pc 4. Handheld Digital Multi Meter 5. Digital Oscilloscope  The software shall have the following capabilities: 1. Schematic Editor 2. Schematic Symbol Editor 3. Footprint Editor 4. Netlist Editor 5. Live 3D Breadboard Tool 6. Advanced PCB Designer				

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*Marvin V. Plarck*  
**Marvin V. Plarck** 81-06-23  
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**RUBY G. MANANGU**  
 City Accountant

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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	a) Automatic and Manual Design Tools b) Creating flex PCB's c) Animated 3D view 7. Electrical Rules Check (ERC) 8. Interpreter 9. Library Manager 10. Parameter Extractor 11. Text and Equation Editor 12. DC analysis 13. Transient Analysis 14. Fourier analysis 15. Digital Simulation 16. HDL Simulation (VHDL, Verilog, Verilog-A, Verilog-AMS) 17. Microcontrollers (MCU) Simulation 1) MCU Simulation and Debugging (PIC, AVR, 8051,8085, HCS, ARM) 2) Linux and Android Simulation (ARM) 3) Mixed Spice Simulation (Berkely and Xspice) 18. Flowchart Editor and Debugger 19. AC analysis 20. Network analysis 21. Noise analysis 22. Symbolic analysis 23. Monte-Carlo and Worst-case analysis 24. Design Tool 25. Optimization 26. Post-processor 27. Presentation 28. Interactive mode 29. Virtual Instruments 1) Digital Multimeter 2) Function Generator				

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 City Mayor

*M. Villarza*  
**Marvin Villarza** 01-06-23  
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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	3) Storage Oscilloscope 4) Signal and Network Analyzer 5) Digital Signal Generator 6) Logic Analyzer 30. Real-time Test & Measurements 31. Mechatronics Extension 1) Sensing and Controlling 2) Robotics 3) Automotive Electronics 32. Faster MCU simulation, real time simulation of delays 33. Verilog-AMS: analogue events in digital context 34. New format at Fourier analysis: $D * \cos(kwt + fi)$ 35. The software accepts both M and MEG as mega (1e6), but mega is always displayed as MEG (Spice) 36. Macro wizard: Configurable pin order & name at auto generated shapes 37. Zoom or Scroll with mouse wheel, as set at View Options 38. New features in the HDL editor 39. Added reference voltage in the Fourier spectrum dialog 40. Added MicroBasic 1st file handling support in the hex/1st debugger 41. Multilanguage capability, instant language change for licensed languages 42. Open project files with preview of schematics and mechatronics 43. EDIF import 44. Global Spice variables 45. KLU - a faster linear solver and better convergence on large-size or special circuits 46. Enhanced and accelerated VHDL and Verilog simulation 10x times faster than in v9 47. Xilinx simprim simulation in digital and in mixed mode				

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6	48. Verilog A 49. Verilog AMS 50. MCU C compiling on 8051, AVR, PIC16, PIC18, PIC32, ARM 51. Pspice compatible AD-DA interface 52. Oscilloscope works together with the interactive mode 53. Frequency and waveform parameters are shown with cursors 54. Hotkeys to AC and Transient Analysis 55. Cursor Max and Min functions added to the Process menu <b>Fiber Optic Communication Trainer - KL-900D</b>  Features: *With four different data transmission ways (self-module transmission, module-to-module transmission, PC-to-module transmission, and module-to-PC transmission). *The experiment will show you how easy it is to make productive use of fiber optic materials. *The equipment that you assemble will transmit voice from one point to another, using light traveling through an optical fiber.  Specifications: Main Unit 1. Power: AC-DC Adapter a. AC input: 100 ~ 240V b. DC output: 15V, 500mA 2. Microphone Circuit a. Frequency range: 20Hz ~ 12KHz b. With gain 20 amplified circuit 3. Push-button Switch a. N.O. Type b. With LED indication	unit	2	1,458,600.00	2,917,200.00

