*Schedule of item for Supplying, installing, testing & commissioning of 800 KVA Electrical sub-station equipments with H.T and L.T Cables for under Construction Hall Building and House Tutor Building of Jatir Janak Bangabandhu Sheikh Mujibur Rahman Hall, University of Dhaka.*

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| SI. No. | **Description of Items (Sub Head-A)** | Qty | Unit | Rate | Amount in Taka |
|  | **HT (11 KV) SWITCHGEAR** |  |  |  |  |
| 1 | Supply of 11 KV, 3-phase, 50 Hz, indoor type, high tension switchgear complete with Vacuum Circuit Breaker, 800 A hard-drawn electrolytic copper bus-bars, 1 No 0-15 KV range voltmeter & 1 no. ammeter of adequate range both with selector switch, 1 no. of panel heater with auto thermostat control switch, manual ON & OFF push button switch and ON-OFF-TRIP indicators including following components (components such as VCB, CT, PT, microprocessor controlled IDMT relay shall be manufactured according to relevant NEMA / VDE / IEC / JIS / BS standards and shall have type test certificate (within 5 years) according to relevant IEC standard assembled locally in 14 SWG sheet steel metal clad, dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet as per relevant IEC standards and as per accepted / approved by the Engineer. |  |  |  |  |
|  | Incase of 630 KVA or above capacity sub-station, the switchgear panel shall have to be furnished with audible alarm & auxiliary relays for sensing signals from buchholz relay and operation of HT switchgear.   CTRatio   For 800 KVA transformer 50/5/5 |  |  |  |  |
|  | **With withdrawable type Vacuum Circuit Breaker.** |  |  |  |  |
|  | (i)1 Set of 11KV, 630 Amps (25KA), 3-phase, 50 Hz, trolley mounted fully withdrawable type Vacuum Circuit Breaker complete with motor operated spring charged stored energy mechanism for auto tripping at 12/24/48/110 volts D.C (without battery) . |  |  |  |  |
|  | (ii) 2 Nos. 11 KV, cast resin insulated, dry type; double pole PT having ratio 11/0. 11, burden 50VA, class 0.5 for metering & protection. |  |  |  |  |
|  | (iii) 3 Nos. 11 KV cast resin insulated, dry type, double core CT of adequate current ratio (compatible with the transformer capacity), burden 10-15 VA, first core of class 0.5 M5 for metering and second core of class 10P10 for protection. |  |  |  |  |
|  | (iv) 1 No of Triple pole solid-state microprocessor control IDMT relay with 2 elements of over current and short circuit protection and one for earth fault protection. |  |  |  |  |
|  | (v) 1 No. 415V, 6A (10KA) TPMCB for PT secondary protection. |  |  |  |  |
|  | (a) Assembled by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET / CUET / DUET / KUET / RUET. | 1.00 | Each |  |  |
| 2 | **THREE PHASE OIL TYPE TRANSFORMER** |  |  |  |  |
|  | Supply of following oil-immersed, natural air cooled, 3-phase, 50-Hz, 11KV/0.415 KV & 0.24 KV indoor/outdoor type distribution transformer of DYN11 vector group complete with two windings of high conductivity copper having basic impulse insulation level 75 KV , dielectric strength 28 KV (for 1 min), HT & LV porcelain bushings, manual 5 position standard tap changer, conservator, thermometer, oil inlet & outlet valves, oil level indicator, dehydrating breather, lifting lugs, earthling terminals, wheel, data plate etc. including painting, suitable for operation at 40°C ambient temperature with maximum temperature rise 60°C, tested in Bangladesh as per NEMA / VDE / IEC / BS standards. |  |  |  |  |
| 2.1 | (a) Capacity: 80**0 KVA with buchholz relay.** |  |  |  |  |
|  | (b) No load loss: 1400 watts (Maximum) |  |  |  |  |
|  | (c) Full load loss: 9000 watts (Maximum) |  |  |  |  |
|  | (d) Percentage impedance : 5-5.5% |  |  |  |  |
|  | Manufactured by Govt. of Bangladesh owned / shared company or having type test certificate for the required or higher capacity of transformer according to relevant IEC standards from any internationally accredited independent laboratory. | 1.00 | Each |  |  |
| 3 | LT SWITCH GEAR & ELT SWITCH GEAR |  |  |  |  |
|  | Supply of 415 V, 3-phase, 50 Hz, indoor type low tension switch-gear of following specification complete with voltmeter (0-500V) & ammeter of adequate rating both with selector switch, indicating lamps for ON-OFF and following components (components such as TPMCCBs shall be manufactured according to relevant NEMA / VDE / IEC / JIS / BS standards and shall have test certificate (within 5 years) according to relevant IEC Standard) assembled locally in 14 SWG sheet steel metal clad, dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet as per relevant IEC standards and as per accepted / approved by the Engineer. |  |  |  |  |
|  | Assembled by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET / CUET / DUET / KUET / RUET. |  |  |  |  |
| 3.1 | **For 800 KVA Transformer:** |  |  |  |  |
