



## TAMIL UNIVERSITY, THANJAVUR

Tender Document

For

**Supply, Installation, Testing & Commissioning of 3phase 415V,  
1500 RPM, 320 KVA silent Type with acoustic encloser DG Set**

Tender Notice No: 2/2019-20 Nalkai

**NOVEMBER 2019**

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## **TAMIL UNIVERSITY, THANJAVUR**

**Name of Work: Supply, Installation, Testing & Commissioning of 3 Phase 415V, 1500 RPM, 320 KVA silent Type with acoustic encloser DG Set at Tamil University, Thanjavur**

### **1. INVITATION**

On behalf of the Tamil University, Thanjavur, Tender is invited for the “Supply, Installation, Testing & Commissioning of 3phase 415V, 1500 RPM, 320 KVA silent Type with acoustic encloser DG Set” at Tamil University, Thanjavur under two cover tender systems (pre-qualification bit & Commercial bit) from reputed firms/ service providers/ reputed agencies by the Registrar Tamil University, Thanjavur as per schedule. One cover shall contain EMD & Pre-Qualification documents and the second cover shall contain Commercial bit. The Last date for submission of tender is on or before date is **25.11.2019** at **14.30 P.M.**

### **2. PRE-QUALIFICATION CRITERIA**

- a) The Bidder should have 10 Years previous excellent performance in Supply, Installation, Testing & Commissioning of 3phase 415V, 1500 RPM, 320 KVA silent Type with acoustic enclose DG Set in respect of the Government departments / State Universities/ other educational institutions/Agencies.
- b) GST Registration from Govt., of India
- c) The bidder should have recorded an average annual turnover of Rs.1.00 Crore per year during the last three (3) financial years. (2016-17, 2017-2018 & 2018-2019). The bidder should submit the Annual Report/Audited Accounts Certified by Auditor in this regards.
- d) The bidders should have not been Black listed by any of the Government Agency in the past years for any reasons whatsoever.
- e) The bidder should have to produce FORM -16 for the last 3 financial year .
- f) See paragraph No 17.2 for further details.

### **3. SCOPE**

The scope of this tender is to “Supply, Installation, Testing & Commissioning of 3phase 415V, 1500 RPM, 320 KVA silent Type with acoustic enclose DG Set” at Tamil University, Thanjavur . The responsibilities of the selected tenderer are given below:

1. Company should have good track record over for the past three years

#### **4. PERIOD OF COMPLETION**

With in one month against the supply order

#### **5. EARNEST MONEY DEPOSIT**

- An Earnest Money Deposit of Rs. **24,500/-** (Rupees Twenty Four thousand Five hundred only) should be accompanied along with the Pre-Qualification tender.
- The Earnest Money Deposit should be remitted in the form of Demand Draft issued by any Nationalized or Scheduled Banks drawn in the favour of "The Registrar, Tamil University, Thanjavur 613 010.
- NOTE: The EMD in the form of Bank Guarantee/ Cheque or other form will not be accepted.
- Pre-Qualification Bid without the requisite Earnest Money Deposit will be summarily rejected and treated as Non-Responsive tender.
- If the tenderer withdraws his tender after the acceptance of the tender, the Earnest Money Deposit paid by the Tenderer will be forfeited. No separate order is required forfeiture of EMD which follows from the order after acceptance and received the supply order from the university at any cost. Such withdrawal if any, is subject to legal proceedings by the university and cost of damage should be claimed from the tenderer.

#### **6. EMD forfeit**

If the successful tenderer fails to supply the material within the prescribed time frame, the Earnest Money Deposit amount remitted by the tenderer along with the Pre-Qualification Bid will be forfeited and legal procedures by the University and the cost of the damage should be claimed from the Tenderer.

#### **7. LANGUAGE OF TWO COVER TENDER SYSTEM**

Tenders shall be offered in the prescribed forms in ENGLISH Language only.

#### **8. VALIDITY OF BID**

The Bids shall be valid for a period of 90 days (Ninety days) from the date of opening.