**MA. JOSEFINA G. BELMONTE**  
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*Martin Volante*  
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**RUBY G. MANANGU**  
 City Accountant

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	4. Function generator a. Output sine wave with adjustable output amplitude b. Output square wave, with CMOS level c. Frequency range: 6Hz ~ 2KHz 5. Output Speaker a. 8Ω, 1/4W 6. Transmitter Module a. Optical fiber light: Red LED, λ = 660nm b. Max. drive current: 50mA c. Effective coupling micro-lens spotlight d. Emitter follower 7. Receiver Module a. Optical receiving diode i. λ peak: 880nm ii. Connectable plastic optical fiber with 1000 m core iii. Effective coupling micro lens spotlight iv. Max. consumption power: 100mW b. With amplified, gain, restoring sharpness circuit 8. Data transmission elements a. Chip set: AVR8515, 8bits, 8MHz crystal b. LCD: back light 20 x2 letter chip c. Keyboard: 4 x 4 16Key d. Character mode: single letter or string letter available e. Send mode: OFF (self-module transmission), transceiver (module-to-module), PC module module PC f. With reset function g. Communication interface: RS 232C, 9600 baud rate h. Software environment: Windows base  Experiment Modules 1. 2mm connection leads are used throughout the system				

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*Marvin Valante*  
**Marvin Valante** 61-06-23  
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7	2. The building blocks and components symbols of the circuits are printed on the surface of each module. 3. Modules are secured in plastic housings 4. Comprehensive experimental manual 5. Use bridge plugs on circuit loop to reduce the possibility of errors  List of Experiments 1. Characteristic of fiber optics experiment 2. Applications of fiber optics experiment 3. Light sources of fiber optics 4. Light and fiber optics interaction experiment 5. Fiber optic transmitters experiment 6. Receivers for fiber optic system experiment 7. Fiber optic expand and network experiment 8. Fiber optic connectors and lose-polishing experiment 9. Fiber optical data-transmission-self-transceiver experiment 10. Fiber optical data-transmission-double-transceiver experiment 11. Fiber optical data-transmission - PC module experiment 12. Fiber optical data-transmission - module PC experiment  Accessories 1. 2mm test lead: 1set 2. Plastic fiber optics: 1set 3. Experiment manual 4. RS-232 to USB adapter 5. Connection plug pitch =10mm 6. Headphone and microphone Industrial Electronics Trainer - KL-500  Features: *Comprehensive study including the theoretical study and practical	unit	2	3,202,800.00	6,405,600.00

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PO Number **2212052**

Purchase Order Date: **DEC 23 2022**

Procuring Unit : <b>QUEZON CITY UNIVERSITY</b>	Project Number : <b>QCU-22-ELTE-1322B</b>
Company Name : <b>HYTEC POWER INC.</b>	Mode of Procurement : <b>Public Bidding</b>
Address : <b>No. 2 T. Cruz St., Cruzville Subd., Zabarte Road, Novaliches, Quezon City</b>	Resolution No. : <b>22-PB-522</b>
Business Type : <b>Corporation Registration #CS200401804</b>	TIN Number : <b>229-283-188-000</b>
	Contact Number : <b>09158093937</b>

**Sir/Madam:**  
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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	exercises *Use of industrial-type components, devices and circuits *The Industrial Electronic Trainer is a self-contained training equipment allowing students to learn more than 70 experiments through a power supply unit and 16 replaceable modules.  Specification: 1. Power Supply Unit (1) ACV output voltage: 18V-0V-18V, 0.5A (2) ACV output voltage: 12V-0V-12V, 0.5A (3) DCV output voltage: +12V, 0.5A (4) DCV output voltage: +5V, 0.5A 2. Meter/Motor Unit (1) Dual-scale ACV: 150V-300V, class 2.5 (2) Dual-scale ACA: 0-100mA-1A, class 2.5 (3) Dual-scale DCV: 0-10V-20V, class 2.5 (4) Dual-scale DCA: 0-100mA-1A, class 2.5 (5) AC110V/220V motor  List of Experiments 1. Power Supply Unit Experiments (1) AC voltage measurement (2) DC voltage measurement 2. UJT Experiments UJT Characteristic & Equivalent Circuit (1) UJT introduction (2) UJT characteristic (3) UJT equivalent circuit (4) CDS trigger, RTH trigger UJT Oscillator Circuit & Timer Switch				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*M. Villarta*  
**Martin Villarta**  
 Signature Over Printed Name of Supplier / Date **01-06-23**

