

يجب على الشركات المتقدمة فى المناقصة تسجيل
بياناتها على موقع بوابه المشتريات الحكومية
(www.etenders.gov.eg.)



جامعة قنا
الادارة العامة للاحتياجات
ادارة التعاقدات المركزية

طابع شهيد فئة ٥ ج

جامعة قنا

كراسة الشروط والمواصفات

الخاصة بالمناقصة العامة لشراء اجهزة لمعمل الهندسة الصحية والبيئية

وأجهزة لمعمل الهيدروليكا ومصادر المياه لكلية الهندسة

جلسة الثلاثاء الموافق ٢٣ / ١٢ / ٢٠٢٥ الساعة الثانية عشر ظهرا

- سعر الكراسة : ٤٩٩ ج اربعمائة تسعة وتسعون جنهما لا غير + ١٤ % ض.ق.م

اسم المورد طالب الكراسة:.....

عنوانه:.....

تم سداد قيمة الكراسة بالإيصال رقم بتاريخ / / ٢٠٢٥ م

بإذاعة المراسلات والاتصال بالجامعة :

جامعة قنا - الادارة العامة للاحتياجات بقنا - الادارة المركزية الجديدة (مبنى د.١ / رئيس الجامعة) الدور الارضى

- قنا - الكيلو ٦ طريق قنا - سفاجا

تليفون ٠٩٦٣٢١١٢٧٣ داخلي ١٢٣٦/١٢٣٧ ت/فاكس ٠٩٦٣٢٢٠١٦٩ فاكس/٠٩٦٣٢١١٢٨٠

١- الشروط العامة

- المستندات التي تتضمنها هذه المناقصة
- كراسة الشروط والمواصفات.
- المواصفات الفنية.
- جدول الأسعار.

٢- القوانين واللوائح المنظمة للمناقصة:

- تخضع هذه المناقصة لأحكام قانون تنظيم التعاقدات التي تبرمها الجهات العامة الصادر بالقانون رقم (١٨٢) لسنة ٢٠١٨ ولائحة التنفيذية ، بالإضافة الى احكام القانون رقم (٥) لسنة ٢٠١٥ في شأن تفضيل المنتجات المصرية في العقود الحكومية ولائحته التنفيذية ويمكن تحميل صورة استرشادية من القانونين المشار إليهما بدون مقابل ودون أدنى مسئولية على الجامعة من خلال بوابة المشتريات الحكومية (www.etenders.gov.eg)، كما يسرى بشأن التعاقد كافة القوانين واللوائح والقرارات والأعراف ذات الصلة بموضوع المناقصة فيما لم يرد بشأنه نص في العقد.
- يجوز لأصحاب الشركات المتقدمة إن يحضروا جلسة فتح المظاريف الفنية والمالية ، ويجوز لمقدمي العطاءات أن يفوضوا من يرونة لحضور جلسة فتح المظاريف شريطة تقديم التفويض الدال على ذلك

٣- الشطب من سجلات الموردين:

إذا تبين أن المتعاقد قد استعمل بنفسه أو بواسطة غيره الغش أو التلاعب في تعامله مع الجهة الإدارية المتعاقدة أو في حصوله على العقد فإنه سيتم اتخاذ الإجراءات القانونية لشطب اسمه من سجلات الموردين بالجهات الحكومية.

٤- لغة تقديم العطاء:

يقدم العطاء باللغة العربية – وفي حالة تقديم مستند بأي لغة أخرى يتم ترجمته إلى اللغة العربية عن طريق مقدم العطاء من مكتب معتمد – ويعتبر النص العربي هو المعول عليه في حالة الاختلاف أو الالتباس في المضمون ويسمح باستخدام اللغة الانجليزية فيما يخص المواصفات الفنية فقط في الحالات التي تستدعي الطبيعة الفنية الخاصة بها ذلك .

٥- توقيتات تسليم العطاء:

تسلم العطاءات - بمكتب السيد الأستاذ / مدير عام الاحتياجات - الادارة المركزية الجديدة (مبنى السيد ا.د / رئيس الجامعة) الدور الارضى . قنا – الكيلو ٦ طريق قنا - جامعة قنا ، وذلك قبل الساعة الثانية عشر ظهرا من اليوم المحدد لفتح المظاريف الفنية، ولن يعتد بأي عطاء يرد بعد هذا الموعد - ولا يلتفت إلى أي ادعاء من صاحب العطاء بحصول خطأ في عطائه إذا قدم بعد فتح المظاريف الفنية.

٦- إلغاء المناقصة وتعديل الشروط والمواصفات:

يحق للجامعة إلغاء المناقصة قبل البت فيها إذا استغنى عنها نهائياً أو إذا اقتضت المصلحة العامة ذلك، ويحق للجامعة إصدار إضافات أو حذف أو تعديل لمضمون أي بند أو مستند من مستندات المناقصة بموجب كتاب يرسل بالبريد السريع عن طريق الهيئة القومية للبريد مع تعريضه في ذات الوقت بالبريد الإلكتروني أو الفاكس بحسب الأحوال، بالإضافة إلى نشرها على بوابة التعاقدات العامة إلى جميع الشركات المتنافسة والتي قامت بشراء كراسة الشروط والمواصفات وذلك قبل فتح المظاريف الفنية بوقت كاف على أن تعتبر أي إضافة أو حذف أو تعديل تم إخطار الشركات المتنافسة به جزءاً لا يتجزأ من هذه الشروط وملزماً في أي مرحلة من مراحلها.

٧- مدة سريان العطاءات:

مدة سريان العطاءات ثلاثة أشهر (٩٠ يوم) من تاريخ فتح المظاريف الفنية وللجامعة الحق في طلب مد سريان العطاءات إذا ما اقتضت الضرورة ذلك. ويبقى العطاء نافذ المفعول وغير جائز الرجوع فيه من وقت تصديده بمعرفة مقدم العطاء بغض النظر عن موعد استلامه بمعرفة الجامعة وحتى نهاية مدة سريان العطاء.

٨- التوريد ومدة التعاقد:

- مدة التوريد لا تزيد عن (شهرين) من تاريخ اليوم التالي لاستلام أمر التوريد الصادر.
- التوريد بمخازن الجامعة.

٩- سحب العطاء:

إذا انسحب مقدم العطاء من العملية قبل الميعاد المحدد لجلسة فتح المظاريف الفنية يصبح التأمين المؤقت المؤدى حقاً للجامعة دون حاجة إلى إنذار أو اللجوء إلى القضاء أو اتخاذ أى إجراءات أو إقامة الدليل على حصول ضرر، أو استئذائه من أى مبالغ مستحقة أو تستحق لديها أو لدى أى جهة إدارية أخرى لصاحب العطاء المذكور

١٠- التأمين المؤقت والنهائي:

• التأمين المؤقت:

- ٢ يجب أن يكون العطاء مصحوباً بالتأمين المؤقت بمبلغ ٢٥٠٠٠٠ جنهما (فقط مائتان وخمسون الف جنهما) يوضع داخل المظروف الفنى ولا يلتفت الى العطاء الغير مصحوب بتأمين مؤقت كامل ويكون التأمين بخطاب ضمان بنكى وألا يقترن بأى قيد أو شرط ويجب أن يكون سارياً لمدة ثلاثين يوماً بعد تاريخ انتهاء مدة صلاحية سريان العطاء أو تاريخ انتهاء مدة صلاحيتها او نقداً .
- إذا كان التأمين نقداً فيودع بخزينة الجامعة بموجب إيصال رسمى يثبت رقمه وتاريخه فى العطاء ولا يجوز وضع نقود أو أوراق بنكنوت مع العطاء.
- يتم التحصيل للتأمين باحد الثلاث طرق الاتية :-

- مدفوعة الصراف .
- مدفوعة المواطن .
- ماكينات التحصيل الالكتروني . وذلك طبقا لقرار وزير المالية رقم ٢٦٩ لسنة ٢٠١٨ م والمعدل لقرار وزير المالية رقم ٧٦٠ بخصوص استكمال منظومة التحصيل الالكتروني ونشر ماكينات التحصيل واليات التحصيل الثلاثة سالفه الذكر .
- لاتقبل الشيكات بجميع انواعها .

● التأمين النهائي:

على صاحب العطاء الفائز ان يؤدي التأمين النهائي خلال عشرة أيام عمل بنسبة (٥%) من قيمة إخطار الترسية تبدأ من اليوم التالي لإخطاره بقبول عطائه ، ويتم الإخطار بكتاب يرسل بخدمة البريد السريع عن طريق الهيئة القومية للبريد، مع تعريضه في ذات الوقت بالبريد الإلكتروني أو الفاكس بحسب الأحوال .

ويتم الاحتفاظ بالتأمين النهائي لدى الجامعة حتى اتمام التوريد وقبول الاصناف المتعاقد عليها

وإذا لم تقم الشركة الراسى عليها المناقصة بأداء التأمين النهائي في المهلة المحددة جاز للجامعة- بموجب اخطاره ودون حاجة لاتخاذ أي إجراء أخر لإلغاء العقد كما يحق للجامعة تنفيذ العقد بواسطة احد مقدمي العطاءات التالية لعطائه بحسب ترتيب أولوياتها . ويصبح التأمين المؤقت في جميع الحالات من حق الجامعة كما يكون لها أن تخصم قيمة كل خسارة تلحق بها من أية مبالغ مستحقة أو تستحق لديها للشركة صاحبة العطاء المقبول وفي حالة عدم كفايتها تلجأ إلى خصمها من مستحقات الشركة لدى أية جهة إدارية أخرى أيا كان سبب. الاستحقاق ، وذلك كلة مع عدم الاخلال بحقها في الرجوع عليه قضائيا بما لم تتمكن من استيفائه من حقوق بالطريق الاداري .

١١- الفحص والاستلام:

يتم الفحص والاستلام طبقا لاحكام القانون رقم ١٨٢ لسنة ٢٠١٨ بتنظيم التعاقدات التي تبرمها الجهات العامة ولانحة التنفيذية وذلك بمعرفة لجنة فنية تشكلها الجامعة .

١٢- تقديم الفواتير وطريقة السداد:

يتم سداد ثمن الاصناف للشركة التي يتم الترسية عليها بعد إتمام إجراءات الفحص والاستلام وذلك في خلال ثلاثين يوما من من تاريخ الفحص والقبول والاعتماد بمعرفة الجامعة وذلك عن طريق الدفع الالكتروني مع تقديم أصل رقم حساب الشركة الراسى عليها بخطاب معتمد من البنك بسداد مستحقاتها عن طريق الدفع الالكتروني.

١٣- التنازل للأخرين:

لا يحق للشركة المتعاقد معها أن تتنازل عن العقد أو أي جزء منه أو أي التزام ينشأ عنه مع الاخذ في الاعتبار احكام القانون رقم ١٨٢ لسنة ٢٠١٨ بتنظيم التعاقدات التي تبرمها الجهات العامة في هذا الشأن ولانحة التنفيذية .

١٤ - التنفيذ ومقابل التأخير

على الشركة أن تقوم بتوريد (الاصناف) موضوع التعاقد في المواعيد المتفق عليها في العقد وطبقاً للجدول الزمني المقدم في عرضها والمذكور بأمر التوريد وإذا تقاعست أو تأخرت في التوريد موضوع التعاقد أو إذا نفذتها على نحو غير المتفق عليه، أو إذا امتنعت عن تنفيذ أي التزام ناشئ عن التعاقد، يكون للجامعة الحق في مصادرة التأمين النهائي فضلاً عن حق الجامعة في الرجوع على الشركة بغرامة عن المدة التي تأخرت فيها الشركة عن التوريد المتفق عليه وطبقاً للجدول الزمنية المدرجة بالعقد، ولا يدخل في حساب مدة التأخير مدد التوقف التي يثبت لجهة التعاقد نشأتها عن أسباب قهرية لا يد للشركة فيها، وتوقع نسب مقابل التأخير أو يتم رفعها طبقاً لما هو وارد بالقانون رقم (١٨٢) لسنة ٢٠١٨ بتنظيم التعاقدات التي تبرمها الجهات العامة ولائحته التنفيذية.

١٥ - مسؤولية الشركة عن أعمالها:

تكون الشركة مسؤولة عن الأضرار التي قد تترتب على وجود أي عيوب فنية للاصناف التي تم توريدها، وتتحمل كامل المسؤولية عما يحدث من أضرار بسبب هذه العيوب.

١٦ - مخالفة شروط العقد:

يجوز للجامعة فسخ العقد أو تنفيذه على حساب الشركة المتعاقدة إذا أخلت بأي شرط من شروطه ويكون الفسخ أو التنفيذ على حساب الشركة بقرار من السلطة المختصة وتعلن بموجب كتاب يرسل بالبريد السريع عن طريق الهيئة القومية للبريد، مع تعزيره في ذات الوقت بالبريد الإلكتروني أو الفاكس بحسب الأحوال، على عنونها المبين بالعقد.

١٧ - كراسة الشروط والمواصفات:

ترفق الشركة المتقدمة النسخة الأصلية من كراسة الشروط والمواصفات موقعة ومختومة بخاتم الشركة ويعتبر ذلك قبولا من الشركة بكل ما ورد فيها وتعتبر كراسة الشروط والمواصفات جزءاً لا يتجزأ من العقد الذي سيوقع بين الجامعة وبين الشركة التي سيسند إليها التوريد ولا يعتد بأي تعديل في الكراسة بسبب ما تدونه الشركة المتقدمة من اشتراطات.

