



F No.: PI/NAHEP/CAAST/VNMKV/ 680/2023

Date: 29/ 5/2023

To,

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Subject:** Invitation of quotation "consumable electronics components for PG/Ph.D student research work" at NAHEP, VNMKV Parbhani.

Dear Sir,

1. You are invited to submit your most competitive lowest quotation for the following Goods: -

Sr. No.	Brief Description of the goods	Service Year Period	Delivery Period	Place of Delivery	Installation requirement, if any
1	List is given in following table	1 Year	After awarding the contract & the period of validity of quotation	Office of PI, NAHEP-CAAST, VNMKV, Parbhani.	Yes, with installation

- The above Quotation price is including GST constraints to the duration from August 2022 up to march 2024.

List of consumable electronics components for PG/Ph.D student research work is mentioned below

Sr. No	Name	Specifications	Quantity
<b>Category : Electronics Development</b>			
1	Arduino UNO WiFi REV2	Microcontroller: ATMEGA4809, Operating Voltage: 5V, Input Voltage (recommended): 7-12V, Digital I/O Pins: 14 (6 Provide PWM Output), PWM Digital I/O Pins: 6, Analog Input Pins: 6, DC Current per I/O Pin: 20mA, DC Current for 3.3V Pin: 50mA, Flash Memory: 48KB (ATMEGA4809), SRAM: 6,144KB (ATMEGA4809)	70
2	Arduino Nano or equivalent	ATmega328P- 8bit AVR family microcontroller, equivalent or better, Operating Voltage: 5V, Digital I/O Pins : 14 (of which 6 provide PWM output), Analog Input Pins : 8, Accessories: Compatible USB cable ( length -6 inch or more)	70
3	Arduino Mega or equivalent	ATmega 2560P - 8-bit AVR family microcontroller, equivalent or better. Operating Voltage: 5V, Digital I/O Pins: 54 (of which 6 provide PWM output), Analog Input Pins: 16, Accessories: Case shell enclosure, compatible USB cable (length - 6 inch or more)	70
4	Raspberry Pi 3 Model B+	RASPBERRY PI 3 MODEL B+, equivalent or better	20
5	Raspberry Pi 4 Model	Accessories - MicroSD card - 32 GB, USB 3.0 cable (1 meter), HDMI to VGA - 1 meter, HDMI to VGA adapter, Case shell enclosure	20
6	Breadboards & Mini Breadboard	Solderless 400 pin breadboard	70
7		Solderless 800 pin breadboard	30
8		Self-Adhesive Proto Shield	30

000062

File Proposed by





No.: PI/NAHEP/CAAST/VNMKV/680/2023

Date: 29/5/2023

9	General Purpose solderable Board	9x15 cm Double Sided Universal PCB Prototype Board	50
10		5x7 cm Double Sided Universal PCB Prototype Board	50
11	Berg Strips	Female Berg Strip, 2.54mm pitch, 40 pin single row, breakable pin	50
12		Male Berg Strip, 2.54mm pitch, 40 pin single row, breakable pin	50
13	16x2 LCD display	Dot matrix LCD display. 16 characters X 2 lines. I2C	35
14	16x4 LCD display	Dot matrix LCD display. 16 characters X 4 lines. I2C	35
15	OLED Display Module	1.5 inch 128x128 General OLED Display Module	20
16	Cooling Fan	DC 12V 2510 Cooling Fan - 25X25X10 mm Size	20
17	USB Cables	USB Cable Set (A to B, 12 inch or more)	20
18		USB Cable Set (Mini, 12 inches or more)	20
19	Battery	12V 1.2Ah Rechargeable Sealed Lead Acid Battery with one battery charger	4
20		9-12V 2000 to 2500 mAh rechargeable battery chargers. Equivalent or better	2
21		9-12V 2000 to 2500 mAh rechargeable battery with 2 chargers. Equivalent or better	10
22	Resistor Kit	One kit contains - 30 carbon film resistors of 20 different resistance values each assorted, packaged together and labelled. Wattage: 0.125W to 1W. Values: 0Ω, 1.5Ω, 4.7Ω, 10Ω, 47Ω, 100Ω, 220Ω, 330Ω, 470Ω, 680Ω, 1kΩ, 2.2kΩ, 3.3kΩ, 4.7kΩ, 10kΩ, 22kΩ, 47kΩ, 100kΩ, 330kΩ, 1MΩ	30
23	Capacitor Kit	One kit contains - 20 electrolytic capacitors of 10 different capacitance values each. Assorted kit packaged together and labelled. Values: 10pF, 22pF, 100pF, 1nF, 10nF, 100nF, 1μF, 10μF, 100μF, 1000μF	30
24	Linear Voltage Regulator	7805, 7812, 7809	70
25	Water Pump module	DC12V 3W Submersible Water Pump or equivalent	20
26	Bluetooth module	HC 05 Bluetooth module, Voltage Rating: 5V	35
27	Piezoelectric Plate	Normal Copper based 4 cm Diameter approx.	35
28	8*8 LED Matrix Module	Max7219 Dot LED Matrix Module. MCU Control LED Display Module	15
29	7 Segment Led Display	LED 4-Digit Display Module, 4-Pin interface: Vcc, Gnd, Data, Clock, Voltage Rating: 2.4V to 5.5V	70
30	GSM	Sim900 GPRS Transfer Board Micro Sim Gsm Core TTL Port Module for Arduino	15
31	GPS	GY-NEO6MV2 new GPS module	15
32	Laser Diode Emitter	650 nm 5mW Mini Laser Dot Diode Module	35
33	LDR Module	5mm/12mm, Photosensitive LDR Light Sensor Module	70
34	Keypad	Universal 16 Key Switch Keypad	35

