REPUBLIC OF THE PHILIPPINES
QUEZON CITY GOVERNMENT
BIDS AND AWARDS COMMITTEE –
GOODS AND SERVICES

PHILIPPINE BIDDING DOCUMENTS

(As Harmonized with Development Partners)

PROCUREMENT OF VARIOUS ENGINEERING EQUIPMENT

PROJECT NO. QCU-22-ELTE-1322B

Government of the Republic of the Philippines

Sixth Edition
July 2020

Preface

These Philippine Bidding Documents (PBDs) for the procurement of Goods through Competitive Bidding have been prepared by the Government of the Philippines for use by any branch, constitutional commission or office, agency, department, bureau, office, or instrumentality of the Government of the Philippines, National Government Agencies, including Government-Owned and/or Controlled Corporations, Government Financing Institutions, State Universities and Colleges, and Local Government Unit. The procedures and practices presented in this document have been developed through broad experience, and are for mandatory use in projects that are financed in whole or in part by the Government of the Philippines or any foreign government/foreign or international financing institution in accordance with the provisions of the 2016 revised Implementing Rules and Regulations of Republic Act No. 9184.

The Bidding Documents shall clearly and adequately define, among others: (i) the objectives, scope, and expected outputs and/or results of the proposed contract or Framework Agreement, as the case may be; (ii) the eligibility requirements of Bidders; (iii) the expected contract or Framework Agreement duration, the estimated quantity in the case of procurement of goods, delivery schedule and/or time frame; and (iv) the obligations, duties, and/or functions of the winning bidder.

Care should be taken to check the relevance of the provisions of the PBDs against the requirements of the specific Goods to be procured. If duplication of a subject is inevitable in other sections of the document prepared by the Procuring Entity, care must be exercised to avoid contradictions between clauses dealing with the same matter.

Moreover, each section is prepared with notes intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They shall not be included in the final documents. The following general directions should be observed when using the documents:

a.   All the documents listed in the Table of Contents are normally required for the procurement of Goods. However, they should be adapted as necessary to the circumstances of the particular Procurement Project.

b.   Specific details, such as the "*name of the Procuring Entity*" and "*address for bid submission,*" should be furnished in the Instructions to Bidders, Bid Data Sheet, and Special Conditions of Contract. The final documents should contain neither blank spaces nor options.

c.   This Preface and the footnotes or notes in italics included in the Invitation to Bid, Bid Data Sheet, General Conditions of Contract, Special Conditions of Contract, Schedule of Requirements, and Specifications are not part of the text of the final document, although they contain instructions that the Procuring Entity should strictly follow.

d.   The cover should be modified as required to identify the Bidding Documents as to the Procurement Project, Project Identification Number, and Procuring Entity, in addition to the date of issue.

e. Modifications for specific Procurement Project details should be provided in the Special Conditions of Contract as amendments to the Conditions of Contract. For easy completion, whenever reference has to be made to specific clauses in the Bid Data Sheet or Special Conditions of Contract, these terms shall be printed in bold typeface on Sections I (Instructions to Bidders) and III (General Conditions of Contract), respectively.

f. For guidelines on the use of Bidding Forms and the procurement of Foreign-Assisted Projects, these will be covered by a separate issuance of the Government Procurement Policy Board.

Table of Contents

Glossary of Acronyms, Terms, and Abbreviations

ABC – Approved Budget for the Contract.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender*. (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

CDA - Cooperative Development Authority.

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

CIF – Cost Insurance and Freight.

CIP – Carriage and Insurance Paid.

CPI – Consumer Price Index.

DDP – Refers to the quoted price of the Goods, which means "delivered duty paid."

DTI – Department of Trade and Industry.

EXW – Ex works.

FCA – "Free Carrier" shipping point.

FOB – "Free on Board" shipping point.

Foreign-funded Procurement or Foreign-Assisted Project– Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

Framework Agreement – Refers to a written agreement between a procuring entity and a supplier or service provider that identifies the terms and conditions, under which specific purchases, otherwise known as "Call-Offs," are made for the duration of the agreement. It is in the nature of an option contract between the procuring entity and the bidder(s) granting the procuring entity the option to either place an order for any of the goods or services identified in the Framework Agreement List or not buy at all, within a minimum period of one (1) year to a maximum period of three (3) years. (GPPB Resolution No. 27-2019)

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

GPPB – Government Procurement Policy Board.

INCOTERMS – International Commercial Terms.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency

which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

Supplier – refers to a citizen, or any corporate body or commercial company duly organized and registered under the laws where it is established, habitually established in business and engaged in the manufacture or sale of the merchandise or performance of the general services covered by his bid. (Item 3.8 of GPPB Resolution No. 13-2019, dated 23 May 2019). Supplier as used in these Bidding Documents may likewise refer to a distributor, manufacturer, contractor, or consultant.

UN – United Nations.

Section I. Invitation to Bid

Notes on the Invitation to Bid

The Invitation to Bid (IB) provides information that enables potential Bidders to decide whether to participate in the procurement at hand. The IB shall be posted in accordance with Section 21.2 of the 2016 revised IRR of RA No. 9184.

Apart from the essential items listed in the Bidding Documents, the IB should also indicate the following:

a. The date of availability of the Bidding Documents, which shall be from the time the IB is first advertised/posted until the deadline for the submission and receipt of bids;

b. The place where the Bidding Documents may be acquired or the website where it may be downloaded;

c. The deadline for the submission and receipt of bids; and

d. Any important bid evaluation criteria (*e.g.*, the application of a margin of preference in bid evaluation).

The IB should be incorporated in the Bidding Documents. The information contained in the IB must conform to the Bidding Documents and in particular to the relevant information in the Bid Data Sheet.

QUEZON CITY GOVERNMENT
BAC – GOODS AND SERVICES

INVITATION TO BID

QUEZON CITY
Great.Green.Growing.

