



DAV UNIVERSITY

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TENDER NOTICE

Sealed Tenders* are invited from manufactures / authorized distributors, for supply, installation and commissioning of following items:

S.No	Name and description of Item	EMD (refundable in case of unsuccessful bid)
1	Equipment for Mechanical Engineering - I.C_Engine Lab	2.5% of quoted price or Rs. 1 Lakh, whichever is higher.

*Standard terms and conditions of tender [DAVU] applicable.

1. Bonafide and reputed manufacturers / Indian agents (on behalf of their foreign Principals) may submit the Tender Form, [download Tender Form and detailed specifications etc. in respect of the above items from the University website www.davuniversity.org] along with Earnest Money Deposit (EMD) draft drawn in favour of Registrar, DAV University Jalandhar, during working days between 09.00 a.m.to 05.00 p.m.

2. The last date of the receipt of the Bids is **28/05/2014 up to 5.00 p.m.**

3. The Bids will be opened on **03/06/2014 at 3.00 p.m.** in the Registrar Office.

4. The Tender forms are to be submitted in two separate sealed envelopes- one envelope containing Technical Bid (Part A) and second envelope containing Financial Bid (Part B). Both the above sealed envelopes should be put in another duly sealed envelope and super scribed information as follows: ["TENDER FOR Provision of electric rising main/block main panel/floor panels/laying of cables from main sub-station" WITH TENDER NO., DUE DATE AND OTHER RELEVANT DETAILS] and should be addressed to The Registrar, DAV UNIVERSITY, Sarmastpur, Jalandhar and submitted in the Registrar Office, DAV University, Jalandhar.

5. On the due date, only Technical Bids (Part A) will be opened. Financial Bids (Part B) shall only be opened after acceptance of Technical Bids by the competent authority. Successful bidders of technical bids will be informed about the date and time of the opening of financial bids. Financial bids shall be opened by Tender Opening Committee on the date, time and venue communicated to the representative of bidder, who in turn may attend the proceedings of the committee.

6. Tender must be received in the office of the Registrar in person or through post latest by **28/05/2014 up to 5.00 p.m.** Tenders received later than this date shall not be considered, irrespective of the reasons for delay. E-mail/Fax Tender or Tender without Earnest Money Deposit (EMD) will be summarily rejected.

7. DAV University reserves the right to reject any / all the tenders without assigning any reason whatsoever.

Tender No: 1/2014-4A5/Date: **15/05/2014**

Due Date for Opening: **03/06/2014**

REGISTRAR



SPECIFICATIONS – I.C_Engine Lab

1. SINGLE CYLINDER 2 STROKE PETROL ENGINE TEST RIG.

TECHNICAL SPECIFICATIONS

ENGINE: - 2 stroke, 1 cylinder, Air cooled, 7 HP.

Brand New Assembled Engine

Make – BAJAJ/EQUIVALENT

Speed – 4500 rpm

No of cylinder – 1

Compression ratio – 7: 1

Type of cooling –air

Type of loading - Electrical Dynamometer

Type of starting –kick start

ACCESSORIES:

1. Air Intake measurement along with Air reservoir, Orifice plate and water tube manometer.
2. Fuel consumption measurement arrangement.
3. Exhaust gas calorimeter.
4. Multi channel Digital Temperature Indicator.
5. Measurement Flask & stop clock.
6. Accelerator & Ignition switch,
7. Control panel with stand.
8. Electrical Dynamometer
9. All other accessories in complete to perform various experiments on above machineries.

MANUAL:

A technical manual is required to be supplied along with the product, which describes the equipment and experimental procedures.

2. FOUR STROKE FOUR CYLINDER DIESEL ENGINE TEST RIG

1. Multi cylinder 4 stroke, 4 cylinder

Diesel engine: **BRAND NEW MARUTI SWIFT ENGINE** make or **EQUIVALENT** with all the accessories.