|  | **INCOMING :** |  |  |  |  |
|  | 1 Set - 415V, 1500 amp. TP&NE hard drawn electrolytic copper busbar. |  |  |  |  |
|  | 1 No. - 415V, 1250 Amps (50KA), adjustable type TP ACB for main control with thermal overload & instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | 3 Nos. - 415V, 1200/5 ratio current transformer with suitable accuracy & burden. |  |  |  |  |
|  | **OUTGOING :** |  |  |  |  |
|  | 1 No.- 415V, 800A (65KA) adjustable type TPMCCB with instantaneous electro-magnetic short circuit release (for PFI control). |  |  |  |  |
|  | 2 Nos.- 415V, 300 / 320A (35KA) adjustable type TPMCCB with instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | 4 Nos.- 415V, 250A (35KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | 1 No.- 415V, 150/160A (25KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | 1 No.- 415V, 30 / 32A (16KA) TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release. | 1.00 | Each |  |  |
| 3.2 | **For 300 KVA Generator** |  |  |  |  |
|  | **INCOMING** |  |  |  |  |
|  | 1 Set - 415V, 600 amp. TP&NE hard drawn electrolytic copper bus bar. |  |  |  |  |
|  | 1 No.- 415V, 400 Amps (35KA), adjustable type TPMCCB for main control with thermal overload & instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | 3 Nos. - 415V, 400/5 ratio current transformer with suitable accuracy & burden. |  |  |  |  |
|  | **OUTGOING** |  |  |  |  |
|  | 02 Nos.- 415V, 400A (35KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | 02 Nos.- 415V, 100A (25KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | 1 No.- 415V, 60/63A (16KA) TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release. |  |  |  |  |
|  | **Assembled by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET/ CUET/ DUET/ KUET/ RUET.** | 1.00 | Each |  |  |
| 4 | **POWER FACTOR IMPROVEMENT PANEL** |  |  |  |  |
|  | Supply of following 415 volt, 3 phase, 50 Hz power factor improvement panel complete with TP busbars and earth block, micro processor controlled auto power factor correction relay with digital PF reading display, capacitor bank, contactor, fuse, ON indicators for every stage of capacitor bank (except directly connected one) etc. shall be manufactured & tested as per NEMA/VDE/IEC/JIS/BSS standards assembled locally in 16 SWG sheet steel clad dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet. as per relevant IEC standards and as per accepted/approved by the Engineer. |  |  |  |  |
| 4.1 | **For 800 KVA Transformer** |  |  |  |  |
|  | **PFI Capacity- 475 KVAR** |  |  |  |  |
|  | 3 Nos.- 415V, 900A hard drawn electrolytic copper busbar. |  |  |  |  |
|  | 1 No. - 415V, 25 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection directly with line through fuse. |  |  |  |  |
|  | 4 Nos. - 415V, 25 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge resistor. |  |  |  |  |
|  | 5 Nos. - 415V, 50 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge resistor. |  |  |  |  |
|  | 1 No. - 415V, 100 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge resistor. |  |  |  |  |
|  | 4 Nos. - 415V, 40 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. |  |  |  |  |
|  | 5 Nos. - 415V, 80 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. |  |  |  |  |
|  | 1 No. - 415V, 160 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. |  |  |  |  |
|  | 15 Nos. - 415V, 50 Amps, HRC fuse with base. |  |  |  |  |
|  | 15 Nos. - 415V, 100 Amps, HRC fuse with base. |  |  |  |  |
|  | 3 Nos. - 415V, 200 Amps, HRC fuse with base. |  |  |  |  |
|  | Assembled by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET/ CUET/ DUET/ KUET/ RUET. | 1.00 | Each |  |  |
| 5 | **Lightning Arrester and Drop-out fuse.** |  |  |  |  |
| 5.1 | Supply of outdoor type11 KV, 50 Hz, 100A, (10 KA), 75 KV BIL lightning arrester complete with mounting accessories etc. manufactured by GEM Co. Ltd, Bangladesh /ENERGYPAC or equivalent product of USA EU Countries (3 Nos. in a set). | 1.00 | per set |  |  |
| 5.2 | Supply of outdoor type 11KV, 50 Hz, 5KA (20 KA) dropout fuse complete with mounting accessories etc. manufactured by GEM Co. Ltd, Bangladesh /ENERGYPAC or equivalent product of USA /EU Countries (3 Nos. in a set). | 1.00 | per set |  |  |
|  | **INSTALLATION** |  |  |  |  |
| 6 | Installations, testing and commissioning of following 11 KV, 50 Hz. 3-phase, indoor type HT switchgear and HT Meter on prepared foundation with the help of necessary tools, plants, skilled labour & technician as per direction of the Engineer-in-charge. |  |  |  |  |
| 6.1 | HT Switch Gear With withdrawable type Vacuum Circuit breaker | 1.00 | per job |  |  |
| 6.2 | HT meter | 1.00 | per job |  |  |
| 6.3 | RMU | 1.00 | per job |  |  |
