Government College of Engineering

Station Road, Osmanpura, Aurangabad – 431 005

Phone : (0240) 2366101, 110, 111
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Web – http://www.geca.ac.in

No. GECA/E&TC/Store/2018-19/4183

Date.19.12.2018

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To

Geca web site & Notice Board

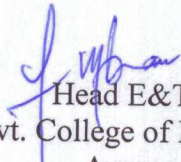**Subject :- Quotation for Supply of Following Item As per Annexure Attached**

Dear Sir,

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5. Quotation should be in sealed cover and superscripted as **"Quotations" for Electronics & Telecommunication Department** Due on : 28.12.2018 at 5 P.M.

6. Quotation should be valid for Six Month.

7. Quotation not complying with the above conditions and incomplete once will not be considered.

8. Right to reject any or all quotations rates are with the under signed.

9. No advance shall be paid and No part payment shall be made.

10. Rates quoted must be inclusive of All applicable Taxes.

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12. Only Registered Venders need to submit Quotation

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Sr.No.	Specification	Approx Qty.	Remark
01	Microwave Integrated Circuits Trainer Set -upto S Band (2-3GHz)	01	

Head E&TC Dept.
Govt. College of Engineering,
Aurangabad

Sr. No.	Detail Specification	Qty
	Microwave circuit Components with embedded control covers various concept and characterization related with RF and Microwave circuit for studying the characteristic of any MIC(Integrated circuit) frequency range upto 3 GHz. The main focus is Embeded&Microstrip component fusion , frequency should up to 3GHz. Device should modular in approach .sine square triangular digital & variable dc bias control unit compatible with MATLAB test code should provided. Complete setup with Generator, MIC Components and Meter Gold Plated Components and Connectors Microwave Generator Signal Generator Microwave Solid State Source • Frequency Range : continuously variable in S-Band • LCD Display • Impedance : 50 ohm • Min RF level : 5mW • Output Level Variation : 10 - 20 dB • Operating Modes: Sweep, CW, Int. AM, Int. FM, Ext. AM, • PC communication • Modulating Frequency: 100 Hz to 5 kHz AM square wave, FM triangular wave • Power Supply : 230V ±10%, 50Hz VSWR Meter MIC Components Learning Material Transmitting and Receiving mast **VSWR Meter:** Sensitivity : 0.1mV for 200W input impedance for full scale deflection Noise Level : Less than 0.02mV Range : 0 - 60 dB in 10 dB steps Input : Un-biased low and high impedance crystal biased crystal (200 and 200K) Meter Scale : SWR 1-4, SWR 3-10, dB 0-10, expand SWR 1-1.3, dB 0-2 Gain Control : Adjusts the reference level, variable range 0 -10 dB (approximate) Input Connector : BNC (F) Input Frequency : 1000Hz ±10% Power Supply : 230V ±10%, 50Hz / 60Hz on request Power consumption : 2VA(approximate) Dimension (mm) : W 262 x D 316 x H 130 **List of devices** L type impedance Matching for complex load ,Quarter wave matching for variable resistive load ,Binomial quarter wave matching for 200 Ohm resistive load , 2.4GHz RF attenuator with MATLAB based triggering & controlling SPDT PIN Diode configurable With TTL control , , MMIC Based Driver Amplifier ,ISM BAND -180 to 180 phase shifter with voltage control ,LNA, Power Amplifier, phase shifter, Directional	

coupler, slotted line,Unfolded Lange Coupler,Folded Lange Coupler,Branch Line Quadrature Hybrid,Hybrid Ring Rat Race,Band Stop Open Stub,High Pass Short Stub,PIN Diode SPST Switch,PIN Diode Variable Attenuator,PHEMT Low Noise Amplifier,MMIC InGaP HBT Amplifier,Mixer: Double Balanced,Microstrip Circulator,Half Wave Resonator,Tapered Line Transformer,Mis-matched/matched Loads,Wilkinson Unequal Power Divider,Voltage Control Oscillator,Schottky Diode Detector,Bandpass Filter Tapped Hairpin,Low Pass Filter Open Stub,Low Pass Stepped Impedance, Attenuator pad(3,6,10 dB)

