جامعة مؤتة
Mutah University
وحدة اللوازم

جامعة مؤتة لجان الشراء

عطاء رقم 7/ل ر/2026

توريد وتركيب وتشغيل وتدريب أجهزة مخبرية/ كلية العلوم

السادة ..... يرجى موافاتنا بأسعار المواد المبين تفاصيلها بالكشف المرفق المكون من 10 صفحات، وتسليمها الى وحدة اللوازم/ دائرة المشتريات في موقع جامعة مؤتة/ الكرك-المجمع الإداري بالظرف المختوم مكتوب عليه اسم العطاء ورقمه واسم المتعهد ورقم التلفون والفاكس الخاص بالمتعهد على أن يلتزم المتعهد بما يلي:

رئيس اللجنة:

1- أخر موعد لتسليم العروض يوم الاحد تاريخ 2026/2/22، قبل الساعة الثانية عشرة ظهراً.
2- ثمن نسخة العطاء (125) دينار غير مستردة وتشترى عن طريق مكتب ارتباط الجامعة/ عمان، أو عن طريق وحدة اللوازم/ جامعة مؤتة – المجمع الإداري، ويكون اخر موعد لبيع النسخ يوم الاحد تاريخ 2026/2/22 لغاية الساعة الحادية عشرة صباحاً.
3- ارفاق رخصة المهن وشهادة التسجيل ووصل ثمن نسخة العطاء بالعرض على ان يكون المتعهد مشترك بنظام الفوترة الالكتروني.
4- تقديم العرض (نسخة أصلية، ونسخة إلكترونية "Word أو Excel").
5- تقديم كفالة او شيك مصدق كدخول للعطاء بنسبة 3% من قيمة العرض، وكفالة او شيك مصدق كحسن تنفيذ بنسبة 10% من قيمة الإحالة في حالة تمت الإحالة.
6- تدفع الطوابع القانونية وأية رسوم تترتب على قرار الإحالة خلال 10 أيام من تاريخ التبليغ بالإحالة.
7- تقديم الأسعار شامله الضريبة العامة على المبيعات وشاملة الرسوم الجمركية واية رسوم وضرائب.
8- عرض الأسعار المقدم من المناقص جزء لا يتجزأ من قرار الإحالة.
9- المواد المطلوبة قابلة للزيادة او النقصان بنسبة 25%.
10- صلاحية العرض (90) يوم على الأقل.
11- يتم فتح العروض المقدمة بعد ربع ساعة من وقت الاغلاق المبين أعلاه.
12- للجامعة الحق بإلغاء العطاء دون ذكر الأسباب.
13- تعتبر شروط نظام المشتريات الحكومية رقم 8 لعام 2022 وملحقاته والتعليمات الصادرة بموجبه جزء لا يتجزأ من شروط العطاء وتكون شروطه هي المرجحة إذا تعارض أي منها مع الشروط الواردة أعلاه (علماً بأن شروط النظام المشار اليه أعلاه على موقع الجامعة (العطاءات).

اسم المناقص: **رقم الهاتف:** **التوقيع:**

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عطاء رقم 7/ل ف/2026

توريد وتركيب وتشغيل وتدريب أجهزة مخبرية/ كلية العلوم

Item #	Instrument	Quantity
1.	Oven for calcination under inert conditions with its accessories (it could be a tubular furnace)	1
2.	Top loading Balances	3
3.	Analytical Balances	1
4.	Conductivity meter	1
5.	Rotational viscometer with its accessories	1
6.	pH meter	1
7.	Hot plate	3
8.	Water distiller unit	2
9.	Electrodes for a potentiometer	Different types
10.	Fourier transform infrared spectroscopy (FTIR) with its accessories	1
11.	Gas Chromatography – Thermal conductivity detector with its accessories	1
12.	High Performance Liquid Chromatography – Diode array detector with its accessories	1
13.	Atomic Absorption spectrometer with its accessories with its accessories	1
14.	Photoelectric flame photometer with its accessories	1
15.	Gas analyzer or mass spectrometry with its accessories	1

Important Notes:

- **The offers of the chromatography and FTIR instruments (Items 10 to 15) should include intensive training courses for operation and regular daily and monthly maintenance and troubleshooting at the manufacturer's site or a similar location for two persons, included with the offer.**

- **A three-year service contract should also be included with the offers of items from 10 to 15.**