2. Electrical Dynamometer: Any reputed make.

TECHNICAL SPECIFICATIONS:

1. Digital RPM indicator with sensor:
2. Digital temperature Indicator with selector switch: Eutech Systems make or Equivalent.
3. Fuel Measurement by graduated glass pipette with Three Way Control valve.
4. Air intake measurement with air chamber / orifice meter / U tube manometer with graduated scale.
5. Exhaust Gas Calorimeter with protective coating to prevent heat loss / temperature probes at inlet and outlet.
6. Rotameter for water flow measurement for Engine Water Jacket
7. Water meter for water flow measurement through Exhaust Gas Calorimeter.
8. Load Bank with Electrical Finned type heaters with cooling arrangement .Engine can be loaded in steps of 1 Kw by means of switches
9. Digital Voltmeter / Ammeter for Power measurement.



SPECIAL FEATURES:

1. Entire system is mounted on VIBRA MOUNT to reduce the vibrations.
2. Control panel / Measurement and Engine setup are separate.
3. Sturdy Base Frame.
4. Steel structure is Powder coated.

RANGE OF EXPERINMENTS:

1. Engine volumetric fuel efficiency.
2. Plot brake power / brake thermal efficiency.
3. Plot brake power / specific fuel consumption.
4. Plot brake power / mechanical efficiency.
5. Complete energy balance.

All other accessories in complete to perform various experiments on above machineries.

MANUAL:

A technical manual to be supplied along with the product, which describes the equipment and experimental procedure

3. FOUR STROKE 4 CYLINDER PETROL ENGINE TEST RIG

1. Multi cylinder 4 stroke, 4-cylinder water-cooled Petrol engine: Maruti **MAKE BRAND NEW WAGON R ENGINE.**

2. with all the accessories like clutch plate assembly , clutch rod , Accelerator Control , Starter, Dynamo , Cutout , Ignition switch , Oil gauge

3. Hydraulic Dynamometer. With water flow measurement with manual / auto loading

TECHNICAL SPECIFICATIONS:

1. Digital RPM indicator with sensor: Reputed make
2. Digital temperature Indicator with selector switch: Reputed make.
3. Fuel Measurement by graduated glass pipette with control valve.
4. Air intake measurement with air chamber / orifice meter / U tube manometer with graduated scale.
5. Rotameter for water flow measurement for Engine Water Jacket: Reputed Make.
6. Water meter for water flow measurement for Hydraulic Dynamometer:
7. Knife Switches: 4 nos. for Morse Test Arrangement.

SPECIAL FEATURES:

1. Entire system is mounted on VIBRA MOUNT to reduce the vibrations.
2. Control panel / Measurement and Engine setup are separate.
3. Sturdy Base Frame.
4. Steel structure is Powder coated.

EXPERINMENTS TO PERFORM:

1. Engine volumetric fuel efficiency.
2. Plot brake power / brake thermal efficiency.
3. Plot brake power / specific fuel consumption.
4. Plot brake power / mechanical efficiency.
5. Morse test determining frictional power.

All other accessories in complete to perform various experiments on above machineries.

MANUAL:



A technical manual to be supplied along with the product, which describes the equipment and experimental procedure.