١٨ - الشكاوى:

في حالة إخلال جهة الطرح بأحكام قانون تنظيم التعاقدات التي تبرمها الجهات العامة رقم ١٨٢ لسنة ٢٠١٨ ولائحته التنفيذية بالتزاماتها أو بمهامها القانونية، يحق للشركة التقدم بشكاواها إلى مكتب شكاوى التعاقدات العمومية والتابع مباشرة لوزير المالية الكائن مقره (١٣ شارع منصور - لاطوغلى - القاهرة) للنظر والفصل في الشكاوى.

١٩ - يكون تقديم الشكاوى ممن له مصلحة في ذلك إلى مكتب شكاوى التعاقدات العمومية وفقاً للمواعيد التالية:

- أ- الشكاوى المتعلقة بإجراءات الطرح وكراسة الشروط تقدم قبل الموعد المحدد لفتح المظاريف الفنية بيومي عمل على الأقل.
 - ب- الشكاوى المتعلقة بالبت الفني تقدم قبل الموعد المحدد لجلسة فتح المظاريف المالية بيومي عمل على الأقل.
 - ت- الشكاوى المتعلقة بالبت المالي تقدم قبل الموعد المحدد للتعاقد بيومي عمل على الأقل.
 - ث- الشكاوى المتعلقة بدخول إجراءات التعاقد حيز التنفيذ بعد يوم عمل على الأكثر من صدور القرار الذي تتضرر منه الشركة الشاكية.
- كما يتم تقديم صورة من الشكاوى إلى الجامعة في ذات التوقيت.

٢٠- إنهاء التعاقد:

يحق للجامعة إنهاء العقد في حالة صدور القوانين المفعلة والمستجدة بالحكومة والتي قد يكون لها تأثير مباشر على التوريد محل العقد وعلى الشركة وفور استلامها إخطار الجامعة بإنهاء العقد، كما يجوز للجامعة إنهاء العقد إذا تسببت الشركة أو أخلت إخلالاً أساسياً (رئيسياً) بالعقد

٢١- المراسلات:

• أثناء إجراءات المناقصة:

تكون جميع المخاطبات والإخطارات والمطالبات والبيانات المتعلقة بالمناقصة كتابة باللغة العربية ويلزم تسليمها إلى إدارة المشتريات المركزية بمقر الجامعة بقنا .

• خلال التعاقد والتنفيذ:

تكون جميع المخاطبات والإخطارات والمطالبات والبيانات المتعلقة بالعقد وتنفيذه كتابة باللغة العربية، ويلزم تسليمها إلى إدارة المشتريات المركزية بمقر الجامعة بقنا .

٢٢- إمداد وتقديم العطاء:

يجب ان تراعى الشركات المتنافسة عند اعداد عطاءها الالتزام التام بالبنود الواردة بكراسة الشروط والمواصفات وملحقاتها إن وجدت وأحكام قانون تنظيم التعاقدات التي تبرمها الجهات العامة الصادر بالقانون رقم (١٨٢) لسنة ٢٠١٨ ولائحة التنفيذية وكذا أحكام القانون رقم (٥ لسنة ٢٠١٥) في شأن تفضيل المنتجات المصرية في العقود الحكومية ولائحته التنفيذية وسيتم استبعاد العطاء الذي يثبت بالدراسة مخالفة لاي من هذه المواصفات او الشروط والاحكام .

يسلم العطاء داخل مظروف مغلق يتضمن مظروفين منفصلين مغلقين أحدهما للعرض الفني والأخر للعرض المالي ويقدم العرض بصورة ورقية وعلى أن تكون كافة المستندات المطلوبة موقعة ومختومة من الشركة.

• المظروف الفني:

يراعى ألا يحتوى المظروف الفني على أية اسعار وسيتم استبعاد أى عطاء تضمن في مظروفه الفني أية اسعار ويجب أن يكون العطاء مصحوباً بكامل التأمين المؤقت وذلك على النحو الموضح بالبند رقم (١٠)

ويجب ان يحتوى المظروف الفني على المستندات الآتية :

• بيانات الشركة الإدارية:

- ١) بيان بالشكل القانوني للشركة مقدمة العطاء والمستندات الدالة على قيامها قانوناً.
- ٢) شهادة التسجيل لدى مصلحة الضرائب المصرية (القيمة المضافة).
- ٣) البطاقة الضريبية سارية وأخر إقرار ضريبي .
- ٤) السجل التجاري سارى .
- ٥) سابقة الأعمال في نفس مجال المناقصة .
- ٦) شهادة بالموقف الضريبي (اخر اقرار ضريبي للضرائب العامة – والضريبة على القيمة المضافة)
- ٧) شهادة تسجيل بمنظومة الفاتورة الالكترونية .
- ٨) أصل خطاب برقم حساب الشركة مقدمة العطاء لدى البنك الذي تتعامل معه .

• المظروف المالى:

يجب ان يحتوى المظروف المالى على المستندات الاتية:

- ١ . قائمة الاسعار موضحا بها السعر الاساسى بالجنية المصرى للصنف شامل كافة الضرائب والرسوم والدمغات .
- ٢ . الشهادة الصادرة من اتحاد الصناعات المصرية والداله على استيفاء المنتج الصناعى المقدم فى المناقصة بالنسبة للمكون الصناعى المصرى (ان وجدت) .
- ٢٣ - فى حالة الاحتياج الى كميات زيادة أونقص سيكون ذلك بنسبة (١٥%) من كمية كل بند بالكراسة بذات الشروط ومواصفات والأسعار.
- ٢٤ - يلتزم المورد الراسي عليه الاصناف بسداد قيمة المستحق للهيئة العامة للتأمينات الاجتماعية والقوى العاملة (العمالة الغير منتظمة) .
- ٢٥ - الارتباط المالى : عن ميزانية ٢٠٢٥/٢٠٢٦ .
- ٢٦ - التقييم الفنى للعطاءات : مقبول / مرفوض
- ٢٧ - اسس التقييم المالى : يتم التقييم بين العروض المقبولة فنيا على اساس الافضل شروطا والاقل سعرا .

المواصفات الفنية

أولاً: الأجهزة المطلوبة لمعمل الهيدروليكا ومصادر المياه

Contents

No.	Description	Qty.
1	Open Channel Flume 15 mt قناة مائية مفتوحة بطول ١٥ مترًا	1
1.1	Control Structures منشآت التحكم	1
1.2	Change in cross-section structures منشآت تغيير المقطع العرضي	1
1.3	Flow measuring flumes مجري قياس التصريف	1
1.4	Other Experiments تجارب أخرى	1
1.5	Measuring instruments أجهزة القياس	1
1.6	Software برامج حاسوبية	1
2	Main Hydraulic Bench منضدة هيدروليكية رئيسية	2
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4	Losses in a Pipe System جهاز بيان الفواقد في نظام الأنابيب	1
5	Orifice & Free Jet Flow جهاز التدفق خلال فوهة والجت الحر	1
6	Bed-Load Transport in River Training Simulator جهاز محاكاة نقل حمولة القاع في تجارب الأنهار والمجري المائية	1
7	Advanced Hydrological Systems Simulator (including PC desktop) جهاز محاكاة متقدم للأنظمة الهيدرولوجية (يشمل جهاز كمبيوتر مكتبي)	1
8	Seepage-Streams Investigations Equipment جهاز دراسة التسرب والجريان في التربة	1
9	Cake & Depth Filtration Trainer جهاز التدريب على الترشيح الطبقي والاعماق	1
10	Demonstration for the Effect of Precipitation جهاز توضيح تأثير التساقط والمطر	1
11	Sedimentation Tanks Trainer جهاز تدريب على أحواض الترسيب	1
12	Groundwater Flow Trainer جهاز تدريب على سريان المياه الجوفية	1
13	Hydrology Virtual Lab. Software (including 9 PC desktop) برنامج معمل هيدرولوجيا افتراضي (يشمل ٩ أجهزة كمبيوتر مكتبي)	1
14	PC Core i7 / 16 GB RAM / SSD512/ HDD 1T/19" LED Monitor / mouse / keyboard كمبيوتر مكتبي بمعالج Core i7 وذاكرة ١٦ جيجابايت وقرص SSD بسعة ٥١٢ جيجابايت وقرص HDD بسعة ١ تيرابايت، وشاشة LED مقاس ١٩ بوصة وفأرة ولوحة مفاتيح (من نوع DELL أو	8

	(HP	
15	Interactive Display 65 inch شاشة تفاعلية مقاس ٦٥ بوصة	2
16	Portable Electromagnetic flow meter جهاز قياس السرعة (كهرومغناطيسي ثلاثي الأبعاد محمول)	1
17	Trainee Chair كرسي متدرب	25
18	Instructor Chair كرسي مكتب	2
19	Instructor Desk مكتب	2
20	Laboratory Bench بنش معمل	4
21	Storage Cabinet دولاب تخزين	2

Hydraulics and water resources Lab

Item البند	Qty الكمية	Description and Specifications اسم الصنف والمواصفات
ملاحظات: المنشأ (أوروبي – أمريكي – ياباني – انتاج محلي). يجب ان تحقق الأجهزة والبند الحد الأدنى من المواصفات التالية:		
1	1	<p><u>Open Channel Flume 15 mt.</u> <u>قناة مائية مفتوحة بطول ١٥ مترًا</u></p> <p style="background-color: #f4a460; padding: 2px;">Should cover the following training contents (like or better than):</p> <p>Demonstrating the following:</p> <ul style="list-style-type: none"> • Uniform and non-uniform discharge • Flow formulae • Flow transition (hydraulic jump) • Energy dissipation (hydraulic jump, stilling basin) • Flow-measuring flumes • Local losses due to obstacles <p>Control Structures</p> <ul style="list-style-type: none"> • Sluice Gate <ul style="list-style-type: none"> ➤ Free discharge under a sluice gate. ➤ Submerged discharge under a sluice gate. <ul style="list-style-type: none"> ➤ Observation of jet contraction. ➤ Observation of downstream hydraulic jumps. • Radial Gate <ul style="list-style-type: none"> ➤ Free discharge under a radial gate. ➤ Submerged discharge under a radial gate. <ul style="list-style-type: none"> ➤ Observation of jet contraction. ➤ Observation of downstream hydraulic jumps. • Set of Plate Weirs, Four types <ul style="list-style-type: none"> ➤ Free and submerged over-fall at the sharp crested weir ➤ Effect of aeration on flow processes at plate weirs ➤ Together with a level gauge: <ul style="list-style-type: none"> ○ Plate weirs as measuring weirs: determination of the discharge coefficient; comparison of the measuring weirs (Cipolletti, Rhebok and Thomson) ○ Determination of the discharge

- Comparison of the theoretical and the
- Measured discharge
- Broad-Crested Weir
 - Free and submerged over-fall at the broad crested weir.
 - Effect of the weir edges on flow processes.
 - Sharp-edged contour.
 - Rounded contour.
 - Together with a level gauge:
 - Determination of the discharge coefficient.
 - Determination of the discharge.
 - Comparison of the theoretical and the measured discharge.
- Crump Weir
 - Free and submerged over-fall at the Crump weir
 - Observation of downstream hydraulics jumps
 - Discharge at a sill
 - Together with a level gauge:
 - Determination of the discharge
 - Comparison of the theoretical and the measured discharge
- Siphon Weir
 - The functioning of a siphon weir.
 - The flow rate of a siphon weir.
 - Comparison of pipe flow and free over-fall in a siphon weir.
- Rake
 - Behavior of open channel flow with reduced flow cross-section.
 - Subcritical discharge
 - Supercritical discharge
 - Determination of loss coefficients.
 - Effect of the bar profile
 - Effect of rake inclination
 - Determination of screen loss coefficients.
- Elements for Energy Dissipation
 - Comparison of the effect of different elements for energy dissipation such as: chute blocks, baffle blocks and end sills.

- Observation of the hydraulic jump with and without end sills respectively baffle blocks.

Change in Cross-Section

- Flume Bottom with Pebble Stones
 - Fundamentals of open channel flow: uniform and non-uniform discharge.
 - Effect of flume bottom roughness on flow behavior.
 - Flow formulae.
- Sill
 - Behavior of open channel flow at a reduction of flow cross-section.
- Culvert
 - Behavior of open channel flow at reduced flow cross-sections.
 - Free and submerged culvert inlet.
 - Culvert outlet with free or submerged discharge
 - Different shapes of culvert cross-section
 - Rectangular cross-section
 - Circular cross-section
- Set of Piers, Seven Profiles
 - Subcritical discharge with little or considerable reduction of cross-section.
 - Supercritical discharge with little or considerable reduction of cross-section.
 - Effect of the pier profile.
 - Backwater upstream of piers.
 - Flow transition at the pier.
 - Effect of angle of attack.

Flow-Measuring Flumes

- Venturi Flume
 - Discharge measurement in open channels.
- Parshall Flume
 - Discharge measurement in open channels.
- Trapezoidal Flume
 - Discharge measurement in open channels.

Other Experiments

- Vibrating Piles

- Vibration of a single pile.
 - Observation of a Karman vortex street
 - Effect of the rod diameter
 - Effect of additional masses

- Coupled vibrations between two piles.