000063

File Proposed by





Date: 23/06/2023

F No.: PI/NAHEP/CAAST/VNMKV/630/2023

35	JoyStick	2-axis joystick with push button function	20
36	Active Buzzer	Small 5 volt	100
37		Big 5 volt	100
38	Motor driver Module	L293D	35
39	Sound Playback Module	ISD1820 voice recording module or equivalent	35
40	DC Plastic Gear motor with wheel	12V, 150RPM, Side Shaft BO (Battery operation) Motor	70
41	Node MCU	ESP 8266 ,I2C, 1 wire, plug and play	70
42	WeMos D1 R2	WeMos D1 R2 with WiFi ESP 8266,Operating Voltage: 5V	35
43	Vibrating Motor	Operating Voltage: 1.5 to 3V	35
44	Alligator Connectors	Multi-Colour Alligator Connectors - 12 inch	500
45	Battery clips with DC Jack	9-volt battery clips with DC Jack	50
46	Hook-up Wires	Red & Black set 100 Meters each	5
47	Jumper Cable	Male-Male	300
48		Male-Female	300
49		Female-Female	300
50	RGB LEDs	Regular 5mm 3-5 volt Range	600
51	LEDs	Red, Green, Blue, Yellow and White	15
52	Diodes and Transistors Kit	One Kit Contains - 25 Assorted Basic Diodes of 4 different types each	5
53		Types: NPN Transistor - 2N3904, BC547 PNP Transistor - 2N3906, BC557 Silicon	
54		Diode - 1N4148, Power Diode -1N4004/4001 Wattage: 1W, Current rating: 1A, Assorted kit packaged together and labeled Equivalent or better	
55	Button Switch Set	One Kit Contains - 100 buttons of different types, Types: Push, toggle, rotary, selector and slide switch ,Assorted kit packaged together and labelled	5
56	Capacitive touch Module	MPR 121 with I2C,Voltage Range: 2.5V to 3.6V DC	35
57	Capacitive Touch Switch Module	Digital Capacitive touch switch module -TTP223B, Voltage Range: 2V to 5V DC	35

Sr. No	Name	Specifications	Quantity
<b>Category: Internet of Things &amp; Sensors</b>			
58	IR Sensors, Obstacle avoider sensor module	LM393, Detection distance: 2-30 cm, Detection angle: 30 - 40°	70
59	Triple Axis Magnetometer	3-Axis Magneto resistive Sensors, I2C Digital Interface Integrated 12-bit ADC Range of -8 to +8 Gauss 160 Hz Maximum o/p range	70
60	Humidity Sensor	Operating range: 20 – 95 % RH, Temperature: 0 - 60 Celsius, Power supply: 1.5V AC (Max sine) Operating frequency: 500Hz - 2kHz	70
61	MQ Series sensors	MQ-2 Smoke Detection	35

000064

File Proposed by.