عطاء رقم 7/ل ف/2026

توريد وتركيب وتشغيل وتدريب أجهزة مخبرية/ كلية العلوم

رقم البند	اسم الجهاز	المواصفات	العدد
1	Oven for calcination under inert conditions with its accessories (it could be a tubular furnace)	• Heating type: Three-zone independently controlled heating for uniform temperature profile • Maximum temperature: ≥1100°C (≥1200°C preferred) • Heating elements: Kanthal A-1, $MoSi_2$, or silicon carbide elements • Heating rate: Programmable 0.1-20°C/min (minimum range) • Cooling rate: Natural or forced cooling capability • Temperature uniformity: ±5°C over 200 mm hot zone at 1000°C • Temperature control: PID controller with auto-tuning function • Temperature accuracy: ±1°C of setpoint • Over-temperature protection: Independent safety thermostat • Tube material: High-purity alumina (99.7% Al_2O_3) or quartz (for ≤1000°C) • Tube dimensions: ○ Outer diameter: 50-60 mm (standard) ○ Inner diameter: 45-55 mm ○ Length: 600-1000 mm (heated length: 300-400 mm) • Gas inlet ports: Minimum 2 independent inlets with flow meters/controllers • Flow control: ○ Mass Flow Controllers (MFCs): For at least 2 gases ○ Flow range: 10-500 sccm per gas • Controller type: Digital programmable controller with touchscreen interface • Programming capability: At least 10 program segments (ramp, hold, step) • Display: Real-time temperature, setpoint, program status, gas flows • Boat/sample holders: Alumina boats (multiple sizes) ○ Small: 50 × 10 × 10 mm (for ~0.1-0.5 g) ○ Medium: 100 × 15 × 15 mm (for ~0.5-2 g) ○ Large: 150 × 20 × 20 mm (for ~2-3 g)
2	Top Loading Balance	• Capacity 500 - 1000 g • Readability 0.01 – 0.001g Includes Calibration Weights	3
3	Analytical balance	• Capacity: 220g • Readout(d): 0.0001g Built-in calibration weight	1
4	conductivity meter	• Bench top • Provides high resolution and accuracy for precise multi-parameter measurements. • Conductivity range 0,001 µS/cm - 1000 mS/cm	1

1	• Range: 1 to 2,000,000 mPa·s • Accuracy: ±1% (Newtonian fluids) • Rotors: Must include 4 standard rotors (#1-#4) • Speeds: Minimum 8 discrete speeds • Auto-Range Function: Instrument automatically selects the correct rotor and speed. • Stability Indicator: Clear visual signal when the measurement is stable for recording. • Data Output: Includes software and cable for PC connection and data transfer. • Full system (unit, rotors, guard leg, stand, tools) • Traceable calibration certificate • User manual & data software • Low-viscosity rotor/adapter for measurements below 10 mPa·s. • Minimum 1-year warranty • On-site installation and basic user training	Rotational viscometer system for laboratory use:	5
1	✓ Bench top pH/mV ✓ Provides high resolution and accuracy for precise multi-parameter measurements. ✓ Additional technical buffers in memory ✓ pH calibration up to 3 points • Accuracy ±0.01 pH •	pH meter	6
1	• Temp 25 – 550 °C • Speed 0 – 1500 rpm	Hot Plate stirrer	7
2	• Capacity: 5-10 liters per hour • Quality: 1-5 µS / cm @ 25 °C	Distillation unit	8
1	For cyclic voltammetry experiments. Comes with 1- Electrode Refill Solution Electrolyte 100 ml 2-Laboratory Electrode Storage Bottle 3-Pack of Replacement Porous Tips 3-Electrode Filling Pipette	Ag/AgCl (3M KCl) Reference Electrode (7.5 cm length, 3.0 mm disk OD)	9a
20	Strip's general dimensions: 3.4 x 1.0 x 0.05 cm. Reference electrode and electric contacts made of silver	Screen-printed electrodes, disposable	9b
1	✓ For cyclic voltammetry experiments ✓ 25 mL with PTFE stoppers and sparging/purging accessories ✓ The cell features five ports (14/20) for working, counter, and reference electrodes as well as gas sparge/purge tubes. Five PTFE Stoppers	Standard Electrochemical Cell (conventional three electrode glass cell) Comes with: Platinum wire electrode (Auxiliary/counter electrode) Teflon coated stir bar	9c