- Wave Generator

- Observation of waves: different wave shapes
- Using the set of beaches module, study the absorption and reflection of wave forces at different beaches.
 - Using the set of piers, study the behavior of waves at piers

- Set of Beaches

- With the wave generator:
 - Wave run-up at an impermeable plain beach.
 - Wave run-up at an impermeable rough beach.
 - Wave run-up at a beach with permeable surface.
 - Effect of beach inclination.
 - Effect of depth of water.

- Sediment Trap

- Observation of bed-load transport along the flume bottom.
- Rolling and saltation bed-load transport.
- Formation and migration of ripples and dunes.
- Understanding of fluvial obstacle marks using the Slice gate module.

- Sediment Feeder

- Observation of bed-load transport along the flume bottom.
- Rolling and saltation bed-load transport
- Formation and migration of ripples and dunes
- Understanding of fluvial obstacle marks using the Slice gate module.

- Closed Sediment Circuit

- Observation of bed-load transport along the flume bottom.
- Rolling and saltation bed-load transport.
- Formation and migration of ripples and dunes.
- Understanding of fluvial obstacle marks using the Slice gate module.

Measuring instruments

- Level Gauge (**3 units**)

- Study the discharge depth for many experiments in open channel flow.

Minimum Technical Specifications Required (Like or better than):

- The trainer is a system that illustrates the basic principles of an Open- Channel flow.
- The trainer consists of five main units, an open channel flume, experimental modules, an operation and control panel, a remote-control unit with a touch screen and a PC unit.
- The open channel flume, the operation, control panel, the PC unit are connected to each other by electric and data acquisition cables.
- The open channel flume consists of reinforced glass sections fixed to a sturdy structure with a shaker plate.
- The open channel flume acts as a close water cycle as the open channel is supplied with water tanks as supply and drain tanks and a high - power pump.
- The open channel flume consists of sections of reinforced glass sides and stainless-steel base fixed to a sturdy metal structure with a shaker plate, two of the glass sections are service stations to supply water at steady flow and to drain water back to tanks.
- The tanks are made from stainless steel.
- Each section base of the flume has four pressure sensors and four manometers' connections. Each pressure sensor is coupled with a manometer connection. The couples are positioned at equal spaces along the section.
- Each section is also provided with holes to fix the experimental modules (weirs).
- The flume is supported on a right and a lift lifting jacks to incline the flume from 0° to 2.4° using their control panels.
- The whole trainer is operated electrically from the operation and control unit.
- The whole trainer can be controlled manually using the operation and control unit or via the software.
- The operation and control unit contains main circuit breakers of the system, safety circuit breakers for the electrical devices contained in the trainer.
- A software is installed to the remote-control unit to be easy for the trainees to move around the system to observe the flume and control the system at the same time.
- The PC unit demonstrates the process parameters in case of both manual control mode or software control mode.

Control Structures

منشآت التحكم

- Sluice Gate
 - This module is used to study the flow under a sluice gate.
 - The gate opening of the sluice gate and therefore the discharge under the gate can be manually adjusted with a handwheel.
 - The sluice gate has lateral sealing lips.
 - It also includes a scale to read the height of the gate opening.
- Radial Gate
 - This module is used to study the flow under a radial gate.
 - Height of the gate can be adjusted using a lever.

- The radial gate has lateral sealing lips.
- Set of Plate Weirs, Four types
 - This module is used to study the flow over sharp-crested weirs.
 - The module includes 4 sharp-crested weirs for the experimental flume.
 - It includes a rectangular weir with optional aeration as sharp-crested weir.
 - It also includes Thomson weir, Cipolletti weir and Rhebok weir as measuring weirs.
 - The weir height is identical for all weirs.
 - The plate weir to be studied is inserted in a frame.
 - The transparent frame with lateral sealing lips is mounted in the flume.
 - The weirs are made of stainless steel.
- Broad-Crested Weir
 - This module is used to study the flow over broad-crested weirs.
 - The weir has sharp edges.
 - The module includes 2 additional elements for rounded edges.
 - The weir body is hollow with sealing lips.
- Crump Weir
 - This module is a weir according to E.S. Crump.
 - The weir body contour is designed according to E.S. Crump.
 - The weir body includes sealing lips.
- Siphon Weir
 - This module represents a siphon weir with optional venting.
 - It is a siphon weir used for the experimental flume.
 - The weir body is made of reinforced acrylic.
 - The module includes a valve for venting the siphon weir.
 - The weir body is with sealing lips.
- Rake
 - This module is used to study the local losses at a rake.
 - The module includes three different bar profiles.
 - The bar inclination is adjustable.
 - The rake bar spacing can be changed by removing single bars.
 - The frame is transparent with sealing lips.
- Elements for Energy Dissipation
 - This module is used to study the energy dissipation downstream of an ogee-crested weir.
 - The elements for energy dissipation are used for the experimental flume.
 - It is used as an accessory for the Ogee crested weir with two weir outlets module.
 - All elements are made of PVC.
 - The elements include one chute block, two baffle blocks with five rectangular blocks, one baffle block with five triangular blocks, and two end sills with different height.
 - The base plate contains evenly spaced threaded holes.

Change in Cross-Section

منشآت تغيير المقطع العرضي

- Flume Bottom with Pebble Stones
 - This module is used to study the fundamentals of open channel flow.
 - The flume roughness is changed using this flume bottom.
 - The flume bottom contains pebble stones consisting of two elements.
- Sill
 - This module is used to study the reduction of the flow cross-section in a flume.
 - The sill is used for the main experimental flume.
 - The sill has sealing lips.
- Culvert
 - This module is used to study the full flow through culvert and partially filled culvert.
 - The culvert is used for the experimental flume.
 - The channel body is transparent and made from PMMA.
 - The channel body is hollow, fitted with a rectangular and a circular cross-section.
 - The module includes 2 covers to close the unused cross section.
 - The channel body has sealing lips.
 - The module also contains clamping device for mounting the Culvert into the experimental flume.
- Set of Piers, Seven Profiles
 - This module is used to study the lateral reduction of cross-section in the flume.
 - The piers are used with the experimental flume
 - These piers cause little or considerable reduction of cross-section caused by piers.
 - The pier profiles include rectangular, circular, square, rounded on one end, rounded on both ends, tapering profile on one end and tapering profile on both ends
 - There is a pier holder with clamping device for the mounting of piers into the experimental flume.
 - Up to three piers can be mounted at the same time on nine different positions
 - The pier holder contains angle scale to indicate the angle of attack.

Flow-Measuring Flumes

مجري قياس التصريف

- Venturi Flume
 - This module represents a typical flow measuring flume.
 - The venturi flume is used for the experimental flume.
 - The venturi flume consists of one base plate, two side elements, and one clamping device.
 - The side elements have sealing lips.

- Parshall Flume
 - This module represents a typical flow measuring flume
 - The Parshall flume is used for the experimental flume.
 - The Parshall flume consists of a profiled base plate, two side elements, and clamping device.
 - The Parshall flume has sealing lips.
- Trapezoidal Flume
 - This module represents a typical flow measuring flume.
 - The trapezoidal flume is used for the experimental flume.
 - The trapezoidal flume contains sealing lips.

Other Experiments

تجارب أخرى

- Vibrating Piles
 - This module is used to study the vibrations of a single pile or of two parallel piles in a flow.
 - The rods are used as vibrating piles for the experimental flume.
 - The module contains three single rods with different diameters.
 - The module includes a weight holder with weights as additional masses for the single rod to be studied.
 - Vibration of 2 parallel piles can be achieved by 2 identical rods with holding device and the distance of rods is adjustable.
 - When a single rod is studied, the holding device for parallel piles is fastened on the flume bottom.
- Wave Generator
 - This module is used for the generation of surface waves
 - The wave generator is used for the experimental flume.
 - The generation of surface waves is done by a paddle swinging back and forth.
 - The drive of the paddle is through a crank mechanism and motor with gear.
 - The crank mechanism stroke is adjustable.
 - The motor has variable speed through a frequency converter.
- Set of Beaches
 - In combination with the wave generator, the set of beaches is used to study the wave run-up at different beaches.
 - The beaches are used for the experimental flume. This module allows the study of the wave run-up at different beaches including impermeable plain beach, impermeable rough beach, and beach with permeable surface.
 - The simulation of differently ascending beaches can be done by adjusting the inclination of the beach body.
 - All components are made of corrosion resistant materials.
- Sediment Trap
 - This module represents a bed-load transport in open channels.
 - This module allows experiments on bedload transport in the experimental flume.

- The sediment trap is permanently mounted between the experimental section and the outlet element of the experimental flume.
- The sediment feed is manual using a bucket filled with sand.
- The sediment feeder is available as an option to provide even sediment feed using a vibrating conveyor.
- Sediment Feeder
 - This module represents sediment feed using a vibrating conveyor.
 - The unit is a sediment feeder for a sediment feed to the experimental flume.
 - It is used as an accessory for the sediment trap.
 - The module is mounted above the inlet of the experimental section of the experimental flume.
- Closed Sediment Circuit
 - This module considers the bed-load transport and consists of a sediment trap, a sediment feed and a pipe system.
 - The unit represents a bed-load transport with closed sediment circuit for the experimental flume.
 - The unit includes a screen basket that act as sediment trap, to be inserted into the water tank below the outlet element of experimental flume.
 - The unit also includes a pump with pipe system for transporting the water/sand mixture from the trap to the sediment feed.
 - The sediment feed is directly into the experimental section.
 - The height of sediment feed above the flume bottom can be varied.
 - The sediment is removed from the flume using screen on the second water tank.
 - The experimental flume can be extended with the closed sediment circuit at any time.
- Instrument Carrier
 - This carrier is to be placed on the rails of the experimental flume; it is moved along the entire experimental section.
 - The instrument carrier is intended as carrier for instruments such as the pitot static tube, or the level gauge.
 - Using the carrier, the used instrument can be moved to nearly every point of the flow.
 - The instrument carrier consists of a frame where the instrument can be fixed; this frame can be moved on rollers along the entire length of the experimental flume.
 - Transverse to the flow, the frame can slide along rails to any position.
 - The exact determination of the position of the used instrument is achieved with scales. The instrument carrier includes a scale with pointer transverse to the flow.
 - Parallel to the flow, a pointer of the carrier is used to indicate the position on the scale of the experimental flume.

- **Level Gauge**
 - The module represents an accessory for measuring water levels.
 - It is a device used for measuring discharge depths in the experimental flume.
 - It is used together with the instrument carrier module.
 - The measurement is done either with probe tip or hook.
 - It consists of a vertically travelling probe tip or hook.
 - It also includes a scale to indicate the discharge depth.
 - All components are made of corrosion resistant materials.
- **Flow Sensors with Digital Counter**
 - The wide dynamic flow range of 0.3 to 6 m/s (1 to 20 ft/s) allows the sensor to measure liquid flow rates in full pipes and can be used in low pressure systems.
 - The Model 515 sensors are offered in a variety of materials for a wide range of pipe sizes and insertion configurations.
- **Tube Manometers**
 - This module is used to display up to ten discharge depths along the experimental section simultaneously.
 - The holding device of the manometer is mounted directly at the experimental section of the experimental flume.
 - The holding device is fitted with screws and spirit level to compensate for the inclination of the experimental section.
 - The connection between the measuring points of the experimental section and tube manometers is done by a set of hoses.
- **Electronic Pressure Measurement, 10x 0...50 mbar**
 - It is used to display up to ten pressure heads simultaneously along the experimental section of the experimental flume in software.
 - The pressure sensors are connected to the measuring points of the experimental section.
 - The module includes a measuring amplifier with inputs for the flow rate sensor of the experimental flume and the pressure sensors.
 - The maximum distance between PC and switch box should be about 6m.
 - There is a storage system to house the components.

Other Accessories

- **System for Data Acquisition and Automation**
 - This system represents the automated operation and data acquisition of the experimental flume.
 - The system offers the automated operation and data acquisition of the experimental flume.
 - The adjustment of electrical inclination and displacement sensor are mounted on height adjustable support of experimental flume.
 - The maximum distance between PC and switch box should be about 6m.
 - The electrical connection of inclination adjustment is done with switch box of the experimental flume.