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**

**Approved Budget for the Contract : 33,780,000.00**

*2/1/23*





Republic of the Philippines  
**PROCUREMENT DEPARTMENT**  
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	(1) UJT relaxation oscillator (2) UJT timer switch 3. PUT Experiments PUT Characteristic & Equivalent Circuit (1) PUT introduction (2) PUT characteristic (3) PUT equivalent circuit (4) CDS trigger (5) RTH trigger PUT Oscillator Circuit & Timer Switch (1) PUT circuit oscillator (2) PUT timer sw 4. PUT & SCR Experiments PUT Staircase Generator & Voltage Control Ramp Circuit (1) PUT staircase generator circuit (2) PUT voltage control ramp circuit SCR Characteristic & RC Shift Control Circuit (1) SCR principle (2) SCR characteristic curve (3) SCR construction (4) SCR trigger mode (5) SCR RC phase control circuit 5. SCS Experiments SCS Characteristic Experiment (1) SCS construction and operation mode (2) Use VOM meter measuring SCS (3) SCS schmitt circuit (4) SCS simulate PUT circuit SCS Trigger Circuit Experiment (1) CDS trigger (2) RTH trigger				

**MA. JOSEFINA G. BELMONTE**  
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*Marrin Villarta*  
**Marrin Villarta** 01-06-23  
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**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**

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Stock No.	Item	Unit of Issue	QTY	Unit Cost	Amount
	6. UJT & PUT Trigger SCR Experiments UJT Trigger SCR Phase Control Circuit (1) Phase control basic circuit (2) Phase control analysis (3) AC phase control circuit analysis (4) UJT trigger SCR phase control circuit PUT Trigger SCR Phase Control Circuit 7. SCR Control DC Motor & DIAC, TRIAC SCR Characteristic Experiments SCR Control DC Motor Forward / Reverse Experiment (1) SCR cut-off principle (2) SCR control DC motor forward / reverse control experiment DIAC, TRIAC Characteristic Experiment (1) DIAC construction and characteristic (2) DIAC operation mode and measurement (3) TRIAC construction and characteristic (4) TRIAC trigger mode (5) TRIAC static measurement 8. Automatic Control Lamp, TRIAC Control Speed Experiments Automatic Control Lamp Experiment (1) TRIAC shift control (2) TRIAC automatic control lamp experiment TRIAC Control Motor Speed Experiment (1) Different motor introduction (2) TRIAC control motor speed experiment 9. Temperature Ratio, Photo-Couple and Touch Control Experiments Bridge Temperature Ratio Control Experiment (1) Electronic component of thermal resistor (2) SCR bridge temperature ratio control experiment Photo-Couple and Touch Control Experiment (1) Photo-couple control circuit				

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**Marvin Villanar** 01-06-23  
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*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