		Teflon tubing 1/16" OD - 200 cm. PK-4 Electrode Polishing Kit	
6	with an area of 0.071 cm^2, 3.0 mm disk OD, 7.0 mm OD PCTFE shroud, 7.5 cm length	Glassy carbon Voltammetry disk Electrodes	9d
1	Interferometer : Michelson interferometer (30° incident angle) Equipped with advanced dynamic alignment system Sealed interferometer. Light source : High-energy ceramic. Detector : DLATGS detector with temperature control. Wavenumber range : 7,800 to 350 cm−1. Wavenumber repeatability : ±0.0008cm- or better Wavenumber accuracy : ±0.15 cm-1 or less Resolution : 0.9, 2, 4, 8, 16 cm−1. SN ratio : 36,000:1 or higher. Data sampling : Temperature-controlled semiconductor laser. Software Measurement: Spectrum measurement, Continuous measurement, Atmospheric correction measurement, Simple measurement mode Hardware monitor : Self-diagnosis function, Status monitor. Measurement support function : Spectrum advisor function. Search functions : Spectrum search (based on similarity), Peak search, Text search, Combination search, Setting of search conditions, Search of user library and commercial library, Creation of user library. Quantitative functions : Multi-point calibration curve method, CLS quantitative method ,Photometrics Recalculation function for quantitative and photometric results. ATR (Attenuated Total Reflection) sampling accessory. The system is fully controlled by software installed on a PC with printer.	FTIR With ATR	10
1	"We are researching photocatalytic water splitting and need to automatically and quantitatively monitor H_2, O_2, CO_2, and light hydrocarbons (CH_4, C_2H_4) every 1-5 minutes from a sealed reactor. We need a turn-key GC solution with automated gas sampling valves." Display: Color touch screen Column Oven Fits up to two 105 m × 0.530 mm I.D. capillary columns, and\ or molecular sieve column for gases Temperature range : (ambient +2 °C) to 420 °C or more. Temperature Setpoint Resolution: 0.1 °C Temperature accuracy: ± 1% Temperature deviation: < 3 °C	Gas Chromatography system with Thermal Conductivity Detector and automated gas sampling valves.	11

	Temperature stability: set value ± 0.2 °C or less Programmable temperature ramps: 32 ramps Negative ramps: possible Settable time for each step : 9999.99 min Programmed rate settings range : −240 to 250 °C/min Oven cool down time : 450 °C to 50 °C in 3.8 min or less Column oven cooling speed: three stages (high/middle/ low) and custom settings Injection Port Split/Splitless Injection Unit Injection mode : : Split; Splitless; High pressure injection Split ratio : Up to 12500:1 Pressure range : 0 to 1020 kPa Maximum operating temperature: 420 °C or higher Automated gas sampling valves Flow Controller Automatically compensates for variations in atmospheric pressure and temperature Pressure units: psi, kPa, bar Pressure range : 0 to 1020 kPa Pressure setpoint resolution: 0.1 kPa Pressure program ramps : 7 Supports control modes for constant pressure, constant linear velocity and constant column flow. Supported carrier gas types: He, N2, H2, Ar Carrier gas flow range He : 0 to 1250 mL/min N2 : 0 to 580 mL/min H2 : 0 to 1250 mL/min Ar : 0 to 580 mL/min Flow setpoint resolution: 0.15 mL/min Flow ramps : 7 Flow sensor accuracy : < ± 5 % Flow sensor repeatability : < ± 0.5 % of setpoint or less Liquid Autosampler Sampler Sample for processing: 6 Samples Thermal Conductivity Detector (TCD) Sensitivity : > 19000 mV × mL/mg (decane) Dynamic range : 1 × 105 Max operating temperature : 400 °C Max acquisition rate : 1 ms (1000 Hz) Flow rate settings: Makeup (He, H2, N2, Ar) : 0 to 20 mL/min Certifications IEC61010-1, IEC61010-2-010 CE marking UL/CSA Certification EU RoHS/Chinese RoHS The system is fully controlled by software installed on a PC with printer.		