F No.: PI/NAHEP/CAAST/VNMKV/660/2023

Date: 29/03/2023

62		MQ-3 Alcohol - Ethanol Sensor	35
63		MQ-4 Methane Natural Gas Sensor	35
64		MQ-6 Liquefied Petroleum Gas Sensor	35
65		MQ-7 High Sensitivity CO Carbon Monoxide Sensor Detector	35
67		MQ-8 Hydrogen Gas Sensor	35
68		MQ-135 Air Quality Sensor	35
69	IR transmitter/ receiver	TSOP 1738 , Switching rate: 38 KHz, Voltage Rating: 5V	70
70	Ultrasonic Sensor Module HC-SR-04 or compatible	Working Voltage - DC 5V, Working current - 15 mA ,Working Frequency - 40 Hz, Range - 1 cm to 4 m ,Effectual Angle - <15° ,Measuring Angle - 30° Resolution - 0.3 cm	70
71	Triple Axis accelerometer	3-axis sensing, Small, low-profile package 4 mm × 4 mm × 1.45 mm LFCSP Low Power: 350 µA (typical) Single-supply operation: 1.8 V to 3.6 V Temperature stability	35
72	PIR Motion Detector Module	High digital pulse when motion detected, Low digital pulse when idle /no motion detected, Sensitivity range (up to 6 m) Power supply: 5V – 12V	70
73	Pulse Rate Heart Sensor	Pulse Rate Sensor Finger Based (finger or earlobe) Working voltage 3-5V	35
74	Relay Module	5V 10A - 2 Channel Relay Module. Compatible with Arduino	70
75	Relay Module	5V 10A - 1 Channel Relay Module. Compatible with Arduino	70
76	Big Sound microphone module	Large Electret capsule sound module	70
77	Soil Moisture Sensor module	FC-28 with LM293 comparator, Operating Voltage: 3.3V to 5V	70
78	Touch Sensor	Capacitive Touch Sensor Module. TTP22X series. Voltage Range: 2.4V to 5.5V	70
79	Metal Touch Sensor Module	KY-036 or equivalent metal touch sensor module	70
80	Rain Drop Sensor	Rain Sensitive, Rain Drop Detection Sensor Module. Voltage Range: 3.3V to 5.5V , Size: 5mm X 40mm or equivalent.	35
81	Flex Sensor	Flex Sensor. Size - 2.2 Inches	35
82	Temperature Sensor	LM35 Full range temperature sensor. Voltage Range: 4V to 30V. Error: ±0.5°C	70
83	Temperature and humidity sensor module	DHT 11 , Voltage Range: 3V to 5V	70
84	Force Pressure Sensor	Force sensitive resistor with a square, 1.75x1.5" sensing area	35
85	Colour Recognition Sensor	TCS3200 Colour Recognition Sensor	35
86	Water Flow Sensor	Arduino Compatible Water flow sensor. 5V DC Input	35
87	Sound Sensor	Sound Sensor Module, Microphones module	70
88	IR Sensors Array module for Line Following	8 IR Sensors Array module for Line Following, Operating Voltage: 5V	35
89	Power Bank	10000 mAh 5-volt Power Bank	10