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*JRS*



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	(2) FET construction and characteristic (3) Touch alarm circuit 10. Over / Under Voltage Breaker and Flasher Control Experiments Over / Under Voltage Breaker Experiment (1) OPA characteristic with reverse & non-reverse circuit (2) Voltage comparison circuit Flasher Control Experiment (1) Application of TRIAC power control (2) AC circuit control (3) Multivibrator 11. TRIAC Liquid Level & IC Timer Switch Experiments TRIAC Liquid Level Control Experiment (1) Digital circuit introduction (2) TRIAC liquid level control experiment IC Timer Switch Experiment (1) NE 555 IC circuit introduction (2) IC timer switch experiment 12. Digital Signal Driver & Zero-Voltage Switch Experiments Digital Signal Driver Control Experiment Digital signal driver control experiment Zero-Voltage Switch Experiments (I) Ideal half-wave zero-voltage switch experiments 13. Zero-Voltage Switch Experiments Zero-Voltage Switch Experiments (II) (1) TRIAC zero-voltage switch experiments (2) IC mode zero-voltage switch experiments 14. SCR Converter Experiments (1) Parallel converter introduction (2) Series converter introduction (3) Converter trigger source (4) Converter voltage adjustment				

**MA. JOSEFINA G. BELMONTE**  
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*Marvin Villarba*  
**Marvin Villarba** 21-26-23  
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*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

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8	(5) Converter output-waveform improvement 15. SCR Rectifier Circuit Experiments (1) Single-phase half-wave rectifier (2) Single-phase full-wave rectifier (3) Single-phase bridge rectifier (4) Three-phase half-wave rectifier (5) Three-phase full-wave rectifier 16. JFET / MOSFET Characteristic & MOSFET Speed Control Experiments (1) JFET characteristic experiment (2) MOSFET characteristic experiment (3) MOSFET speed control experiment 17. IGBT Characteristic & IGBT Speed Control Experiments (1) IGBT characteristic experiment (2) IGBT speed control experiment 18. Accessories (Including Storage Cabinet 2 pcs) 19. Rack Frame 20. Power Supply (0+-30V, 3A) 21. Transformer (For local 3 phase power not 220V) 21. Digital Storage Oscilloscope 22. Hand-held digital multimeter Programmable Logic Controller Trainer - PLC-220  Features: 1. Input-simulation switches function as level and pulse Input for different input signal 2. It is particularly suitable for installation of output relay helps to increase load current 3. Easy-to-use, Windows-based development software 4. Assorted peripheral devices and other devices that support external extensions, it particularly suits laboratory experiment	unit	2	1,301,500.00	2,603,000.00

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*M. Villalta*  
**Morvin Villalta**  
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**RUBY G. MANANGU**  
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	and project implementation. 5. Various simulations I/O devices for studying and observing the results 6. Using 4mm safety sockets on Input/Output terminals to ensure users' safety 7. The suitcase-design makes it easy to carry, move and store  <b>TECHNICAL SPECIFICATION</b> 1. AC Adapter: input 100V ~ 240V AC, output 24V DC 2. PLC Main Unit: SIEMENS SIMATIC S7-1214C 3. Digital Input: 14 4. Digital Output: 10 5. Analog Input: 2 6. Support High-speed Counters: 6 7. Support PTO/PWM Pulses: 4 (total) 8. Support Timers: limited by the amount of memory in the CPU 9. Communication Ports: PROFINET 10. Module Expansion Port and DIO Extension Port 11. Traffic Light Control Module 12. Tank-filling Device Module 13. 4-digit, 7-segment Display 14. 4-digit Thumbwheel Switch 15. Step Motor 16. Encoder 17. 24V DC Motor 18. Proximity Sensor 19. Micro Switch 20. Buzzer 21. 4 x 4 Keypad 22. Analog Input Knob: 0 ~ 10V DC 23. 24V DC Expansion Power				

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**Marvin Vilata** 21-06-23  
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**RUBY G. MANANGU**  
 City Accountant

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	24. Windows-based programming software (STEP 7 TIA Portal)				
	List of Experiments 1. STEP 7 TIA portal operations (1) Editing ladder program (2) Testing ladder program (3) Monitoring status 2. Basic control circuits (1) Self-holding circuit (2) Flashing control (3) Inching control (4) Single button Control 3. Light control (1) Simple light control (2) Complex light control 4. Traffic light control (1) Traffic light controller (conventional) (2) Traffic light controller (code block) 5. Digital clock control (1) 7-segment display control (2) Time clock 6. Step motor control (1) Speed and direction control (2) Encoder operation (3) Step motor and encoder (4) Step motor's step display 7. Tank filling device control (1) Tank filling control (2) Thumbwheel device (3) Tank filling control with thumbwheel 8. Keypad control				