4. COMPUTERISED 4 STROKE SINGLE CYLINDER VARIABLE COMPRESSION RATIO DIESEL ENGINE TEST RIG

- A. ENGINE - Single Cylinder Diesel engine having variable Compression ratio arrangement.
Four stroke Single cylinder, water cooled, developing 5 BHP at 1500 rpm.
- B. ELECTRICAL DYNAMOMETER: - Model NEC-22' LC suitable for testing Engine.
Max. Power – 5 BHP
Load Weighing Mechanism – It consists of Calibrated Loading rheostat of Maximum Capacity 3 KW fitted with Knife switch arrangements to Load the Engine.
- C. COMMON BASE FRAME: - The Engine and Dynamometer are mounted on a common rigid channel frame, which can be directly mounted on the foundation block.
- D. CARBON SHAFT: - A suitable carbon shaft for connecting Engine to Dynamometer is provided.
- E. CARBON SHAFT GUARD: - For protection from rotating shaft.
- F. FUEL FLOW MEASUREMENT: - NEC make volumetric fuel consumption measuring unit consisting of Calibrated Pipette of 50 CC.. A fuel tank is also supplied of 10 liters capacity.
- G. EXHAUST GAS CALORIMETER SYSTEM: - With Cooling Water Flow-rate and computerized temperature measurement for measuring heat carried by exhaust gases – consisting of cooling water arrangement for Exhaust Gases, Rotameter for measuring rate of flow of water , 6 Nos. temperature sensors and transmitter card is provided for measuring various temperatures required for heat balance sheet with Cr-Al thermocouples.
- H. COMPUTERIZED AIR FLOW MEASUREMENT SET-UP: - Consisting of calibrated system based on pressure drop across orifice meter. An orifice meter for measuring rate of flow of intake air, consisting of an air tank and an orifice suitable for the Engine in accordance with the cubic displacement of the Engine to be tested and a glass 'U' tube manometer etc.
- I. COMPUTER: - (Minimum P IV) suitable to carry out the analysis.
- J. P-V SYSTEM: - It consists of the following:
a) Pressure Sensor with Signal Conditioner and Water Cooled Adapter.
PCB General Purpose ICP Pressure Probe, 5000 psi, and 1 mV/psi, 0.218" Diameter stainless steel diaphragm.
The sensor is acceleration Compensated & hermetically sealed.
General Purpose Coaxial cable – 10 ft, with 10-32 to BNC Plug
Signal Conditioner, 1 Channel, selected gain, BNC input/output connection.
- c) NI Cards for Triggered Data Acquisition Cards with suitable NI Driver for the same, suitable for PCI Bus Interface.
- K. ENGINE PERFORMANCE ANALYSIS (E.P.A) SOFTWARE: - For carrying out the analysis of the Engine test carried out. This software communicates with the various systems as per the settings, Displays various parameters on the monitor, stores the test data to a file and then created reports of test analysis, which can be printed by means of printer provided. The above system consists enables to work out the following parameters of the Engine Full and Part Load Performance



Air/Fuel Ratio at Various Loads
Heat Balance Sheet and Energy Studies
B.H.P

Brake Thermal Efficiency
Specific Fuel Consumption
Mechanical Efficiency
Variable Compression Ratio

The test rig enables to determine B.H.P. specific fuel consumption. Air fuel ratio and heat balance sheet at different loads.

A technical manual accompanies the unit.

5. EXPERIMENTAL WATER COOLING TOWER

PRODUCT INTRODUCTION

Water Cooling Tower Demonstration Unit i.e. Water Cooling Tower designed to carry out experiments and study of water cooling cycle in details for the students of Mechanical Engineering or Polytechnics.

MECHANICAL SPECIFICATIONS

- A. Tower Size: - cross section- 0.15m X 0.15m X 1.2m
- B. Packing: - Expanded wire mesh.
- C. Centrifugal Fan: - Suitable capacity.
- D. Hot water tank: with Heater Fitted in Tank.
- E. Water meter to measure water inlet flow.
- F. Dry bulb, wet bulb thermometers: - 2 sets.
- G. Penalized electric controls and switches.

EXPERIMENTS TO PERFORM

- A. Experimental water-cooling tower model comprises of tower of 0.15m X 0.15m. Crosssectional area.
- B. A water-cooling tower as a steady flow device that uses a combination of mass & energy transfer to cool water by exposing it to an extended surface to the atmosphere.

MANUAL

An instruction manual is to be supplied with the apparatus, which describes theory involved, range and procedure of experiments,

6. SURFACE CONDENSER TEST RIG

1. Mini Boiler: - Non IBR type fitted with all following mountings and accessories
 - Pressure Gauge
 - Pressure Relief Valve
 - Automatic Pressure Switch
 - Drain valve
 - Water Level Indicator
2. Digital Temperature Indicator Cr- Al type (Multi channel type) with Cr- Al thermocouples.



3. Heat Exchanger (Surface type) 2 pass type with Steam Inlet and Outlet connections and control valve.
4. Pump: Centrifugal type
5. Flow meter: To measure Water Flow rate in Kg/min.

All the Above Materials shall be fitted with Heavy duty M.S Frame with Powder Coated Panel.