November 02, 2022

	PROJECT NO.	OFFICE	PROJECT NAME	AMOUNT	SOURCE OF FUND	DELIVERY PERIOD
1.	DBO-22-OE-1272	DEPARTMENT OF THE BUILDING OFFICIAL	PRINTER AND OTHERS	P 1,577,668.00	TRUST FUND	30 CD
2.	ASC-22-HCS-1264	AMORANTO SPORTS COMPLEX	VARIOUS HARDWARE SUPPLIES (PAINT BRUSH AND OTHERS)	P 1,393,447.18	GENRAL FUND	30CD
3.	OCM-22-GI2-1578	OFFICE OF THE CITY MAYOR	VARIOUS GROCERY ITEMS AND OTHERS	P 40,031,246.95	GENERAL FUND	15 CD
4.	OCM-22-HCS-1640	OFFICE OF THE CITY MAYOR	RAKE AND OTHERS	P 14,474,126.04	GENERAL FUND	1 MONTH
5.	OCM-22-AP1-1639	OFFICE OF THE CITY MAYOR	VARIOUS AGRICULTURAL PRODUCTS AND OTHERS	P 18,430,300.00	GENERAL FUND	30 CD
6.	OCM-22-OESC-1466B	OFFICE OF THE CITY MAYOR	INK AND OTHERS	P 10,352,500.00	GENERAL FUND	30 CD
7.	QCDRRMO-22-VEHICLES-1630	QUEZON CITY DISASTER RISK REDUCTION AND MANAGEMENT OFFICE (ENGINEERING DEPARTMENT)	GARBAGE CRANE WITH CLAMSHELL BUCKET FOR DREDGING	P 9,000,000.00	TRUST FUND	180 CD
8.	OCIBELMONTE-22-FOODSTUFF-1663	OFFICE OF COUNCILOR IRENE R. BELMONTE	CUPCAKE AND BOTTLED WATER	P 2,780,000.00	GENERAL FUND	30 CD
9.	HEALTH-22-DM-1675	QUEZON CITY HEALTH DEPARTMENT	VARIOUS DRUGS AND MEDICINES	P 127,960,300.00	GENERAL FUND	1 MONTH
10.	CONSO-22-SG-1682	OFFICE OF THE CITY MAYOR – POPS PLAN / DEPARTMENT OF PUBLIC ORDER AND SAFETY	BIKE WITH ACCESSORIES AND HELMET	P 1,760,000.00	GENERAL FUND	30 CD
11.	CONSO-22-CE1-1522B	OFFICE OF THE CITY MAYOR - POPS PLAN (RCS)	SUPPLY AND INSTALLATION OF TWO-WAY RADIO REPEATER SYSTEM	P 4,714,308.00	GENERAL FUND	1 MONTH
12.	OCM(POPS)-22-FOODSTUFF-1124	OFFICE OF THE CITY MAYOR – POPS PLAN	FOOD SUPPLIES AND OTHERS	P 3,864,260.00	GENERAL FUND	1 MONTH
13.	OCM(POPS)-22-HLMF-1197	OFFICE OF THE CITY MAYOR – POPS PLAN	HOTEL ACCOMMODATION AND OTHERS	P 4,992,000.00	GENERAL FUND	1 MONTH
14.	OCM(POPS)-22-CS1-1638	OFFICE OF THE CITY MAYOR – POPS PLAN	FOOD AND DRINKS AND OTHERS	P 3,840,126.00	GENERAL FUND	1 MONTH
15.	OCM(POPS)-22-VEHICLES-985B	OFFICE OF THE CITY MAYOR - POPS PLAN (TFTTM)	MOTORCYCLE	P 3,200,000.00	GENERAL FUND	30 CD
16.	QCU-22-ELTE-1322B	QUEZON CITY UNIVERSITY	VARIOUS ENGINEERING EQUIPMENT	P 33,780,000.00	TRUST FUND	90 CD
17.	QCU-22-PS2-1278	QUEZON CITY UNIVERSITY	PRINTING OF BROCHURES AND OTHERS	P 1,195,080.00	GENERAL FUND	1 MONTH

1. The **QUEZON CITY LOCAL GOVERNMENT**, through the *General Fund and Trust Fund of various years* intends to apply the sums stated above being the ABC to payments under the contract for *the above stated projects of contract for each lot/item*. Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The **QUEZON CITY LOCAL GOVERNMENT** now invites bids for various **Projects**. Delivery of the Goods is required *as stated above*. Bidders should have completed, within **the last three (3) years** from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. Instructions to Bidders.

3. Bidding will be conducted through open competitive bidding procedures using a non-discretionary *"pass/fail"* criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

a. Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines, and to citizens or organizations of a country the laws or regulations of which grant similar rights or privileges to Filipino citizens, pursuant to RA No. 5183.

4. Prospective Bidders may obtain further information from *QUEZON CITY GOVERNMENT Bids and Awards Committee (BAC) Secretariat* and inspect the Bidding Documents at the address given below during *weekdays from 8:00 a.m. – 5:00 p.m.*

5. A complete set of Bidding Documents may be acquired by interested Bidders on *Thursday, November 03, 2022* from the given address and website(s) below *and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB.* The Procuring Entity shall allow the bidder to present its proof of payment for the fees *in person.*

STANDARD RATES:

Approved Budget for the Contract	Maximum Cost of Bidding Documents (in Philippine Peso)
500,000 and below	500.00
More than 500,000 up to 1 Million	1,000.00
More than 1 Million up to 5 Million	5,000.00
More than 5 Million up to 10 Million	10,000.00
More than 10 Million up to 50 Million	25,000.00
More than 50 Million up to 500 Million	50,000.00
More than 500 Million	75,000.00

The following are the requirements for purchase of Bidding Documents;
1. PhilGEPS Registration Certificate (Platinum – 3 pages)
2. Document Request List (DRL)
3. Authorization to Purchase Bidding Documents
    3.1 Corporate Secretary Certificate for corporation (specific for the project)
    3.2 Special Power of Attorney for single proprietorship (specific for the project)
4. Notarized Joint Venture Agreement (as applicable)

6. The *Quezon City Local Government* will hold a Pre-Bid Conference on 10:00 A.M. of **Thursday, November 10, 2022** at **2nd Floor, Procurement Department-Bidding Room, Finance Building, Quezon City Hall Compound**, and/or through video conferencing *via Zoom* which shall be open to prospective bidders.