**MA. JOSEFINA G. BELMONTE**  
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*M. N. N. N.*  
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*J.A.S.*



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9	(1) Keypad operation (2) Digital lock control 9. DC motor control (1) Analog Input Controller (2) PWM speed controller (3) Proximity and micro switches (4) Automatic speed control  Accessories 1. Power Cord 2. Experiment Manual 3. Connecting Leads Set 4. Industrial Ethernet Cable, CAT 6, Length 6M 5. SIMATIC STEP 7 BASIC TIA Portal Software DVD Microcontroller Application Module Trainer - MTS-887  The equipment shall have the following technical specifications: 1. PIC16F887 chip x 1 (1) 40 pins (35 input/output pins) (2) 368 bytes RAM memory (3) Nano Watt Technology (4) (4) 10-Bit Analog-to-Digital (A/D) Converter (5) Operating Frequency (0~20MHz) 2. UART to USB Interface x 1 3. EEPROM 64Kbits x 1 4. 20 x 2 character LCD x 1 5. 4-digit 7-segment display x 1 6. Capacitive sensing button x 1 7. LED x 11 8. 8 x 8 multicolor dot matrix LED display x 1 9. Buzzer and status LED x 1	unit	1	436,000.00	436,000.00

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*M. Villanueva*  
**Martin Villanueva**  
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01-06-23

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*Ruby G. Manangu*  
**RUBY G. MANANGU**  
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2/11/23

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	10. 5K variable resistor x 1 11. AD590 temperature sensor x 1 12. Stepping motor and status LED 7.5 degrees x 1 13. 10 x 2 extend socket x 2 14. Slide switch x 8 15. 4 x 4 matrix keypad x 1 16. Built-in power supply: Input: 100~240VAC, 50/60Hz, 0.65A Output: 12V/1.2A, 5V/2.1A, 3.3V/1A  The equipment shall be able to perform the following experiments: 1. Basic I/O Controls 2. External Interrupt I/O Experiment 3. Chip Clock 4. Watch dog Timer 5. Timer 6. UART 7. I2C 8. LCD module experiment 9. Temperature Measurement experiment 10. LED matrix display experiment 11. Stepping Motor experiment 12. Capacitive touch sensing experiment  The set shall include the following accessories: 1. A.C. power cord 1pc 2. Fuse 1pc 3. Experiment manual 1pc 4. Experiment CD 1pc 5. USB A-B type cable, 150cm 1pc 6. IDC cable 10x2 pin, 20cm 1pc				

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 Martin Villalobos  
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10	7. Dupont Line 1P-1P, 150mm 20pc 8. 6pin Programmer Cable 1pc 9. Microchip PICkit 3 debugger/ programmer Electronics Application Training System - MTS-101  Features: 1.The trainer includes various I/O peripherals suitable for learning Arduino project 2.Independent I/O blocks, allowing users to use Dupont wire to build their own applications 3.Step by step procedure in experiment manual 4.With dual power design, users can select either Arduino or External power for I/O devices. 5.Solderless Breadboard allow users to create more circuits and integrate them into the system  Specifications: 1. Power (1) Input: 110V/220V AC, 50Hz/60Hz (2) Output: +5V/1.5A, +3.3V/0.5A 2. Control board (1) Arduino UNO R3 compatible (2) Core: ATMEGA328P (3) Digital IO: 14 (D0~D13) (4) Analog IO: 6 (A0~A5) (5) PWM output: 6 (D3, D5, D6, D9, D10, D11) (6) Support AREF pin (7) Support Tx/Rx pin (8) Support I C interface (9) Support ISP download	set	2	629,000.00	1,258,000.00

