

# MAKLUMAT SPESIFIKASI ITEM

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## MAKLUMAT SPESIFIKASI ITEM

<b>No Pelawaan</b>	: UiTM/B1/PER/SHR/B/0425/0015
<b>Butiran Tawaran</b>	: CADANGAN MEMBEKAL, MENGHANTAR, MEMASANG, MENGUJILARI DAN MENYELENGGARA PERALATAN
<b>Keterangan Item</b>	: 0609030100076 : Servo System / Modular Servo System
<b>Nama Spesifikasi</b>	: Cadangan Membekal, Menghantar, Memasang Dan Mengujilari Peralatan Servo Modular System Untuk
<b>Kuantiti</b>	: 1.000

Butiran Keperluan	Calit	Tawaran Syarikat
<b>1 GENERAL REQUIREMENTS</b>		
I Vendors must comply with all the requirements specified in this tender document	<input type="checkbox"/>	
II Vendors must bear all costs of supplying the specified quantity of items to UiTM. Such costs shall include the costs of delivery, installation, commissioning, training, troubleshoot and maintenance work (including parts labour and on-site service) within the specified warranty period	<input type="checkbox"/>	
<b>2 GENERAL SPECIFICATION</b>		
<b>I Descriptions</b>		
A) The Modular Servo System is a unique equipment designed to study the theory and practice of automatic control systems. It has been designed for teaching the theory of open and closed-loop, speed and positional control systems using modular units, both mechanical and electronic, that can be configured to demonstrate the various methods of control techniques. To introduce the student to all phase of control system and advanced control methods.	<input type="checkbox"/>	

**Butiran Keperluan**

**Calit                      Tawaran Syarikat**

II   Features shall include:

- A)   Modular and Flexible.
- B)   Self-contained units with mimic diagrams on function blocks.
- C)   Units can be investigated individually before building systems.
- D)   "Hands on" assembly of working system.
- E)   Magnetic unit bases creating a versatile and stable system.
- F)   Can be used for advanced work.

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III   Curriculum Coverage

- A)   Operational amplifiers.
- B)   Motor speed characteristics.
- C)   d.c. error channel.
- D)   Simple position control.
- E)   Closed-loop position control.
- F)   Simple speed control.
- G)   Deadband & step response.
- H)   Velocity feedback.

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**Butiran Keperluan****Calit****Tawaran Syarikat**

I) Analysis of simple speed control with speed response.

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J) Position response.

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K) Closed-loop frequency response.

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L) Identification of motor time constants.

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M) Identification of velocity error constant.

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N) Frequency and transient response.

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O) Measurement of following error.

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P) Stability consideration & the use of lead, lag & combined networks.

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Q) Tachogenerator feedback & the effect on system performance.

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R) Acceleration feedback.

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S) Linearisation of system.

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**3 TECHNICAL SPECIFICATION****I Operational Amplifier Unit**☐

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A) Multiple inputs and various feedback arrangement.

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B) Uses include summation to produce operating error for closed-loop systems.

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C) Addition of extra time constants to demonstrate instability.

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Butiran Keperluan

II Attenuator Unit

- A) Twin calibrated potentiometers mounted in one case.
- B) For gain and tacho-feedback control.

III Pre-Amplifier Unit

- A) Two (2) input channels and a push-pull output for direct drive of the servo amplifier.
- B) Gain approx : 25
- C) Includes a switched defined time constant network.

IV Servo Amplifier

- A) Operates the motor connected via a 12-way socket.
- B) Protective circuit limits the motor current under overload conditions.

V Power Supply

- A) Input tappings : 100V, 110V, 120V, 200V, 220V, 240V, 50/60Hz, 40VA.
- B) Output : 24V d.c., 2A unregulated .
- C) Connect directly to the servo amplifier via a 12-way sockets.
- D) Stabilised d.c. at :  $\pm 15V$ .
- E) Socket to operate smaller amplifier units : 15mA on 4mm.

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**Butiran Keperluan**

- F) Supply frequency on 4mm sockets : 9V rms.
- G) Supply frequency provide reference phase : 18V.

