



# REGENT EDUCATION & RESEARCH FOUNDATION GROUP OF INSTITUTIONS

To,  
The Convenor of Research and Development Cell,  
Regent Education and Research Foundation Group of Institutions,  
Barrackpore, Kolkata 700121

Date: 22/04/2022

**Subject: Proposal for Establishment of Robotics Lab and Procurement of High-End Desktop Computer**

Dear Sir,

I hope this letter finds you in good health and high spirits. On behalf of the Robotics Club at Regent Education and Research Foundation Group of Institutions, I am writing to request funding for the establishment of a state-of-the-art Robotics Lab and the procurement of a high-end desktop computer. Our vision is to foster a culture of innovation, creativity, and advanced research within the field of robotics, enabling students to gain practical experience and skills that align with the industry's demands.

### Objective:

- The primary objective of this proposal is to establish a dedicated Robotics Lab within the institute premises, equipped with modern robotics hardware, software, and tools.
- This lab will serve as a hub for various robotics-related activities, workshops, research, and competitions,
- Empowering our students to stay at the forefront of cutting-edge technology.

### Project Description:

#### Robotics Lab Development:

The Robotics Lab will be designed to offer a conducive environment for students and researchers to work collaboratively on robotics projects. The lab will consist of the following components:

- a. Robotics Kits: We will acquire a range of robotic kits, including mobile robots, robotic arms, sensors, actuators, and microcontrollers, to facilitate hands-on learning and project development.
- b. Computer and 3D printers: To support programming and 3D modelling, we intend to set up computer workstations equipped with the necessary software and tools for programming robotic systems and a
- c. Test and Measurement Equipment: The lab will be equipped with essential test and measurement tools to calibrate and troubleshoot robotic systems effectively.

#### High-End Desktop Computer:

In addition to the Robotics Lab, we seek to procure a high-end desktop computer with advanced processing capabilities, ample memory, and top-tier graphics, enabling resource-intensive simulations, 3D modeling, and AI-based programming tasks.

### Budget Breakdown:

The estimated cost for the Robotics Lab development and the high-end desktop computer is as follows:



Campus : Regent Education & Research Foundation Group of Institutions

E-mail : [rerfkolkata@gmail.com](mailto:rerfkolkata@gmail.com), Website : [www.rerf.in](http://www.rerf.in)

#### Campus Address:

Bara Kanthalia, Barrackpore  
P.O: Sewli Telinipara, P.S.: Titagarh  
Kolkata - 700 121  
Tel.: 033-3008-5442/432/431, Fax: 033-3008-5442

#### Regd. Office Address:

11/3, Biresw Guha Street  
7<sup>th</sup> Floor, Kolkata - 700 017  
Tel.: 033-3221-3013



# REGENT EDUCATION & RESEARCH FOUNDATION GROUP OF INSTITUTIONS

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Robotics Kits and Components: INR 2,00,000  
Computer Workstations: INR 60,000  
Test and Measurement Equipment: INR 30,000  
Total: INR 2,90,000

## Funding Request:

We kindly request the Research and Development Cell to grant us a total of INR 2,90,000 for the establishment of the Robotics Lab which also includes an allocation of INR 60,000 to procure the high-end desktop computer.

## Benefits and Impact:

The proposed Robotics Lab will provide numerous benefits to the institution and its students:

**Skill Development:** Students will gain hands-on experience in robotics and automation, enhancing their problem-solving and critical-thinking abilities.

**Research and Innovation:** The lab will foster a culture of research, innovation, and entrepreneurship in the field of robotics, encouraging students to develop groundbreaking projects.

**Industry Relevance:** By equipping students with practical robotics knowledge, the lab will enhance their employability and readiness for the ever-evolving job market.

**Prestige:** The Robotics Lab will elevate the institution's reputation by showcasing its commitment to cutting-edge technology and practical education.