## **9. SUBMISSION OF BIDS**

- a. Tenders should be submitted only through Post (or) in person in the Tender Box placed at the Registrar, Tamil University, Thanjavur – 613 010.
- b. A two stage bidding procedure will be followed. Cover-1 shall contain the EMD, Pre-Qualification Bid, Signed Tender Conditions and Bidding document. The Cover-2 shall contain only the Financial Bid i.e., the cost of the components as in the Schedule C.

## **10. OPENING OF TENDERS.**

The Cover-1 containing the original copy of the EMD, Pre-Qualification Bid and Tender Conditions and Bidding document will be opened by The Registrar, Tamil University, Thanjavur at 15.00 **Hours on 25.11.2019** itself, in the presence of the Tenderers (or) their Authorized Representatives, who choose to be present. The Pre-Qualification Bids of the Tenderers will be evaluated. The Financial Bids i.e., Cover-2 of the Tenderers will be opened only for the Tenderers, who have cleared Pre-Qualification criteria. The date and time of opening of the Financial Bids will be informed to the qualifying Tenderers, in the Pre-Qualification bids.

## **11. PAYMENT, SCHEDULE**

After the supply of Materials in good condition with prescribed manner, the payment should be produced offer with spot payment condition may be ignored. The Supply should be of current manufacturing. If the stores are found defective, the same shall be replaced by the supplier immediately free of cost of the consignee's dept inclusive of all freight and handling charges. Fails which the Tamil University shall have a right to recover these charges from any payment.

Security Deposit: 2% of value of Contract. This includes the EMD already remitted by the contractor.

## **12. NEGOTIATION**

If it is felt that the price quoted by the lowest Tenderer is exorbitantly high with reference to the prevailing market rate, negotiation of rates will be made with the lowest Tenderer, for reducing the quoted rates to the reasonable levels. If the tender contains unbalanced items/rates the lowest tenderer must be prepared to furnish the detailed cost break

up and other clarifications to the proposals submitted by them, as may be required to adjudge the reasonableness of their price proposals.

### **13. LIQUIDATED DAMAGES**

Liquidated damages will be imposed on the contractor for the lapses/short fall in achieving the rate of progress as per existing schedule.

### **14. LEGAL JURISDICTION:**

Jurisdiction of all legal proceedings, if necessary, relating to the above tender shall be the appropriate court in Thanjavur only.

### **15. ARBITRATION**

Any fact or condition, which may not have been mentioned in Terms & Conditions and may arise after issuing work order, shall be decided as per the State Government policy/rules. In case rules/policies do not provide such situation, the issue will be referred for arbitration. Arbitration for any such dispute shall be conducted in accordance with the provisions of Arbitration and Conciliation Act 1996 or any statutory modification or re-enactment thereof.

### **16. WHOM TO CONTACT**

For any clarifications regarding tendering, the bidders shall contact the Registrar at the following address.

The Registrar,  
Tamil University  
Thanjavur – 613 010.  
Telephone: 04362-226720  
Email: tamilunivreg@gmail.com

### **17. INFORMATION AND INSTRUCTIONS**

#### **17.1 FOR SPECIAL ATTENTION**

Bids are invited in accordance with Tamil Nadu Transparency in Tenders

Act, 1998 & Tamil Nadu Transparency in Tenders Rules, 2000.

#### **17.2 PRE-QUALIFICATION CRITERIA**

The bidding tenderer should be registered under Indian Company's and in existence for more than three years and should comply with the following eligibility criteria:

- i. Should have GST registration issued by Government of India.
- ii. Should be an Income Tax Assessee with PAN Card.
- iii. Should have **Supplied DG Set** to any State University/ Govt. Organizations in India.
- iv. Should be ready to provide a satisfactory demonstration of the actual working of **320 KVA silent Type with acoustic enclose DG Set** to the Tamil University staff.
- v. Authorization letter from Principals/Appropriate authority of Manufacturer should be produced without OEM letter the bidder will be rejected.