| 7 | Installation, testing and commissioning of following 11 KV/.415KV transformer on prepared platform on pole / c.c. foundation with the help of necessary tools & plants. skilled labour & technician as per direction of the Engineer-in-charge. |  |  |  |  |
| 7.1 | 800 KVA 3 phase transformer on C.C. pad | 1.00 | per job |  |  |
| 8 | Installation, testing and commissioning of 415V, 3-phase, 50 Hz indoor type LT/ELT switchgear/P.F.I. plant suitable for following capacity transformer on prepared c.c. foundation with the help of necessary tools & plants, skilled labour & technician as per direction of the Engineer-in-charge. |  |  |  |  |
| 8.1 | For 800 KVA Transformer (LT & PFI) | 2.00 | per job |  |  |
| 8.2 | For 300 KVA Generator (ELT) | 1.00 | per job |  |  |
| 9 | Installation of HT drop out fuse/ lightning arrester/ disconnection switch on prepared U-channel cross-arm on single / H-pole with necessary fixing materials complete as per instruction of the Engineer-in-charge. |  |  |  |  |
| 9.1 | Drop out fuse. | 1.00 | Set |  |  |
| 9.2 | Lightning arrester. | 1.00 | Set |  |  |
| 10 | **HT CABLE** |  |  |  |  |
|  | Providing and laying of sizes HT(11KV)PVC insulated, sheathed, screend & armoured (NYSEYFGBY) / HT(11 KV) armoured XLPE Cable: All electrical contacts shall be of brass/copper connected through connector or soldering( no twisting shall be allowed) and cables shall be manufactured and tested according to relavent IEC/BDS/ BS/ VDE standards . The work shall be carried out as per direction/approval/acceptance of the Engineer. |  |  |  |  |
|  | 1) In kutcha ground by cutting 45.7cm width X 91.4cm depth trench with necessary brick or tile Protection and mending the damages good by refiling trench with proper compaction. |  |  |  |  |
|  | 2) In pucca floor through required size of PVC pipe cutting trench of necessary size and mending the damages with one layer 1st class flat brick soling, 75mm thick (1:2:4) CC works with neat cement finishing etc. |  |  |  |  |
|  | 3) In pucca ground / road through required size of pvc pipe by cutting 45.70cm width x 91.40 cm depth trench mending good the damages by earth refilling with proper compaction providing 50mm thick compacted premix bituminous carpeting over one layer of 1st class flat brick soling and 75 mm thick compacked water bound macadam of Khoa of brick. |  |  |  |  |
|  | **Cable manufacturer(s) must have valid test certificate from internationally accrediated laboratory (like CPRI, KEMA etc) accepted / approved by the Engineer.** |  |  |  |  |
|  | **3C x 185 sqmm XLPE cable/ NYSEYFGBY Cable** |  |  |  |  |
| 10.1 | **In kutcha ground/pucca floor/road** | 365.00 | per meter |  |  |
| 11 | Surface conduit wiring with the following PVC insulated and sheathed stranded cable (NYY/)/ XLPE insulated and PVC sheathed stranded cable(2XY) & PVC insulated green/white coloured ECC wire (BYA) through PVC conduit of reputed manufacturer complete with fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass/copper connected through connector or soldering ( no twisting shall be allowed) and cables shall be manufactured and tested according to relavent IEC/BDS/BS/VDE standards . The work shall be carried out as per direction/approval/acceptance of the Engineer. |  |  |  |  |
|  | Cable manufacturer(s) must have valid test certificate from internationally accrediated laboratory (like CPRI, KEMA etc) accepted / approved by the Engineer |  |  |  |  |
| 11.1 | 1C-4x10sq.mm (NYY/2XY) with 10 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 40 mm having wall thickness of 1.9 mm | 25.00 | per meter |  |  |
| 11.2 | 1C-4x25 sqmm (NYY / 2XY) with 16 sqmm (BYA) ECC wire through GI pipe of minimum inner dia 50 mm. | 15.00 | per meter |  |  |
| 11.3 | 1C-4x120 sqmm (NYY / 2XY) with 70 sqmm (BYA) ECC wire through GI pipe of minimum inner dia 75 mm. | 15.00 | per meter |  |  |
| 11.4 | 1C-4x400 sq.mm (NYY/2XY) with 185 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 100 mm having wall thickness of 3 mm | 30.00 | per meter |  |  |
|  | **Under Ground Cable** |  |  |  |  |
| 12 | Providing & laying of the following **PVC insulated & sheathed cable (NYY) / XLPE insulated & PVC sheathed cable (2XY)** with PVC insulated green/white coloured ECC wire (BYA) connecting at both ends, through PVC pipe & accessories in the following manner: All electrical contacts shall be of brass/copper connected through connector or soldering ( no twisting shall be allowed) and cables shall be manufactured and tested according to relavent IEC/BDS/ BS/ VDE standards. The work shall be carried out as per direction/approval/acceptance of the Engineer. |  |  |  |  |
|  | In kutcha ground by cutting 45.70 cm width x 91.40 cm depth trench with necessary brick or tile protection and mending the damages good by refilling trench with proper compaction; |  |  |  |  |
