

**STATE BANK OF INDIA**

**ELECTRICAL BOQ FOR 3rd FLOOR (Right Wing), A- BLOCK, LHO, NEW DELHI**

**Note: The premises is located on 3rd Floor. Provision for scaffolding etc. to be taken in the quoted rates. Nothing extra shall be paid in this regard.**

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
1	Wiring for light point/ fan point/ wall fan point/ exhaust fan/ light sockets etc. with 1.5 sq.mm. PVC insulated 1100 V Grade copper conductor (FRLS) wires & 1.5 sq.mm. copper earth wire in concealed/ surface using 16 SWG MS conduits, accessories such as bends, tees, saddles, draw boxes, mounting boxes, inner plates, cover plates, ceiling rose etc (wherever required) and chromium plates brass screws/ rowel plug etc. The circuit wiring starting from DB to point control box/ switch box using 2 X 2.5 sq.mm PVC insulated 1100 V grade multi- stranded copper conductor wire & 2.5 sq.mm. PVC insulated earth wire (color code to be used). (Flexible conduit/ elbow not allowed). The conduit to be laid in ceiling with proper clamps/ wall/ floor and filling the chase with cement mortar and finishing the same in original form/ wooden partition/ above false ceiling with proper clamps etc. all complete.				
	(Wherever required as per standard specifications).				
	i) Each circuit shall have independent earth wire.				
	ii) Each point shall be earthed.				
	iii) Circuit wiring is to be included in point wiring rates.				
i	One light points controlled by one 6 amp. Modular switch	Nos.	40.00		
ii	Two light points controlled by one 6 amp. Modular switch	Nos.	46.00		
iii	Three light points controlled by one 6 amp. Modular switch	Nos.	33.00		
iv	Four light points controlled by one 6 amp. Modular switch	Nos.	27.00		
vi	One call bell point with ceiling rose/ 6amp. 3 pin socket controlled by one 6 amp. Push Modular switch. With call bell	Nos.	11.00		
vii	One wall fan/ exhaust fan point controlled by one 6 amp. Modular switch. The switch should be at switchboard level	Nos.	49.00		



S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
viii	One 5 pin socket controlled by one 6 amp. Modular switch complete assembly includes plate box etc.				
a	Dependent	Nos.	20.00		
ix	Same as serial no 1 but using 2*2.5 + 1*2.5 Sqmm Copper Conductor FRLS wires from DB to first 6A, 5 Pin modular socket controlled by one 6A switch and looped to the nearest second point with same 2*2.5 + 1*1.5 Sqmm copper conductor wires FRLS insulated 1100V grade (Maximum 2 points in a circuit)				
a	Primary	Nos.	31.00		
b	Secondary	Nos.	60.00		
x	Same as serial no 1 but using 2*2.5 + 1*2.5 Sqmm Copper Conductor FRLS wires from DB to first 6A (Only Primary Points for VRV AC unit)	Nos.	22.00		
xi	Same as serial no 1 but using 2*2.5 + 1*2.5 Sqmm Copper Conductor FRLS wires from DB to first 16 Amp MCB two Nos. , for Glow sign Board.				
a	Primary Point	Nos.	2.00		
2	<b>POWER POINTS</b>				
	Same as serial no.1, but wiring for 16 Amp, 6-pin sockets by using 2*4 sq.mm. PVC insulated 1100 V grade copper conductor wire with independent 1* 4.0 sq.mm earth wire from D.B. to first point 1 <sup>st</sup> socket and 1 <sup>st</sup> to 2 <sup>nd</sup> , socket with 2*2.5 sq.mm. and 1*2.5 earth wire including providing and fixing of 16 Amp, 6 -pin socket with 16 Amp. Switch. (Modular type switch/ socket/ plate etc. complete assembly).				
a)	Primary point	Nos.	25.00		
b)	Secondary point	Nos.	24.00		
4	<b>COMPUTER POINTS</b>				