    Topic: BAC-GOODS Pre-Bid Conference Meeting
    Join Zoom Meeting
    https://us02web.zoom.us/j/84835002246?pwd=OVRuVE0weXZMNXYwZG5LaWd1dXk1QT09

    Meeting ID: 848 3500 2246
    Passcode: 154733

7. Bids must be duly received by the BAC Secretariat through manual submission at the 2nd Floor, Procurement Department, Finance Building, Quezon City Hall Compound on or before 11:00 A.M. of **Tuesday, November 22, 2022**. Late bids shall not be accepted.

8. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 14.

9. Bid opening shall be on 1:00 P.M. of **Tuesday, November 22, 2022** at the given address below and/or via Zoom. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.
    Topic: BAC-GOODS & SERVICES BIDDING
    Join Zoom Meeting
    https://us02web.zoom.us/j/85850855933?pwd=R2dZUUp4Z3lyU29iZGV1WmdKRjZCdz09

Meeting ID: 858 5085 5933
Passcode: 118682

10.   The *Quezon City Local Government* reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised IRR of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.

11.   For further information, please refer to:

ATTY. DOMINIC B. GARCIA
OIC, Procurement Department
2nd Floor, Procurement Department,
Finance Building, Quezon City Hall Compound
Elliptical Road, Barangay Central Diliman, Quezon City.
Email Add: bacgoods.procurement@quezoncity.gov.ph
Tel. No. (02)8988-4242 loc. 8506/8710
Website: **www.quezoncity.gov.ph**

12.   You may visit the following websites:

For downloading of Bidding Documents: **www.quezoncity.gov.ph**

By:

MA. MARGARITA T. SANTOS
Chairperson, QC-BAC-Goods and Services

Section II. Instructions to Bidders

Notes on the Instructions to Bidders

This Section on the Instruction to Bidders (ITB) provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Procuring Entity. It also provides information on bid submission, eligibility check, opening and evaluation of bids, post-qualification, and on the award of contract.

1. **Scope of Bid**

    The Procuring Entity, **Quezon City Local Government** *wishes* to receive Bids for the **PROCUREMENT OF VARIOUS ENGINEERING EQUIPMENT** with identification number **QCU-22-ELTE-1322B.**

    [Note: The Project Identification Number is assigned by the Procuring Entity based on its own coding scheme and is not the same as the PhilGEPS reference number, which is generated after the posting of the bid opportunity on the PhilGEPS website.]

    The Procurement Project (referred to herein as "Project") is composed of ***Ten (10) items***, the details of which are described in Section VII (Technical Specifications).

2. **Funding Information**

    2.1.   The GOP through the source of funding as indicated below for **2022** in the amount of **THIRTY THREE MILLION SEVEN HUNDRED EIGHTY THOUSAND PESOS AND 00/100 ONLY (PHP33,780,000.00).**

    2.2.   The source of funding is:

    a.   LGUs, the Annual or Supplemental Budget, as approved by the Sanggunian.

3. **Bidding Requirements**

    The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manuals and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

    Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or **IB** by the BAC through the issuance of a supplemental or bid bulletin.

    The Bidder, by the act of submitting its Bid, shall be deemed to have verified and accepted the general requirements of this Project, including other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

4. **Corrupt, Fraudulent, Collusive, and Coercive Practices**

    The Procuring Entity, as well as the Bidders and Suppliers, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex "I" of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

5. Eligible Bidders

5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.

5.2. Foreign ownership exceeding those allowed under the rules may participate pursuant to:

    i. When a Treaty or International or Executive Agreement as provided in Section 4 of the RA No. 9184 and its 2016 revised IRR allow foreign bidders to participate;

    ii. Citizens, corporations, or associations of a country, included in the list issued by the GPPB, the laws or regulations of which grant reciprocal rights or privileges to citizens, corporations, or associations of the Philippines;

    iii. When the Goods sought to be procured are not available from local suppliers; or

    iv. When there is a need to prevent situations that defeat competition or restrain trade.

5.3. Pursuant to Section 23.4.1.3 of the 2016 revised IRR of RA No.9184, the Bidder shall have an SLCC that is at least one (1) contract similar to the Project the value of which, adjusted to current prices using the PSA's CPI, must be at least equivalent to:

    a. For the procurement of Non-Expendable Supplies and Services: The Bidder must have completed a single contract that is similar to this Project, equivalent to at least fifty percent (50%) of the ABC.

5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.1 of the 2016 IRR of RA No. 9184.

6. Origin of Goods

There is no restriction on the origin of goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN, subject to Domestic Preference requirements under **ITB** Clause 18.

7. Subcontracts

7.1. The Bidder may subcontract portions of the Project to the extent allowed by the Procuring Entity as stated herein, but in no case more than twenty percent (20%) of the Project.

The Procuring Entity has prescribed that: Subcontracting is not allowed.

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address and/or through videoconferencing as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

10. Documents comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section VIII (Checklist of Technical and Financial Documents)**.

10.2. The Bidder's SLCC as indicated in **ITB** Clause 5.3 should have been completed within *the last three (3) years* prior to the deadline for the submission and receipt of bids.