000065

File Proposed by





F No.: PI/NAHEP/CAAST/VNMKV/680/2023

Date: 23/05/2023

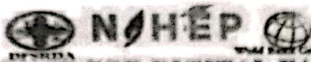
90	RFID Reader – Tags	Current :13-26mA / DC 3.3V, Idle Current :10-13mA Sleep Current <80uA, Peak Current <30mA Operating Frequency: 3.56MHz <30mA, Read range between 20 cm to 1 m	35
<b>Category: Robotics</b>			
91	Stepper motor with Driver board	28BYJ-48 ULN2003 5V Stepper Motor + ULN2003 Driver Board	70
92	DC motor	12V DC Gear 150 RPM	35
93	Servo motors	Position Servo Angle based Metal Gear	35
94		Small Servo Metal Gear	35
95		Continuous Metal Gear Servo 360	35
96		Small Servo Plastic Gear	70
97	150 RPM BO Motor	150 RPM BO Motor	70
98	L298P Motor Driver	L298P Motor Driver Shield or relative Driver Shield	35
99	Servo Motor Tester	CCPM 3 channel Servo Tester	35
100	Robotics DIY Kit	Robotics DIY kit with programmable intelligent brain/brick.	20
101	Self-balancing Robot kit	ESP32: 240MHz dual-core, 600 DMIPS, 520KB SRAM, Wi-Fi, dual-mode Bluetooth	144
<b>Category : Rapid Prototyping Tools</b>			
102	3D Printer Kit and tools	Printer Type: FDM (Fused Deposition Modelling), Minimum Dimensions: 160mm *160mm *160mm Build Size or 4 litre Build Volume., Nozzle: 0.3mm to 0.4mm nozzle diameter, slicing software should be free or Open source, LCD Screen UI that display print metrics, Good Heated Print bed. Material Compatibility - PLA, ABS, and derivatives of PLA, Ninjaflex Quality Anti-bacterial/fungal Cover. Repair Kit - with spare springs, screws, keys, tweezers, etc.	1
103	Filament for 3D printer	Compatible 1000 Grams Filament in 5 different colours	10
104	Filament Storage Box	Compatible Filament storage box	10
105	Set of Arts & Crafts Accessories – e.g.- stationary items and basic prototyping material	Cardboard	10
106		Foam core boards	10
107		Wood glue – 500 ml	2
108		Acrylic sheet, 3mm	5
<b>Category : Mechanical Tools</b>			
109	Tweezer Set	6 Pc Non-Magnetic Tweezer Set Size - 6 inches	10
110	Spanner Set	12-piece combination Spanner Set Range - 4 mm to 30 mm	1
111	Precision Screw Driver Set	6 Piece Precision Screw Driver Set Types: PH0, PH1, Flat head - 1.4mm, 2mm, 2.4mm, 3mm	5
112	Wire Strippers	Wire Stripper Cutter Plier With Spring -26x6x20 cm (LxWxH)	5
113	Cordless Rotary Multitool Set	Cordless Rotary multitool with all cutting, grinding, polishing, engraving and drill bits. Speed: Adjustable up to 30000 RPM Battery Type: Li-ion Voltage/current range: 8-10V, 0-2 A	2



F No.: PI/NAHEP/CAAST/VNMKV/68<sup>0</sup>/2023

Date: 23/05/2023

114	Air Blower	500 W or more. Variable speed blower	2
115	File set	6 pc file set Working length - 6 inch	2
116	Mini File set	6 pc mini file set Working length - 3 inch	2
<b>Category: Electric &amp; Measurement Tools</b>			
117	Hot glue gun	Works with standard 0.5-inch glue sticks. Temperature - 230 to 280 degree Celsius	5
118	Adapters	DC power Adapter with 5V, 2A	15
119	Adapters	DC power Adapter with 12V, 2A	15
120	Electric Screw Driver Set	Multipurpose Electric screwdriver set. Accessories - Compatible bits Mode - Wireless Battery - Li-ion 3.6V or equivalent with charging dock	1
121	Dual Temperature Heat Gun	1800 W Dual Temperature Heat Gun	1
122	Soldering Helping hand	Specifications: Adjustable crocodile holding clamps/clip. Soldering iron holder. LED light. Magnifying lens.	2
123	Glue Sticks	11 mm x 200mm Hot Melt Glue Stick	200
124	Nuts and Bolts and screw	Specs - M4X12MM M4X20MM M5X16MM M5X25MM M6X20MM	1
125	Cable Tie	Small Cable Tie Pack - Pack of 200	20
126		Medium Cable Tie Pack - Pack of 200	10
127		Big Cable Tie Pack - Pack of 100	10
128	Power Strip Adaptors	Standard Quality Extension with 5Amp safety fuse. 5 or more sockets in each extension. 5-meter length of each extension.	5
129	USB TO DC jack cable	USB to DC jack cable for Battery bank	20
130	Electric Wires	Twisted Red black pair	20 Meter
131	Safety goggles (with/without LED torch)	Polycarbonate Safety goggles Clear lens with no tint	70
132	Safety Gloves Pairs	Latex Coating Gloves (Medium Size)	35
133	clamp meter	FLUKE, Model Number 302+, 400A AC Clamp Meter Type-Digital, Display Type-LED	1
134	12v dc Motor 775	Speed Voltage: 12V DC. Speed: 4500 RPM. Torque: 4.16 N-cm. Output Power: 16.90w. Rated current (mA): 2200, Shaft diameter: 2.3 mm. Shaft length: 6 mm.	10
135	300RPM 12V Dc Motor	Voltage-12 V, RPM-300, Load Current 0.3A, Stall Torque-3.5 Kg-cm	10
136	DC5V Humidifier USB Spray Module	4.5 to 5V, Power-2 W, Power on trigger, 108KHz oscillation	10
137	Relay Module	4 Channel, Operating voltage: 5V	20
138	I2C Module	5V Operating Voltage	100
139	Peltier Refrigeration Module	Thermoelectric Peltier electric cooling kit, GL style refrigeration cooling kit	10
140	Smart Car Chassis	Operating voltage-6v, Max. Load-6 Kg, O/P shaft	10