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
a	Wiring with 2x2.5 sq.mm. + 1x2.5 sq.mm. PVC insulated 1100 V grade multi stranded copper conductor wires in 2 mm thick PVC conduit from UPS DB to computer point. Each point to have 3 nos. 6 amps. 5 pin modular type sockets, one 6 amps modular switch with all accessories, inner/ outer plates, metal box etc. and to be fixed on wooden partitions/ by grouting on wall etc. as per requirement at site. The switch should be fixed above the top of counter with indicator and sockets under the counter.				
	Primary	Nos.	28.00		
	Secondary	Nos.	55.00		
b	Wiring with 2x2.5 sq.mm + 1x2.5 sq.mm PVC insulated 1100 V grade multi stranded copper conductor wires in 2 mm thick PVC conduit from UPS DB to computer point. Each point to have <b>1 nos. 16 amps 5 pin modular type sockets, 1 No's 16 amps modular switch</b> with all accessories, inner/ outer plates, metal box etc and to be fixed on wooden partitions/ by grouting on wall etc as per requirement at site. The switch should be fixed above the top of counter and sockets under the counter. or as directed by the engineer incharge for the <b>Fire Panel, Data Rack</b>				
	Primary	Nos.	3.00		
	Secondary	Nos.	3.00		
<b>B.</b>	<b>CONDUITING FOR TELEPHONE, COMPUTER &amp; CONDUITING, WIRING FOR T.V. SYSTEM.</b>				
1.0	<b>TELEPHONE SYSTEM</b>				
1.1	Wiring for VOICE from Jack Panel in telephone rack to computer workstation with Cat-6 voice cable of make CommScope/ Systemax/ Belden in PVC conduits of size 20/ 25 mm including providing ferrules at both ends and termination at both ends including providing & fixing frame for telephone socket with shutter, RJ 45 outlet, faceplate and mounting box complete of modular type of make CommScope/ Systemax/ Belden. This work includes supply and laying of CAT-6 cable in PVC conduits throughout the length, from the I/O hub to the point.	Nos.	106.00		

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
1.2	Supplying, laying, effecting terminations, testing and commissioning of 0.51 mm dia Cu. Conductor, twisted, colour coded with polythene capor barrier, telephone cables in the existing tray or in conduit including providing &fixing conduit pipe or cable tray as required from building tag block to the floor as required.				
a)	Supplying & fixing 100 pair krone tag block with enclosure.	Nos.	2.00		
b)	P/L 100 Pair of PVC insulated PVC sheathed multi core jelly filled armored telephone.	Mtrs.	100.00		
2	<b>COMPUTER NETWORKING</b>				
2.1	Wiring for computer networking from Jack Panel in data rack to computer workstation with <b>Cat-6A</b> computer cable in PVC conduits of size 20/ 25 mm including providing ferrules at both ends and termination at both ends including providing & fixing frame for Cat-6A with shutter, RJ 45 outlet, faceplate and mounting box complete of modular type, This work includes supply and laying of CAT 6A cable in PVC conduits throughout the length, from the I/O hub to the point.	Nos.	164.00		
2.2	Supplying and fixing 24 U (Rack with glass door, opening in the front power panel 1 (horizontal), cable manager 1 lock & key).	Nos.	2.00		
2.3	Supply, Installation, Testing & Commissioning of 24 port Jack Panel – for CAT 6A	Nos.	12.00		
2.4	Supplying and fixing Patch Cord-2 Meter-(DBPS Mounting Cord) – CAT 6A	Nos.	60.00		
2.5	Supplying and fixing Patch Cord-1 Meter- CAT 6A	Nos.	164.00		
2.6	Supply and fixing of 1.6 mm thick G.I. Box along with RG 6 T.V Co axial socket with Cover Plate.	Nos.	8.00		
2.7	Supply, drawing, connecting, testing and commissioning of T.V Coaxial cable RG 6 in existing conduit.	RM	150.00		
<b>C.</b>	<b>CABLES, MAINS &amp; SUBMAINS</b>				