10.3. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. Similar to the required authentication above, for Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an Apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

11. Documents comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Section VIII (Checklist of Technical and Financial Documents)**.

11.2. If the Bidder claims preference as a Domestic Bidder or Domestic Entity, a certification issued by DTI shall be provided by the Bidder in accordance with Section 43.1.3 of the 2016 revised IRR of RA No. 9184.

11.3. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.

11.4. For Foreign-funded Procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Bid Prices

12.1. Prices indicated on the Price Schedule shall be entered separately in the following manner:

a. For Goods offered from within the Procuring Entity's country:

     i. The price of the Goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable);

     ii. The cost of all customs duties and sales and other taxes already paid or payable;

     iii. The cost of transportation, insurance, and other costs incidental to delivery of the Goods to their final destination; and

     iv. The price of other (incidental) services, if any, listed in e.

b. For Goods offered from abroad:

     i. Unless otherwise stated in the **BDS**, the price of the Goods shall be quoted delivered duty paid (DDP) with the place of destination in the Philippines as specified in the **BDS**. In quoting the price, the Bidder shall be free to use transportation through carriers registered in any eligible country. Similarly, the Bidder may obtain insurance services from any eligible source country.

     ii. The price of other (incidental) services, if any, as listed in **Section VII (Technical Specifications).**

13. Bid and Payment Currencies

13.1. For Goods that the Bidder will supply from outside the Philippines, the bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies, shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

13.2. Payment of the contract price shall be made in:

a. Philippine Pesos.

14. Bid Security

14.1. The Bidder shall submit a Bid Securing Declaration[1] or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

14.2. The Bid and bid security *in no case shall exceed One Hundred Twenty (120) calendar days from the date of opening of bids, unless duly extended by the bidder upon the request of the Head of the Procuring Entity (HoPE) of the Quezon City Local Government.* Any Bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

---

[1] In the case of Framework Agreement, the undertaking shall refer to entering into contract with the Procuring Entity and furnishing of the performance security or the performance securing declaration within ten (10) calendar days from receipt of Notice to Execute Framework Agreement.

15. Sealing and Marking of Bids

Each Bidder shall submit one copy of the first and second components of its Bid.

The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

If the Procuring Entity allows the submission of bids through online submission or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

16. Deadline for Submission of Bids

16.1. The Bidders shall submit on the specified date and time through manual submission as indicated in paragraph 7 of the **IB.**

17. Opening and Preliminary Examination of Bids

17.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance.   In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

17.2. The preliminary examination of bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

18. Domestic Preference

18.1. The Procuring Entity will grant a margin of preference for the purpose of comparison of Bids in accordance with Section 43.1.2 of the 2016 revised IRR of RA No. 9184.

19. Detailed Evaluation and Comparison of Bids

19.1. The Procuring BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*," using non-discretionary pass/fail criteria.   The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of the 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, bidders may submit a proposal on any of the lots or items, and evaluation will be undertaken on a per lot or item basis, as the case maybe. In this case, the Bid Security as required by **ITB** Clause 15 shall be submitted for each lot or item separately.

19.3. The descriptions of the lots or items shall be indicated in **Section VII (Technical Specifications)**, although the ABCs of these lots or items are indicated in the **BDS** for purposes of the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184. The NFCC must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder.

19.4. The Project shall be awarded as follows:

One Project having several items that shall be awarded as one contract.

19.5. Except for bidders submitting a committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation, all Bids must include the NFCC computation pursuant to Section 23.4.1.4 of the 2016 revised IRR of RA No. 9184, which must be sufficient for the total of the ABCs for all the lots or items participated in by the prospective Bidder. For bidders submitting the committed Line of Credit, it must be at least equal to ten percent (10%) of the ABCs for all the lots or items participated in by the prospective Bidder.

20. Post-Qualification

20.1. Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit its latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS) and other appropriate licenses and permits required by law and stated in the **BDS**.

21. Signing of the Contract

21.1. The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

Section III. Bid Data Sheet

Notes on the Bid Data Sheet

The Bid Data Sheet (BDS) consists of provisions that supplement, amend, or specify in detail, information, or requirements included in the ITB found in Section II, which are specific to each procurement.

This Section is intended to assist the Procuring Entity in providing the specific information in relation to corresponding clauses in the ITB and has to be prepared for each specific procurement.

The Procuring Entity should specify in the BDS information and requirements specific to the circumstances of the Procuring Entity, the processing of the procurement, and the bid evaluation criteria that will apply to the Bids. In preparing the BDS, the following aspects should be checked:

   a.   Information that specifies and complements provisions of the ITB must be incorporated.

   b.   Amendments and/or supplements, if any, to provisions of the ITB as necessitated by the circumstances of the specific procurement, must also be incorporated.

Bid Data Sheet

ITB Clause	
5.3	For this purpose, contracts similar to the Project shall be: a. *A single contract similar to **the item/s to be bid** and must be at least **fifty percent (50%)** of the ABC.* b. Completed within the last three (3) years prior to the deadline for the submission and receipt of bids substantially in a **FORM prescribed by the QC-BAC-GOODS AND SERVICES, must be accompanied by a copy of Certificate of Acceptance by the end-user or Official Receipt (O.R) or Sales Invoice (S.I.) issued for the Contract.**
7.1	Subcontracting is not allowed.
12	The price of the Goods shall be quoted DDP *within Quezon City* or the applicable International Commercial Terms (INCOTERMS) for this Project.
14.1	The bid security shall be in the form of a Bid Securing Declaration, or any of the following forms and amounts: a. The amount of not less than **Php 675,600.00** or equivalent to two percent (2%) of ABC if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; or b. The amount of not less than **Php 1,689,000.00** or equivalent to five percent (5%) of ABC if bid security is in Surety Bond.
19.3	*[In case the Project will be awarded by lot, list the grouping of lots by specifying the group title, items, and the quantity for every identified lot, and the corresponding ABC for each lot.]* *[In case the project will be awarded by item, list each item indicating its quantity and ABC.]*
20.2	List of required licenses and permits relevant to the Project and the corresponding law requiring it. • No additional requirements

21.2	Additional required documents relevant to the Project that are required by existing laws and/or the Procuring Entity.
	