**CENTRE OF EXCELLENCE FOR DIGITAL FARMING SOLUTIONS FOR  
ENHANCING PRODUCTIVITY BY ROBOTS, DRONES and AGVs.**  
VASANTRAO NAIK MARATHIWADA KRISHI VIDYAPEETH, PARBHANI (M.S.) INDIA  
Contact No. 02452\_223002, 223802 Mob. 9422111232 Email: nahep.caast.vnmkv@gmail.com  
www.vnmkv.org.in : www.nahep.vnmkv.org.in

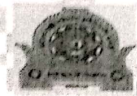


F No.: PI/NAHEP/CAAST/VNMKV/680/2023

Date: 29/05/2023

		speed-500 RPM, Nominal Torque -%kg/Cm	
141	Bluetooth Controlled Gripper Robot	Light weight ABS chasis	10
142	Drone kit	Quad Copter economic combo kit	5
143	Acrylic Plexiglass	2mm Sheet 18"x24" DIY Projects 2mm	5
144	Rainbow Color Flat Ribbon Cable	Length-5m,High quality & good resistance	25
145	Brushless DC Motor 1500W 60 V	Rated Voltage: 60v Rated Power: 1500W Rated Speed: 3200 RPM	12
146	Brushless DC Motor 3000W 60 V	Rated Voltage: 60v,Rated Power: 3000W,Rated Current: 50 A Rated Speed: 4200 RPM,Peak Torque:14nm,Peak Power:5000W	12
147	1000W 48V Brushless DC Motor	Rated Voltage: 48v Rated Power: 1000W Rated Current: 25A Rated Speed: 3000 RPM	12
148	ESP32 38Pin Development Board	1. 2.4GHz Dual-Mode WiFi + Bluetooth Development Board, 38PIN,Ultra-Low power consumption works perfectly with the IDE,Support LWIP protocol, Freertos,Support Three Modes: AP, STA, and AP+STA	70
Total Amount without GST			
@18% GST			
Total with GST			





F No.: PI/NAHEP/CAAST/VNMKV/690/2023

Date: 25/01/2023

1. **Place of Delivery:** CENTER OF EXCELLENCE FOR DIGITAL FARMING SOLUTIONS FOR ENHANCING PRODUCTION BY ROBOTS, DRONES and AGVs. Vasant Rao Naik Marathwada Krishi Vidyapeeth Parbhani.
2. Government of India has received a financing fund from Bank World Bank for Reconstruction and Development towards of National Agricultural Higher Education Project NAHEP (CAAST-DFSRDA, VNMKV, Parbhani) and intends to apply part of the proceeds of this loan to eligible payments under the contract for which this invitation for quotations is issued.
3. **Bid Price**
  - a) The contract shall be for the full quantity as described above. Corrections, if any, shall be by made by crossing out, initialing, dating and re writing.
  - b) All duties, taxes and other levies payable on the raw materials and components shall be included in the total price.
  - c) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
  - d) The prices shall be quoted in Indian Rupees only.
  - e) **No, advance or partial payment allowed, Payment will be made after validation by client.**
  - f) **Grand total must include product cost, all the taxes, transportation charges, etc.**
4. Each bidder shall submit only one quotation.
5. **Validity of Quotation**

Quotation shall remain valid for a period not less than 30 days after deadline date specified for submission.
6. **Evaluation of Quotations**

The Purchaser will evaluate and compare the quotations determined to be substantially responsive i.e. which are properly signed; and Conform to the terms and conditions, and technical specifications. The quotations would be evaluated for the entire item together/ would be evaluated separately for each item.