#### **DOCUMENTS TO BE PRODUCED**

Copy of the work order and the issued by the concerned Government Department / Agency.

2. The bidder should have got their Firm registered with the Goods & Service Tax Directorate.

#### **DOCUMENTS TO BE PRODUCED**

- a) Copy of the Goods & Service Tax Registration Certificate issued by the competent authority.

3. The bidder should have recorded an average annual turn over of Rs. **1.00 Crore** per year during the last three (3) financial years (2016-17, 2017-18 & 2018-2019).

#### **DOCUMENTS TO BE PRODUCED**

Copy of the Audited Balance sheet with associated documents duly certified by a Chartered Accountant.

4. The bidders should have not been Black listed by any Government Agency in the past years for the reasons whatsoever.

## DOCUMENTS TO BE PRODUCED

A self-declaration in form of an undertaking to the effect that they have not been Blacklisted by any Government Department to be given in Rs.20/- valued India Non – Judicial stamp paper duly notarized.

### 18.METHODS OF TENDERING

- i. If the qualified application is made by an individual, it should be signed by the individual with his full name and current correct address.
- ii. If the qualified application is made by a sole Proprietary Firm, it shall be signed by the Proprietor along with his full name and full name of the Firm with its current address. Document with regard to Registration as FIRM by the Registrar of Firms should be produced.
- iii. If the Qualified application is made by a FIRM in partnership, it shall be signed by all the partners of the Firm with their full name and current address or by a PARTNER authorized by the Firm (either as per Articles of the Deed of Partnership or by power of Attorney) for signing in Tenders, Agreements etc., In which case, certified copy of the Registered Deed of Partnership along with the current address of all the partners and a certified Photocopy of the Registered Power of Attorney issued in favour of the Signatory, should be produced.
- iv. If the Qualified application is made by a “Limited Company” it shall be signed by a duly authorized person holding the power of attorney for signing the application, in which case, the certified copy of the power of attorney shall accompany the application. Such limited company or Corporation shall also furnish satisfactory evidence of its existence along with the Pre-Qualification Application.
- v. If the Qualified application from joint ventures is not acceptable.
- vi. All the documents including the Pre-Qualification Bid Application should have dated Signature.
- vii. All the originals of the documentary evidences shall be produced, if asked for verification at the time of opening of Pre-Qualification tender or subsequently.
- viii. Any clarification on the documents submitted by the bidder may be called for by the Commercial Taxes Department.

### 19.CAPABILITY OF APPLICANT

The Applicant shall include with the Pre-Qualification, details in the prescribed performs vide Schedule ‘A’ and ‘B’,

- i. Schedule – ‘A’ - Affidavit
- ii. Schedule – ‘B’ - Self-Declaration on Black-listing certificate
- iii. Schedule – ‘C’ - Commercial Quote

### 20. OPENING OF BIDS

- i. Bids received in sealed cover up to **14.30** Hrs on **25.11.2019** will be opened on the same day at **15.00** Hrs by the Registrar, Tamil University, Thanjavur in the presence of the Applicants or their authorized representative.



- ii. If the Pre-Qualification Bid and Financial Bid received belatedly on account of any reasons whatsoever, will not be opened or considered and will be rejected and returned to the applicant.
- iii. Telegraphic Applications will not be entertained.
- iv. After evaluation of Pre-Qualification Bid the opening date of Financial Bid will be notified to the qualified applicants well in advance.

#### SCHEDULE 'A'

#### AFFIDAVIT

(To be furnished in Twenty Rupees Non-Judicial Stamp paper duly certified by Notary Public)

- 1) I/We the undersigned solemnly declare that all the statements made in the documents records etc., submitted along with this application are true and correct to the best of my knowledge and belief.
- 2) I/We, the undersigned do hereby certify that neither our firm/company nor any of its constituent partners have abandoned any work / works of similar nature and magnitude in India, during the last five years.
- 3) I/We, the undersigned do hereby certify that any of the contracts awarded to me/ us has not been terminated rescinded, due to breach of contract on my/ our part, during the last five years.
- 4) I/We, the undersigned authorize and request any bank/ person / firm/ corporation/ Government departments to furnish pertinent information deemed necessary and requested by the Registrar, Tamil University, Thanjavur to verify the statements made by me/ us or to assess my/ out to assess my / our competence and general reputation.
- 5) I/We, the undersigned, understands that further qualifying information/ clarification on the statements made by me/ us may be requested and agrees to furnish such information / clarification within "Five working days" from the date of receipt of such request from the Registrar, Tamil University, Thanjavur-10.