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
1	Supplying all materials and laying/ pulling 1100 volts grade PVC insulated copper conductor wires (FRLS) in MS conduit with all fixing accessories after cutting the floor, wall and the like etc. and replastering the floor level to original. Conduit must be 30 mm below the floor finish level.				
i	4 X 10 sq.mm. + 2 X 6 sq.mm. (UPS Input)	RM	25.0		
ii	2 X 10 sq.mm. + 1 X 10 sq.mm. (UPS Input/ Output)	RM	90.0		
iii	2 X 6 sq.mm. + 1 X 6 sq.mm. (UPS Input/ Output)	RM	60.0		
iv	Supplying, laying, testing & commissioning of 4 C X 16 sq.mm. at 1100 volts grade PVC insulated copper conductor armoured cable with 10 gauge earth copper wire including cables end termination using appropriate Lugs, Glands, termination accessories, Clamps etc. as required as per specification <b>(LIGHT DB, POWER DB, UPS Room, VRV Input)</b> .	RM	475.00		
iv	Supplying, laying, testing & commissioning of 4 C X 35 sq.mm. at 1100 volts grade PVC insulated aluminum conductor armoured cable including cables end termination using appropriate Lugs, Glands, termination accessories, Clamps etc. as required as per specification <b>(for Main Connection Lighting Load)</b> .	RM	30.00		
v	Supplying, laying, testing & commissioning of 4 C X 70 sq.mm. at 1100 volts grade PVC insulated aluminum conductor armoured cable including cables end termination using appropriate Lugs, Glands, termination accessories, Clamps etc. as required as per specification <b>(for Main Connection Power Load)</b> .	RM	30.00		
<b>D. DISTRIBUTION BOARD</b>					

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	Supplying, installing, testing & commissioning of surface/ recessed mountings, Double door 415 volts TPN MCB distribution board of steel steel, 1.6mm thick dust phosphatized and painted, inclusive of 100 amps, tinned copper busbars, earthbar, common neutral link, din bar for mounting of MCB's detachable gland/ knock out plate & with built in loose wire box, and superior make terminal connectors for all incoming and outgoing circuits duly prewired with adequate size of PVC insulated copper wires between the bus bars and the MCB's as well as the incomer and upto the terminal connectors/ neutral link and ready for installation of following ways as required.				
	Use 'B' curve MCB's for lighting & small power circuits, 'C' curve for motor duty i.e. for pumps, AC motors, window and split AC's etc. & 'D' curve for UPS DB's i.e. for computers/ PC's circuit. Main incomer & outgoing circuit MCB's shall be selected accordingly i.e. type B,C & D. Contractor to select the MCB's accordingly as per the nature of the circuit/ load.				
	Each DB shall have separate neutral links of rating not less than 100A for each phase. The main incoming neutral link shall be in addition to three outgoing neutral links and shall be of 125 A.				
	UPS DB's shall have a dedicated Earthing link fixed on insulated supports, which will be in addition to body earth link.				
	All internal inter connecting wiring within the DB's shall be PVC insulated flexible copper conductor wires of adequate capacity as per the current rating.				
	Inside each DB, a DB chart is to be fixed.				
a	<b>8-way TPN DB (LIGHT DB &amp; 6A RAW)</b>	No.	2.00		
	<b>Incomer:-</b>				
	1 No. 40 Amp TPN (10 KA) MCB with 40 A DP RCCB (100 MA) each phase				
	<b>Outgoing:-</b>				
	18 Nos.10/20 Amp (10 KA) SP MCB				
b	<b>4-way TPN DB (VRV DB)</b>	No.	4.00		
	<b>Incomer:-</b>				
	1 No. 40 Amp TPN (10 KA) MCB with 40 A DP RCCB (100 MA) each phase				
	<b>Outgoing:-</b>				
	6 Nos.10/20 Amp (10 KA) SP MCB				
c	<b>6-way TPN DB (LIGHT DB &amp; 6A RAW)</b>	No.	2.00		



S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	<b>Incomer:-</b>				
	1 No. 40 Amp TPN (10 KA) MCB with 40 A DP RCCB (100 MA) each phase				
	<b>Outgoing:-</b>				
	12 Nos.10/20 Amp (10 KA) SP MCB				
d	<b>6-way TPN DB (16A RAW POWER DB)</b>	No.	2.00		
	<b>Incomer:-</b>				
	1 No. 63 Amp TPN (10 KA) MCB with 40 A DP RCCB (100 MA) each phase				
	<b>Outgoing:-</b>				
	12 Nos.10/20 Amp (10 KA) SP MCB				
e	<b>12-way SPN DB (For UPS OUTPUT DB)</b>	No.	4.00		
	<b>Incomer:-</b>				
	1 No. 40 Amp DP (10 KA) MCB with 40 A DP RCCB (100 MA)				
	<b>Outgoing:-</b>				
	8 Nos. 40 Amp (10 KA) SP MCB				
f	<b>12-way SPN DB (For UPS INPUT)</b> with 1 Nos. 63 A TPN MCB as incomer and 2 Nos. 63 A TPN MCB as outgoing	No.	1.00		
g	<b>2-way SPN 40 A DB</b> with DP MCB (For UPS Input/ output )	No.	4.00		
h	<b>63 A TPN RCCB-in IP 65 rated MS enclosure</b> (For VRV Input)	No.	5.00		
<b>E (LIGHT FITTINGS &amp; ACCESSORIES)</b>					
	Supplying, installation with hanging support, testing and commissioning of following light fixtures with electronic Ballasts, Tubes, lamps, all fixing materials including connecting wires etc. all complete as per the directions of Engineer-in-charge (All LED Light Fixures should be covered with minimum 1 Years onsite replacement warranty).				
i	FULL GLOW 2 X 2 LED 36 W slim Smart Panel of make As specified in tender document or approved by SBI/ Architect.	Nos.	57.00		
ii	Supplying, fixing, testing and commissioning of 15 W LED (Maximum 150 mm cut-out size) commercial type down lighter of make as specified in tender document or approved by SBI/ Architect.	Nos.	140.00		
iii	Supplying, fixing, testing and commissioning of 20 W LED T 8 fitting make As specified in tender document or approved by SBI/ Architect.	Nos.	1.00		

