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Tawaran Syarikat

Calit

MAKLUMAT SPESIFIKASI ITEM

No Pelawaan	:	UiTM/B1/PER/SHR/B/0525/0021
Butiran Tawaran	:	Cadangan Membekal, Menghantar, Memasang, Mengujilari Dan Menyelenggara Peralatan Pengajaran dan
Keterangan Item	:	0609010700048 : Electrical/Electricity/Electronic Wares : Relay Control Board/ Relay Module
Nama Spesifikasi	:	Analog Communication Trainers
Kuantiti	:	9.000

I GENERAL REQUIREMENTS

I Vendors must comply with all the requirements specified in this tender document

- II Vendors must bear all costs of supplying the specified quantity of items to UiTM. Such costs shall include the costs of delivery, installation, commissioning, training, troubleshoot and maintenance work (including parts labour and on-site service) within the specified warranty period
- 2 SPECIFICATION
 - I The trainer includes the basic & advanced modules to experiment on fundamental & higher level of analog & digital topics of a telecommunication course. The purpose of the modules is to enable the student to acquire a clear experimental view of the basic & advanced concepts and familiarization with the operative aspects of the work in the telecommunication laboratory. This trainer combined the modules with experimental circuits. It can offer the beginner complete courses of basic & advanced communication in 10 Analog Experiments Modules, then they can complete various experiments independently.
- II List Of Experiments:

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Butiran Keperluan	Calit	Tawaran Syarikat
 Experiment 1 MC4046 FM Modulator (Carrier Signal: 20 kHz, Audio Signal: 1 kHz) Experiment 2 LM566 FM Modulator (Carrier Signal: 20 kHz, Audio Signal: 500 Hz ~ 700 Hz) 		
G) FM Demodulator		
 Experiment 1 MC4046 FM Demodulator (Carrier Signal: 20 kHz, Audio Signal: 1 kHz) Experiment 2 LM565 FM Demodulator (Carrier Signal: 20 kHz, Audio Signal: 500 Hz ~ 700 Hz) H) TDM Multiplexer 		
 Experiment 1 Waveform Generator (Sine Wave Signal Generator: 13 kHz, Triangle Wave SignalGenerator: 2.3 kHz, Square Wave Signal Generator: 2.3 kHz) Experiment 2 TDM Multiplexer (Transmission Channels: 3 Channels, Switching Time:500 ms ~ 50ms) 		
I) TDM Demultiplexer		
 Experiment 1 TDM Demultiplexer (Transmission Channels: 3 Channels, Switching Time:500 ms ~ 50 ms) J) FDM Multiplexer 		
 Experiment 1 FDM Signal Generator (Carrier Signal: 500 kHz ~ 1.5 MHz, Audio Signal: 500Hz~1.5kHz) Experiment 2 DSB-SC Modulated Signal Generator (Carrier Signal: 500 kHz ~ 1.5 MHz, Audio Signal: 500 Hz ~ 1.5 kHz) Experiment 3 FDM Multiplexer (Modulation Type: DSB-SC Signal, Transmission Bandwidth: 2 MHz) K) FDM Demultiplexer 		
 Experiment 1 FDM Demultiplexer (Modulation Type: DSB-SC Signal, Demultiplexing Type: Product Demultiplexer) L) Analog-to-Digital Converter 		
 Experiment 1 ADC0804 Analog-to-digital Converter (Resolution: 8 bits, Analog Input Voltage: 0 V ~ 5 V) Experiment 2 ADC0809 Analog-to-digital Converter (Resolution: 8 bits, Analog Input Voltage: 0 V ~ 5 V) 		
M) Digital-to-Analog Converter		
 Experiment 1 R-2R Digital-to-analog Converter (Digital Input: 4 bits, Analog Output: 0 V ~ 5 V) N) Frequency Converter 		
 Experiment 1 Frequency Multiplier (Carrier Signal: 10 kHz) Experiment 2 Up/Down Frequency Converter (Carrier Signal @ LO port: 100 kHz; Carrier Signal @ 		
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Butiran Keperluan Calit **Tawaran Syarikat** RF port: 120 kHz) O) Signal Recovery • Experiment 1 Carrier Signal Recovery Circuit (Carrier Signal: 10 kHz) • Experiment 2 Clock Recovery Circuit (Clock Signal: TTL, Encoded Signal: Manchester, Clock Frequency: $5 \text{ kHz} \sim 10 \text{ kHz}$) **III Accessory Sets:** • 2mm Stackable Test Lead Set (350mm Length) Assorting in 5 different colors 30 units : Red x 6. Yellow x 6. Blue x 6. Black x 6. Green x 6 • 4mm Stackable Test Lead Set (350mm Length) Assorting in 5 different colors 10 units : Red x 2, Yellow x 2, Blue x 2, Black x 2, Green x 2 • Experiments Frame (1450mm Length) a. Epoxy Coated Steel Bended T Slot Frame b. Din Standard A4 With Two Shelves c. Side Frame: T Shape d. Dimension: • Length : 1450mm • Width : 20mm • Height : 300mm IV Universal Lab Station: • DC Power Supply Fixed Output: +5V/0.5A, -5V/0.5A, +12V/0.5A, -12V/0.5A Variable Output: $+0V \sim +23V/0.5A$. $-0V \sim -23V/0.5A$