|  | Cable manufacturer(s) must have valid test certificate from internationally accrediated laboratory (like CPRI, KEMA etc) accepted / approved by the Engineer |  |  |  |  |
| 12.1 | 1C-4 x 25 sq.mm (NYY/2XY) with 16 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 50 mm having wall thickness of 2.5 mm | 50.00 | per meter |  |  |
|  | In kutcha/pucca ground |  |  |  |  |
| 12.2 | 1C-4 x 35 sq.mm (NYY/2XY) with 16 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 50 mm having wall thickness of 2.5 mm |  |  |  |  |
|  | In kutcha/pucca ground | 80.00 | per meter |  |  |
| 12.3 | 1C-4x95 sq.mm (NYY/2XY) with 50 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 75 mm having wall thickness of 3 mm |  |  |  |  |
|  | In kutcha/pucca ground | 30.00 | per meter |  |  |
| 12.4 | 1C-4x185 sq.mm (NYY/2XY) with 95 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 100 mm having wall thickness of 3 mm |  |  |  |  |
|  | In kutcha/pucca ground | 35.00 | per meter |  |  |
|  | **CONCEALED CONDUIT WIRING** |  |  |  |  |
| 13 | Concealed conduit wiring for following point looping at the switch board with earth terminal including circuit wiring with IC-2x1.5 sq.mm PVC insulated and sheathed stranded cable (BYM) & 1.5 sq.mm PVC insulated green/white coloured ECC wire (BYA) through PVC conduit of reputed manufacturer of minimum 25 mm dia & 1.5 mm wall thickness complete with 18 SWG GP sheet, switch board and pull box with 3mm thick ebonite sheet cover,5 amps. piano switch, ceiling rose, fixing materials etc. as required including mending the damages good . All electrical contacts shall be of brass/copper connected through connector or soldering ( no twisting shall be allowed) and cables shall be manufactured and tested according to relavent IEC/BDS/BS/VDE standards.The work shall be carried out as per direction/approval/acceptance of the Engineer. |  |  |  |  |
|  | **Cable manufacturer(s) must have valid test certificate from internationally accrediated laboratory (like CPRI, KEMA etc) accepted / approved by the Engineer** |  |  |  |  |
| 13.1 | Light/ Exhaust or Wall bracket Fan Point | 25.00 | per point |  |  |
| 13.2 | Fan Point | 8.00 | per point |  |  |
| 14 | Concealed conduit wiring with following PVC insulated and sheathed stranded cable (BYM) & PVC insulated Green / White coloured ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet and pull box with 3mm thick ebonite sheet cover, fixing materials etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering ( no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards. The work shall be carried out as per direction & approval of the Engineer. |  |  |  |  |
|  | Cable manufacturer(s) must have valid test certificate from internationally accrediated laboratory (like CPRI, KEMA etc) accepted / approved by the Engineer |  |  |  |  |
| 14.1 | 1C-2x2.5sqmm (BYM) cable with 2.5sqmm (BYA) ECC wire through PVC pipe of minimum inner dia 16 mm having wall thickness of 1.5 mm | 100.00 | per meter |  |  |
| 15 | **3-PHASE DISTRIBUTION SYSTEM** |  |  |  |  |
|  | **Bus-Bar** |  |  |  |  |
|  | Providing and fixing 500v 3-PHASE BUSBAR system assembled in 18 SWG M.S. board having the following components and specifications in/c arrangement of cable/wire connection, hinged type top cover, two coats gray hammer painting over anti-corrosive coat etc. on prepared board/wall. |  |  |  |  |
| 15.1 | **60 Amps.BUSBAR system** |  |  |  |  |
|  | 1. Copper flat bar(5nos): 4 nos 9"x1"x3mm and 1 no 4"x1"x3mm for earthing mounted on insulator at both ends individually. Equal size of hole on bar at 0.5" interval 2"-3" gap between each bar |  |  |  |  |
|  | 2. Bus-bar chamber : Size 13"x13"x8" made of 18SWG MS sheet with hinged type door and locking arrangement enclosure complete with porcelain insulators complete | 2.00 | Each |  |  |
| 15.2 | **200 Amps.BUSBAR system** |  |  |  |  |
|  | 1. Copper flat bar(5nos): 15"x1"x3mm and 1 no 4"x1"x3mm for earthing mounted on insulator at both ends individually. Equal size of hole on bar at 0.5" interval 2"-3" gap between each bar |  |  |  |  |
|  | 2. Bus-bar chamber : Size 19"x17"x8" made of 18SWG MS sheet with hinged type door and locking arrangement |  |  |  |  |
|  | enclosure complete with porcelain insulators complete | 1.00 | Each |  |  |
| 15.3 | **400 Amps.BUSBAR system** |  |  |  |  |
|  | 1. Copper flat bar(5nos): 4 nos 18"x1"x3mm and 1 no 4"x1"x3mm for earthing mounted on insulator at both ends individually. Equal size of hole on bar at 0.5" interval 2"-3" gap between each bar |  |  |  |  |
|  | 2. Bus-bar chamber : Size 24"x24"x8" made of 18SWG MS sheet with hinged type door and locking arrangement enclosure complete with porcelain insulators complete | 1.00 | Each |  |  |
| 15.4 | **500 Amps.BUSBAR system** |  |  |  |  |
|  | 1. Copper flat bar(5nos): 4 nos 18"x1"x3mm and 1 no 4"x1"x3mm for earthingmounted on insulator at both ends individually. Equal size of hole on bar at 0.5" interval 2"-3" gap between each bar |  |  |  |  |