-

Technical Data:

- Flume length: 15m.
 - Flume dimensions W x D: 300 mm x 450 mm
 - Experimental unit
 - » It is divided into four section 2.5 m
 - each, with inlet section 2.5 m and
 - outlet section 2.5 m
 - Pump
 - » Flow rate: 132 m³/hr.
 - » Power consumption: 4,75kW
 - » Head: 30 m.
 - » Power: 20 Hp, with inverter of 20 HP.
 - Flow sensor:
 - » Flow sensor: paddle.
 - » Flow rate range: 0-100 m³/hr.
 - Wave generator:
 - » Power: ¾ Hp.
 - » Gear box: step down from 150 to 110
 - rpm.
 - » Inverter: 1 Hp.
- Tank: 1100L
Inclination Motor
 - » Motor power: 1,1kW
 - » Speed: 935min-1

Control Structures

- Set of Plate Weirs, Four types
 - Thomson weir: triangular weir opening
 - Rhebok weir: rectangular weir opening
 - Cipolletti weir: trapezoidal weir opening
- Crump Weir
 - Weir body
 - Made of reinforced acrylic
 - Inclination (upstream): 1:2
 - Inclination (downstream): 1:5
- Siphon Weir
 - Material: reinforced acrylic
- Rake
 - Number of removable bars: 15
 - Bar inclination: 40°...90°, graduation: 5°

Change in Cross-Section

- Flume Bottom with Pebble Stones
 - Inclination of inlet/outlet element: approx. 15°

- Culvert
 - Culvert cross-sections
- Set of Piers, Seven Profiles
 - Piers made of reinforced acrylic
 - Angle scale: $\pm 90^\circ$

Other Experiments

- Vibrating Piles
 - Single rods: 600mm long, made of PVC, Diameters = 8mm, 10mm and 12mm
 - Weights: 3× 100g and 1× 40g (holder)
 - Rods for vibration of 2 parallel piles: 2x D=8mm
- Wave Generator
 - Motor
 - Power output: ¾ Hp
 - Gear box: step down from 150 to 110 rpm.
 - Inverter: 1 Hp.
- Sediment Trap
 - Sediment trap made of stainless steel
- Sediment Feeder
 - Feed rate: 0,5m³/h
 - Feed frequency: 3600min⁻¹
 - Funnel content: 50L
- Closed Sediment Circuit
 - Pump
 - Power consumption: 1,1kW
 - Max. flow rate: 36m³/h
 - Max. head: 11m
 - Screen basket
 - Aperture size: 0,3mm (49mesh)
 - Capacity: approx. 120L

Measuring instruments

- Level Gauge
 - Scale measuring range: 0...630mm
 - Max. travel: 630mm
- Flow Sensors with Digital Counter
 - Operating Range:
 - 0.3 to 6 m/s
 - 1 to 20 ft/s
 - Pipe Size Range:
 - DN15 to DN900
 - ½ to 36 in.
 - Linearity:
 - $\pm 1\%$ of max. range @ 25 °C (77 °F)

		<ul style="list-style-type: none"> ➤ Repeatability: <ul style="list-style-type: none"> ○ $\pm 0.5\%$ of max. range @ 25 °C (77 °F) • Tube Manometers <ul style="list-style-type: none"> ➤ Measuring ranges: 0- 510 mm WC, graduation: 1mm. • Electronic Pressure Measurement, 10x 0...50 mbar <ul style="list-style-type: none"> ➤ Pressure: 10x 0 - 50mbar, corresponds to 0- 500 mm WC ➤ Flow rate: 1x 0...130m³/h
2	2	<p>Main Hydraulic Bench <u>منضدة هيدروليكية رئيسية</u></p> <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • The Main Hydraulic acts as the main unit for fluid mechanics experimental units. • The Unit is designed to supply the other experimental units with water in a closed circuit. • The Unit has a multi water outlet and designed to be matching with all fluid mechanics trainer. • The Educational Unit is designed to determine the volumetric flow rate during performing experiments. • The Unit's flow rate is adjustable with regulating value, and can be accurately measured by a calibrated stepped cylinder with using a stopwatch. • The closed water circuit consists of the underlying storage tank with a powerful submersible pump and the measuring tank arranged above, in which the returning water is collected. • The measuring tank is stepped, for larger and smaller volumetric flow rates. • A measuring cylinder flask is used for very small volumetric flow rates. • It has an on/off switch, a regulating valve to control the flow. <p>Technical Data</p> <ul style="list-style-type: none"> • Head: H = 10m <ul style="list-style-type: none"> ○ Pump type: submersible pump ○ Type of fluid: water ○ Flow: Q = 200 liter/min • Measuring tank <ul style="list-style-type: none"> ○ Large volumetric measuring tank= 40 L ○ Small volumetric measuring tank= 10 L • Level indicator: <ul style="list-style-type: none"> ○ Attached with measuring tank • Graduated Beaker Flask 3 Liter • Electrical supply: 230V, 50Hz • Valves <ul style="list-style-type: none"> ○ gate valve ○ Ball valve • Stopwatch 0 9h 59min 59 sec
3	2	<p>Bernoulli's Principle Demonstration Unit <u>جهاز توضيح قاعدة برنولي</u></p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> • Velocity Profile in the Venturi Nozzle • Pressure Distribution Venturi Nozzle • Determination of Flow Rate Factor <p>Minimum Technical Specifications Required (Like or better than):</p>

		<ul style="list-style-type: none"> • The demonstration unit is used to study the static pressures and total pressure distribution along with the venturi nozzle. • The experimental unit is positioned easily and securely on the work surface of the main hydraulic unit that acts as the supply of water to the unit. • The experiment was run based on Bernoulli's principle states that for an invincible flow, an increase in the speed of the fluid occurs simultaneously with a decrease in pressure or a decrease in fluid potential energy. • All pipes are transparent for clear investigation of the experiment for students. • The educational unit include venturi and movable pitot tube which is used to measure the total pressure. • The Pitot tube and Venturi are in an axial position and the position of measuring can be easily investigated with pitot tube inside the venturi with a clear transparency system. • The system includes a manometer with 6 tubes for displaying measuring points of static pressure & one for pitot tube which is used to measure the total pressure. <p><u>Technical Data</u></p> <ul style="list-style-type: none"> • Pitot tube <ul style="list-style-type: none"> ○ Distance movable range: 200 mm • Venturi nozzle <ul style="list-style-type: none"> ○ Transparent front panel (made of clear Acrylic and having convergent and divergent portions) ○ Throat diameter: 10 mm ○ inlet diameter: 25 mm ○ Inlet taper angle: 12 ○ Outlet taper angle : 3 ○ Six measuring points • Manometer <ul style="list-style-type: none"> ○ No.6 of them for static pressure 0 ... 370 mm wc ○ No.1 for total pressure 0 ... 370 mm wc • Valves <ul style="list-style-type: none"> ○ No.2 gate valves <p>Water supply from hydraulic base unit module</p>
4	1	<p><u>Losses in a Pipe System</u> <u>جهاز بيان الفواقد في نظام الأنابيب</u></p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> • Pipe flow with friction. • Coefficients of resistance for Pipe elbow • Coefficients of resistance for Cross-section change • Coefficients of resistance for Pipe branch • Coefficient of resistance for pipe fittings • Opening characteristics of shut-off devices • Volumetric flow measurement with nozzle/orifice • Volumetric flow measurement with Venturi tube <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • The educational unit contains six different pipe sections capable of being shut off individually. • The pipe sections are equipped with piping elements such as sudden contraction, sudden enlargement, Y-pieces, T-pieces, corners and bends. • In one pipe section, different shut-off devices and measuring objects are installed. • The unit is supplied with different measuring objects for determining the flow rate according to the differential pressure method. • The measuring objects are made of transparent material and provide excellent insight into the inner structure.

		<ul style="list-style-type: none"> The measuring objects include Venturi nozzle, orifice plate flow meter and measuring nozzle. The shut-off devices include angle seat valve and gate valve. The pressure measuring points in the piping system are designed as annular chambers. This creates a largely interference-free pressure measurement. The opening characteristic of the shut-off devices are also recorded. The pressures are measured with tube manometers. The experimental unit is positioned easily and securely on the work surface of the main hydraulic unit. The water is supplied and the flow rate measured by the main hydraulic unit. <p>Technical Data</p> <ul style="list-style-type: none"> Pipe section to hold fittings or measuring objects <ul style="list-style-type: none"> 25 x 1,8mm, PVC Pipe Sections <ul style="list-style-type: none"> Inside diameter: <ul style="list-style-type: none"> straight: d=25 x 1,8mm, length: 800mm, PVC sudden contraction: d=25x 1,8-16 x 1,5mm, PVC sudden enlargement: d=16 x 1,5-25 x 1,8mm, PVC with 2 x Y-piece 45° and 2 x T-piece with 2 x 90° elbow/bend: d=16 x 1,5mm, PVC and 2 x 45° elbow: d=16 x 1,5mm, PVC 2 x twin tube manometers: 0...1000 mmWC Measuring Ranges <p>Pressure: 0...0,1bar</p>
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5	1	<p>Orifice & Free Jet Flow جهاز التدفق خلال فوهة والجت الحر</p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> Investigation the path of the water jet at different outlet velocities Investigation the relation between level of the tank and velocity outlet of water flow Demonstrating the theoretical and actual outlet velocity Determination of contraction coefficient for different contours (rounded/square) and different dimension for each type <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> The Orifice and Free Jet Flow unit consists of a cylindrical tank with an orifice plate set into its side. An adjustable overflow pipe is adjacent to the head tank to allow changes in the water level. The unit also contains a graphical white-board attached to the backboard, and the rods should be adjusted to follow the trajectory of the water jet. The positions of the tops of the rods can be marked to plot the trajectory. The rods can be locked, using knobs on the Holder. Changeable Four orifice contours with 4 mm and 8 mm diameters and 4x4 and 8x8 square jets are provided. The experimental unit is positioned easily and securely on the work surface of the Main Hydraulic Unit that acts as the supply of water to the unit. <p>Technical Data</p> <ul style="list-style-type: none"> Transparent Tank <ul style="list-style-type: none"> Volume: approx.:13liter With adjustable over flow Dimension: D X L (160 X 160) mm Four Contours <ul style="list-style-type: none"> Rounded Counters No.1 Dia = 4 mm No.1 Dia = 8 mm
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		<ul style="list-style-type: none"> ○ Squared Contours ○ NO.1 LxW (4x4) mm ○ NO.1 LxW (8X8) mm ● Movable Rods <ul style="list-style-type: none"> ○ 9 movable rods ○ Length: 350 mm ● White Board Panel (Scaled Panel) <p>Hydraulic bench uses as water supply for the experimental trainer</p>
6	1	<p><u>Bed-Load Transport in River Training Simulator</u></p> <p>جهاز محاكاة نقل حمولة القاع في تجارب الأنهار والمجاري المائية</p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> ● Demonstration of bed-load transport in open channels ● Understanding how flow velocity affects bed-load transport ● Demonstration of ripple formation on the river bed ● observing the formation of meanders ● Demonstration of fluvial obstacle marks on structures » bridge pier with rectangular profile <ul style="list-style-type: none"> » Rounded-nosed bridge pier » Pointed-nosed bridge pier » Island (round or rectangular) ● Fixed, smooth bed flow ● Flow over a mobile sand bed ● Mechanics of sediment transport ● Depositionary features and facies ● Local scour ● Flow structures ● Bedform hysteresis ● Flow over a fixed, gravel bed <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> ● The unit is designed for the study of open-channel bed-load transport. ● The educational unit consists mainly of the stainless-steel experimental section, inlet element, outlet element, closed water circuit, 1 set of models. ● The closed water circuit include water tank, pump, and flow meter, the tank after the water drain contains a sediment trap with a filter element for sand. ● The flow meter is used to determine the discharge. ● The large dimensions of the experimental section enable the modelling of river courses with and without structure, the experimental section is supplied with grooves for plate weirs to achieve different flow conditions. ● The sediment is held in the experimental section by plate weirs at the inlet and at the outlet. ● In addition to bed-load transport in open channels without structures, some models can also be used to observe fluvial obstacle marks, namely scour

formation and siltation at structures.

- The models supplied with the unit are three bridge piers, two islands, set of deflection plates which are inserted into the experimental section, these models can be configured to make another model.
- The educational unit is supplied with a movable instrument carrier and a point gauge which allows profile measurement in the sediment along the bottom and the determination of the discharge depth at each point on the experimental section.
- The main components of the educational unit such as the experimental section, inlet and outlet element are made of stainless steel.
- The sand grains are 1-2 mm in diameter

Technical Data:

- Power consumption: 2,2kW
- Pump max. head: 11,5m
- Pump max. flow rate: 74m³/h
- Storage tank, content: approx. 1000L
- Flow meter measuring range: 80 m³/h

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Advanced Hydrological Systems Simulator

جهاز محاكاة متقدم للأنظمة الهيدرولوجية (يشمل جهاز كمبيوتر مكتبي)

Should cover the following training contents (like or better than):

- Transient processes demonstrating.
 - Effect of rainfall of varying duration on the discharge.
 - Storage capacity of a soil.
- Investigating steady processes.
 - Seepage flow.
 - Effects of wells on the groundwater level over time.
- Flow behavior of rivers, obstacles in the river bed, sediment transport in rivers.
- Construction of draw-down curves for one or two well systems in a sand bed
- Hydraulic gradients in ground water flow
- Formation of river features and development over time
- Sediment transport, bedload motion, scour and erosion

Minimum Technical Specifications Required (Like or better than):

- The trainer includes mainly reservoir that is filled with sand, made of stainless steel with inclination adjustment.
- The trainer contains a closed water circuit with storage reservoir and pump.
- The trainer provides a wide variety of experiments.
- The trainer is equipped with a precipitation device, which includes a timer to define the times of precipitation, which is consists of eight nozzles.