	• Statement of Warranty:
	   ➢ One (1) year on parts
	
	• Notarized Affidavit of Undertaking for the After-Sales Service
	
	   1. Supplier must conduct after-sales training for the end-user after the completion of delivery for 10 engineering faculty members and laboratory personnel for 5 days
	   2. Free semi-annual training with certification, on request
	   3. Free product inspection, on request
	   4. Free consultation/seminar, on request
	   5. Free product demonstration on selected item, on request
	   6. Free continuous technical support for equipment parts including services and repair as long as the equipment is functional
	
	• Submit a Copy of ISO 9001 Certification to ensure that the quality of products and services complies with industry and international standards

Section IV. General Conditions of Contract

Notes on the General Conditions of Contract

The General Conditions of Contract (GCC) in this Section, read in conjunction with the Special Conditions of Contract in Section V and other documents listed therein, should be a complete document expressing all the rights and obligations of the parties.

Matters governing performance of the Supplier, payments under the contract, or matters affecting the risks, rights, and obligations of the parties under the contract are included in the GCC and Special Conditions of Contract.

Any complementary information, which may be needed, shall be introduced only through the Special Conditions of Contract.

1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

Additional requirements for the completion of this Contract shall be provided in the **Special Conditions of Contract (SCC).**

2. Advance Payment and Terms of Payment

2.1. Advance payment of the contract amount is provided under Annex "D" of the revised 2016 IRR of RA No. 9184.

2.2. The Procuring Entity is allowed to determine the terms of payment on the partial or staggered delivery of the Goods procured, provided such partial payment shall correspond to the value of the goods delivered and accepted in accordance with prevailing accounting and auditing rules and regulations. The terms of payment are indicated in the **SCC.**

3. Performance Security

Within ten (10) calendar days from receipt of the Notice of Award by the Bidder from the Procuring Entity but in no case later than prior to the signing of the Contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR of RA No. 9184.

4. Inspection and Tests

The Procuring Entity or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Project specifications at no extra cost to the Procuring Entity in accordance with the Generic Procurement Manual. In addition to tests in the **SCC**, **Section IV (Technical Specifications)** shall specify what inspections and/or tests the Procuring Entity requires, and where they are to be conducted. The Procuring Entity shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

All reasonable facilities and assistance for the inspection and testing of Goods, including access to drawings and production data, shall be provided by the Supplier to the authorized inspectors at no charge to the Procuring Entity.

5. Warranty

6.1. In order to assure that manufacturing defects shall be corrected by the Supplier, a warranty shall be required from the Supplier as provided under Section 62.1 of the 2016 revised IRR of RA No. 9184.

6.2. The Procuring Entity shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall, repair or replace the defective Goods or parts thereof without cost to the Procuring Entity, pursuant to the Generic Procurement Manual.

6.   Liability of the Supplier

The Supplier's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

If the Supplier is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

Section V. Special Conditions of Contract

Notes on the Special Conditions of Contract

Similar to the BDS, the clauses in this Section are intended to assist the Procuring Entity in providing contract-specific information in relation to corresponding clauses in the GCC found in Section IV.

The Special Conditions of Contract (SCC) complement the GCC, specifying contractual requirements linked to the special circumstances of the Procuring Entity, the Procuring Entity's country, the sector, and the Goods purchased. In preparing this Section, the following aspects should be checked:

    a. Information that complements provisions of the GCC must be incorporated.

    b. Amendments and/or supplements to provisions of the GCC as necessitated by the circumstances of the specific purchase, must also be incorporated.

However, no special condition which defeats or negates the general intent and purpose of the provisions of the GCC should be incorporated herein.

Special Conditions of Contract

GCC Clause	
1	*[List here any additional requirements for the completion of this Contract. The following requirements and the corresponding provisions may be deleted, amended, or retained depending on its applicability to this Contract:]*
	Delivery and Documents –
	For purposes of the Contract, "EXW," "FOB," "FCA," "CIF," "CIP," "DDP" and other trade terms used to describe the obligations of the parties shall have the meanings assigned to them by the current edition of INCOTERMS published by the International Chamber of Commerce, Paris. The Delivery terms of this Contract shall be as follows:
	[For Goods supplied from abroad, state:] "The delivery terms applicable to the Contract are DDP delivered *[indicate place of destination]*. In accordance with INCOTERMS."
	[For Goods supplied from within the Philippines, state:] "The delivery terms applicable to this Contract are delivered *[indicate place of destination]*. Risk and title will pass from the Supplier to the Procuring Entity upon receipt and final acceptance of the Goods at their final destination."
	Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in Section VI (Schedule of Requirements).
	For purposes of this Clause the Procuring Entity's Representative at the Project Site is *[indicate name(s)]*.
	Incidental Services –
	The Supplier is required to provide all of the following services, including additional services, if any, specified in Section VI. Schedule of Requirements: *Select appropriate requirements and delete the rest.*
	a. performance or supervision of on-site assembly and/or start-up of the supplied Goods;
	b. furnishing of tools required for assembly and/or maintenance of the supplied Goods;
	c. furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;
	d. performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and
	e. training of the Procuring Entity's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods.
	f. *[Specify additional incidental service requirements, as needed.]*
	The Contract price for the Goods shall include the prices charged by the Supplier for incidental services and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

| | | **Spare Parts –**

The Supplier is required to provide all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:

Select appropriate requirements and delete the rest.

    a. such spare parts as the Procuring Entity may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under this Contract; and

    b. in the event of termination of production of the spare parts:

        i. advance notification to the Procuring Entity of the pending termination, in sufficient time to permit the Procuring Entity to procure needed requirements; and

        ii. following such termination, furnishing at no cost to the Procuring Entity, the blueprints, drawings, and specifications of the spare parts, if requested.