DUAL VCO With programmable control, Ceramic based Low Pass Filter ,, Cable Based Notch Filter ,Microstrip based High Pass Filter ,Microstrip based Band stop Filter ,power divider with unequal split ,Power divider 1 to 4 ,Square Ring resonator ,pin diode based Modulator ,Branch line unequal Coupler . Coaxial Slotted Line

50 Ohms Matched Termination
SMA(M) – 4 Nos, Short
termination SMA(M), Teflon based RG316 cables 4 nos SMA(M)-SMA(M), SMA(F)-
SMA(F), Software

Scope of Learning

- Data Communication and control using MIC components
- Measurement of Transmission Loss and Reflection Loss
- Measurement of substrate dielectric constant using Ring Resonator
- Measurement of power division, isolation and return loss characteristics
- Measurement of coupling, isolation and return loss characteristics
- Measurement of coupling and directivity
- Measurement of Low Pass Filter characteristics
- Measurement of Band Pass Filter characteristics
- Measurement of Band Stop Filter characteristics
- Measurement of characteristics of Patch Antennas
- Measurement of characteristics of an MIC Amplifier
- To study RF switch
- To study RF Mixer
- Measurement of Guide wavelength, Free Space Wavelength and SWR using Measuring Line
- Measurement of Directivity and Gain of Antennas :Yagi Antenna, Patch Antenna, Dipole Antenna
- To study the characteristics of Isolator
- To study the characteristics of Circulator
- Properties of Directional Coupler: Measurement of coupling factor, Directivity, return loss of a load, main line insertion loss,isolation, VSWR of ports.
- Measurement of S11, S12, S21, S22 parameters of microstrip components
- Properties of Branch Line Coupler: Measurement of coupling factor, return loss of a load, main line insertion loss, isolation, VSWR of ports.
- Properties of Hybrid Ring Rat race Coupler: Measurement of

Power division or Decoupling between Sum and Diff arms of a rat race coupler, Measurement of Insertion loss S21 & S41, Measurement of Return Loss/ impedance match at ports 1 & 4 – S11, S44, measurement of Isolation between ports 1 & 3 – S13, Measurement of Phase difference in output arms 2&4 as 180Deg.

- To measure gain, isolation, VSWR of ports of mmic amplifier.
- To measure Insertion loss, isolation and VSWR of port microwave SPST PIN diode switch.
- To measure Insertion loss, isolation and VSWR of port microwave SPST PIN diode Modulator. Operation of PIN diode modulator. Study of square wave modulation of PIN modulator.
- Measurement of power division and isolation characteristic of a microstrip 3 dB power divider.
- To measure isolation, VSWR of ports of Radial stub.
- To measure VSWR of ports of 50 ohms microstrip line, Matched load, open stub, Short Stub, mismatch.
- Low pass filter characteristics insertion loss, pass band, port VSWR
- Measurement of resonance characteristics of a microstrip ring resonator and determination of dielectric constant of the substrate.

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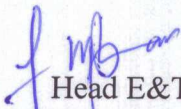**Subject :- Quotation for Supply of Following Item As per Annexure Attached**

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Sr.No.	Specification	Approx Qty.	Remark
01	Arduino and ARM9 Boards with peripherals interface development board	As per details attached	