|  | 2. Bus-bar chamber : Size 24"x24"x8" made of 18SWG MS sheet with hinged type door and locking arrangement enclosure complete with porcelain insulators complete | 2.00 | Each |  |  |
| 16 | **CIRCUIT BREAKER (SPMCB)** |  |  |  |  |
|  | Providing & fixing on a prepared board 250 volt grade following single pole miniature circuit Breaker (SPMCBS) having minimum breaking capacity 6-KA with thermal over-current and instantaneous electromagnetic short circuit release provision. |  |  |  |  |
| 16.1 | 10 Amps. | 4.00 | Each |  |  |
| 16.2 | 16 Amps. | 10.00 | Each |  |  |
| 17 | **TPMCB** |  |  |  |  |
|  | Providing & fixing on a prepared board 500 volt grade following Triple pole miniature circuit Breaker (TPMCB) having minimum breaking capacity 6-KA with thermal over-current and instantaneous electromagnetic short circuit release provision. |  |  |  |  |
| 17.1 | 20 Amps. | 2.00 | Each |  |  |
| 18 | Supplying of 415V, 3 phase, 50Hz following capacity control circuit breaker feeder unit as per following specification with thermal overcurrent & instantaneous electromagnetic short-circuit release manufactured and tested as per NEMA / IEC / VDE / BS / JIS standards (adjustable type above 100A rating) for sub-station L.T panel. |  |  |  |  |
|  | Rated operating voltage : 220-690 V. Rated insulation voltage : 690 volt. Rated impulse withstand voltage : 6KV. Utilization category : A or B |  |  |  |  |
| 18.1 | **30/32A (16KA) TPMCCB** | 1.00 | Each |  |  |
| 18.2 | **60/63A (16KA) TPMCCB** | 2.00 | Each |  |  |
| 18.3 | **100A (16KA) TPMCCB** | 4.00 | Each |  |  |
| 18.4 | **200A (25KA) TPMCCB** | 1.00 | Each |  |  |
| 18.5 | **320A (35KA) TPMCCB** | 2.00 | Each |  |  |
| 18.6 | **400A (35KA) TPMCCB** | 4.00 | Each |  |  |
| 19 | **SOCKET OUTLETS** |  |  |  |  |
|  | Providing & fixing 250 volt single phase universal combined switch socket outlet (surface / concealed type) manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standards mounted on required size 18 SWG galvanized plain sheet board / plastic board (self-extinguishing 650oC) of 76.2 mm. (3") depth. Sample to be approved by the engineer. (Manufacturer shall have certificate of standard which they follow) | 10.00 | Each |  |  |
|  | **13 / 15 / 16 / 20 Amps**. |  |  |  |  |
| 20 | **GANG SWITCH.** |  |  |  |  |
|  | Providing & fixing 250 volts. 5 / 6 amps (minimum) concealed type following switch / switch socket manufactured and tested in accordance with relevant IEC / VDE / NEMA / BS / JIS standards mounted on required size 18 SWG galvanized plain sheet / PVC board (Self-extinguishing 650oC) of 76.2 mm (3") depth. All electrical contacts shall be of brass / copper. |  |  |  |  |
| 20.1 | One gang switch | 2.00 | Each |  |  |
| 20.2 | Two gang switch | 2.00 | Each |  |  |
| 20.3 | Three gang switch | 4.00 | Each |  |  |
| 20.4 | Four gang switch | 4.00 | Each |  |  |
| 21 | **CEILING FAN** |  |  |  |  |
|  | Supplying & fixing AC capacitor type ceiling fan (without regulator) of following specifications and sizes complete with minimum 305 mm. (1 ft) long down rod, blades, capacitor canopy, etc. connecting PVC wire complete as required . |  |  |  |  |
|  | Rated voltage : 220 volts |  |  |  |  |
|  | Rated frequency : 50 Hz |  |  |  |  |
|  | Rated speed : 300 rpm ± 10 % |  |  |  |  |
|  | Service Value : Minimum 2.80 m3/ min/watt |  |  |  |  |
|  | Temperature Rise : Maximum 70ºC |  |  |  |  |
|  | Class of Insulation : Class-E |  |  |  |  |
| 21.1 | 1422.4 mm. (56") Sweep with fan hook | 8.00 | Each |  |  |
|  | Input power : Maximum 65 watt. |  |  |  |  |
| 22 | EXHAUST FAN AND WALL BRACKET FAN |  |  |  |  |
|  | Providing and fixing of following axial flow A.C capacitor type wall mounted exhaust fan complete with blade, steel frame standard wall louver shutter, PVC insulated connecting wire etc complete as required including cutting wall and mending good the damages as per direction of the Engineer. |  |  |  |  |
| 22.1 | 10"/12" Exhaust fan plastic body (Foreign made accepted/approved by the Engineer.) | 4.00 | Each |  |  |
|  | **LIGHT FITTINGS** |  |  |  |  |
| 23 | Providing & fixing the 1 x 4' x 40 watt industrial type Fluorescent tube light fitting of following manufacturers (as per picture No.12.4) consisting of powder coated 22 SWG sheet steel frame of min.length 1226mm & breadth209mm, superior quality electronic ballast with one year guarantee, holder, necessary wiring with 2 x 0.4 sq mm PVC insulated (stranded) flexible FR wire, earth terminal etc. & to be suspended with double brass chain / 12.7 mm dia oxidized / chromium-plated brass pipe of about 450 mm length, complete (except lamp) of following model & as per sample accepted/approved by the Engineer. |  |  |  |  |