Dated Signature of the applicant with seal

(To be signed by the officer authorized by the Firm company to sign on behalf of the Firm/Company with Company's seal)

Note: In case of sole proprietary concern, affidavit should be signed only by the sole Proprietor.

(Title of the Firm/Company)

(Date)

The above named dependent has understood the contents well and solemnly and sincerely declared and affirmed by the deponent in my presence at and signed before me on this day of

(Seal)

(Signature of the Notary Public)

SCHEDULE "B"

Self-Declaration on Black Listing Certificate.

SCHEDULE “C”

**Technical Schedule**

**Name of the Work: Supply, Installation, Testing & Commissioning of 3 Phase 415V,  
1500 RPM, 320 KVA silent Type with acoustic encloser DG Set at  
Tamil University, Thanjavur**

Sl. NO	Name of the Items	Unit	Qty	Remarks
1	<p>Supply, installation testing and commissioning of 3 phase 415V, 50 Hz, 1500 RPM, 320KVA salient type (having acoustic enclosure canopy approved by CPCB as per specifications attached)DG sets. The DG set have :</p> <p>(a) The engine: shall have water/coolant cooled multi cylinder diesel engine capable of delivering 380.00 BHP complete with fuel filter, air filter, by pass filter starter, Dynamo flywheel, coupling guard, governor, battery charger alternator, fuel/feed pump. Electric hour meter either on the instrument panel or on the control panel etc. complete as per specifications and required( Engine Make and model shall be scheduled as per Annexure attached).</p> <p>(b) The alternator: shall be of Three phase, 4 wire, 50 Hz,0.8 PF at 415 volts, 1500 RPM. Capable of delivering 320 KVA coupled to diesel engine mentioned in (a) above (Alternator make and model shall be selected out of list as per Annexure attached).</p> <p>The DG set shall include all accessories items, protections, safety parameters, control Panel, base frame with anti-vibration mount pad, fuel tank with indicator, fuel pipe with pump, residential type exhaust silencer, 2X12 volt 180 amp-hour battery complete with copper conductor battery leads of required length and socket/clamps including M.S stands for battery with wooden base, adaptor box etc complete as required for a 320 KVA DG Set as per the manufacturer recommendations or as per direction of the engineer in charge at site.</p> <p>(Note: 1.The agency provides CPCB approval, manufacture test report of all major items, before delivery of material at site.) 2.The rate are included with civil foundation and synthetic insulating mat suitable for 11kv required for DG set as per site available</p>	1no	each	
2	<p>Supply, installation testing and commissioning of floor mounted totally enclosed sheet 16SWG steel AMF panel suitable for operation of 320KVA DG set comprising of ACB's for alternator and main supply and shall include all accessories such as bus bar fitting, instruments protection, control unit, MCB, Dial plates, control cables for connecting DG set and AMF panel complete etc. As per specification requirement or as per the direction of the Engineer in charge.</p>	1no		