## Conclusion:

We firmly believe that establishing a Robotics Lab and procuring a high-end desktop computer will significantly contribute to the academic and research excellence of Regent Education and Research Foundation Group of Institutions. We are committed to ensuring the efficient utilization of the funds for the benefit of the students and the institution.

We eagerly await your favourable response to our proposal. Please feel free to contact us if you require any further information or clarification.

Thank you for considering our request.

Sincerely,

Avik Ghosh Dastidar  
Convenor, Robotics Club  
Regent Education and Research Foundation Group of Institutions  
Mail: [avikgd@regent.ac.in](mailto:avikgd@regent.ac.in)  
Ph: 9433742010



Campus : Regent Education & Research Foundation Group of Institutions

E-mail : [rerfkolkata@gmail.com](mailto:rerfkolkata@gmail.com), Website : [www.rerf.in](http://www.rerf.in)

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# Components and approximate price for proposed ROBITICS LAB, RERF

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
Microcontroller Board	1	Arduino UNO R3 Atmega328p	10	949.00	9490.00
	2	Arduino Mega 2560 R3	5	1499.00	7495.00
	3	Arduino Nano ATmega328P Nano V3	5	899.00	4495.00
	4	Raspberry Pi 4, 8GB RAM	4	8260.00	33040.00
	5	BeagleBone Black Rev C	1	5426.82	5426.82
	6	Waveshare XNUCLEO-F103RB, Improved STM32 NUCLEO Board	1	4099.00	4099.00
	7	Adafruit Industries LLC 2542 FONA 800 GSM 850MHz, 900MHz, 1.8GHz, 1.9GHz	1	3800.00	3800.00
<b>Microcontroller Board Total</b>					<b>54520.00</b>
Bread Board	8	830 Points Bread Board	10	220.00	2200.00
	9	400 Points Bread Board	10	195.00	1950.00
	10	170 Points Bread Board	10	64.00	640.00
<b>Bread Board Total</b>					<b>4790.00</b>
USB Cable	11	Type-A to Mini Type-B USB 2.0 Cable for Arduino NANO 1m length	5	289.00	1445.00

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Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	12	Type-A to Type-B USB 2.0 Cable for Arduino UNO/Mega 1m length	15	299.00	4485.00
<b>USB Cable Total</b>					<b>5930.00</b>

<b>Bread Board Jumper Cable</b>	13	Male to Male	500	3.00	1500.00
	14	Male to Female	400	3.00	1200.00
	15	Female to Female	200	3.00	600.00
<b>Bread Board Jumper Cable Total</b>					<b>3300.00</b>

<b>Breadboard Wire</b>	16	P/N B-30-1000 Single-Core Breadboard Wire - Colour RED in meter	10		
	17	P/N B-30-1000 Single-Core Breadboard Wire - Colour GREEN in meter	10		
	18	P/N B-30-1000 Single-Core Breadboard Wire - Colour BLUE in meter	10		600.00
	19	P/N B-30-1000 Single-Core Breadboard Wire - Colour BLACK in meter	10		
	20	P/N B-30-1000 Single-Core Breadboard Wire - Colour YELLOW in meter	10		
<b>Breadboard Wire Total</b>					<b>600.00</b>

<b>Other wires</b>	21	20 Gauge single core copper wire of different colours (200 Meters)	1		200.00
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## Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	22	Multiple Core Flexible Copper Wires and Cables (100 Meters) -RED and BLACK	1		200.00
<b>Other wires Total</b>					<b>400.00</b>

### Sensors

23	HC-SR04 Ultrasonic Transducer Sensor	5	136.00	680.00
24	MQ2 Gas Sensor	5	98.00	490.00
25	IR Proximity Sensor For Line Follower	10	30.00	300.00
26	IR Analog Distance	5	505.00	2525.00
27	Dht11 Digital Relative Humidity & Temperature Sensor Module	5	99.00	495.00
28	MLX90614 Contactless Temperature Sensor Module	2	839.00	1678.00
29	Mpu6050 3 Axis Gyroscope And Accelerometer Module	5	123.00	615.00
30	LM393 Optical Photosensitive LDR light sensor module	5	38.00	190.00
31	PIR HC-SR501 Passive Infrared PIR Motion Sensor	5	65.00	325.00
32	SW-420 Normally Closed Alarm Vibration Sensor Module	5	61.00	305.00
33	IR Infrared Flame Sensor Module	5	55.00	275.00
34	Laser Beam Sensor Module Tube Laser Receiver Module Non-Modulator	2	110.00	220.00
35	650nm Laser Module 6mm 5V 5mW Red Laser Diode with Copper Head	2	90.00	180.00

## Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	36	TTP223 Capacitive Touch Sensor Module for Arduino	5	29.00	145.00
	37	TTP229 16-Channel Digital Capacitive Switch Touch Sensor Module for Arduino	2	112.00	224.00
	38	Soil Moisture Sensor	5	52.00	260.00
	39	10kg Load Cell with HX711 Weight Weighing A/d Module Pressure Sensor	2	560.00	1120.00
	40	R307 Fingerprint Reader Module	2	899.00	1798.00
	41	TCS3200 Color Sensor KG038	2	499.00	998.00
	42	Raspberry Pi 5MP Camera Board	2	290.00	580.00
	43	OV7670 300KP VGA Camera Image Sensor Module	2	179.00	358.00
	44	MPU6050 - Triple Axis Gyro Accelerometer Module	4	123.00	492.00
	45	Mercury Medallion Module	2	49.00	98.00
	46	Photo interrupter module	2	48.00	96.00
	47	SMD 3 Color LED Module	2	59.00	118.00
	48	Small passive buzzer module	2	33.00	66.00
	49	KY-024 Linear Magnetic Hall Effect Sensor Module	2	49.00	98.00
	50	Tilt Switch Module	2	57.00	114.00
	51	JoyStick Shield Module Robotics Control	2	285.00	570.00

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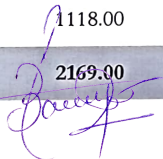
# Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	52	Magnetic Reed Switch Sensor Module	2	185.00	370.00
	53	TCRT5000 Dual Channel Line Tracking Sensor Module	8	44.00	352.00
	54	Sound Detection Sensor	2	54.00	108.00
	55	360 Degree Rotary Encoder Module	2	58.00	116.00
	56	1/8 inch Water Flow Sensor - YF-S401	2	290.00	580.00
	57	12V 0.25A 55ml/min Silicone Tube Liquid Pump	2	399.00	798.00
<b>Sensors Total</b>		<b>Total + 18% GST</b>			<b>20929.66</b>
<b>Motor</b>	58	SG90 Micro Servo Motor	5	99.00	495.00
	59	Dc Bo Dual Shaft Motor	6	55.00	330.00
	60	Stepper Motor DC 5V 4 Phase 5 Wire with ULN2003 Driver Board	4	139.00	556.00
	61	1800 Kv Bldc Brushless Dc Motor	4	345.00	1380.00
	62	1000 RPM - 12V Centre Shaft DC Geared Motor	8	135.00	1080.00
	63	60 RPM Single Shaft BO Motor - Straight	6	55.00	330.00
<b>Motor Total</b>		<b>Total + 18% GST</b>			<b>4921.78</b>



## Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
Shield / Driver	64	L293D Motor Driver/Stepper/Servo Shield	8	135.00	1080.00
	65	PCA9685 16 Channel 12-bit PWM Servo Motor Driver I2C Module	2	389.00	778.00
	66	Generic 170PST Prototype Shield Expansion Board with SYB-170 Mini Breadboard Base for Arduino UNO Proto Shield	10	81.00	810.00
	67	Iic/I2C/Twi/Spi Serial Interface Board Module For Arduino 1602 Lcd Display	5	59.00	295.00
	68	Ethernet W5100 Shield Network Expansion Board	5	1239.00	6195.00
	69	Micro Sd Card Module Tf Card Memory Shield	5	51.00	255.00
	70	L293D Wifi Motor Drive Shield For Node Mcu ESP8266 ESP-12E	2	158.00	316.00
	71	LM358 Gain Amplification Operational Amplifier Module	2	73.00	146.00
	72	ISD1760 Voice Recording and Playback Module	2	395.00	790.00
<b>Shield / Driver Total</b>	<b>Total + 18% GST</b>				<b>12584.70</b>
Display	73	Lcd 16X2 Yellow/blue Backlight Alphanumeric Display	5	135.00	675.00
	74	0.96 Inch I2C IIC Interface OLED Screen Display 4 Pin	2	188.00	376.00
	75	2.4 Inch Touch Screen TFT Display with Shield	2	559.00	1118.00
<b>Display Total</b>					<b>2169.00</b>