|  | **Ceiling / wall mounted type :-** |  |  |  |  |
| 23.1 | Crescent cat No. CTLS- 9 x1 x 40 watt or Asha cat No. ACSTLS 330 x 1x 40 watt or |  |  |  |  |
|  | Gloria cat No. GTF- 759 x 1 x 40 watt or Anyasha cat No. ACTLS 98 x 1x 40 watt or |  |  |  |  |
|  | Swash cat No. SCTF- 12/78 x 1 x 40 watt or equivalent product. | 24.00 | Each |  |  |
|  | **HT METERING** |  |  |  |  |
| 24 | Supply of HT metering unit for 11kv sub-station with TP hard drawn electrolytic copper busbar earth link bars manufacture 16 SWG power coat painted louver sheet steel metal enclosed free standing floor mounting dust and vermin proof completely factory assembled & suitable for indoor use in/c all standard IP54 accessories manufactured & type tested in accordance with NEMA/IEC/JIS/BDS standereds (Country of origin: USA/Japan/EU countries or relevant supply Electriciy Authority ) and as per approved/accepted by the Engineer. |  |  |  |  |
|  | 1 no. 3-phase 4 wire single/double tarrif solid state programmable KWH meter with LCD display, MDI on kw integration period 30 minutes. |  |  |  |  |
|  | 3 nos. cast resin PT |  |  |  |  |
|  | Ratio: 11000: root3/110v: root3 |  |  |  |  |
|  | Burden: 50VA, class: 0.5 for metering |  |  |  |  |
|  | 1 no. TPMCCB for PT secondary rotection |  |  |  |  |
|  | 3 nos. cast resin CT……/ 5A(Adedequte rating) |  |  |  |  |
|  | 15 VA class 0.5 M5 for metering with selector switch |  |  |  |  |
|  | 3 nos. indicating light phase indicator RYB |  |  |  |  |
|  | 1 set cable terminal block with cover |  |  |  |  |
|  | 1 no. pannel heter. |  |  |  |  |
| 24.1 | for 800 KVA | 1.00 | Each |  |  |
|  | **EARTHING** |  |  |  |  |
| 25 | Earthing the electrical installation with 40 mm. (1.5") dia G.I. pipe (Earth electrode) having 6.35 mm. dia hole across the pipe at 305 mm. interval securedly bonded by soldering with 2 nos.of No2 SWG HDBC earth leads with its protection by 20 mm. (3/4") dia G.I. pipe up-to plinth level run at a depth of 609.6 mm. (2 ft.) below G.L.up-to main board to be earthed including necessary connecting copper sockets, bolts, nuts, etc. complete for maintaining earth resistance within 1 ohm. |  |  |  |  |
| 25.1 | Depth of bottom of main electrode at 37338 mm. (122.5 ft) from GL & length of electrode 36576 mm. (120 ft). | 9.00 | per set |  |  |
| 26.1 | Construction of Earthing inspection pit inside measurement 600 mm x 600 mm with 250 mm thick brick in cement morter (1:4) with 100mm thick RCC top slab (1:2:4) with 1% re-inforcement 450 mm dia water sealed CI man-hole cover with locking arrangement including necessary earth works, site filling and one brick flat soling 75 mm thick (1:3:6) base concrete for making inlet channel & 12mm thick (1:2) cement plaster with neat finishing etc.all complete up to a depth of .75 meter. | 9.00 | Each |  |  |
| 26.2 | Providing & drawing No.2 SWG HDBC wire through 12.7 mm. (½") dia G.I. pipe including fitting, fixing the G.I. pipe in wall or column complete as required. | 200.00 | per meter |  |  |
| 27 | Supply & fixing of heat shrink termination kit out-door / in-door use complete with DIN lugs earth connection hardware & cable preparation kit (In-door & outdoor) at the point of cable termination for 11 KV 3-core PVC insulated & PVC sheathed & armoured / non-armoured cable of the following sizes . |  |  |  |  |
|  | **FOR IN-DOOR USE** |  |  |  |  |
| 27.1 | 3 x 185 mm2 | 6.00 | per kit |  |  |
| 28 | **ON GRID SOLAR-PANEL SYSTEM** |  |  |  |  |
|  | Supplying, installation, testing & commissioning of solar power system (on grid / grid tie) with required quantities of mono / poly crystalline silicon solar PV modules, inverter, energy meter, etc as per following standards, specifications and certificaton.The system will be able to produce power for supplying to grid with required compatible solar cables (DC cables) and all necessary accessories to complete the installation providing one year free operation & maintenance of the system.  Solar system shall have to comply following specification: |  |  |  |  |
|  | **Solar PV Module / Panel** :  I. The manufacturing, installation, testing and commissioning of   solar PV module / panel shall be inconformity with the requirement  of IEC 61215, IEC 61730 (latest edition) standards certificate  issued by the internationally recognized authority such   as CE / TUV / VDE or equivalent certifying body according to the  above requirment shall have to be submitted by the bidder. II. Solar panels shall be installed pointing to the right direction  to capture most of the solar energy to transform it into electricity   with the facility to be adjusted from the horizontal to 12 degree  in summer and to 35 degree in winter to get the   maximum efficiency and must face the true south in our   country. For fixed panel mounting system, the panels must be  tilted (22.5 ± 1) degree with horizontal and must face the south  in Bangladesh.  III. The average efficiency of PV module should be minimum 14%. IV. The complete PV module shall be diode protected at junction   box to protect reverse current. |  |  |  |  |