- The trainer allows water to flow in or out through two chambers on the sides.
- The reservoir is separated from the chambers by fine mesh screens, also it is provided with 19 measuring connections at the bottom to detect groundwater levels, which are displayed on 19 tube manometers.
- The trainer is supplied by two wells, to measure the lowering of groundwater.
- The trainer makes a path of a river by small weir in the supply and drain.
- Different water levels can be generated.
- Water supply and water drain can be opened and closed.
- The trainer can be equipped with three different models which make it easy to study the flow around obstacles and the resulting lee>s transport in the river bed.
- The trainer is equipped with three flow meters with different measuring ranges.
- The trainer includes a measuring reservoir at the drain which contains a measuring weir for determining the water level and a force sensor for determining the amount of sediment.
- The trainer includes a control panel with digital displays for the measured values.
- The unit is provided with an interactive software used for data acquisition and visualization which makes the experiments clear and enables fast execution of experiments with reliable results.
- The unit is provided with a USB socket for connection with PC through which the measured values are transmitted to the software.
- The sand grains are must be 1 to 2 mm in diameter (not included)
- The training system can be inclined using hydraulic jack which can be operated through a mounted motor. The system is also supplied with Up/Down button to lift the system either up or down.
- The hydraulic jack is supplied with two limit switches to provide safety for the channel by preventing it from going up or down over a certain value.
- The system is also supplied with blocks which are located on the main frame plate to provide further safety during channel movement in case of hydraulic jack break down

Technical Data:

- Experiment reservoir
 - » Inclination adjustment: -1~5%
 - » Max. sand filling: 0,3 m3
- Precipitation device
 - » 8 nozzles.
 - » Flow rate: 1- 4.7 L/min

Pump

		<p>» Power consumption: 0,55 kW</p> <p>» Max. flow rate: 1500 L/h</p> <ul style="list-style-type: none"> • Storage tank, stainless steel: 220L • Pressure range: 0-300 mmWC <p>Flow rate ranges</p> <p>» 0-1050L/h, 0-320L/h (water supply)</p> <p>» 0-1000L/h (water drain)</p> <ul style="list-style-type: none"> • Sediment mass: 0-5000 g
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8	1	<p><u>Seepage-Streams Investigations Equipment</u></p> <p>جهاز محاكاة متقدم للأنظمة الهيدرولوجية (يشمل جهاز كمبيوتر مكتبي)</p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> • Determining flow nets in permeable media graphically. • Understanding of seepage under a sheet pile. • Understanding of seepage through an earth dam. • Understanding of drainage at an open ditch. • Determining the pressure curve at a foundation. • Determining the pressure curve at a retaining wall. • Groundwater levels over time in various models. • Control of seepage through permeable soils by sub-soil drainage. • Distribution of uplift pressure on hydraulic structures. • Reducing uplift pressure and lateral thrust by drainage. • Formation and behavior of ‘Quicksand’. • Stability of an earth dam. • Draining an excavation site using wells. <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • The educational unit can be used to visualize streamlines in seepage and groundwater flow on different models using a different medium. • The unit also helps in studying the effects of water pressure on different structures Where they are displayed as pressure curves. • The trainer consists of a transparent tank filled with sand where various models can be placed in the sand bed to demonstrate typical structures. • The unit also contains a closed water circuit with storage tank and pump. • Adjustable overflows are provided close to each end of the tank so that constant water levels may be maintained in each half of the tank.
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		<ul style="list-style-type: none"> • The unit allows the separation between the experimental section and the feed and discharge chambers by fine mesh screens. • The water supply is adjusted by a valve, and a contrast medium to make the streamlines visible, as they occur in seepage and groundwater flow. • The unit is distinguished by its glass viewing window which allows optimal observation of the experiments. • The educational unit is supplied with various models such as: sheet pile, retaining wall and foundation, these models allow an extensive range • of experiments, such as pressure distribution on retaining walls or seepage and groundwater flow under sheet piles. • The “foundation” and “retaining wall” models are provided with tubes to show the pressures on the models. • In the experimental section, there are measuring connections to detect groundwater levels, where the groundwater levels are displayed on 14 tube manometers. <p>Technical Data:</p> <ul style="list-style-type: none"> • Pump max. flow rate: 4m³/h • Pump max. head: 4m • Tank for contrast medium: 0,5L • Storage tank, stainless steel: 96L
9	1	<p><u>Cake & Depth Filtration Trainer</u></p> <p style="text-align: right;"><u>جهاز التدريب على الترشيح الطبقي والاعمق</u></p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> • Demonstrating of principles of filtration: Darcy’s equation • Performing depth filtration with different bulk solids and suspensions • Performing cake filtration with different suspensions • Identification of characteristic filtration values <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • The training kit is made of light-weight metal chassis which accommodate different components of the system. • Two tube manometers are provided to measure the pressure loss in the filter. • Suspension flow from the laboratory hopper at the top down to the filter and passes through the filter medium. • In cake filtration, the filter medium provides the foundation for build-up of the filter cake. • In depth filtration, the filter medium supports the bulk solids (filter medium layer; gravel). • Filter at the bottom center with sintered filter medium on its bottom to capture the particles • Filter chamber contains (diatomite + sand)

		<ul style="list-style-type: none"> • Ultraviolet printed drawing to illustrate different filtration methods. • A stop watch is provided to calculate time
10	1	<p><u>Demonstration for the Effect of Precipitation</u></p> <p><u>جهاز توضيح تأثير التساقط والمطر</u></p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> • Effect of precipitation of varying duration or intensity on soils with different saturation. • Hydrographs recording after precipitation. • Storage capacity of soils with different saturation. • Compare the natural drainage with the drainage via drainage pipe. • Influence of rainwater retention basin on the hydrograph <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • The trainer is a tool of representation of hydrological data such as precipitation, groundwater levels or discharges. • The trainer includes a tank with a sand filling, which is flowed through by water. • The water is supplied to the tank via a precipitation device with two nozzles that can be adjusted separately via valves. • The water is drained either via a drainage pipe or a drain chamber, which is separated from the experimental section by a screen. • The draining water is distributed over 17 transparent chambers. • A profile over time of the water drain is created. • The water levels are measured and plotted in a hydrograph. • Drip pans can be used to demonstrate the lag of the drainage through rainwater retention basins. • The water supply is controlled by a valve and read on a flow meter. • The timed discharges are adjusted via electronic timers.
11	1	<p><u>Sedimentation Tanks Trainer</u></p> <p><u>جهاز تدريب على أحواض الترسيب</u></p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> • Determine the hydraulic loading rate. • Influence of the following parameters on the separation process: • Concentration of solids • Flow rate • Flow velocity in the inlet • Water level in the sedimentation tank • Investigation of the flow conditions. • Demonstration on how lamellas affect the sedimentation process. <p>Minimum Technical Specifications Required (Like or better than):</p>

		<ul style="list-style-type: none"> • A concentrated suspension is prepared in a tank, comprising water and the solid to be separated. • A pump transports the concentrated suspension to the sedimentation tank. • Upstream of the sedimentation tank the suspension is mixed with fresh water. • The raw water generated in this way flows into the sedimentation tank via an inlet weir. • A stirring machine is located upstream of the inlet weir. • The treated water first flows under a baffle and then over a weir to the outlet. • The height of the weir on the outlet side is adjustable and allows the water level in the sedimentation tank to be changed. • The water level above the inlet weir can also be adjusted. This affects the flow velocity over the inlet weir. • A lamella unit can be inserted into the experimental section. This makes it possible to study how lamellas affect the separation process. • The flow rates of the concentrated suspension and the fresh water are adjusted via valves. So, the mixing ratio, and the concentration of solids in the inlet to the sedimentation tank, can be adjusted. • An electromagnetic flow rate sensor measures the flow rate in the inlet of the sedimentation tank. • Flow rate and speed of the stirring machine are displayed digitally. • The sedimentation tank is equipped with lighting to better observe the flow conditions.
12	1	<p><u>Groundwater Flow Trainer</u></p> <p>جهاز تدريب على سريان المياه الجوفية</p> <p>Should cover the following training contents (like or better than):</p> <ul style="list-style-type: none"> • Determining the groundwater level. • Lowering of groundwater level via two wells. • Groundwater flow on excavation pits. • Groundwater studies under concentric load on the substrate. <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • The water is supplied to the tank via two horizontal open-seam tubes that can be activated separately via valves. • This results in various experiment possibilities with flowing groundwater. • The investigation of various extractions is facilitated by two wells with open-seam tubes, which are also activated individually via valves. • Three different models allow the study of excavation pits. • At the bottom of the tank there are orthogonally arranged measuring connections to detect groundwater levels. • Groundwater levels are displayed on 19 tube manometers.
13	1	<p><u>Hydrology Virtual Lab. Software</u></p>

Minimum Technical Specifications Required (Like or better than):

- Provide digitally replicated versions of educational training systems' physical hardware Hydrology Virtual Lab.
- The software is an exact replica of the actual trainer, allowing each student to use the system independently, conduct experiments, keep track and monitor the system's behavior in correspondence to each step performed.
- The software allows each user to create an account with his or her personal information, which he or she is required to use later to log in and access their account in order to resume their previous work.
- The "Settings" icon on the Home Page allows the user to switch between the Arabic and English Languages.
- Users can also view their progress in each laboratory, which is displayed in percentages by expanding the arrow shown on the Home Page.
- Each Virtual Lab includes several experiments as well as an introduction, illustrative view and explanation of the system's components, parts, measuring devices, modules, and panels.
- Each experiment contains a variety of simple easy-to-use features that allow students to have a hands-on, comprehensive experience that ensures full understanding of the required educational content.
- The features include a fully dissected view of the actual training system, which users can display by simply clicking on any module, switch, or panel to zoom in on the item and display its name, function, and any other related information.
- User can display educational and training instructions using features such as: The "Intro" icon that displays the objectives of the experiments, the "Experiment" icon which walks the students through the experiment step by step, and the "Explain" icon which displays related scientific/mathematical formulas, Laws, Theories, Fundamentals, and Working Principles of the educational system.
- The software allows the user to replay the experiments while using the system at any time or starting their own customized experiments
- Experiments include Explanation Videos, which show complete instructional operation guidance accompanied by a clear voiceover A Software Monitor Panel allows monitoring, analyzing, recording, and charting of the system's

		<p>parameters in the Virtual Laboratory of educational systems that include software interfacing.</p> <ul style="list-style-type: none"> • The "Software Monitor" feature is divided into two sections: the "System" section, which displays the readings of various sensors and gauges, and the "Chart" section, which displays the points table and plot graphs. • The user can print the answer sheet to fill out with their notes and system readings, and they can also save the points table, plotted graph, and screenshot of the system readings in the "System" section. They are all saved in pdf format for easy printing. • 3D Virtual Labs provides security and safety guidelines for the use of the laboratory in reality with the advantage that the virtual lab is not subject to damage with any wrong use and the pleasure of re-experimenting when making any wrong step during the experiment.
14	8	<p><u>PC Core i7 / 16GB RAM / SSD512/HDD 1T/19" LED Monitor / mouse / keyboard (DELL/HP).</u> <u>كمبيوتر مكتبي بمعالج Core i7 وذاكرة ١٦ جيجابايت وقرص SSD بسعة ٥١٢ جيجابايت وقرص HDD بسعة ١ تيرابايت، وشاشة LED مقاس ١٩ بوصة وفأرة ولوحة مفاتيح (من نوع DELL أو HP)</u></p>
15	2	<p><u>Interactive board 65 inch</u> <u>شاشة تفاعلية مقاس ٦٥ بوصة</u></p>
16	1	<p><u>Electromagnetic Current meter (3D)</u> <u>(Portable 3-dimentional electromagnetic current meter)</u> <u>جهاز قياس السرعة (كهرومغناطيسي ثلاثي الأبعاد محمول)</u> Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • Flow rate measurement of Micro flow speed to High flow speed of X,Y, Z components are possible and can be obtained flow direction. • Simple measurement of direct reading of Display. Data storage measurement of keep the device depth or distance with the flow speed data. Continuous measuring method of real time transfer to the P.C. • Store the flow rate data with distance or time to the Memory. Easy to processing by P.C • Able to use extra Detector in case of occur truble. (Compatibility of Detector) • High accurate measurement is always by adjust most suitable sensitivity automatically according to the flow speed.