• AC Power Supply Fixed Output: 19V-15V-9V-0V-9V-15V-19V

• Function Generator

Sine, Triangle and Square waveform output, Frequency range: 1Hz to 1MHz in 6 decades, With fine adjust, Amplitude and DC offset control, TTL Mode Output Range: 1Hz to 1MHz in 6 decades Six frequency ranges: 1Hz to 10Hz, 10Hz to 100Hz, 100Hz to 1KHz, 1KHz to 10KHz, 10KHz to 100KHz, 100KHz to 1MHz

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Butiran Keperluan

- IV Sine wave output: 0 to 12V peak to peak variable, Triangle wave output: 0 to 8V peak to peak variable, Square wave output: 0 to 16V peak to peak variable
 - Five (5) Data Switches Module

5 units slide switches and corresponding output terminals. When switch is set at "down" position, the output is LO level; contrarily, it is to be HI level when setting at "up" position.

- Multi Interface Adaptor Module
- Miniature Socket, 2mm Socket & 4mm Banana Adaptors
- 3 CATALOGUES / BROCHURES
- I Vendors must provide the catalogues / brochures / technical specification manuals with the tender proposal
- II Original copies of user and operational manual of the equipment must be provided
- 4 WARRANTY AND SUPPORT
- I Vendors must have local service for repair services and provide on call services when required by UiTM
- II Vendors must provide details of warranty. INCLUDING ALL parts, labour, basic phone support for hardware issue, repairs onsite). Please attach the Letter of Warranty (LOW) from the principle, which states that UiTM is entitled to three (1) years of warranty upon project completion
- III Vendors be responsible for the installation, commissioning and test-run of the equipment and accompanying software (if applicable) to the satisfaction of UNIVERSITI TEKNOLOGI MARA before final acceptance.
- IV All cost on delivery. installation, commissioning, training and test run shall be borne by the vendor
- V The vendors **MUST** provide a genuine product. The vendors must be supported back-to-back by a principle (manufacturer) to provide maintenance services for equipment supplied. The vendors should attach a Letter of Authorization (LOA) from Distributors/ Principal.
- VI Free support through fax, email, telephone must be provided during the warranty period
- 5 OTHER REQUIREMENTS
- I Note that all other related material, components, cabling and others, which are required to ensure full operation of the above package must be supplied and borne by vendors



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Butiran Keperluan

- 6 TRAINING
- I Tenderers are required to provide training for the use, maintenance and troubleshoot of the equipment to the Technical Staff & Lecture of Electrical Engineering School, College of Engineering, UiTM Shah Alam and all training-related costs are borne by the tenderers.
- II A minimum of two (2) days training for a minimum of five (5) participants covering each module. (Vendors must provide details/syllabus of the training module)
- III Complete training materials and documentation must be provided to all participants
- IV The training MUST be conducted by trainers who are certified by principal. Please attach the trainer's certification that is certified by principal supplier.

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