|  | XI. Internal power consumption : <1 W for 1 kWp inverter XII. Communication port : RS 485 / RS 232. shall have the option   to be incorporated with remote monitoring system. XIII. Degree of protection : according to IP65 and IEC 60529. XIV. Shall have lightning induced current by surge protective device of adequate rating both in DC and AC side in parallel  at the entry and exit terminal of the inverter. Shall also  have over load and over current protection from both DC   and AC side.  XV. Compliance : ISO9001 & ROHS (Restriction of   Hazardous Substances) certified company. XVI. Test result from BUET or Institute of Renewable Energy,  Dhaka University for key spec items of solar inverter  (self-consumption, efficiency, solar priority, dual mode  with auto switching, power factor shall be provided. |  |  |  |  |
|  | **Inverter** :    The inverter shall be suitable for using on grid / grid tie solar panel. The inverter shall have following features : I. Inverter type : grid tie.  II. Built in MPPT charge controller.  III. AC grid voltage 230 ± 5% (single phase)/ 415v ± 5%  (three phase) AC IV. AC grid frequency : 50±4 Hz V. Power factor : cosθ = 1. VI. Operating temperature range : 0°C- 50°C VII. Relative humidity : 0- 95%, non- condensing  VIII. Total harmonic distortion : <3% IX. Efficiency : minimum 90%  X. Noise <50 dB at 1m distance |  |  |  |  |
|  | XI. Internal power consumption : <1 W for 1 kWp inverter XII. Communication port : RS 485 / RS 232. shall have the option   to be incorporated with remote monitoring system. XIII. Degree of protection : according to IP65 and IEC 60529. XIV. Shall have lightning induced current by surge protective  device of adequate rating both in DC and AC side in parallel  at the entry and exit terminal of the inverter. Shall also  have over load and over current protection from both DC   and AC side.  XV. Compliance : ISO9001 & ROHS (Restriction of   Hazardous Substances) certified company. XVI. Test result from BUET or Institute of Renewable Energy,  Dhaka University for key spec items of solar inverter  (self-consumption, efficiency, solar priority, dual mode  with auto switching, power factor shall be provided. |  |  |  |  |
|  | **Energy Meter** :  Supplying and installation of energy meters with following features :   I. Single phase / three phase (as per requirement) II. Shall be able to measure and record the amount of solar   energy provided by the system. |  |  |  |  |
|  | **General guidelines / Criteria** :  I. The bidder shall examine the site before the design of solar  system & its components II. The bidder shall have facilities for installing, testing &   commissioning of solar panel.  III. Adequate space & height shall be provided in the rows of  panels for easy air flow to avoid excessive heat generation in   the panel and to provide access for rain water drainage   and damage to protect from dirty water. Minimum air gap between   two panel shall be 25 mm. |  |  |  |  |
|  | IV. All frames of the PV module, combiner box, charge   controller, inverter, lightning air terminal, building earth  electrode, etc. shall be equipotential bonded and earthed by  one or more conventional and / or chemical electrode system  with soil conductivity enhancing material. The earth resistance  must be less than 1 Ohm. For large installation above 10 kw   solar system, several down conductor with more than 4   earth electrodes (minimum 3 meter apart) or two earth   electrodes (minimum 5 meter apart) connected by  equipotent bonding conductor running at the periphery of  the building shall be installed as per related standard and   code of practice. |  |  |  |  |
|  | V. The solar panel mounting shall be of galvanized iron or   equivalent to ensure rust protection of the installation. All nut  bolts shall be of stainless steel (SS) or galvanized mild   steel (MS) materials. |  |  |  |  |
|  | VI. After successful completion, testing & commissioning of the   whole system the contractor shall have to train   nominated person(s) of the user for a period of at least   seven (07) days. VII. After completion of whole system and before handing over  the system to the concerned authority, the contractor must have  to provide minimum 30 days' satisfactory operation   for performance evaluation. VIII. Technical specification with catalogue of PV module,   inverter must be submitted with technical offer. IX. Only PWD approved cable shall be used for wiring. |  |  |  |  |