Head E&TC Dept.
Govt. College of Engineering,
Aurangabad

Annexure

Sr. No.	Description	Qty
1	HC SR-04 (Distance Sensor)	2
2	PIR Sensor (Motion Detection Sensor)	2
3	DHT 11 (Humidity and Temperature Sensor)	2
4	LM35 (Temperature Sensor)	2
5	LDR (Light Sensor for Arduino)	2
6	BH1750 Sensor (Light Sensor for Raspberry Pi 2)	2
7	Colour Sensor	2
8	Soil Moisture Sensor	2
9	ADXL sensor (Accelerometer Sensor) ADXL345	2
10	Water proof Temperature Sensor (DS18B20)	2
11	Xbee S2c series with Base board	2
12	Alcohol sensor Module (MQ-03)	2
13	Air quality sensor Module (MQ-135)	2
14	Carbon Monoxide Sensor Module (MQ-07)	2
15	Smoke Sensor (MQ-02)	2
16	Barometric Pressure Sensor (BMP 180)	2
17	Compass Module (HMC5885)	2
18	DHT22 Humidity and Temp sensor Module	2
19	Flex Sensor 2.2	2
20	Flex Sensor 4.2	2
21	Force sensor	2
22	IR Long Range sensor	2
23	IR Obstacle Avoidance sensor	2
24	Pulse Sensor	2
25	Raindrop sensor	2
26	Reflective Optical Sensor with Transistor Output	2
27	Sound Sensor Module	2
28	Tilt sensor Module	2
29	Hall effect sensor Module	2
30	ECG Module	2
31	EMG/EKG Shield	2
32	Stepper Motors -5v	2
33	Stepper Motors -12v	2
34	stepper Motor Driver Module	2
35	Batteries (9V Hw)	2
36	Snap Connectors with Power Plug	2
37	Servo Motor-1kg torque	2
38	Servo Motor-5kg torque	2
39	USB to RS232 Convertor	2
40	1-channel relay module	2
41	4-channel relay module	2

42	Buzzer	2
43	LCD 16*2 character	2
44	4-digit seven display	2
45	16keypad membrane	2
46	7-segment display	2
47	Arduino Uno	2
48	GLCD 128X64	2
49	Arduino MEGA	2
50	esp32 IoT Board	2
51	Node MCU - ESP8266 IoT Development Board	2
52	Particle Photon (WiFiIoT Development Board)	1
53	LPG Gas Sensor (MQ2)	1
56	2.8" TFT TOUCH SHIELD FOR ARDUINO WITH CAPACITIVE TOUCH	2
57	ESP-8266-01 - WiFi Module	2
58	Bluetooth Low Energy BLE HM-10	2
59	Bluetooth Classic Module HC-05	2
60	RFID Module With RFID Cards (3 tags)	2
61	GSM/GPRS Module (SIM 800)	2
62	GPS Module (Ublox 6M)	2
63	Finger Print Module (R305)	2
64	MQ-2 Gas Sensors	2
65	Thermometers Dallas DS1820	2
66	IR Sensors	2
67	Resistance Thermometers	2
68	Ultrasonic Range Finder module sensor	2
69	RH Sensor	2
70	Three Axis Gyroscope Accelerometer Sensor mpu6050	2
76	PH Sensor Kit	2
77	Temperature Sensor Kit	2
78	Dissolved Oxygen Kit	2
80	VernierArduino Interface Shield	2
81	**ARM processor based development board** Microcontroller based on ARM Cortex –M (B) ARM Cortex-R4 based processors (C) Legacy ARM7 and ARM9 Devices (D) ARM SecurCore based devices (E) Compiler Support for Cortex-M, ARM7, ARM8, ARM9 (F) Including middleware, • IPv4 Networking • USB Device • File System • Graphics (G) Documentation CD, Manual and Learning material CD if any	
	CORTEX M3 Board with Interfaces (Ha rdware)	1

(A) Single Board Computer/Evalution Board for NXP LPC1760 series
 (1) 100MHz ARM Cortex -M3 processor - LPC 1768 based MCU in 100 -pin LQFP
(2) On -Chip Memory: 512KB Flash and 64KB RAM
3) Color QVGA TFT LCD
 (4) 10/100 Ethernet Port
 (5) USB 2.0 Full Speed - USB, USB –
(6) Control for ADC Input OTG, and USB Host
 (7) 2 CAN interfaces, 2 Serial Ports, SD/MMC Card Interface, 5 - position Joystick and push –button
 (8) Analog Voltage
 (9) Amplifier and Speaker
 (10) Debug Interface Connectors: 20 -pin JTAG (0.1 inch connector), 10 -pin Cortex debug (0.05 inch connector)
 (11) Provision to work with Interfaces for academic / development
B) Interfaces;
 1. Elevator Interface : Elevator representation by a column of ten LED s . Key (request) and LED indicator (status) for each floor assumed.