		<ul style="list-style-type: none"> ● Process the bulk sampling data to average calculation accurately by computer. ● Directionality: 2 axis 4 bearings ● Measuring range: 0 to ± 2m/s ● Accuracy: <ul style="list-style-type: none"> ○ to ± 0.5m/s : ± 0.01m/s ○ ± 0.5m/s to ± 1 m/s : ± 0.02m/s ○ ± 1 m/s to ± 2 m/s : ± 0.04m/s ● Noise: within ± 0.005m/s (Flow velocity converted value at static water.) ● Average time: 1,5,10,20,40,60,sec. ● Display: LCD 20 characters ● Recording capacity : Approx. 20,000. data ● Calendar : Built-in calendar and watch ● Output : RS-232C ● Auto power save : Without operate the key for 3 min. ● Operating Temp. & Humidity : 0 to 40°C & 20 to 80%HR No be dewy.H ● Power source: AC adaptor AC100V to 240V ● Battery life: Approx.14 hrs. (Continuous operating time) Approx.10 hrs. (full charged time) ● Dimensions(W×H×D) & Weight: Approx.215×75×100 IP65 Approx. 1.3kg
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17	25	<p><u>Trainee Chair</u></p> <p style="text-align: right;">کرسی متدرب</p> <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> ● They often feature adjustable seat height and backrest, allowing trainees to customize the chair to their preferred position and maintain good posture. ● Trainee chairs are equipped with cushioned padding on the seat to provide a comfortable seating experience. ● The padding is typically made from high- quality foam or other supportive materials that offer adequate cushioning without compromising durability. ● Trainee chairs are built to withstand regular use and provide long-lasting performance. They are constructed from durable materials such as metal or high-quality plastic, ensuring stability and reliability even during frequent movement or adjustments. ● Some trainee chairs feature lightweight designs and built-in handles, making them easy to move and rearrange in the classroom or training space. ● This mobility allows trainees to adapt their seating arrangement as needed for
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		<p>group activities or discussions.</p> <ul style="list-style-type: none"> • Trainee chairs are designed for easy cleaning and maintenance. • The materials used are often resistant to stains and spills, allowing for quick and hassle-free cleanup. • Trainee chairs prioritize comfort, functionality, and durability to support trainees' learning experience. • By providing ergonomic support and convenient features, these chairs contribute to a conducive and productive environment for trainees to engage in their educational or training activities.
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18	2	<p><u>Instructor Chair</u> <u>كرسى مكتب</u></p> <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • An instructor chair prioritizes comfort, mobility, and functionality to support instructors in delivering effective and engaging lessons. • They often feature adjustable seat height and backrest, allowing trainees to customize the chair to their preferred position and maintain good posture. • Instructor chairs are equipped with cushioned padding on the seat to provide a comfortable seating experience. • Instructor chairs typically have a swivel base, allowing the instructor to easily rotate and reach different areas of the classroom or training space without straining. • Smooth-rolling casters are commonly incorporated to enable effortless movement across the floor. • These chairs often come with additional adjustable features to cater to individual preferences. • This may include lumbar support, seat depth adjustment, and tilt mechanism, allowing the instructor to find the most comfortable sitting position. • Instructor chairs are built to withstand frequent use and movement. • They are constructed from high-quality materials such as sturdy frames, durable upholstery, and robust mechanisms to ensure long-lasting performance. • Instructor chairs have a professional and sleek appearance to complement the overall classroom or training environment. • Instructor chairs are designed for easy cleaning and maintenance. The materials used are often resistant to stains and spills, allowing for quick and hassle-free cleanup.
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19	2	<p><u>Instructor Desk</u> <u>مكتب</u></p> <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • An L-shaped instructor table offers a spacious, organized, and ergonomic workspace for instructors to conduct their teaching activities. • The table is designed in an L-shape, with two connected segments forming a right angle. • This design provides a spacious and versatile workspace, allowing instructors to have separate areas for different tasks such as computer work, writing, and organizing teaching materials. • The one segment of the L-shape can accommodate a computer or laptop, while another segment provides space for writing and other activities. • This ample surface area allows instructors to organize their materials, place teaching aids, and have multiple tasks within easy reach. • The table is designed with ergonomics in mind to promote comfort and
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		<p>productivity.</p> <ul style="list-style-type: none"> • L-shaped instructor tables incorporate built-in storage options to help keep the workspace organized. • This includes drawers, and cabinets located both segments of the table. • These storage compartments provide convenient spaces for storing teaching materials, documents, stationery, and other essentials. • To support a clean and organized workspace, L-shaped instructor tables include cable management features. • These include built-in cable trays, grommets, and wire management systems that allow instructors to route and hide cables, reducing clutter and tangling. • Instructor tables are constructed from sturdy materials of combination of both wood and metal. • This ensures durability and stability, allowing the table to withstand the demands of regular use in educational or training environments. • L-shaped instructor tables are designed to have a professional and visually appealing appearance. • They are available in various styles, finishes, and color options to complement different classroom or training room aesthetics.
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20	4	<p><u>Laboratory Bench</u></p> <p style="text-align: right;"><u>بنش معمل</u></p> <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • A rectangular laboratory table is a versatile and durable furniture piece designed for laboratory environments. • It provides a sturdy and functional workspace for conducting experiments, research, or other scientific activities. • The laboratory table is primarily constructed using a combination of wood and metal. • The tabletop is made of solid wood, providing a durable and stable surface for laboratory work. • The frame and legs of the table are made of metal, such as steel or aluminum, ensuring strength and stability. • The table features a rectangular shape, offering a spacious and efficient workspace for laboratory tasks. • The straight edges of the table allow for easy arrangement of equipment, tools, and materials. • The combination of wood and metal construction ensures the table's sturdiness and durability, capable of withstanding the demands of laboratory work. • The solid wood tabletop provides resistance to chemicals, spills, and scratches, while the metal frame and legs offer robust support and stability. • The rectangular laboratory table is designed with functionality in mind. • It provides a flat and level surface for performing experiments, setting up equipment, and conducting measurements. • The absence of additional components or features allows for versatility and customization based on specific laboratory requirements. • The spacious tabletop allows for the placement of a lab trainer. • The trainer can utilize the table as a workspace to demonstrate experiments, explain concepts, and guide students during practical sessions. • The sturdy construction of the table ensures stability and support for the trainer's activities. • The materials used in the construction of the table are easy to clean and maintain. • The solid wood tabletop can be wiped clean with appropriate laboratory cleaning agents, while the metal frame and legs are resistant to corrosion and
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		<p>can be easily wiped down.</p> <ul style="list-style-type: none"> • The combination of wood and metal construction provide a visually appealing aesthetic to the laboratory environment. • The natural beauty of wood and the sleekness of metal create a professional and functional appearance
21	2	<p><u>Storage Cabinet</u></p> <p style="text-align: right;">دولاب تخزين</p> <p>Minimum Technical Specifications Required (Like or better than):</p> <ul style="list-style-type: none"> • A storage cabinet for a lab with two doors is a functional and efficient furniture piece designed to provide ample storage space for laboratory equipment, supplies, and materials. • The storage cabinet has a rectangular shape with two hinged doors at the front. • The cabinet is constructed from durable materials of metal to ensure stability and longevity. • The double-door design enables easy organization and retrieval of materials, as it provides a wide opening to the cabinet's interior. • The cabinet is equipped with shelves, offering multiple levels of storage space. • These shelves provide a convenient way to categorize and organize laboratory items. • Users can adjust the height of the shelves according to their requirements, allowing for customization and flexibility in storing various sizes of equipment or supplies. • The cabinet's shelves provide generous storage capacity, accommodating a wide range of laboratory items. • Depending on the size and design of the cabinet, each shelf can typically hold significant weight and size. • This allows for efficient storage of chemicals, glassware, instruments, samples, or other lab essentials. • With multiple shelves, users can allocate different sections for specific types of equipment or materials, making it easier to locate and retrieve items as needed. • Lab personnel can maintain a neat and tidy workspace by storing items securely within the cabinet. • The cabinet's two doors can be equipped with locks to enhance security. • This feature allows for the protection of sensitive or hazardous materials, ensuring they are securely stored and limiting access to authorized personnel only. • The storage cabinet is designed to blend seamlessly with the lab environment. • It may feature a clean and professional appearance, with finishes that are resistant to chemicals or stains, ensuring longevity and easy maintenance. • The storage cabinet's compact footprint helps optimize the use of space in the laboratory. • It can be placed against a wall, in a corner, or integrated into a lab workstation, maximizing the available floor area and contributing to an efficient workflow.

ثانياً: الأجهزة المطلوبة لمعمل الهندسة الصحية

Contents

No.	Description	Qty.
1	High Performance Liquid Chromatograph (HPLC) جهاز الكروماتوغرافيا السائلة عالية الأداء	1
2	Laboratory-grade refrigerator for sample preservation ثلاجة مختبرية لحفظ العينات	١
3	Laboratory vertical drawer-type deep freezer مجمّد عميق رأسي بأدراج للمختبر	١
4	Atomic Absorption Spectrophotometer جهاز قياس الطيف بالامتصاص الذري	1
5	Total Organic Carbon Analyzer جهاز تحليل الكربون العضوي الكلي	1
6	Total Nitrogen Analyzer جهاز تحليل النيتروجين الكلي	1
7	Ion Chromatography System (ICS) جهاز الكروماتوغرافيا الأيونية	1
8	UV-Vis Spectrophotometer جهاز قياس الطيف الضوئي	1
9	Jar testing Apparatus – Flocculator جهاز اختبار الترسيب/الجرة	1
10	Water Distillation Unit وحدة تقطير المياه	1
11	Bacteriology Microscope المجهر البكتريولوجي	1
12	Ceramic Muffle Furnace فرن كهربائي عازل (للاحتراق)	1
13	Digital Bacteriological & Mold Incubator حاضنة رقمية للبكتيريا والفطريات	1
14	Automatic Kjeldahl Nitrogen Analyzer جهاز تحليل نيتروجين كجلدال أوتوماتيكي	1
15	Desiccator مبرد زجاجي	1
16	Peristaltic Pump مضخة تمعجية / انبوية	2
17	Submersible Water Pump مضخة مياه غاطسة	1
18	Digital Hot-plate magnetic stirrer سخان مغناطيسي رقمي مع محرك تقليب	2
19	Multi-rotor & Multi-speed Microtube Centrifuge جهاز طرد مركزي لأنابيب الميكرو متعددة السرعات والرؤوس	1
20	Mini centrifuge for microtubes جهاز طرد مركزي صغير لأنابيب الميكرو	1

21	Classic 7 Orbital Digital Shaker	هزاز مداري رقمي	1
22	Rotator shaker Digital 9 Discs	هزاز دوار رقمي بتسع أقراص	1
23	Chemical Oxygen Demand (COD) analyzer	جهاز تحليل كمية الأوكسجين الكيميائي	1
24	Octagonal PTFE Magnetic Stir Bars (Box of 24)	قضبان تحريك مغناطيسية مثمثة الشكل من التيفلون (علبة ٢٤ قطعة)	2
25	Safety Goggles	نظارات واقية	5
26	Face shields	دروع واقية للوجه	5
27	Silicone Protector Hand Gloves	قفازات حماية من السيليكون	5
28	500ml Filtration Porcelain Buchner Kit Ceramic Suction Funnel Handle Vacuum Pump	طقم ترشيح خزفي مع قمع بوخنر بيد ومضخة تفريغ (٥٠٠ مل)	1
29	30ml Glass Filter Crucible, Sintered Disc	بوتقة ترشيح زجاجية بسعة ٣٠ مل بقرص مسامي	1
30	Benchtop pH Meter	جهاز قياس الأس الهيدروجيني المكتبي	1
31	Benchtop Dissolved Oxygen (DO) Meter	جهاز قياس الأوكسجين المذاب المكتبي	1
32	Glass Cuvette (1 mm Light Path)	كؤيبة زجاجية بمسار ضوئي ١ مم	2
33	1	Laboratory Bottle-Top Dispenser (0.5-5 ml) موزع سوائل مختبري يُركب على الزجاج (٥-٠,٥ مل)	2
	2	Laboratory Bottle-Top Dispenser (1-10 ml) موزع سوائل مختبري يُركب على الزجاج (١-١٠ مل)	2
	3	Laboratory Bottle-Top Dispenser (2.5-25 ml) موزع سوائل مختبري يُركب على الزجاج (٢,٥-٢٥ مل)	2
	4	Laboratory Bottle-Top Dispenser (5-50 ml) موزع سوائل مختبري يُركب على الزجاج (٥-٥٠ مل)	2
34	1	Single Channel Variable Volume Pipette, (500-10,000 µl) ماصة مفردة القناة ذات حجم متغير (١٠,٠٠٠-٥٠٠ ميكرو لتر)	1
	2	Single Channel Variable Volume Pipette, (500-5,000 µl) ماصة مفردة القناة ذات حجم متغير (٥,٠٠٠-٥٠٠ ميكرو لتر)	1
	3	Single Channel Variable Volume Pipette, (100-1,000 µl) ماصة مفردة القناة ذات حجم متغير (١,٠٠٠-١٠٠ ميكرو لتر)	1
	4	Single Channel Variable Volume Pipette, (20-200 µl) ماصة مفردة القناة ذات حجم متغير (٢٠٠-٢٠ ميكرو لتر)	1
	5	Single Channel Variable Volume Pipette, (10-100 µl) ماصة مفردة القناة ذات حجم متغير (١٠٠-١٠ ميكرو لتر)	1
	6	Single Channel Variable Volume Pipette, (5-50 µl) ماصة مفردة القناة ذات حجم متغير (٥٠-٥ ميكرو لتر)	1
	7	Single Channel Variable Volume Pipette, (2-20 µl) ماصة مفردة القناة ذات حجم متغير (٢٠-٢ ميكرو لتر)	1
	8	Single Channel Variable Volume Pipette, (0.5-10 µl) ماصة مفردة القناة ذات حجم متغير (١٠-٠,٥ ميكرو لتر)	1
	9	Single Channel Variable Volume Pipette, (0.1-2.5 µl) ماصة مفردة القناة ذات حجم متغير (٢,٥-٠,١ ميكرو لتر)	1