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
iv	LED Strip for cove lighting (120 LEDs per metre) with driver and necessary installation supporting fittings of Led strip light make as specified in tender document or approved by SBI/ Architect.	Mtr	260.00		
v	Supplying, fixing, testing and commissioning of recessed LED Profile Light Axeon 30 W (4 ft long) with plain diffuser suitable for continuous/ seamless connection of make Wipro/ as specified in tender document or approved by SBI/ Architect.	Nos.	56.00		
vi	Supplying, fixing, testing and commissioning of recessed LED Profile Light Axeon 15 W (2 ft long) with plain diffuser suitable for continuous/ seamless connection of make Wipro/ Philips/ Havells as specified in tender document or approved by Bank/ Architect (Note: First make is the preferred make. Contractor shall take approval before installation).	Nos.	8.00		
vii	Supplying, fixing, testing and commissioning of 9 W COB light of make Philips/ Wipro/ Havells as specified in tender document or approved by Bank/ Architect (Note: First make is the preferred make. Contractor shall take approval before installation).	Nos.	14.00		
viii	Supplying, fixing, testing and commissioning of surface mounted extended body 12 W COB light of make Philips/ Wipro/ Havells as specified in tender document or approved by Bank/ Architect (Note: First make is the preferred make. Contractor shall take approval before installation).	Nos.	5.00		
ix	Supplying, fixing, testing and commissioning of Pendant Light including all accessories, hanging arrangements, down rods etc. as specified in tender document or approved by Bank/ Architect (Basic cost: 30000/) (Note: Contractor shall take approval before installation).	Nos.	1.00		



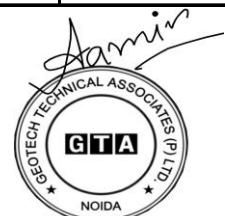
S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
x	Supplying, fixing, testing and commissioning of 1 W COB light of make Philips/ Wipro/ Havells as specified in tender document or approved by Bank/ Architect (Note: First make is the preferred make. Contractor shall take approval before installation).	Nos.	5.00		
xi	Wall mounted fans 400/450 mm dia. make As specified in tender document or approved by SBI/ Architect <b>(METAL BODY)</b> .	Nos.	41.00		
xii	Supply & fixing of 230 mm exhaust fan with louvers and plastic body with all accessories etc. complete of make As specified in tender document or approved by SBI/ Architect.	Nos.	9.00		
<b>F. EARTHING SYSTEM</b>					
1	Supply, Installation, Testing and Commissioning of Maintenance Free Earthing system made up of copper-bonded rod of 10 feet length, 23 mm dia. (Minimum copper bonding shall be 0.25mm) along with Rod-to-Conductor connectors, Earth enhancement material, Pit Cover and other accessories as required and as per specification and other applicable codes (include chamber for earthing, Earthing certificate to be submitted along with the bill).	Nos	2.00		
3	Providing and fixing of Copper/ GI strips in surface or in recess for loop earthing etc. as required.				
i	Providing and fixing 2 X 8 SWG dia. Cu earth wire in PVC conduit on surface or in recess for loop earthing along with the existing surface/ recess cable as required eith using of copper lug at end termination	RM	75.00		
ii	Providing and fixing G.I. earth link with insulator and 10 nos of nut, bolt, washer, and spring washer for earth wire connecting in UPS room.	Nos.	2.00		
4	Providing and fixing of cable tray GI perforated type cable tray of approved make. The cable tray shall be fixed to ceiling/ wall with suitable size of GI clamp, appropriate dia. threaded rod and C Channel putty/ suitable size of MS angle support painted with 2 coats of paint. Item to include provision of scaffolding etc. as required for works.				
a	150 mm wide and 50 mm high	Mtr	100.00		
b	300 mm wide and 50 mm high	Mtr	250.00		