Sales tax in connection with sale of goods shall not be taken into account in evaluation.
7. **Award of contract**

The purchaser will award the contract to be bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation prices.

  - 7.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process the reject all quotations at any time prior to the award of contract.
  - 7.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the supply/Purchase order.
8. **Part payment or part supply orders will not be accepted. The payment will be made immediately after delivery of Goods/Setup/installation/Training/Assignment as per signed up/award of contract.**
9. **The necessary catalogue, leaf lets, operational manual or any other printed material related to goods/material should be provided during completion of contract.**
10. **Normal commercial warranty/guarantee shall be applicable to the supplied goods.**
11. **The rates/prices should be for, VNMKV, Parbhani (MS) India. All leakages-breakage and losses in transit including shortages, if any will be borne by the firm/supplier. Offer should clearly mention the locations for which rates are quoted.**
12. **The firm should provide legit documents of Firm registration, GST registration no. / PAN no. and all legislative documents required as per world bank/ICAR, New Delhi procurement**

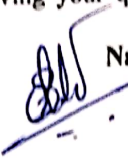




F No.: PL/NAHEP/CAAST/VNMKV/ 380/2023

Date: 29/5/2023

13. In case, any holiday is declared by the Government on the day of opening, the bids will be opened on the next working day at the same time. The Principal Investigator, NAHEP-CAAST-DFSRDA, VNMKV Parbhani, reserves the right to accept or reject any or all the bids.
14. The bids of firm(s) which have either been black-listed by VNMKV, Parbhani or any other Govt. organization will not be accepted. In this regard, the firm has to give an undertaking on the enclosed format.
15. You are requested to provide your offer latest by 05.00 PM on or before 18/06/2023 in the name of Principal Investigator, NAHEP-CAAST-DFSRDA, VNMKV, Parbhani - 431 402. The bids will be opened on the last day of submission at the same time. All suppliers/firms are requested to be present in the chamber of undersigned.
16. Write the title "consumable electronics components for PG/P.hD student research work" on top line of envelopment.
17. We look forward to receiving your quotations and thank you for your interest in this project.

  
Principal Investigator  
National Agricultural Higher Education Project  
CAAST DFSRDA, VNMKV, PARBHANI  
Pin Code-431402, (M.S), INDIA  
Tel. No.:+91 9422111232,

Email: [nahep.caast.vnmkv@gmail.com](mailto:nahep.caast.vnmkv@gmail.com)



F No.: PI/NAHEP/CAAST/VNMKV/ 680 /2023

Date: 29/5 /2023

**consumable electronics components for PG/P.hD student research work**

To,  
 Principal Investigator,  
 NAHEP-CAAST-DFSRDA, VNMKV, Parbhani,  
 Near Vydyanath PG Hostel,  
 Maharashtra-431402

Sl. No.	Description of Goods	Specifications	Qty.	Quoted Unit Rate in Rs.	Total Amount
<b>TOTAL</b>	<b>In Figures</b>				
	<b>In Words</b>				
<b>GST @ 18%</b>					
<b>Grand total (including all taxes)</b>					

**Grand total Cost: Rs. ....**

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. .... (Amount in figure) Rs. .... (Amount in words) within the period specified in the Invitation for Quotation.

We also confirm that the normal commercial warrantee/guarantee of ..... Months shall apply to the offered goods.

We hereby certify that we have neither black-listed by VNMKV, Parbhani nor any other Govt. organization.

We hereby certify that we have no "Conflict of Interest" with NAHEP-CAAST, DFSRDA VNMKV, Parbhani office or staff.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in corrupt, fraudulent, collusive, or obstructive practices (as defined in the prevailing World Bank's sanction procedures) in competing for or in performing the Contract.

**Authorized signature with seal**