35	1	Single Channel Fixed Volume Pipette, 1,000 μ l ماصة مفردة القناة ذات حجم ثابت (١,٠٠٠ ميكرو لتر)	1
	2	Single Channel Fixed Volume Pipette, 500 μ l ماصة مفردة القناة ذات حجم ثابت (٥٠٠ ميكرو لتر)	1
	3	Single Channel Fixed Volume Pipette, 200 μ l ماصة مفردة القناة ذات حجم ثابت (٢٠٠ ميكرو لتر)	1
	4	Single Channel Fixed Volume Pipette, 100 μ l ماصة مفردة القناة ذات حجم ثابت (١٠٠ ميكرو لتر)	1
	5	Single Channel Fixed Volume Pipette, 50 μ l ماصة مفردة القناة ذات حجم ثابت (٥٠ ميكرو لتر)	1
	6	Single Channel Fixed Volume Pipette, 25 μ l ماصة مفردة القناة ذات حجم ثابت (٢٥ ميكرو لتر)	1
	7	Single Channel Fixed Volume Pipette, 20 μ l ماصة مفردة القناة ذات حجم ثابت (٢٠ ميكرو لتر)	1
	8	Single Channel Fixed Volume Pipette, 10 μ l ماصة مفردة القناة ذات حجم ثابت (١٠ ميكرو لتر)	1
36	1	Universal Pipette Tips 10,000 μ l - Bag of 250 units رؤوس ماصات ١٠,٠٠٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
	2	Universal Pipette Tips 5,000 μ l - Bag of 250 units رؤوس ماصات عالمية ٥,٠٠٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
	3	Universal Pipette Tips 1,000 μ l - Bag of 250 units رؤوس ماصات عالمية ١,٠٠٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
	4	Universal Pipette Tips 500 μ l - Bag of 250 units رؤوس ماصات عالمية ٥٠٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
	5	Universal Pipette Tips 200 μ l - Bag of 250 units رؤوس ماصات عالمية ٢٠٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
	6	Universal Pipette Tips 100 μ l - Bag of 250 units رؤوس ماصات عالمية ١٠٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
	7	Universal Pipette Tips 50 μ l - Bag of 250 units رؤوس ماصات عالمية ٥٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
	8	Universal Pipette Tips 25 μ l - Bag of 250 units رؤوس ماصات عالمية ٢٥ ميكرو لتر - كيس ٢٥٠ قطعة	2
	9	Universal Pipette Tips 10 μ l - Bag of 250 units رؤوس ماصات عالمية ١٠ ميكرو لتر - كيس ٢٥٠ قطعة	2
37	Imhoff Cone for Sedimentation with Closed Tip (1,000 ml) مخروط إيمهوف للترسيب بقاعدة مغلقة (١,٠٠٠ مل)	1	
38	Imhoff Cone for Sedimentation with Glass Stopcock (1,000 ml) مخروط إيمهوف للترسيب بصنوبر زجاجي (١,٠٠٠ مل)	1	
39	1	Volumetric Flask with Stopper, class A, (1,000 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (١,٠٠٠ مل)	5
	2	Volumetric Flask with Stopper, class A, (500 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (٥٠٠ مل)	5
	3	Volumetric Flask with Stopper, class A, (250 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (٢٥٠ مل)	5
	4	Volumetric Flask with Stopper, class A, (200 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (٢٠٠ مل)	5
	5	Volumetric Flask with Stopper, class A, (100 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (١٠٠ مل)	5
	6	Volumetric Flask with Stopper, class A, (50 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (٥٠ مل)	5

	7	Volumetric Flask with Stopper, class A, (25 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (٢٥) مل	5
	8	Volumetric Flask with Stopper, class A, (20 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (٢٠) مل	5
	9	Volumetric Flask with Stopper, class A, (10 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (١٠) مل	5
	10	Volumetric Flask with Stopper, class A, (5 ml) دورق حجمي زجاجي بسدادة زجاجية من الفئة أ (٥) مل	5
40	1	Glass Graduated Cylinder – Class A, (5,000 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (٥,٠٠٠) مل	2
	2	Glass Graduated Cylinder – Class A, (2,000 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (٢,٠٠٠) مل	2
	3	Glass Graduated Cylinder – Class A, (1,000 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (١,٠٠٠) مل	5
	4	Glass Graduated Cylinder – Class A, (500 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (٥٠٠) مل	5
	5	Glass Graduated Cylinder – Class A, (250 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (٢٥٠) مل	5
	6	Glass Graduated Cylinder – Class A, (100 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (١٠٠) مل	5
	7	Glass Graduated Cylinder – Class A, (50 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (٥٠) مل	5
	8	Glass Graduated Cylinder – Class A, (25 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (٢٥) مل	5
	9	Glass Graduated Cylinder – Class A, (20 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (٢٠) مل	5
	10	Glass Graduated Cylinder – Class A, (10 ml) أسطوانة مدرّجة زجاجية - فئة (أ) – (١٠) مل	5
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41	1	Tall Form Glass Beaker, (5,000 ml) بيكر زجاجي طويل الشكل – (٥,٠٠٠) مل	2
	2	Tall Form Glass Beaker, (2,000 ml) بيكر زجاجي طويل الشكل – (٢,٠٠٠) مل	2
	3	Tall Form Glass Beaker, (1,000 ml) بيكر زجاجي طويل الشكل – (١,٠٠٠) مل	5
	4	Tall Form Glass Beaker, (600 ml) بيكر زجاجي طويل الشكل – (٦٠٠) مل	5
	5	Tall Form Glass Beaker, (400 ml) بيكر زجاجي طويل الشكل – (٤٠٠) مل	5
	6	Tall Form Glass Beaker, (250 ml) بيكر زجاجي طويل الشكل – (٢٥٠) مل	5
	7	Tall Form Glass Beaker, (200 ml) بيكر زجاجي طويل الشكل – (٢٠٠) مل	5
	8	Tall Form Glass Beaker, (150 ml) بيكر زجاجي طويل الشكل – (١٥٠) مل	5
	9	Tall Form Glass Beaker, (100 ml) بيكر زجاجي طويل الشكل – (١٠٠) مل	5
	10	Tall Form Glass Beaker, (50 ml) بيكر زجاجي طويل الشكل – (٥٠) مل	5

	11	Tall Form Glass Beaker, (25 ml)	بيكر زجاجي طويل الشكل – (٢٥) مل	5
	12	Tall Form Glass Beaker, (20 ml)	بيكر زجاجي طويل الشكل – (٢٠) مل	5
	13	Tall Form Glass Beaker, (10 ml)	بيكر زجاجي طويل الشكل – (١٠) مل	5
42	1	Clear Graduated Bottle ISO GL45, (10,000 ml)	زجاجة زجاجية شفافة مدرجة ISO GL45 (١٠,٠٠٠ مل)	2
	2	Clear Graduated Bottle ISO GL45, (5,000 ml)	زجاجة زجاجية شفافة مدرجة ISO GL45 (٥,٠٠٠ مل)	2
	3	Clear Graduated Bottle ISO GL45, (2,000 ml)	زجاجة زجاجية شفافة مدرجة ISO GL45 (٢,٠٠٠ مل)	5
	4	Clear Graduated Bottle ISO GL45, (1,000 ml)	زجاجة زجاجية شفافة مدرجة ISO GL45 (١,٠٠٠ مل)	25
	5	Clear Graduated Bottle ISO GL45, (500 ml)	زجاجة زجاجية شفافة مدرجة ISO GL45 (٥٠٠ مل)	25
	6	Clear Graduated Bottle ISO GL45, (250 ml)	زجاجة زجاجية شفافة مدرجة ISO GL45 (٢٥٠ مل)	25
	7	Clear Graduated Bottle ISO GL45, (100 ml)	زجاجة زجاجية شفافة مدرجة ISO GL45 (١٠٠ مل)	25
	8	Clear Graduated Bottle ISO GL32, (50 ml)	زجاجة زجاجية شفافة مدرجة ISO GL32 (٥٠ مل)	25
43	1	Glass Graduated Burette – Class AS with Straight Stopcock, (50 ml)	سحاحة زجاجية مدرجة – فئة AS بصنوبر مستقيم (٥٠ مل)	1
	2	Glass Graduated Burette – Class AS with Straight Stopcock, (25 ml)	سحاحة زجاجية مدرجة – فئة AS بصنوبر مستقيم (٢٥ مل)	1
	3	Glass Graduated Burette – Class AS with Straight Stopcock, (10 ml)	سحاحة زجاجية مدرجة – فئة AS بصنوبر مستقيم (١٠ مل)	1
44	1	Plastic Wash Bottle, (1,000 ml)	زجاجة غسيل بلاستيكية (١,٠٠٠ مل)	5
	2	Plastic Wash Bottle, (500 ml)	زجاجة غسيل بلاستيكية (٥٠٠ مل)	5
45		Complete Clear Glass Vial, (100 ml) with Rubber Septum and Aluminum Capsule	قارورة زجاجية شفافة كاملة (١٠٠ مل) بغطاء مطاطي وكبسولة ألومنيوم	50
46		BOD Bottle (300ml)	زجاجة BOD (٣٠٠ مل)	5
47		Winkler Oxygen Bottle, (250 mL)	زجاجة أوكسجين وينكلر (٢٥٠ مل)	١٠
48		Blue Square Bottle with Pipette Dropper Screw Cap	زجاجة زرقاء مربعة بغطاء مع قطارة	5
49	1	Porcelain Evaporating Dish, Flat Bottom (55 mm)	طبق تبخير خزفي مسطح القاع (٥٥ مم)	5
	2	Porcelain Evaporating Dish, Flat Bottom (70 mm)	طبق تبخير خزفي مسطح القاع (٧٠ مم)	5
	3	Porcelain Evaporating Dish, Flat Bottom (85 mm)	طبق تبخير خزفي مسطح القاع (٨٥ مم)	5
	4	Porcelain Evaporating Dish, Flat Bottom (97 mm)	طبق تبخير خزفي مسطح القاع (٩٧ مم)	5
	5	Porcelain Evaporating Dish, Flat Bottom (110 mm)	طبق تبخير خزفي مسطح القاع (١١٠ مم)	5

	6	Porcelain Evaporating Dish, Flat Bottom (125 mm) طبق تبخير خزفي مسطح القاع (١٢٥ مم)	5
	7	Porcelain Evaporating Dish, Flat Bottom (170 mm) طبق تبخير خزفي مسطح القاع (١٧٠ مم)	5
	8	Porcelain Evaporating Dish, Flat Bottom (200 mm) طبق تبخير خزفي مسطح القاع (٢٠٠ مم)	5
	9	Porcelain Evaporating Dish, Flat Bottom (250 mm) طبق تبخير خزفي مسطح القاع (٢٥٠ مم)	5
50	1	Stainless-Steel Test-Tube Rack, 13mm, 12 tubes حامل أنابيب اختبار من الستانلس ستيل ١٣ مم - ١٢ أنبوبيًا	2
	2	Stainless-Steel Test-Tube Rack, 13mm, 24 tubes حامل أنابيب اختبار من الستانلس ستيل ١٣ مم - ٢٤ أنبوبيًا	2
	3	Stainless-Steel Test-Tube Rack, 13mm, 50 tubes حامل أنابيب اختبار من الستانلس ستيل ١٣ مم - ٥٠ أنبوبيًا	2
	4	Stainless-Steel Test-Tube Rack, 16mm, 12 tubes حامل أنابيب اختبار من الستانلس ستيل ١٦ مم - ١٢ أنبوبيًا	2
	5	Stainless-Steel Test-Tube Rack, 16mm, 24 tubes حامل أنابيب اختبار من الستانلس ستيل ١٦ مم - ٢٤ أنبوبيًا	2
	6	Stainless-Steel Test-Tube Rack, 16mm, 50 tubes حامل أنابيب اختبار من الستانلس ستيل ١٦ مم - ٥٠ أنبوبيًا	2
51	1	Plastic Measuring Jug (5,000 ml) إبريق قياس بلاستيكي (٥,٠٠٠ مل)	2
	2	Plastic Measuring Jug (3,000 ml) إبريق قياس بلاستيكي (٣,٠٠٠ مل)	2
	3	Plastic Measuring Jug (2,000 ml) إبريق قياس بلاستيكي (٢,٠٠٠ مل)	2
	4	Plastic Measuring Jug (1,000 ml) إبريق قياس بلاستيكي (١,٠٠٠ مل)	2
	5	Plastic Measuring Jug (500 ml) إبريق قياس بلاستيكي (٥٠٠ مل)	2
52	1	Clear Glass Bottle ISO – GL80 Cap & Ring (1,000 ml) زجاجة زجاج شفاف ISO - بغطاء وطوق GL80 (١,٠٠٠ مل)	20
	2	Clear Glass Bottle ISO – GL80 Cap & Ring (500 ml) زجاجة زجاج شفاف ISO - بغطاء وطوق GL80 (٥٠٠ مل)	20
53	6-Place Automatic Pipettes Stand حامل ماصّات أوتوماتيكي لـ ٦ ماصّات	2	
54	1	Pipette Pump Filler, (25 ml) مضخة تعبئة ماصّات (٢٥ مل)	1
	2	Pipette Pump Filler, (10 ml) مضخة تعبئة ماصّات (١٠ مل)	1
	3	Pipette Pump Filler, (2 ml) مضخة تعبئة ماصّات (٢ مل)	1
55	Analytical Balance Digital Lab Scale, 5 kg Precision ميزان تحليلي رقمي بدقة عالية (سعة ٥ كجم)	2	
٥٦	Analytical / Micro Balance with 3-Door Glass Draft Shield ميزان تحليلي/ميكروي مزود بدرع زجاجي ثلاثي الأبواب	٢	
57	PC Core i7 / 16 GB RAM / SSD512/ HDD 1T/19" LED Monitor / mouse / keyboard (DELL/HP) حاسوب مكتبي (Core i7) / ذاكرة ١٦ غيغابايت / قرص SSD بسعة ٥١٢ غيغابايت / قرص HDD بسعة ١ تيرابايت / شاشة LED مقاس ١٩ بوصة / فأرة ولوحة مفاتيح - DELL أو (HP)	2	