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*M. N. Vialon*  
**Mario Vialon** 21-06-23  
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	(10) Programming interface: USB Type-B 3. Input module (1) Digital input a. 4x4 Keypad: touch button b. DIP switch: 8 bits (2) Analog input a. Slide potentiometer: 20KΩ x 2 b. Joystick x 1 c. Microphone x 1 (3) Sensor input a. CDS sensor x 1 b. Temperature & humidity sensor x 1 c. Accelerometer: 3-axis d. Ultrasonic x 1 e. IR line tracer x 1 4. Output module (1) LED matrix display: 8x8 (2) 4-digit 7-segment display (3) LED Bar: 10 bits (4) RGB LED x 4 (5) High power LED: 1W (6) Serial RGB LED x 20 (7) LCD display: 16x2 (serial & parallel) (8) Relay: 5V, 2 sets (9) DC motor: 5V, 2 sets (10) Step motor: 12V, 7.5 deg / tick (11) Servo motor x 2 (12) Buzzer A: Electromagnetic, self-drive (13) Buzzer B: Electromagnetic, external-drive 5. Communication module (1) WiFi : ESP8266 x 1				

**MA. JOSEFINA G. BELMONTE**  
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	(2) Bluetooth: HC05 x 1 6. Other module Solderless breadboard: 81x51mm, 408 tie points  List of Experiments 1. Buzzer and Keypad Control (1) Button Controlled Buzzer (2) Simple Electronic Organ (3) Music Player 2. LED Matrix Control (1) Static Display (2) Dynamic Display 3. 7-Segment Display Control (1) Alternative Display (2) Simple Digital Clock (3) Human-Machine Interface (HMI) 4. Relay Control (1) ON-OFF Control with Two Buttons (2) ON-OFF Control with One Button 5. Voice and Light Control 6. Analog Input and Output (1) Potentiometer Controlled LED Dimmer (2) Joystick Controlled LED Dimmer 7. Serial Monitor (1) LED Brightness Controller 1 (2) LED Brightness Controller 2 (3) Light Detector (4) Noise Detector (5) Digital Voltmeter 8. Conventional RGB Control (1) Static Display				

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	(2) Dynamic Display				
	9. Serial RGB Control				
	(1) Button Controlled Serial RGB LED				
	(2) Dual Running LED				
	(3) Pressure-Activated Serial RGB LED				
	(4) Voice-Activated Serial RGB LED				
	10. LCD Display Control				
	(1) 8-Bit Interface LCD Control				
	(2) 4-Bit Interface LCD Control				
	(3) IC Interface LCD Control				
	11. Humidity/Temperature Measurement				
	12. Ultrasonic Range Finder				
	(1) Serial Monitor Display				
	(2) LCD Display				
	13. IR Line Tracer				
	14. Servo Motor Control				
	(1) Potentiometer Controlled Servos				
	(2) 2-Axis Robot Control				
	15. 3-Axis MEMS Accelerometer Control				
	16. DC Motor Control				
	(1) Start/Stop Control				
	(2) Speed and Direction Control				
	17. Step Motor Control				
	(1) Unipolar Step Motor Controller				
	(2) Bipolar Step Motor Controller				
	18. Bluetooth Wireless Communications				
	(1) Windows Cross Platform Control				
	(2) Android Cross Platform Control				
	19. Wi-Fi Wireless Networking				
	Data Logger in Cloud				
	20. Color Sensor				

**MA. JOSEFINA G. BELMONTE**  
 City Mayor

*M. Villanueva*  
**Marcus Villanueva** 01-06-23  
 Signature Over Printed Name of Supplier / Date

**Funds Available:**

*Ruby G. Manangu*  
**RUBY G. MANANGU**  
 City Accountant

**OBR :**

**Approved Budget for the Contract : 33,780,000.00**

*2/1/23*