2. Dual DAC Interface: Two 8 - bit D/A converters which can provide current/ voltage output
 3. 4X4 Matrix Hex Keypad Interface: 16 keys from (0 to F)
 4. DC Motor Interface: +12V , 250mA DC motor , Speed control using pulse width modulation technique with 100 Hz pulse frequency
 5. 16 Channel 8 -bit ADC Interface: 16 channel 8 bit data acquisition device based on ADC 0816 . Provision for on -board reference voltage generation using precision voltage Each 01 No. of quantity 13 regulator LM 723. Input signal voltage range ; 0 -5V
 6. Calculator type keyboard Interface: keys 0 to 9, +,-, x, /, =, %, AC, CE, etc. arrangement in 2 groups of 3x4 matrix
7. Keyboard/Display Interface: Calculator style keyboard with seven segment display. 20 Keys arrangement in a 4x5 matrix (0 to 9,. =, +, -, x, /, %, AC, CE, CHK) and six 7 -segment displays
 8. LCD (16X2) Interface: 16x2 (sixteen character per line and two lines) alphanumeric LCD module which can be directly coupled to the programmable peripheral interface 8255 on any of the trainers
 9. Real Time Clock Interface: Based on MSM5832 real - time clock/calendar (RTC) chip which can be interfaced to the programmable peripheral interface 8255A. Battery backup for RTC .

		10. Stepper Motor Interface with Stepper Motor & Power Adapter: Interface should permit ON/OFF control of the individual coils of the stepper motor at varying speeds in either direction. +12V to +5V DC, 3 Kg.cm torque stepper motor. Power Supply and required driver circuitry along with the necessary software to control the operation of the stepper motor. 11.Traffic Lights Interface: Interface with four directions (North, South, East, and West) LED indicators (Left, Right, Straight, Amber, Red and Pedestrian Red/Green). Provision to control 24 LE Ds through 24 port lines of 8255 12. Zigbee Interface: Interface with TarangZigBee Transceiver module (User can select and program in any network topology) 14 13. Power Supply, +5V @3A; +/- 12V @ 250mA, +30V @ 100mA (C) Sample programs for all interfaces, software CD and documentation, Manual and Learning material CD if any	
82	8 megapixel sensor Specifications: Weight 3g Still resolution 8 Megapixels Video modes 1080p30, 720p60 and 640 × 480p60/90 Linux integration V4L2 driver available C programming API OpenMAX IL and others available Sensor Sony IMX219 Sensor resolution 3280 × 2464 pixels Sensor image area 3.68 x 2.76 mm (4.6 mm diagonal) Pixel size 1.12 μm x 1.12 μm Optical size 1/4" Focal length 3.04 mm Horizontal field of view 62.2 degrees Vertical field of view 48.8 degrees Focal ratio (F-Stop) 2.0		
83	Pi NoIR Infrared Camera Specifications: • Improved Resolution o 8 megapixel native resolution high quality Sony IMX219 image sensor o Cameras are capable of 3280 x 2464 pixel static images • Remaining High Quality 100 o Capture video at 1080p30, 720p60 and 640x480p90 resolutions o All software is supported within the latest version of Raspbian Operating System o No Infrared filter making it perfect for taking Infrared photographs or photographing objects in low light (twilight) conditions o 1.4 μm X 1.4 μm pixel with OmniBSI technology for high performance (high sensitivity, low crosstalk, low noise) o Optical size of 1/4"		1
84	PiFace Digital		1