The spare parts and other components required are listed in **Section VI (Schedule of Requirements)** and the cost thereof are included in the contract price.

The Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spare parts or components for the Goods for a period of [*indicate here the time period specified. If not used indicate a time period of three times the warranty period*].

Spare parts or components shall be supplied as promptly as possible, but in any case, within [*insert appropriate time period*] months of placing the order.

Packaging –

The Supplier shall provide such packaging of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in this Contract. The packaging shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packaging case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

The packaging, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified below, and in any subsequent instructions ordered by the Procuring Entity.

The outer packaging must be clearly marked on at least four (4) sides as follows:

Name of the Procuring Entity
Name of the Supplier |

	Contract Description Final Destination Gross weight Any special lifting instructions Any special handling instructions Any relevant HAZCHEM classifications	
	A packaging list identifying the contents and quantities of the package is to be placed on an accessible point of the outer packaging if practical. If not practical the packaging list is to be placed inside the outer packaging but outside the secondary packaging. **Transportation –** Where the Supplier is required under Contract to deliver the Goods CIF, CIP, or DDP, transport of the Goods to the port of destination or such other named place of destination in the Philippines, as shall be specified in this Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price. Where the Supplier is required under this Contract to transport the Goods to a specified place of destination within the Philippines, defined as the Project Site, transport to such place of destination in the Philippines, including insurance and storage, as shall be specified in this Contract, shall be arranged by the Supplier, and related costs shall be included in the contract price.	
	Where the Supplier is required under Contract to deliver the Goods CIF, CIP or DDP, Goods are to be transported on carriers of Philippine registry. In the event that no carrier of Philippine registry is available, Goods may be shipped by a carrier which is not of Philippine registry provided that the Supplier obtains and presents to the Procuring Entity certification to this effect from the nearest Philippine consulate to the port of dispatch. In the event that carriers of Philippine registry are available but their schedule delays the Supplier in its performance of this Contract the period from when the Goods were first ready for shipment and the actual date of shipment the period of delay will be considered force majeure. The Procuring Entity accepts no liability for the damage of Goods during transit other than those prescribed by INCOTERMS for DDP deliveries. In the case of Goods supplied from within the Philippines or supplied by domestic Suppliers risk and title will not be deemed to have passed to the Procuring Entity until their receipt and final acceptance at the final destination. **Intellectual Property Rights –** The Supplier shall indemnify the Procuring Entity against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof.	
2.2	*[If partial payment is allowed, state]* "The terms of payment shall be as follows: _____."	
4	The inspections and tests that will be conducted are: *Product Presentation/Demonstration/Site Inspection, if applicable.*	

Section VI. Schedule of Requirements

PROJECT NAME: PROCUREMENT OF VARIOUS ENGINEERING EQUIPMENT

PROJECT NO. QCU-22-ELTE-1322B

The delivery schedule expressed as weeks/months stipulates hereafter a delivery date which is the date of delivery to the project site.

Item Number	Description	Unit of Issue	Quantity	Delivered, Weeks / Months
	With the following minimum technical specifications or its equivalent			
1	**AM / FM / ASK / FSK Transmitter & Receiver System** **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 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	unit	2	**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	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** 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 3. DSBSC / 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	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 3. Frequency Multiplier Adjustment (Doubler) 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**
2	**Analog and Digital Communications Trainer (Basic Communication System)** **Features:** *It offers the beginner complete courses of basic analog and digital communication.	unit	2	

29

*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 **List of Modules** 1. Analog Communication Modules (1) Oscillator/Second Order LPF & HPF (2) AM Modulator/Demodulator (3) DSB-SC & SSB Modulator/Demodulator (4) FM Modulator/Demodulator (5) PLL Frequency Synthesizer (6) TDM & 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 & Signal Generator Unit (1) Main Unit **List of Experiments** Analog Communication 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 4. Storage Cabinet x 2		**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	5.Rack Frame 6.Digital Storage Oscilloscope 7.Hand-held Digital Multimeter			
3	**Electric Circuit Lab Fundamentals** **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 : ±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	unit	2	**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

31

	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 · Special Electronic Components Experiments Module · Oscillator Experiments and Applications Module **The package equipment must have the following list of Experiment** 1. Experiments for Basic Electricity a. DC voltage measurement, Using an ohmmeter, Resistor characteristics, DC current measurement b. AC voltage and AC Current measurement c. AC RC, RL, and RLC circuit d. Power in AC circuit e. Transformer characteristics f. Series-resonant and Parallel-resonant circuit g. LC filter 2. Experiments for Magnetism a. Magnetic devices and Magnetic field b. Drawing magnetic curves and Magnetic field strength c. Lenz's and Faraday's laws d. Ampere's rule, Fleming's rule and Self-Induction e. Mutual Induction and Magnetic flux detection 3. Experiments for Basic Electronic Circuits a. Diode characteristics, Rectifier circuit, Filter circuit, b. Zener diode, LED, Transistor characteristics c. Multimeter functions d. FET, SCR, UJT characteristics 4. Experiments for Simple Electronic Circuits a. Simple, Complementary, Push-pull and Multistage cascading amplifier b. Voltage regulator c. Wheatstone bridge d. Dimmer circuit e. Relay characteristics f. Touch-controlled switch 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	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			
4	**Digital Electronics Fundamentals Module** **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 **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 (1) Frequency: 50 /60Hz (2) Output voltage: 6Vrms	unit	2	**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