	Note: 1.The rate are included with civil foundation and synthetic insulating mat suitable for 11kv required for AMF panel as per site available ` 2. The agency shall get approval and inspected from the concerned engineer in-charge for drawings before the start of fabrication and dispatch)			
3	Supplying, laying, testing, commissioning of 2nos of 3.5 X 240 sq mm, 1100 volt grade aluminium armoured XLPE insulated and sheathed aluminium conductor cable including cost of providing with proper clamps, identification tags/route marker on tray, wall/ceiling complete etc. as per site requirement or as approved by engineer in charge	40 Mtr.		
4	Supplying and making cable end termination with brass compression glands, insulation tap, chromium plated nut and bolts, crimp aluminium, heavy duty lugs of 2nos 3.5 X 240 sq mm XLPE conductor cable of 1.1 KV grade complete etc required at site as per direction of Engineer.	4set		4 Set
5	Supply, Fabrication and Installation of 50 mm depth and 2mm thickness of perforated MS cable tray including horizontal and vertical bands, reducer, tees, cross members and other accessories as required and duly suspended from the ceiling/ wall with MS suspender and including painting etc. complete as required as below. i. 50 mm wide ii. 300mm wide	15mtr 10mtr		
6	Supply installation testing commissioning of 150 mm Exhaust piping with class- B, MS pipe (Confirming to IS specification) from DG set at the ground floor to the building, terrace along the external wall including the cost, flexible joints, bands, pipe support along with the wall and above terrace label suitable for 320 KVA DG sets manufacture, recommendation, exhaust etc. complete as per specification as per required or as per direction of engineer in charge.	30mtr		
7	Earthing with copper earth plate 600mm X 600 mm X 3 mm thick at depth of 12 feet i/c accessories and providing masoning enclosure with cover plate having locking arrangement and water pipe etc i/c charcoal and salt for copper plate neutral of transfer electrodes etc complete as required.	2set		
8	Earthing with GI earth plate 600 mm X 600mm X 3mm thick i/c accessories and providing masning enclosure with cover plate having locking arrangement and watering pipe etc i/c charcoal and salt for copper plate neutral of transfer electrodes etc. as required	2set		
9	Providing & fixing of 25mm X 5mm GI strip in 40 mm dia GI pipe from earth electrodes as required	15mtr		
10	Providing & fixing of 25mm X 5mm copper strip in 40 mm dia GI pipe from earth electrodes as required.	15mtr		
11	Providing & fixing of 25mm X 5mm copper strip in 40 mm dia GI pipe from earth electrodes as required.	20mtr		
12	Providing & fixing of 25mm X 5mm GI strip on surface or in recess for connection as required.	20mtr		

Set

## COMMERCIAL QUOTE

**Name of the Work: Supply, Installation, Testing & Commissioning of 3 Phase 415V,  
1500 RPM, 320 KVA silent Type with acoustic encloser DG Set at  
Tamil University**

Sl.NO	Name of the Items	Unit	Qty	Rate without Taxes
1	<p>Supply, installation testing and commissioning of 3 phase 415V, 50 Hz, 1500 RPM, 320KVA salient type (having acoustic enclosure canopy approved by CPCB as per specifications attached)DG sets. The DG set have :</p> <p>(a) The engine: shall have water/coolant cooled multi cylinder diesel engine capable of delivering 380.00 BHP complete with fuel filter, air filter, by pass filter starter, Dynamo flywheel, coupling guard, governor, battery charger alternator, fuel/feed pump. Electric hour meter either on the instrument panel or on the control panel etc. complete as per specifications and required( Engine Make and model shall be scheduled as per Annexure attached).</p> <p>(b) The alternator: shall be of Three phase, 4 wire, 50 Hz,0.8 PF at 415 volts, 1500 RPM. Capable of delivering 320 KVA coupled to diesel engine mentioned in (a) above (Alternator make and model shall be selected out of list as per Annexure attached).</p> <p>The DG set shall include all accessories items, protections, safety parameters, control Panel, base frame with anti-vibration mount pad, fuel tank with indicator, fuel pipe with pump, residential type exhaust silencer, 2X12 volt 180 amp-hour battery complete with copper conductor battery leads of required length and socket/clamps including M.S stands for battery with wooden base, adaptor box etc complete as required for a 320 KVA DG Set as per the manufacturer recommendations or as per direction of the engineer in charge at site. (Note: 1.The agency provides CPCB approval, manufacture test report of all major items, before delivery of material at site.) 2.The rate are included with civil foundation and synthetic insulating mat suitable for 11kv required for DG set as per site available</p>	1no	each	
2	<p>Supply, installation testing and commissioning of floor mounted totally enclosed sheet 16SWG steel AMF panel suitable for operation of 320KVA DG set comprising of ACB's for alternator and main</p>	1no		