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
<b>G.</b>	<b>PANEL FOR LIGHTING LOAD/ POWER LOAD</b>				
1	supply, installation, testing and commissionings of cubicle type floor/wall mounted L.T. Metal D.B of reputed make with extendable rotary handle and extended connecting links				
<b>a</b>	<b>1 No. 160 Amps, TPN MCCB (25 KA) with standard enclosure as per manufacturer specification or as approved by the architect/ Bank's Engineer</b>	Nos.	1.00		
<b>b</b>	<b>1 No. 160 Amps, TPN MCCB (25 KA) with standard enclosure as per manufacturer specification or as approved by the architect/ Bank's Engineer</b>	Nos.	1.00		
2	Designing, fabrication, supply, installation, testing and commissionings of front operated cubicle type compartmentalised, front access, free standing on 75MM "I" MS channel, dust and vermin proof (IP 42 degree protection) panel suitable for use at 415V, 3 phase, 4-wire 50Hz system suitable for fault level of required value symmetrical at 415V fabricated from 2 mm thick CRCA MS sheets with hinged, gasketted (Metal based neoprene) locable doors having structural reinforcement including 3 mm thick gland plates on top and bottom, lifting hooks, GI earth strip of required size with 2 nos earth terminals, 2 nos 230V AC operated 250 mm X 250 mm size axial fans for exhaust of heat with On-Off toggle switches including 2 coated primer and 2 power coated paint finish of approved shade over metal surface cleaned and treated with seven tank process complete with interconnections etc as per specifications as required main panel board of approved make from CPRI approved manufacturer as approved by the architect/SBI				

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	Type of Approval as instructed by the SBI/ Architect). All live accessible parts shall be shrouded and all equipment shall be finger touch proof. The busbars insulation shall be with heat shrinkable sleeves SMC/ DMC shrouds and busbar supports shall be used. Padlocking facility shall be provided on all outgoing feeders doors and switch handles shall be locable in OFF position.				
	Suitable arrangement shall be made for termination of multiple incoming cables.				
	All kA values indicated shall be Ics breaking capacity				
	GA drawings shall be got approved by <b>Architect / SBI</b>				
<b>a.</b>	<b>Floor panel for Lighting Load shall consist of: -</b>				
	<b>INCOMER</b>				
	1 no. of 160 A TPN MCCB (25 KA) with extendable rotary handle each				
	<b>BUSBARS</b>				
	200 amps TPN busbar chamber of suitable length with copper busbars. All busbars and interconnections shall be of suitable size copper strips.				
	<b>INDICATING PANEL</b>				
	Digital flush type class-1.0 accuracy multifunction meter showing V, A, PF etc. with 3 Nos. current transformers of 160/5A ratio, 10 VA Class-1.0 metering. - 1 sets				
	Red/Green/Amber ON/ OFF/ TRIP indicating lamps with 2A SP MCB backup protection				
	1 set of three phase indicating lamps along with 2A SP MCB backup protection				
	Restricted Earth fault relay with 3 Nos. current transformers of 160/5 ratio, 10 VA Class 5P 10 (Numeric Relay not required)				
	<b>OUTGOINGS:-</b>				
	2 Nos 40 A DP MCB (10 kA) terminals suitable to receive cable on one side and wire connection to Bus bars (Sign board).				
	2 Nos 63 A TPN MCB (10 kA) terminals suitable to receive cable on one side and wire connection to Bus bars. (For UPS & , Spare)				
	5 Nos 40 A TPN MCB (10 kA) terminals suitable to receive cable on one side and wire connection to Bus bars. (For Light DB, Spare)				