1	Pump Maximum pressure : 500 Bar Degassing unit : Five Lines: Mobile phase 4 + Rinse solution 1 Pumping method : Parallel-type double plunger. Pulsation : ≤ 0.15 MPa or better Flow rate setting range : 0.0001 to 10 mL/min. Flow rate accuracy : ≤ ±1% Flow rate precision : < 0.06 %RSD. Configuration : Four-solvent gradient System. Autosampler Injection volume setting range : 0.1 to 100 µL Injection volume reproducibility: RSD < 0.25% or less Cross-contamination : 0.0005 % or less(typical value) Injection cycle time : 16 sec or less. Samples for processing : more than 200 vials (1.5 mL). Sample cooler : 5 to 45 °C. Column Oven Temperature control range : Room temperature −15 °C to 85 °C Temperature control precision : ±0.15 °C or less PDA Detector Wavelength range : 190 to 800 nm. Spectral resolution : 1.6 nm Slit width : 1.2 nm, 8 nm Wavelength accuracy : ≤ ±1 nm Light source : Deuterium (D2) lamp , tungsten (W) lamp. Flow cell : 10 µL (10mm, TC), 12 MPa The system is fully controlled	HPLC with Diao Array	12
1	Wavelength range : 185.0 to 900.0 nm Monochromator : Aberration-corrected Czerny-Turner mounting. Detector : Photomultiplier tube. Optics : Optical double-beam. Number of HC lamps : 8 lamps. Lamp mode : EMISSION, NON-BGC, BGC-D2, BGC-SR. Flame Burner unit Burner head : Titanium 10 cm slot. Nebulizer : · Pt-Ir capillary, PTFE orifice & ceramic impact bead. Angle adjustment : 0 to 90° Type : Air-C2H2 flame. Flow rate control : Automatic fuel gas flow rate setting (0.1 L/min step), · Manual support gas Fow rate setting & Automatic search of optimum gas flow rate. Safety measures Automatic flame extinction via flame vibration sensor Automatic gas leak check Flame monitor Automatic flame extinction upon power outage or sudden power interruption.	Atomic Absorption Spectrophotometers (AAS) with flame atomization.	13

	Internal fan stop sensor. Software for Data Acquisition & Processing Measurement mode : Flame continuous method Concentration conversion mode : Calibration curve method (order: 1st, 2nd, 3rd). Standard addition method, simple standard addition method (order: 1st). Report generation. C2H2 Gas Cylinder must be supplied. Air Compressor must be supplied. The system is fully controlled by software installed on a PC with printer.		
1	• Measurable elements: ○ Sodium (Na) - Primary channel ○ Potassium (K) - Primary channel ○ Lithium (Li) - Internal standard channel ○ Calcium (Ca) - Optional/expandable channel ○ Barium (Ba) - Optional/expandable channel • Spectral isolation: Interference filters with narrow bandwidth ○ Na: 589 nm filter, bandwidth ≤10 nm ○ K: 767 nm filter, bandwidth ≤10 nm ○ Li: 671 nm filter, bandwidth ≤10 nm • Photodetectors: Silicon photodiodes or photomultiplier tubes for each channel • Measurement range: ○ Na: 0-200 ppm (extendable to 0-1000 ppm with dilution) ○ K: 0-200 ppm (extendable to 0-500 ppm with dilution) ○ Li: 0-200 ppm • Detection limits: ○ Na: ≤0.1 ppm, K: ≤0.1 ppm, Li: ≤0.2 ppm • Precision: ≤1% RSD for 10 replicate measurements of standard solution • Accuracy: ≤2% deviation from certified standard values • Linearity: $R^2 \geq 0.999$ for calibration curves (0-100 ppm) • Measurement time: ≤10 seconds per sample for stable reading • Burner type: Premix laminar flow burner, stainless steel construction • Fuel options: Compatible with LPG (propane/butane) or natural gas • Oxidant: Laboratory compressed air (required pressure: 0.3-0.5 MPa) • Fuel consumption: ≤2 L/min • Flame stability: ≤2% fluctuation over 30 minutes continuous operation • Nebulization rate: 2-6 mL/min, adjustable	Photoelectric flame photometer with its accessories	14