	<p>supply and shall include all accessories such as bus bar fitting, instruments protection, control unit, MCB, Dial plates, control cables for connecting DG set and AMF panel complete etc. As per specification requirement or as per the direction of the Engineer in charge.</p> <p>Note: 1.The rate are included with civil foundation and synthetic insulating mat suitable for 11kv required for AMF panel as per site available ` 2. The agency shall get approval and inspected from the concerned engineer in-charge for drawings before the start of fabrication and dispatch)</p>			
3	<p>Supplying, laying, testing, commissioning of 3.5 X 240 sq mm, 1100 volt grade aluminium XLPE insulated and sheathed aluminium conductor cable including cost of providing with proper clamps, identification tags/route marker on tray, wall/ceiling complete etc. as per site requirement or as approved by engineer in charge</p>	40mtr		
4	<p>Supplying and making cable end termination with brass compression glands, insulation tap, chromium plated nut and bolts, crimp aluminium, heavy duty lugs of 3.5 X 240 sq mm XLPE conductor cable of 1.1 KV grade complete etc required at site as per direction of Engineer.</p>	4set		
5	<p>Supply, Fabrication and Installation of 50 mm depth and 2mm thickness of perforated MS cable tray including horizontal and vertical bands, reducer, tees, cross members and other accessories as required and duly suspended from the ceiling/ wall with MS suspender and including painting etc. complete as required as below.</p> <p>i. 150 mm wide ii. 300mm wide</p>	15mtr 10mtr		
6	<p>Supply installation testing commissioning of 150 mm Exhaust piping with class- B, MS pipe (Confirming to IS specification) from DG set at the ground floor to the building, terrace along the external wall including the cost, flexible joints, bands, pipe support along with the wall and above terrace label suitable for 320 KVA DG sets manufacture, recommendation, exhaust etc. complete as per specification as per required or as per direction of engineer in charge.</p>	30mtr		
7	<p>Earthing with copper earth plate 600mm X 600 mm X 3 mm thick at depth of 12 feet i/c accessories and providing masoning enclosure with cover plate having locking arrangement and water pipe etc i/c charcoal and salt for copper plate neutral of transfer electrodes etc complete as required.</p>	2set		

8	Earthing with GI earth plate 600 mm X 600mm X 3mm thick i/c accessories and providing masoning enclosure with cover plate having locking arrangement and watering pipe etc i/c charcoal and salt for copper plate neutral of transfer electrodes etc. as required	2set		
9	Providing & fixing of 25mm X 5mm GI strip in 40 mm dia GI pipe from earth electrodes as required	15mtr		
10	Providing & fixing of 25mm X 5mm copper strip in 40 mm dia GI pipe from earth electrodes as required.	15mtr		
11	Providing & fixing of 25mm X 5mm copper strip in 40 mm dia GI pipe from earth electrodes as required.	20mtr		
12	Providing & fixing of 25mm X 5mm GI strip on surface or in recess for connection as required.	20mtr		
	Total			

Note: 1) If there is any correction it should be counter signed.

2) Rate should be quoted in figures and words.

(Signature of Bidder)

**10. GUARANTEED TECHNICAL SPECIFICATIONS FOR 320 KVA GENERATOR SET**

<b>(Details to be furnished by the tenderer) Sl. No.</b>	<b>Description</b>	<b>Specification</b>
1.	Generator KVA Rating / Model No.	<b>320 KVA /</b>
<b>Engine</b>		
2.	Make	
3.	Model No.	
4.	BHP Output	
5.	Cooling	
6.	Aspiration	
7.	No. of Cylinders	
8.	RPM	
9.	Compression ratio	
10.	Displacement (ltrs.)	
11.	Fuel oil	
12.	Fuel consumption at no load	
13.	Fuel consumption at 25% load	
14.	Fuel consumption at 50% load	
15.	Fuel consumption at 75% load	
16.	Fuel consumption at full load	
17.	Fuel consumption at 110% load	
18.	Capacity of fuel tank (litres)	
19.	Governor	
20.	Starting system	
21.	Lub oil specification	
22.	Lub oil sump capacity	
23.	Lub oil consumption (ltrs. Per hour)	
24.	Coolant capacity (Engine + Radiator)	
25.	Lub oil change period (hrs.)	
26.	Emission compliance	
27.	Battery rating	