33

	(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 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**
5	**Electronics Fundamentals Module** **Features:** 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 **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	unit	2	

34

: 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) 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 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	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 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 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	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 lst file handling support in the hex/lst 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 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**
6	**Fiber Optic Communication Trainer** **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	unit	2	

	b. With LED indication 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 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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	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			
7	**Industrial Electronics Trainer** **Features:** *Comprehensive study including the theoretical study and practical 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 (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	unit	2	**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	(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 **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 (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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

40

	(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) lC 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 (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**				**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**
8	**Programmable Logic Controller Trainer** **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 and project implementation.	unit	2		

| | 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

TECHNICAL SPECIFICATION
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
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 | | | **Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed** |

	(2) Thumbwheel device (3) Tank filling control with thumbwheel 8. Keypad control (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			
9	**Microcontroller Application Module Trainer** **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 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	unit	1	**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

	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 7. Dupont Line 1P-1P, 150mm 20pc 8. 6pin Programmer Cable 1pc 9. Microchip PICkit 3 debugger/ programmer			
10	**Electronics Application Training System** **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 (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	set	2	**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

44

	(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 (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 (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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**

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** (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			**Within Ninety (90) Calendar Days Upon Issuance of Notice to Proceed**
***			

I hereby certify to comply and deliver all the above requirements.

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

46

Section VII. Technical Specifications

Notes for Preparing the Technical Specifications

A set of precise and clear specifications is a prerequisite for Bidders to respond realistically and competitively to the requirements of the Procuring Entity without qualifying their Bids. In the context of Competitive Bidding, the specifications (*e.g.* production/delivery schedule, manpower requirements, and after-sales service/parts, descriptions of the lots or items) must be prepared to permit the widest possible competition and, at the same time, present a clear statement of the required standards of workmanship, materials, and performance of the goods and services to be procured. Only if this is done will the objectives of transparency, equity, efficiency, fairness, and economy in procurement be realized, responsiveness of bids be ensured, and the subsequent task of bid evaluation and post-qualification facilitated. The specifications should require that all items, materials and accessories to be included or incorporated in the goods be new, unused, and of the most recent or current models, and that they include or incorporate all recent improvements in design and materials unless otherwise provided in the Contract.

Samples of specifications from previous similar procurements are useful in this respect. The use of metric units is encouraged. Depending on the complexity of the goods and the repetitiveness of the type of procurement, it may be advantageous to standardize the General Technical Specifications and incorporate them in a separate subsection. The General Technical Specifications should cover all classes of workmanship, materials, and equipment commonly involved in manufacturing similar goods. Deletions or addenda should then adapt the General Technical Specifications to the particular procurement.

Care must be taken in drafting specifications to ensure that they are not restrictive. In the specification of standards for equipment, materials, and workmanship, recognized Philippine and international standards should be used as much as possible. Where other particular standards are used, whether national standards or other standards, the specifications should state that equipment, materials, and workmanship that meet other authoritative standards, and which ensure at least a substantially equal quality than the standards mentioned, will also be acceptable. The following clause may be inserted in the Special Conditions of Contract or the Technical Specifications.

Sample Clause: Equivalency of Standards and Codes

Wherever reference is made in the Technical Specifications to specific standards and codes to be met by the goods and materials to be furnished or tested, the provisions of the latest edition or revision of the relevant standards and codes shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national or relate to a particular country or region, other authoritative standards that ensure substantial equivalence to the standards and codes specified will be acceptable.

Reference to brand name and catalogue number should be avoided as far as possible; where unavoidable they should always be followed by the words "*or at least equivalent.*" References to brand names cannot be used when the funding source is the GOP.

Where appropriate, drawings, including site plans as required, may be furnished by the Procuring Entity with the Bidding Documents. Similarly, the Supplier may be requested to provide drawings or samples either with its Bid or for prior review by the Procuring Entity during contract execution.

Bidders are also required, as part of the technical specifications, to complete their statement of compliance demonstrating how the items comply with the specification.

Technical Specifications

PROJECT NAME: PROCUREMENT OF VARIOUS ENGINEERING EQUIPMENT
PROJECT NO. QCU-22-ELTE-1322B

Item	Specification	Statement of Compliance
		[Bidders must state here either "Comply" or "Not Comply" against each of the individual parameters of each Specification stating the corresponding performance parameter of the equipment offered. Statements of "Comply" or "Not Comply" must be supported by evidence in a Bidders Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer's un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate. A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidder's statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the applicable laws and issuances.]
	With the following minimum technical specifications or its equivalent	
A.1	**AM / FM / ASK / FSK Transmitter & Receiver System** **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 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** 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 3. DSBSC / 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 3. Frequency Multiplier Adjustment (Doubler) 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	
2	**Analog and Digital Communications Trainer (Basic Communication System)** **Features:** *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 **List of Modules** 1. Analog Communication Modules (1) Oscillator/Second Order LPF & HPF (2) AM Modulator/Demodulator (3) DSB-SC & SSB Modulator/Demodulator (4) FM Modulator/Demodulator (5) PLL Frequency Synthesizer (6) TDM & 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 & Signal Generator Unit (1) Main Unit **List of Experiments** Analog Communication 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 4.Storage Cabinet x 2 5.Rack Frame 6.Digital Storage Oscilloscope 7.Hand-held Digital Multimeter	
3	**Electric Circuit Lab Fundamentals** **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 : ±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 · Special Electronic Components Experiments Module · Oscillator Experiments and Applications Module **The package equipment must have the following list of Experiment** 1. Experiments for Basic Electricity a. DC voltage measurement, Using an ohmmeter, Resistor characteristics, DC current measurement b. AC voltage and AC Current measurement c. AC RC, RL, and RLC circuit d. Power in AC circuit e. Transformer characteristics f. Series-resonant and Parallel-resonant circuit g. LC filter 2. Experiments for Magnetism a. Magnetic devices and Magnetic field b. Drawing magnetic curves and Magnetic field strength c. Lenz's and Faraday's laws d. Ampere's rule, Fleming's rule and Self-Induction e. Mutual Induction and Magnetic flux detection 3. Experiments for Basic Electronic Circuits a. Diode characteristics, Rectifier circuit, Filter circuit, b. Zener diode, LED, Transistor characteristics c. Multimeter functions d. FET, SCR, UJT characteristics 4. Experiments for Simple Electronic Circuits a. Simple, Complementary, Push-pull and Multistage cascading amplifier b. Voltage regulator c. Wheatstone bridge d. Dimmer circuit e. Relay characteristics f. Touch-controlled switch 5. Experiments for Industrial Control Applications a. CDS and Thermistor characteristics	