  
 2169.00

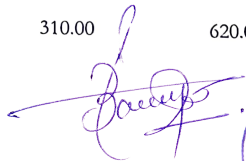





## Component List

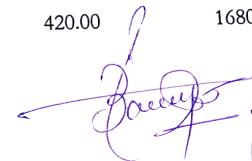
Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
Communication	76	Hc-05 Wireless Bluetooth Module	6	223.00	1338.00
	77	WeMos ESP8266 D1 R2 V2.1.0 WiFi Development Board	2	295.00	590.00
	78	ESP8266 Serial WIFI Wireless Transceiver Module with Breakout Board	2	499.00	998.00
	79	NODEMCU - ESP8266 Wifi Development Board	2	209.00	418.00
	80	NRF24L01 2.4GHz Wireless Transceiver module	6	74.00	444.00
	81	SIM900A GSM Module with SMA Antenna	2	805.00	1610.00
	82	HM-10 Bluetooth Module	6	238.00	1428.00
	83	NEO-6M GPS Module	2	320.00	640.00
	84	SIM808 Bluetooth Compatible GSM/GPRS/GPS Module	2	1899.00	3798.00
	85	ESP32 Development Board with Wifi and Bluetooth	2	395.00	790.00
	86	ESP32-S3-WROOM-1-N8R2 DEV BRD	1	1140.00	1140.00
<b>Communication Total</b>					<b>13291.52</b>

Relay	87	4 Channel 5V 10 A Relay Module	3	140.00	420.00
	88	2 Channel 5V 10 A Relay Module	3	73.00	219.00
	89	12V 1.1 A Solenoid Lock	2	310.00	620.00

## Component List

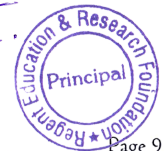
Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
Relay Total					1485.62
Chesis/arm/Robot structures	90	KG192 4-Wheel Robot Smart Car Chassis Kits Car Model with Speed Encoder, wheels, bo motors, wheels, Battery box, clamp screw	2	749.00	1498.00
	91	kit4curious 4 wheel drive curious chassis for diy robotics-Black	2	999.00	1998.00
	92	3D printed Robotic Arm With Gripper incuding All nuts and bolts, Servos	2	699.00	1398.00
	93	Cligo Wireless Remote Controlled Smart Car Chassis	2	449.00	898.00
	94	65mm Robot Wheel for BO Motors	8	38.00	304.00
	95	Robot Wheel 10cm Dia. x 2cm Width	8	62.00	496.00
	96	80mm-A Mecanum Wheel Compatible with 6.7mm Coupling (Pack of 4)	2	919.00	1838.00
	97	Wheel Trolley Cart 25mm Dia 360° Rotation Swivel Caster Wheel (Pack of 4)	1	249.00	249.00
	98	Extention plates for chesis	4	100.00	400.00
	99	L shape clamps	20	79.00	1580.00
	100	U shape clamps	20	149.00	2980.00
	101	Nuts and Bolts of different sizes (Set of 500 pieces)	1	1000.00	1000.00
	102	Plastic gears of differents sizes and shafts (set of 200 pieces)	1	500.00	500.00
103	6 mm Worm gears+22 Teeth (60mm dia) Spur Gear	4	420.00	1680.00	




## Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
Chesis/arm/Robot structures Total					19846.42
<b>Discrete Components</b>	104	3mm Round DIP LED RED (Pack of 50)	1	70.00	70.00
	105	3mm Round DIP LED GREEN (Pack of 50)	1	70.00	70.00
	106	3mm Round DIP LED YELLOW (Pack of 50)	1	70.00	70.00
	107	3mm Round DIP LED BLUE (Pack of 50)	1	70.00	70.00
	108	3mm Round DIP LED WHITE (Pack of 50)	1	70.00	70.00
	109	5mm Round DIP LED RED (Pack of 50)	1	100.00	100.00
	110	5mm Round DIP LED GREEN (Pack of 50)	1	100.00	100.00
	111	5mm Round DIP LED YELLOW (Pack of 50)	1	100.00	100.00
	112	5mm Round DIP LED BLUE (Pack of 50)	1	100.00	100.00
	113	5mm Round DIP LED WHITE (Pack of 50)	1	100.00	100.00
	114	5mm RGB LED MODULE	2	54.00	108.00
	115	0.25w 5% tolerance Registers of all mixed values set of (1000 pieces)	1	340.00	340.00
	116	0.25w 5% tolerance 1K Resistor	100	0.50	50.00
	117	0.25w 5% tolerance 10K Resistor	100	0.50	50.00

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# Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	118	0.25w 5% tolerance 330Ω Resistor	100	0.50	50.00
	119	0.25w 5% tolerance 220Ω Resistor	100	0.50	50.00
	120	0.25w 5% tolerance 100Ω Resistor	100	0.50	50.00
	121	1k, Vertical PCB Preset Variable Resistor Trimmer Potentiometer	10	10.00	100.00
	122	10k, Vertical PCB Preset Variable Resistor Trimmer Potentiometer	10	10.00	100.00
	123	Ceremic Capacitors of all mixed values (set of 100 pieces)	5	120.00	600.00
	124	Electrolytic Capacitor Assortment Box (Set of 500 pieces)	1	1199.00	1199.00
	125	push button 2 pin (set of 50)	1	99.00	99.00
	126	push button 4 pin (set of 50)	1	88.00	88.00
	127	Pack of 10 Choke and Coils Inductors	10	158.00	1580.00
	128	LM7805 Positive Voltage Regulator IC, 5V 1A	5	9.00	45.00
	129	LM1117 3.3V 1A DIP Voltage Regulator	5	38.00	190.00
<b>Discrete Components Total</b>					<b>5549.00</b>
<b>Power Supply</b>	130	3.3v/5v Power Supply Module for Breadboards	10	59.00	590.00
	131	12V 1A Adaptor	5	99.00	495.00

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## Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	132	12V Li-ion 18650 Lithium ion Rechargeable (2000 Mah)	3	819.00	2457.00
	133	12.6V 12V 11.1V 18650 3S Battery Pack Lipo Lithium Battery Charger Constant Voltage Constant Current with Indicator (2A)	1	999.00	999.00
	134	Duracell Ultra Alkaline 9V Batteries	5	184.00	920.00
	135	9V Battery Clip Connector	5	10.00	50.00
	136	DC Power Jack Plug Adapter Connector, 12V 24V Male to 2.1mm x 5.5mm Barrel Connectors	10	20.00	200.00
	137	DC Power Jack Plug Adapter Connector, 12V 24V female to 2.1mm x 5.5mm Barrel Connectors	10	20.00	200.00
	138	6 x AA Battery Case Storage Holder With DC2.1 Power Jack For Arduino	2	200.00	400.00
	139	12V 10A DC SMPS	2	695.00	1390.00
	140	20 Watt - 12 Volt Solar Panel	2	1650.00	3300.00
<b>Power Supply Total</b>					<b>11001.00</b>