	• Aspiration system: Self-aspirating nebulizer with adjustable uptake rate • Drain system: Efficient condensate drain with safety overflow protection • Display: Digital LED or LCD display showing concentration directly • Output units: ppm, mmol/L, or mEq/L selectable • Output options: ○ Direct concentration readout ○ Emission intensity mode ○ Ratio mode (sample/internal standard) • Controls: ○ Zero adjustment knob ○ Sensitivity/calibration control ○ Fuel/air ratio adjustment ○ Ignition control (manual or automatic) Can be connected and operated via software by PC		
1	• Mass range: 1-200 amu minimum (1-300 amu preferred) • Detector configuration: Dual detector system (Faraday cup + Secondary Electron Multiplier) • Minimum detectable partial pressure: ≤5×10^{-15} mbar with SEM • Faraday cup detection limit: ≤1×10^{-14} mbar • Mass resolution: ≤0.5 amu at 10% valley • Scan rate: Up to 20 amu/second for full range scanning • Stability: ≤0.02%/hour drift under constant conditions • Dynamic range: ≥9 orders of magnitude • Capillary inlet system: Heated quartz or stainless steel capillary, 0.15-0.25 mm ID • Inlet temperature range: Ambient to 200°C, with precise temperature control (±2°C) • Membrane inlet option: For dissolved gas detection from liquid phase • Multiple inlet ports: Minimum 3 independent inlets with automatic switching • Pressure reduction system: Two-stage pressure reduction for atmospheric sampling • Inlet flow rate: Adjustable 0.1-10 mL/min • Detection Capabilities for Target Gases • Hydrogen (H_2, m/z 2): ≤1 ppm in atmospheric pressure carrier gas • Carbon dioxide (CO_2, m/z 44): ≤2 ppm • Carbon monoxide (CO, m/z 28): ≤2 ppm • Methane (CH_4, m/z 16): ≤1 ppm • Oxygen (O_2, m/z 32): ≤5 ppm • Water (H_2O, m/z 18): ≤10 ppm	Gas analyzer or mass spectrometry with its accessories	15

	• Light hydrocarbons (C_2-C_4): ≤5 ppm each • Response time (10-90%): ≤500 ms for m/z 2 and m/z 44 • Signal stabilization time: ≤2 seconds after gas concentration change • Time for full scan (1-100 amu): ≤5 seconds • Multiple ion monitoring (MIM) mode: Simultaneous monitoring of at least 8 selected masses • Gas sampling port: Direct connection to batch or flow photoreactor • Pressure compatibility: Sampling from atmospheric pressure to 3 bar absolute • Gas flow compatibility: 0-100 sccm from reactor exhaust • Integrated calibration gas inlet: For on-line calibration during experiments • Multi-component calibration gas: Supplied with system (H_2, CO_2, CO, CH_4, O_2 in balance gas) • Automatic calibration routine: Software-controlled calibration protocol • Calibration gas concentrations: 10, 100, 1000 ppm of each target gas • Software package: QGA Professional or equivalent • Real-time display: Multiple ion monitoring with time-resolved graphs • Data export: ASCII, Excel, and other standard formats • Automated sequences: For repetitive analysis protocols • Quantitative analysis: Automatic concentration calculation from calibration curves • Mass spectra library: For unknown peak identification • Remote access capability: Via network connection PERFORMANCE VALIDATION 1. Detection limit test: For H_2, CO_2, CO, CH_4 at ≤10 ppm level 2. Linearity test: 5-point calibration curve (1-1000 ppm) with $R^2 \geq 0.995$ for all target gases 3. Stability test: ≤5% signal variation over 8 hours continuous operation 4. Cross-sensitivity test: Demonstrate minimal interference between m/z 28 (N_2^+ and CO^+) and m/z 44 (CO_2^+) ACCESSORIES & CONSUMABLES • Spare capillary: 2 pieces of sampling capillary • Calibration gas mixture: Cylinder with certified concentrations (1000 ppm each of H_2, CO_2, CO, CH_4 in balance)		

	• Gas filters: 10 pieces of 2 µm particulate filters
	• Transfer line connectors: Set of Swagelok® or equivalent fittings (1/16" and 1/8")
	• Spare filaments: 3 pieces for ion source
	• Installation by factory-trained engineer
	• Full system validation after installation
	• On mother company training: for 2 researchers
	• Training topics:
	  ○ System operation and daily startup/shutdown
	  ○ Method development for photocatalytic experiments
	  ○ Data analysis and quantification
	  ○ Basic maintenance and troubleshooting
	• Remote support session: within first 3 months of operation
	• Minimum warranty: 3 years on parts and labor		