**VI DC Motor Unit**

- A) Permanent magnet motor.
- B) Inertia disk (thick).
- C) Hexagonal spacer with hubs & collars.
- D) Shaft : 30mm

**VII Input & Output Potentiometers**

- A) Semi-precision.
- B) Servo-type potentiometers
- C) Fitted with calibrated position indicating dials.
- D) Output unit : Carres a rear extension shaft for coupling directly to the Reduction Gear Tacho Unit.

**VIII Loading Unit**

- A) Complete with Brake disc : thin
- B) Fitting for the shaft mounts the aluminium disc which runs between the poles of a separately mounted permanent magnet.
- C) The pole/disc interference adjustable against an arbitrary scale

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**Butiran Keperluan**

D) Provide variable viscous load for the motor.

**Calit**

**Tawaran Syarikat**

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**IX Reduction Gear Tacho**

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A) Ration speed reduction gearbox : 30/1

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B) Dc tachogenerator driven from the high speed input shaft.

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C) Top panel display can be switched to indicate speed in : r/min

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D) Monitor external dc voltage

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E) Hexagonal coupling : complete with four (4) 'o' rings.

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**X PID Unit PID150Y**

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A) This is a proportional plus integral plus derivative control unit for use with control systems using dc electrical signals.

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**XI Ancillary items**

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A) Plastic coated steel baseplate (Qty ; 1)

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B) Leads 4mm plug, 165mm, yellow (Qty : 8)

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C) Leads 4mm plug, 165mm, grey (Qty : 4)

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D) Leads 4mm plug, 270mm, red (Qty : 4)

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E) Leads 4mm plug, 270mm, orange (Qty : 6)

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F) Leads 4mm plug, 270mm, green (Qty : 2)

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**Butiran Keperluan****Calit****Tawaran Syarikat**

G) Leads 4mm plug, 270mm, grey (Qty : 6)

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H) Leads 4mm plug, 570mm, yellow (Qty : 7)

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I) Leads 4mm plug, 570mm, green (Qty : 2)

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J) Leads 4mm plug, 570mm, grey (Qty : 4)

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K) Leads 4mm plug, 3 core (Qty : 6)

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L) Spanners DE OJ (1/4") x (3/16") BS. (Qty :2)

☐**4 CATALOGUES / BROCHURES**

I Vendors must provide the catalogues / brochures / technical specification manuals with the tender proposal

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II Original copies of user and operational manual of the equipment must be provided

☐**5 TRAINING**

I Tenderers are required to provide training for the use, maintenance and troubleshoot of the equipment to the Technical Staff & Lecture of Electrical Engineering School, College of Engineering, UiTM Shah Alam and all training-related costs are borne by the tenderers.

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II A minimum of three (3) days training for a minimum of five (5) participants covering each module. (Vendors must provide details/syllabus of the training module)

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III Complete training materials and documentation must be provided to all participants

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IV The training MUST be conducted by trainers who are certified by principal. Please attach the trainer's certification that is certified by principal supplier.

☐**6 WARRANTY AND SUPPORT**

**Butiran Keperluan**

- I Vendors must have local service for repair services and provide on call services when required by UiTM
- II Vendors must provide details of warranty. INCLUDING ALL parts, labour, basic phone support for hardware issue, repairs onsite). Please attach the Letter of Warranty (LOW) from the principle, which states that UiTM is entitled to 2 years of warranty after purchase has been completion
- III Vendors be responsible for the installation, commissioning and test-run of the equipment and accompanying software (if applicable) to the satisfaction of UNIVERSITI TEKNOLOGI MARA before final acceptance.
- IV All cost on delivery. installation, commissioning and test run shall be borne by the vendor.
- V The vendors MUST provide a genuine product. The vendors must be supported back-to-back by a principle (manufacturer) to provide maintenance services for equipment supplied. The vendors should attach a Letter of Authorization (LOA) from Distributors/ Principal.
- VI Free support through fax, email, telephone must be provided during the warranty period

**7 OTHER REQUIREMENTS**

- I Note that all other related material, components and cabling, which are required to ensure full operation of the above package must be supplied and borne by vendors

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