|  | **Operation & Monitoring :** I. Remote monitoring (web / smart phone based) using   available technology such as GSM (Global System Mobile) ,   GPRS (General Packet Radio Service) etc. II. Local monitoring using LCD display and data logger. III. System fault indication (local and remote) IV. Field programmability. | 2.00 | per KWP |  |  |
| 29 | ELB & LOAD SANCTION | 1.00 | job |  |  |
|  | Miscellaneous charges for obtaining load sanction from ELB and DPDC |  |  |  |  |
|  | in/c necessary clearance from Fire service & Civil defense and |  |  |  |  |
|  | Directorate of Environment etc. for energization of 800 KVA substation |  |  |  |  |
|  | including 640 KW load sanction, deposite the security money etc. |  |  |  |  |
|  | complete as per direction of the Engineer in charge. |  |  |  |  |
| 30 | **Fire Extinguisher** |  |  |  |  |
| 30.1 | Supply & fixing the following capacities Carbon-di-Oxide type fire extinguisher suitable for repeated use complete with wall bracket, discharge nozzle etc. as per sample accepted & approved by the Engineer. |  |  |  |  |
|  | 5 Kg. capacity. | 3.00 | Each |  |  |
| 30.2 | Supply & fixing the following capacity Foam type Fire Extinguisher suitable for repeated use complete with wall bracket etc. as per sampleaccepted/approved by the Engineer. |  |  |  |  |
|  | 9 Litre capacity. | 1.00 | Each |  |  |
| 30.3 | Bucket with Sand & Stand for Bucket | 1.00 | job |  |  |
| 31 | **11 KV RMU (Ring main unit)** |  |  |  |  |
|  | Providing & supply of following metal clad / metal enclosed 11 KV, 3 phase, 50Hz, indoor type high tension double incoming and following number outgoing ring main unit (switchgear) made of sheet steel clade, dust and vermin proof, free standing floor mounting indoor type HT switchgear panel with 800 A, 3 phase hard drawn electrolytic copper bus bars incoming & outgoing both shall have common individual bus bar and all internal wiring and comprising of: |  |  |  |  |
|  | **Incoming feeder :**  11 KV, 25KA, 800 A, 3-phase, 50Hz,metal clad trolley mounted fully withdraw able type vacuum circuit breaker complete with motor operated spring charged stored energy mechanism for auto tripping at 12/24/48/110 volts DC (without battery) maximum service voltage 12 KV short ckt making current 50 KA having 4 NO+ 4 NC auxiliary contacts, capacitor compensated shunt tripping coil, closing solenoid. Origin : Vacuum interrupter from EATON / Schneider / Siemens / ABB / GE or equivalent . |  |  |  |  |
|  | 1 No. Cast resin insulated, double pole, Potential Transformer, ratio: 11/.11 KV, Class 0.5, 50 VA, ( in open delta connection). 1 No. MCB of adequate rating for PT Secondary Protection. 3 Nos. Cast resin insulated, 11 KV dry type double core CT with ratio adequating rating 1st core for metering, 2nd for protection Core 1: 10 VA, Class 0.5M5 Core 2: 15 VA, Class 10P10 |  |  |  |  |
|  | **Outgoing Feeder** :  11 KV, 25KA, 800 A, 3-phase, 50Hz,metal clad trolley mounted fully withdraw able type vacuum circuit breaker complete with motor operated spring charged stored energy mechanism for auto tripping at 12/24/48/110 volts DC (without battery) maximum service voltage 12 KV short ckt making current 50 KA having 4 NO+ 4 NC auxiliary contacts, capacitor compensated shunt tripping coil, closing solenoid. Origin : Vacuum interrupter from EATON / Schneider / Siemens /   ABB / GE or equivalent . |  |  |  |  |
|  | 1 No. Cast resin insulated, double pole, potential transformer, ratio: 11/.11 KV, Class 0.5, 50 VA, (in open delta connection). 1 No. MCB of adequate rating for PT secondary protection. 3 Nos. Cast resin insulated, 11 KV dry type double core CT with ratio ad equating rating 1st core for metering, 2nd for protection Core 1:10 VA, class 0.5M5 Core 2:15 VA, class 10P10 |  |  |  |  |
|  | 3 Nos. Ammeter, adequate rating 1 No Voltmeter, 0-15 KV, with selector switch. 1 No. Triple pole solid state micro processor operated IDMT relay with 2 (two) over current and 1 (one) earth fault protection element with standard settings. Origin: Mlkro, Malaysia or equivalent . 2 Nos. ON and OFF push Button. 3 No's indicating lamps ON and OFF/TRIP 1 No. Panel heater |  |  |  |  |
|  | **03 Limbo** |  |  |  |  |
|  | Incoming-2 Outgoing - 1 | 1.00 | Each |  |  |
| Total Taka | | | | |  |

*Tk.....................................................................*

*In words..........................................................................................................................................................................in*

*Quoted basis of the schedule rate.*

*Contractors should quote their rate both in figures and in words clearly. Sd/-*

*Superintending Engineer Elec.*

*University of Dhaka.*

*Sign. of the contractor............................................................*

*Address...................................................................*

*Date..........................................*