S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	The <b>electrical panel</b> as described above and specifications complete.	Set	1.00		
<b>b.</b>	<b>Floor panel for Power Load shall consist of: -</b>				
	<b>INCOMER</b>				
	1 no. of 160 A TPN MCCB (25 KA) with extendable rotary handle each				
	<b>BUSBARS</b>				
	200 amps TPN busbar chamber of suitable length with copper busbars. All busbars and interconnections shall be of suitable size copper strips.				
	<b>INDICATING PANEL</b>				
	Digital flush type class-1.0 accuracy multifunction meter showing V, A, PF etc. with 3 Nos. current transformers of 160/5A ratio, 10 VA Class-1.0 metering. - 1 sets				
	Red/Green/Amber ON/ OFF/ TRIP indicating lamps with 2A SP MCB backup protection				
	1 set of three phase indicating lamps along with 2A SP MCB backup protection				
	Restricted Earth fault relay with 3 Nos. current transformers of 160/5 ratio, 10 VA Class 5P 10 (Numeric Relay not required)				
	<b>OUTGOINGS:-</b>				
	2 Nos 40 A DP MCB (10 kA) terminals suitable to receive cable on one side and wire connection to Bus bars (AC DB, Spare).				
	13 Nos 63 A TPN MCB (10 kA) terminals suitable to receive cable on one side and wire connection to Bus bars. (For UPS Incomer, Power DB, VRV, Spare)				
	The <b>electrical panel</b> as described above and specifications complete.	Set	1.00		
<b>H</b>	<b>PUBLIC ADDRESS SYSTEM</b>				
1	Point wiring for speakers in 1.5 sq mm twin core shielded type of speaker cable with Providing and fixing in position the following <b>FRLS PVC conduits</b> including all accessories concealed/exposed in F.Ceiling/Wall complete as required including 1.6/2.0 mm thick PVC junction or pull boxes with 3mm thick perspex sheet cover plate complete with 1.6 mm dia G.I. pull wires in the length of conduit. including all accessories.	Nos.	16.00		
2	Supply, installation, testing and commissioning of following Philips (BOSCH) make Music Accessories / Equipments.				
a.	Ceiling Speaker Unit 6 Watts	Nos.	16.00		



S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
b	Power Amplifier, min 150 Watts with output transformer etc. complete. Plena Range/ Ahuja or as approved by the Bank capable of taking Inputs from USB Also.	Nos.	1.00		
<b>I</b>	<b>ONLINE UPS SYSTEM</b>				
1	Supply, Installtion, Testing and Commissioning of 15 kVA UPS system with 1 Hr Battery Backup having the following specifications: <b>make: of Bank's approved Panel of UPS manufacturers only and batteries of Bank's approved Brand only.</b>	Nos.	2.00		
	The UPS shall have pulse width modulation (PWM) technology in True On-line Configuration, with double conversion using IGBTs in the Inverter and converter. Built in galvanic Isolation. b) Provision for configuring three or more UPS system in parallel load sharing mode. Maximum six nos UPS system can be connected in parallel configuration in one cluster. c) The requirement is for fully rated capacity of single module in parallel with similar module sharing the load having provision for adding one or two modules of similar units. Paralleling of UPS should be achieved by paralleling the output on the power side using control logic signal bus. Each UPS should be capable of individually starting, running and feeding to the load apart from parallel operation. Individual battery backup is necessary. Inverters should be synchronized with common by pass supply if required can be connected in parallel for forming N + 1 (Configuration)				
	Inversion Technique: Adaptive pulse width modulation or sine weighted pulse width modulation with high switching frequency (> 12 KHZ for IGBTs).				
	Input Voltage Range: Three Phase 400 Volts + 15%. There should be input to output Isolation through an inbuilt/ separate Isolation transformer.				
	Input frequency: 45 Hz to 55 Hz and it should be compatible with D G Set.				
	Output voltage: 220 / 230 V.A.C. + 1% single phase.				