**ALTERNATOR**

<b>Sl. No.</b>	<b>Description</b>	<b>Specification</b>
<b>28</b>	Make and Model No.	
<b>29</b>	Type	
<b>30</b>	Voltage	
<b>31</b>	Frequency	
<b>32</b>	Phase	
<b>33</b>	Rated current	
<b>34</b>	Power factor	



35	Enclosure	
36	Voltage regulation	
37	Class of Insulation	
<b>Control Panel</b>		
38	Make	
39	Type	
40	Overall dimensions (L x B x H)	
41	Finish	
42	Sheet metal size	
43	Make and type of contactors / circuit breakers	
44	Make and type of instruments	
45	Make and type of switch fuse units	
46	Other facilities incorporated	
46 a	KWH Meter Digital with Spare	
<b>Generator set</b>		
47	Noise level	
48	Overall dimensions of the DG set	
49	Overall canopy dimension	
50	Approx. Total weight (Dry)	
51	Type of coupling/bearing deatils	
1.	<b>TEST ON ENGINE:</b> a. Engine starting time b. 12 hour running at full load followed by 1 hour running at 110% of load c. Fuel consumption test d. 1 hour running at full load e. 1 hour running at ¾ load	
2.	<b>Over Speed Test</b>	
3.	<b>TEST ON CONTROL PANEL</b> a. Insulation resistance test b. High voltage withstand test c. Functional and operation test d. Secondary induction test on meters & relays e. Mechanical test on components	
4.	<b>TEST ON ALTERNATOR</b> <b>TCs to be furnished</b> a. Insulation measurement b. High voltage test on rotor and stator windings c. Temperature rise test (test cert. review) d. Mechanical Balance e. Stator Voltage balance f. Over speed g. Stator phase sequence check h. Vibration & noise level i. Stator & rotor winding resistance measurement j. Overload Capability test	

5.	<b>TEST ON EXCITATION SYSTEM</b> TCs to be furnished: a. High voltage test on windings b. Measurement of stator & rotor resistance c. Response test d. Open Circuit magnetisation test	
6.	<b>TEST ON VOLTAGE REGULATOR:</b> a. Sensitivity test b. Response time test	
7	<b>GENERAL</b> a. Dimensional Check b. Bill of Material c. Checking of Assembly as per GA	
8	<b>TEST ON ASSEMBLED SET:</b> a. No load Test b. Load Tests at different loads for Specific Fuel Consumption c. Sound and Vibration measurement Test at different loads d. AVT / Governor response Test e. Over speed Test f. Load Throw-off Test	

<b>11. LIST OF APPROVED MAKE OF MATERIALS</b>	
1. Alternator	: Equivalent to Kirloskar / Stamford / Leroy Somers
2. Engine	: Equivalent to Cummins / Caterpillar / Kirloskar - Greens
3. ACB/MCCB	: Equivalent to Siemens / Merlin Gerin / L & T
4. Contactors & Relays	: Equivalent to Siemens / Merlin Gerin/ L & T
5. Control Wires, etc.	: Equivalent to ATLAS / Finolex / Power flux / Polycab RR Cables
6. Meters	: Equivalent to Cadal / Rishiba / AE
7. Push Button / Selector Switches	: Equivalent to Essen / Vaishnav
8. Armoured Cables	: Equivalent to CCI / Finolex / Universal / Polycab
9. Batteries	: Equivalent to Exide / Amaron