53

	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	
4	**Digital Electronics Fundamentals Module** **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 **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 (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 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	

| 5 | **Electronics Fundamentals Module**

Features:
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

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 : ±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 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 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
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
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 lst file handling support in the hex/lst 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 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	
6	**Fiber Optic Communication Trainer** **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
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
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	
7	**Industrial Electronics Trainer** **Features:** *Comprehensive study including the theoretical study and practical 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 (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 **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 (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) lC 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 (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**	
8	**Programmable Logic Controller Trainer** **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 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

TECHNICAL SPECIFICATION
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
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
(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	
9	**Microcontroller Application Module Trainer** **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 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		

	7. Dupont Line 1P-1P, 150mm 20pc 8. 6pin Programmer Cable 1pc 9. Microchip PICkit 3 debugger/ programmer	
10	**Electronics Application Training System** **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 (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 (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
(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
(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

66

	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		
B.	**Compliance to the Schedule of Requirements (Section VI)**		

I hereby certify to comply and deliver all the above requirements.

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Section VIII. Checklist of Technical and Financial Documents

Notes on the Checklist of Technical and Financial Documents

The prescribed documents in the checklist are mandatory to be submitted in the Bid, but shall be subject to the following:

a. GPPB Resolution No. 09-2020 on the efficient procurement measures during a State of Calamity or other similar issuances that shall allow the use of alternate documents in lieu of the mandated requirements; or

b. Any subsequent GPPB issuances adjusting the documentary requirements after the effectivity of the adoption of the PBDs.

The BAC shall be checking the submitted documents of each Bidder against this checklist to ascertain if they are all present, using a non-discretionary "pass/fail" criterion pursuant to Section 30 of the 2016 revised IRR of RA No. 9184.

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages) **in accordance with Section 8.5.2 of the IRR;**

Technical Documents

☐ (b) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid (in a **FORM prescribed by the QC-BAC-GOODS AND SERVICES**); **and**

☐ (f) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided for in Sections 23.4.1.3 and 23.4.2.4 of the 2016 revised IRR of RA No. 9184, within the relevant period as provided in the Bidding Documents (in a **FORM prescribed by the QC-BAC-GOODS AND SERVICES**); **and**

☐ (g) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
or
Original copy of Notarized Bid Securing Declaration; **and**

☐ (h) Conformity with Section VI. (Schedule of Requirements) and Section VII. (Technical Specifications), which may include production/delivery schedule, manpower requirements, and/or after-sales/parts, if applicable; **and**

☐ (i) Original duly signed Omnibus Sworn Statement (OSS);
and if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

Financial Documents

☐ (j) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC) (in a **FORM prescribed by the QC-BAC-GOODS AND SERVICES**);
or
A committed Line of Credit from a Universal or Commercial Bank in lieu of its NFCC computation.

Class "B" Documents

☐ (k) If applicable, a duly signed joint venture agreement (JVA) in case the joint venture is already in existence;
or
duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

Other documentary requirements under RA No. 9184 (as applicable)

☐ (l) *[For foreign bidders claiming by reason of their country's extension of reciprocal rights to Filipinos]* Certification from the relevant government office of their country stating that Filipinos are allowed to participate in government procurement activities for the same item or product.

☐ (m) Certification from the DTI if the Bidder claims preference as a Domestic Bidder or Domestic Entity.

II. FINANCIAL COMPONENT ENVELOPE

☐ (a) Original of duly signed and accomplished Financial Bid Form; **and**

☐ (b) Original of duly signed and accomplished Price Schedule(s).

III. REQUIRED DOCUMENTS in BDS SECTION 20.2 and 21.2

- Statement of Warranty:
  - ➢ One (1) year on parts

- Notarized Affidavit of Undertaking for the After-Sales Service

  1. Supplier must conduct after-sales training for the end-user after the completion of delivery for 10 engineering faculty members and laboratory personnel for 5 days
  2. Free semi-annual training with certification, on request
  3. Free product inspection, on request
  4. Free consultation/seminar, on request
  5. Free product demonstration on selected item, on request
  6. Free continuous technical support for equipment parts including services and repair as long as the equipment is functional

- Submit a Copy of ISO 9001 Certification to ensure that the quality of products and services complies with industry and international standards

Note:

1. Please refer to
[https://drive.google.com/file/d/1uiYurh5WrpBL5B_pqpzAb62yucAblR1p/view?usp=sharing] for the following requirements:
   a. Computation of NFCC;
   b. List of All Ongoing Contracts/List of Contracts already awarded but not yet started;
   c. Statement of Single Largest Completed Contract

2. Please refer to GPPB Resolution No. 16-2020 for the following requirements:
   a. Bid Form;
   b. Price Schedule (for Goods Offered from Abroad/ Within the Philippines)
   c. Bid Securing Declaration; and
   d. Omnibus Sworn Statement

Republic of the Philippines

gppb

Government Procurement Policy Board