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	Output frequency: 50 Hz +/- 4% (Synchronous to mains) 50 Hz +/- 1% (Free running)				
	Line low/High cut off: 330 VAC to 478VAC				
	Total DC Voltage 15 KVA: >=240 V DC				
	Power factor: The UPS shall be provided with Auto input P.F. correction system to obtain P.F. 0.95 to unity when the connected load P.F. varies from 0.6 to unity.				
	Total Harmonic Distortion (o/p voltage): < 4% for non-linear load				
	Total Harmonic Distortion (Input current): < 8% at 50% load. < 2 % for Linear Load < 5% at full load. Non Linear				
	Waveform (output): Sine Wave, UPS shall have Cold start feature				
	Overload capacity: 110% for 10 minutes, 150% for 1 minute. During the test or actual condition, the load should not get transferred to mains through static switch.				
	Transient response and voltage recovery time for step load: For 100% Step load i.e. from full load to no load and no load to full load: Dip < 3%, Peak < 3% with recovery time within 3 cycles to normal output voltage				
	Minimum overall Efficiency at % load: At 100 i.e full load - 92%, At 66% - 88%, At 33% load - 86%				
	The UPS should be capable to deliver rated KVA at 0.9 P.F. UPS should be designed for delivering rated KVA at ambient temperature from 0 to 40 Degree Celsius. It should also be capable to deliver approx. 80% of rated output at 50 degree Celsius ambient temperature.				
	Relative Humidity: Upto 95% at 35 degree Celsius non-condensing				
	Noise level: At 1 meter from the UPS. < 65 decibels. (On demand Proto-type test certificate be submitted)				

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	Charger: Built in IGBT based solid state float-cum-boost charger with automatic boost/trickle charge modes with current limiting features. The charger characteristics shall be such as to match the float/boost charging of the batteries as per battery characteristic, for enhancing the life of batteries. The charger should be designed for 1 hours back up period at rated KVA				
	Battery recharge time (after complete discharge) to 100% charge - 8 hours				
	Crest factor: > 3				
	Interface facility The UPS system should have necessary hardware and software with RS-232 port to work on DOS/SCO Unix (open screen) Novell/ Network/ Current & advanced window operating system. It should be compatible for connecting to Building Management System. (B) Remote manageability through SNMP facility. There is a facility to monitor and broad cast to server wherever necessary condition such as: i) Power failure, back up time, low battery warning & auto file closure. ii) The software should be capable of automatically closing the files (auto closure feature) in the server so that the data/ program files on the server are not lost/ corrupted.				

S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	Protection: a) Isolation – Separate/ In-built isolation transformer shall be provided for isolation transformer for fully isolation from mains and surge / spike suppressors to be incorporated. Both input and output to have MCBs. Battery connection to have MCB/MCCB/ Switch b) Current limiting protection (Fuse less Electronic). Built in overload/ short circuit protection with snubber circuits for current limit. c) Soft start on Inverter and charger arrangement. d) Phase locking mechanism for UPS and mains frequency- for 3 phase output. e) Over voltage / under voltage protection. MCB with Alarm. Load connected to the UPS should be protected under any circumstance. f) Short circuit protection through HRC fuses (high speed) for devices such as IGBTs. g) Short circuit/ overload protection through MCB / MCCB. h) All other protection systems required for safety of UPS system, such as over temperature protection etc.				
	I). Static (Auto) bye-pass switch: Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to bye-pass and vice-versa. Should take care of 100% load transfer without break				
	II). Manual by-pass switch: Should be provided.				
	Indications: a). Mains ON with phase indication for single phase / 3 phase separately for all the phases. b). Inverter ON / OFF / FAULTY / TRIP (Reason) c). Battery Low d). Static by-pass ON e). Over temperature f). Earth Leakage				
	Alarmi): Low battery alarm to be provided i) % load iii) Failure of invertor				



S.No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT
	iv) mains failure / load on battery alarm to be provided. Both should be audio visual. v) Over temperature alarm in two stages 1st stage : Warning, intermittent audio alarm 2nd stage : Tripping, continuous audio visual and <del>resetable</del>				
	Metering: Digital panel Meter or LCD display system to indicate the following: i). A.C. voltage : Input/ output ii). A.C. current : Input/output or % load iii). D.C. battery voltage iv). D.C. Charging / discharging current v). Frequency – Input/ Output				
	Battery set: Complete with self standing cubicle or cabinet				
	Battery set A. SMF Batteries ii) Make like: Exide/ Panasonic/ Amara Raja (iii) Note: Only Valve Regulated Lead Acid (VRLA) type SMF batteries of 20 HR rated capacity electrolyte in paste form are acceptable. Any other type including calcium batteries are not acceptable.				
	Degree of protection: IP 20				
	<b>TOTAL FOR ELECTRICAL WORKS</b>				
Note:- The rates quoted includes all other taxes , duties , loading, unloading , transportation, other expenses etc to site. only GST will be paid Extra					