### Soldering

141	Safe Antistatic 936 Analog Soldering Station with 50W Soldering Iron & Stand	2	4335.00	8670.00
142	25 Watt soldering iron	2	300.00	600.00
143	10 Watt soldering iron	2		
144	Professional 220V-40W Electrically Heated Manual Desoldering Pump	2	499.00	998.00
145	Soldering wire 50 gm+flux	2	300.00	600.00



# Component List

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Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	146	Anti-Static Non-Slip Magnetic Silicone Repair Mat, Multi Work Station Soldering Mat (45 x 30 cm)	1	600.00	600.00
	147	3.5X / 12X Helping Hand Magnifier Magnifying with Soldering Stand & LED Light	2	870.00	1740.00
	148	Soldering Iron Stand	1	60.00	60.00
	149	Soldering Iron Tip Cleaner Steel Wire with /Stand Set Tool	1	470.00	470.00
<b>Soldering Total</b>					<b>13738.00</b>

Tools	150	Anti Static ESD Safe Tweezers set for Electronics - Straight Pointed, Flat and curved Tip	1	489.00	489.00
	151	Wire Striper & Cutter, Size: 5" (125mm)	2	90.00	180.00
	152	7 Inch Combination Plier (Multi-purpose)	2	300.00	600.00
	153	Multi-purpose Long Nose Plier, 6 Inches	1	200.00	200.00
	154	Interchangeable Precision Screwdriver Tool Set Kit with Magnetic Holder	1	200.00	200.00
	155	Combination Screw Driver Set with Tester	1	250.00	250.00
	156	PCB Micro Drill Machine With Power Supply with Drill Bits	1	700.00	700.00
<b>Tools Total</b>					<b>2619.00</b>

Misc 157 TH-M98 Digital Multimeter 2 799.00 1598.00

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# Component List

Lab. at RIRFGI

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	158	DPDT ON-Off 6 Pin 2 Position Slide Switch (set of 8)	1	280.00	280.00
	159	40watt Glue Gun	1	300.00	300.00
	160	Glue Stick	20	300.00	6000.00
	161	3D printer (WOL 3D ENDER - 3 MAX Model 2022)	1	26191.00	26191.00
	162	3D Printer Heat Bed Platform Sticker Sheet 235x235mm (Consumable)	1	379.00	379.00
	163	22Pieces 3D Printer Extruder Nozzle MK8	1	449.00	449.00
	164	PLA 3d Filament 1.75mm (White, 1kg) (Consumable)	1	1000.00	1000.00
	165	PLA 3d Filament 1.75mm (Black, 1kg) (Consumable)	1	1000.00	1000.00
	166	PLA 3d Filament 1.75mm (RED, 1kg) (Consumable)	1	1000.00	1000.00
	167	PLA 3d Filament 1.75mm (GREEN, 1kg) (Consumable)	1	1000.00	1000.00
	168	PLA 3d Filament 1.75mm (BLUE, 1kg) (Consumable)	1	1000.00	1000.00
	169	Raspberry pi 4 case Model B Acrylic case with Fan with heatsink Included	4	308.00	1232.00
	170	Hitsink for LM7805	5	150.00	750.00
	171	Hitsink for LM1117	4	250.00	1000.00
	172	Polyolefin Heat Shrink Tube Sleeve of different size (set of 300 pieces)	2	431.00	862.00
	173	Solar Charger Controller with Battery Regulator and LCD Display with USB Port 12V/24V (10A)	2	632.00	1264.00

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### Component List

Item Type	SL No	Specification	Quantity	Approx cost per unit	Approx Total Cost
	174	12V 92W Thermoelectric Peltier Plate Module 40mm x 40mm with CPU Cooling Fan and Heat sink	4	499.00	1996.00
	175	Desktop (i7 8GB RAM 500GB HDD 17" Monitor)	1	65000.00	65000.00
<b>Misc Total</b>					<b>112301.00</b>
<b>Grand Total</b>					<b>289976.70</b>



For payment 289976.70/-  
 (In Words) Two Lakhs Eight Thousand Nine Hundred and Seventy Six and 70/100  
only  
 Principal  
 RERFGI, Barrackpore