7. MULTI CYLINDER PETROL ENGINE TEST RIG WITH LPG

1. Multi cylinder 4 strokes, 3-cylinder water-cooled Petrol engine: Maruti **MAKE BRAND NEW**

ALTO ENGINE

2. with all the accessories like clutch plate assembly, clutch rod , Accelerator Control , Starter, Dynamo, Cutout, Ignition switch, Oil gauge
3. Hydraulic Dynamometer. With water flow measurement with manual / auto loading

TECHNICAL SPECIFICATIONS:

1. Digital RPM indicator with sensor: Reputed make
2. Digital temperature Indicator with selector switch: Reputed make.
3. Fuel Measurement by graduated glass pipette with control valve.
4. Air intake measurement with air chamber / orifice meter / U tube manometer with graduated scale.
5. Rota meter for water flow measurement for Engine Water Jacket: Reputed Make.
6. Water meter for water flow measurement for Hydraulic Dynamometer:
7. LPG KIT WITH CYLINDER
8. Reversing switch for dual fuel arrangement between Petrol & LPG

SPECIAL FEATURES:

1. Entire system is mounted on VIBRA MOUNT to reduce the vibrations.
2. Control panel / Measurement and Engine setup are separate.
3. Sturdy Base Frame.
4. Steel structure is Powder coated.

EXPERINMENTS TO PERFORM :

1. Engine volumetric fuel efficiency.
2. Plot brake power / brake thermal efficiency.
3. Plot brake power / specific fuel consumption.
4. Plot brake power / mechanical efficiency.

All other accessories in complete to perform various experiments on above machineries.

MANUAL:

A technical manual to be supplied along with the product, which describes the equipment and experimental procedure.

8. TWO STAGE AIR COMPRESSOR TEST RIG

The Test Rig comprises of a Two-Stage Air Compressor fitted with an air tank with orifice, pressure gauges and an energy meter to measure the input. The compressor is mounted on air receiver along with the motor, and is provided with air relief valve (safety) and a pressure



switch. The unit determines volumetric efficiency and isothermal efficiency at various discharge pressures.

SPECIFICATIONS

1. Air compressor- Double Cylinder Two Stage Type Driven by a 3 hp. Three phase motor mounted on air receiver provided with delivery valve.
2. Pressure gauges.
3. Air tank and orifice with water manometer for air intake measurement
4. Energy meter accompanies the equipment's.
5. Digital Temp. Indicator to measure temperatures at Different locations.

SERVICES REQUIRED

1. Floor space of 2.5 x 1.5 m
2. 440 v, 15 A, 3 ph. Ac supply with neutral and earthing connection.
3. A hand tachometer. (It can be supplied at extra cost)

9. CUT SECTIONAL 4 STROKES 4 CYLINDER PETROL ENGINE FITTED WITH REDUCTION GEAR BOX AND MOTOR

- showing tappet movement
- showing valves and valve springs movement
- showing piston movement
- showing crank shaft, connecting rod movement
- showing cam shaft, push rod and rocker movement
- showing rocker arm movement
- showing fly wheel movement
- showing full cut sectional view of all parts as dynamo, carburetor, fuel pump, water body, piston, exhaust, fuel tank, self starter, distributor, filter, oil pump etc.
- showing cut sectional view of exhaust manifold & inlet manifold.
- showing valve timing gears.

10. CUT SECTIONAL 4 STROKES 4 CYLINDER DIESEL ENGINE FITTED WITH REDUCTION GEAR BOX AND MOTOR

- showing tappet movement
- showing valve and valve springs movement
- showing piston movement
- showing crank shaft, connecting rod movement
- showing rocker arm movement
- showing cam shaft, push rod and rocker movement
- showing full cut sectional view of all parts as dynamo, carburetor, fuel pump, water body, piston, exhaust, fuel tank, self starter, filter, oil pump etc.
- showing cut sectional view of inlet and exhaust manifold.
- showing cut sectional view of m multi cylinder fuel injection pump
- showing complete movement in 4 cylinder fuel injection pump.