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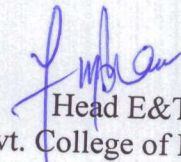
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Sr.No.	Specification	Approx Qty.	Remark
01	PIC Microcontroller Multiprogrammer Board	06	

Head E&TC Dept.
Govt. College of Engineering,
Aurangabad

Sr. No.	Detail Specification	Qty
	PIC Microcontroller Multiprogrammer Board directly programmable through FLOW CODE based advanced graphical programming language. .flexible development to be able to program a range of 8,14,18,28 and 40 pin PIC microcontroller devices from the DSPIC series PICmicro microcontroller range. The board should support Flow Chart, C & ASM Programming Techniques . on board provision for PICKit 3 and above interface .	

dsPIC30 dsPIC development board. It's loaded with modules need in development of DSP applications. On-board programmer and debugger, CAN support, temperature sensors, display connectors and six I/O groups are just part of the modules on this board. It is delivered with dsPIC30F4013 device.

- Applications Developing and testing firmware, creating prototypes, learning embedded programming Displays On-board 4-digit 7-segment display. Also supports GLCD 128x64 and LCD 2x16.Touch Screen Resistive Architectureds
- PIC/PIC24 (16-bit)MCU Comes with dsPIC on-board modules Sockets for LM35 and DS1820 temperature sensors, ADC PotentiometersProgramming On-board mikroProg for dsPIC. ICD2/ICD3 connector available for connecting external programmer.
- StorageSerial EEPROM (1024 Bytes)
- Sound and AudioPiezo buzzer
- Expandability2 x mikroBUS sockets, 2 x IDC10 headers for each PORT
- IntegrationMountingholesInput Voltage5V (via USB) or 9-32V AC, 7-23V DC (via adapter)
-
- dsPIC development system
- mikroC or mikroBasic or mikroPascal for dsPIC compiler
- SmartPROTO Board
- EasyConnect Board
- Character LCD 2x16 with blue backlight
- Graphic LCD 128x64 with TouchPanel
- Serial Cable with thumbscrews
- Plastic Pen for TouchPanel
- DS1820 Temperature Sensor
- USB cable
-
- 40pin-SIF Socket
- 8 Nos. Point LEDs (Logic Output): Ports are grouped with their buttons and LEDs
- TFT board with touch screen enables to develop multimedia applications.
- three additional GND pins for easier access of your oscilloscope

probes.
- Write UART applications for laptops too. Besides RS-232, USB-UART
- Character LCD 2x16 with blue backlight
- Graphic LCD 128x64 with TouchPanel
- Plastic Pen for TouchPanel
- DS1820 Temperature Sensor
- Wire Jumpers Female to Female (15cm length, 10pcs)
- Wire Jumpers Male to Male (15cm length, 10pcs)
- Wire Jumpers Female to Male (15cm length, 10pcs)
- 16/24/32 bit codec with a maximum sampling frequency of 48KHz
- Low cost audio capture and play back circuitry using the 12 bit ADC and PWM Audio
- Microphone and line level inputs with adjustable input gain
- 100mW headphone amplifier with digital volume control
- Board includes integrated debugger / programmer
- USB powered

-

Benefits

- Evaluate Real Time Applications
- Supports Embedded C, ASM
- ISP Programming | SPI | I2C Communications
- Facility to interface external devices

MCU

- Devices :
- dsPIC30F40
- Devices compatible with dsPIC30F3014 Memory : 8K-32K FLASH - Program
- Clock : 10MHz crystal, Max = 80 MHz

Kit Includes

- dsPIC30F Development Kit
- Power Adaptor
- RS232 Cable, USB Cable
- User Guide HW/SW
- CD Contains:
  - Examples.
  - ISP Programmer.
  - IDE.
  - Datasheets