Sanitary Engineering Laboratory

Item البند	Qty الكمية	Description and Specifications اسم الصنف والمواصفات																
<p>ملاحظات: المنشأ (أوروبي – أمريكي – ياباني – إنتاج محلي). يجب ان تحقق الأجهزة والبند الحد الأدنى من المواصفات التالية:</p>																		
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3	1	<p>Laboratory vertical drawer-type deep freezer</p> <p>مجمّد عميق رأسي بأدراج للمختبر</p> <ul style="list-style-type: none"> Capacity: \geq 335 liters. Temperature range: down to -30 °C (adjustable). Digital temperature controller with display. Multiple drawers/compartments for organized storage. Alarm system for temperature rise or power failure. Manual/automatic defrost system. Lockable door for safety. Power supply: 220–240 V, 50/60 Hz. 												
4	١	<p>Atomic Absorption Spectrophotometer جهاز قياس الطيف بالامتصاص الذري</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Measurement Principle</td> <td>Atomic Absorption Spectroscopy (Flame and Graphite Furnace, optional Hydride Generator)</td> </tr> <tr> <td>Wavelength Range</td> <td>190 – 900 nm</td> </tr> </tbody> </table>	Category	Specification	Measurement Principle	Atomic Absorption Spectroscopy (Flame and Graphite Furnace, optional Hydride Generator)	Wavelength Range	190 – 900 nm						
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Wavelength Accuracy	≤ ±0.1 nm
Wavelength Repeatability	≤ 0.05 nm
Spectral Bandwidth	0.1, 0.2, 0.4, 0.5, 0.7, 1.0, 1.4, 2.0, 2.4, 5.0 nm (wide selectable range)
Grating	Czerny-Turner, holographic grating, 1800 lines/mm
Resolution	< 40% (per manufacturer data)
Detector	Photomultiplier Tube (PMT) or solid-state detector
Baseline Stability	< 0.004 Abs/30 min (better than <0.005 Abs/hr)
Characteristic Concentration	≤ 0.04 µg/mL / 1% (Cu)
Detection Limit	≤ 0.008 µg/mL (Cu, with furnace)
Background Correction	Deuterium Lamp and/or Zeeman Effect, >30 times calibration efficiency
Atomization System	Flame: Air-Acetylene, N ₂ O-Acetylene; Graphite Furnace (optional); Hydride Generator (optional)
Burner	10 cm Titanium burner head, corrosion resistant
Accessories	RS232 serial port, Oil-free air compressor, Glass atomizer, Cu hollow cathode lamp, Atomizer unit, Burner unit dust cover, Water-separating gas filter
Readout Modes	Absorbance, Concentration, Emission
Calibration	Multi-point, linear/non-linear, standard additions
Software	Windows-based, PC-controlled with data storage, reporting, and autosampler support
Safety Features	Flame failure protection, gas leak detection, interlocks
Power Supply	220V±10 V AC, 50/60 Hz
Gas Requirements	Air: ~10 L/min (2-3 bar); Acetylene: ~2-3 L/min (1 bar); N ₂ O: ~10 L/min (4-5 bar)

5	1	Total Organic Carbon Analyzer	جهاز تحليل الكربون العضوي الكلي
		Category	Specification
		Measurement Principle	High-Temperature catalytic combustion (680-1000 °C) with NDIR detection
		Parameters Measured	TOC (Total Organic Carbon), TC (Total Carbon), IC (Inorganic Carbon), NPOC (Non-Purgeable Organic Carbon); optional TN (Total Nitrogen)
		Oxidation Method	Combustion in oxygen/synthetic air atmosphere with platinum catalyst
		Detection Method	Non-Dispersive Infrared (NDIR) detector
		Measuring Range (TOC)	~50 µg/L to 20,000 mg/L
		Detection Limit	≤ 30 µg/L (some models down to ≤5 µg/L with special configuration)
		Precision (RSD)	≤ 2% or better
		Accuracy	±2% of reading or ±0.5 mg/L
		Sample Types	Environmental water, wastewater, process water, seawater, drinking water
		Sample Introduction	Autosampler (multi-position) or manual injection
Analysis Time	Typically 3-5 minutes per sample		

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		pH/Conductivity modules
	Pump	All-PEEK dual plunger high-precision pump, 0.1–5 mL/min, max pressure up to 5000 psi
	Injection System	Automatic injection valve, Injection Volume 1–100 µL
	Separation Column	High-selectivity ion-exchange column (anion/cation), guard column included
	Column Oven	5–60 °C with preheating and ±0.01 °C stability
	Suppressor	Electrolytic self-regenerating suppressor with background reduction
	Detector	High-sensitivity conductivity detector with constant temperature control; amperometric detector; expandable to UV/Vis
	Sensitivity	< 1 nS/cm
	Resolution	≥ 1.5 (for adjacent ion separation)
	Flow Path	Fully plastic (PEEK), acid/alkali/organic solvent resistant, leakage-proof
	Power Supply	220–240 V, 50/60 Hz
	Electronics	Industrial-grade components with advanced shielding, 24-bit A/D data acquisition chip
	User Interface	7.0-inch color touchscreen, real-time monitoring (conductivity, current, flow, range, pressure, valve & suppressor status)
	Software	PC-based Chromatography software + touchscreen sync, data acquisition, spectral display, auto processing, fault diagnosis, remote control
	Operation Features	One-button rinsing, automatic valve recognition, automatic maintenance & flow path flushing
	Performance	High sensitivity, high operational stability, reproducibility, fast response
	Applications	Environmental monitoring (water, air, AOX, solid waste), pharmaceuticals, food safety, disease control, chemical industry, metallurgy, hydrogeology, agriculture, forensics (explosives), construction materials, flour quality

8	1	UV-Vis Spectrophotometer	جهاز قياس الطيف الضوئي
		Category	Specification
		Wavelength Range	190 – 1100 nm (UV-Vis)
		Spectral Bandwidth	2.0 nm (typical), selectable
		Wavelength Accuracy	±0.3 nm or better
		Wavelength Repeatability	±0.1 nm
		Photometric Range	-0.3 to 3.5 Abs (0–200% T)
		Photometric Accuracy	±0.002 Abs at 1.0 Abs
		Photometric Repeatability	±0.001 Abs
		Stray Light	≤ 0.05% T at 220 nm & 340 nm; High stability and low stray light due to double-beam optics
		Light Source	Tungsten-halogen lamp and Deuterium lamp (long-life, easily replaceable)
		Detector	Imported silicon photodiode / photomultiplier tube (PMT) for accuracy
		Optical Design	Double-beam optical system, 1200 lines/mm diffraction grating

		Scanning Speed	Fast/Medium/Slow (typically up to 3000 nm/min)
		Data Output	USB port, optional printer interface
		Display	128×64 dot matrix LCD; Direct display of standard curves and test data
		Software / Memory	Built-in and/or PC software for quantitative analysis, kinetics, wavelength scanning, multi-wavelength; Internal memory for 200 datasets & 100 standard curves
		Cuvette Holder	Standard 10 mm path length; options for variable path length or flow cell
		Power Supply	AC220V±10%, 50/60 Hz
		Dimensions	Approx. 450 × 380 × 200 mm
		Accessories	Quartz cuvettes (UV) 2 pcs, glass cuvettes (Visible) 4 pcs, dust cover, power cable, user manual, software CD/USB
		Safety Features	Automatic lamp cut-off, overload protection

9	1	Jar testing Apparatus – Flocculator جهاز اختبار الترسيب/الجرة	
		Category	Specification
		Number of Jars	6 acrylic round beakers with 1.0 L capacity
		Acrylic round beaker dimension	110 mm diameter, 180 mm height
		Stirring Speed	10~1000rpm, 1 rpm increment, stepless speed regulation, accuracy ±0.5%
		Speed Gradient	10~1000/s. Just for round beaker
		Running Time	0-99 minutes per step, up to 10 steps/program, 12 programs stored
		Operation Modes	Synchronous or independent paddle operation
		Display	LCD with automatic G and GT value calculation
		Dimensions	1080 × 350 × 400 mm
		Weight	~30 kg
		Measurement Temp. Range	0~50°C
		Measurement Temp. Accuracy	±1°C
		Consumption	80W
Power Supply	AC220V±10%, 50Hz		

10	1	Water Distillation Unit وحدة تقطير المياه	
		Category	Specification
		Type	Multi-stage distillation unit
		Distillate Output Capacity	20 liters per hour
		Distillate Purity	Conductivity (≤1 μS/cm), resistivity (≥1 MΩ·cm), pH (typically 5-7)
		Organic Matter Content	< 0.1 ppm
	Safety & Controls	<ul style="list-style-type: none"> ✓ Automatic cut-off for: <ul style="list-style-type: none"> • Low water level • Overheating • Power surge ✓ Pressure Safety Valve ✓ Automatic restart after water supply resumes 	

		Power Supply	220-240 V AC, 50/60 Hz, single phase
		Cooling Water Supply	Flow rate (e.g., 1-2 L/min, 0.2-0.4 bar)
11	1	Bacteriology Microscope المجهر البكتريولوجي	
		Category	Specification
		Type	Compound Light Microscope – Bacteriology use
		Optical Head	Trinocular preferred for camera attachment), 30° inclined, 360° rotatable
		Eyepiece (Ocular lenses)	Wide Field 10×, FN 18-20 mm, anti-fungal coated
		Objectives	Achromatic lenses: 4×, 10×, 40× (spring-loaded), 100× Oil immersion
		Total Magnification	40× – 1000×
		Condenser	Abbe condenser, NA 1.25, with iris diaphragm
		Stage	Mechanical stage with slide holder, X-Y coaxial movement
		Focusing System	Coaxial coarse & fine focus, smooth adjustment, stage upward movement
		Stand/Body	Sturdy, vibration-free, anti-fungal optics coating
		Optional Features	Trinocular port for digital camera
		Accessories	Immersion oil, Dust cover, Spare lamp/LED, Instruction manual
		Power Supply	220-240 V, 50/60 Hz
		Resolution	Up to 0.2 μm
12	1	Ceramic Muffle Furnace فرن كهربائي عازل (للاحتراق)	
		Category	Specification
		Type	PT-1200M
		Heating mode	Three-side heating wire
		Working Temperature	1100° C
		Maximum Temperature	1200° C
		Heating Rate	0 – 20° C/min
		Temperature accuracy	± 1° C
		Temperature range	0 – 1200° C
		Chamber material	Ceramic Fiber
		Chamber Size (D*W*H) mm	400*400*400
		Effective Volume (L)	64
		Heating Element	Resistance wire (Nickel-chromium alloy wire)
		Timer	0 – 9999 minutes
		Shell material	Spraying cold rolled steel
		Temperature control	Use microcomputer PID control of heating (40 programmable steps and PID automatic control)
		Door open way	Right
		Safety Features	<ul style="list-style-type: none"> • Over temperature alarm • Power off when door open
		Power	AC220V/3.5kw

13	1	Digital Bacteriological & Mold Incubator حاضنة رقمية للبكتيريا والفطريات	
		Category	Specification
		Type	Digital Bacteriological / Mold Incubator, programmable, with temperature & humidity control
		Temperature Control	<ul style="list-style-type: none"> • Range: 5 – 80 °C • Resolution: 0.1 °C • Accuracy: ±0.5 °C • Uniformity: Forced convection with fan
		Humidity Control	Advanced microcomputer control for precise humidity regulation (for mold/fungal incubator)
		Volume	Effective volume: ۷۰ Litre
		Chamber Size (mm)	۴۱۵ × ۳۵۰ × 500 mm (D × W × H)
		Exterior Size (mm)	۵۷۰ × ۵۶۰ × ۱۰۵۰ mm (D × W × H)
		Timer	0 – 9999 minutes programmable
		Construction	<ul style="list-style-type: none"> • Inner chamber: High-quality stainless steel, rounded corners, anti-corrosive, easy to clean • Exterior: Powder-coated steel • Insulation: Glass wool or mineral wool
		Doors	<ul style="list-style-type: none"> • Insulated outer metal door • Inner glass observation door • Transparent window for monitoring without disturbance • Magnetic door sealing for airtight closure
		Shelves	Adjustable, perforated stainless steel shelves (removable, flexible arrangement)
		Air Circulation	Integrated uniform air circulation ensures even temperature & humidity distribution
		Display & Control	<ul style="list-style-type: none"> • 4-digit LED digital display • Microprocessor-based programmable control for temperature, humidity, and lighting cycles
		Safety Features	<ul style="list-style-type: none"> • Over-temperature protection • Over-humidity protection (for mold incubator) • Audible & visual alarms • Automatic cut-off in case of fault
		Additional Functions	<ul style="list-style-type: none"> • Programmable settings for growth cycles • Optional CO₂ and lighting control for advanced applications
		Monitoring	Remote monitoring available (network/SMS alerts) in advanced models
Energy Efficiency	Low power consumption, energy-efficient design		
Power Supply	AC 220 V, 50 Hz		
Applications	<ul style="list-style-type: none"> • Bacteriological incubation • Mold & fungal growth studies • Microbiology & environmental research • Food, pharma, and biotech quality control 		
14	1	Automatic Kjeldahl Nitrogen Analyzer جهاز تحليل نيتروجين كيلدال أوتوماتيكي	
		Category	Specification
		Distillation Unit	- Measuring Range: 0.1 – 300 mg N

	<ul style="list-style-type: none"> - Accuracy: $\pm 1\%$ - Reproducibility: $\pm 0.5\%$ - Heating method: Steam distillation or electric heating - Operation mode: auto/manual - dual mode - Distillation time: $\leq 5\text{--}10$ min per sample - Water Consumption: 1.0 ~ 5 L/min - (Cooling water temperature is 18°C) - Recovery rate: $\geq 99\%$ (for nitrogen compounds) - Material: Acid- and alkali-resistant glass/ PTFE
Condenser	<ul style="list-style-type: none"> - Type: High-efficiency water-cooled condenser - Cooling water consumption: 1–3 L/min - Material: Borosilicate glass or PTFE
Automatic Reagent Addition	<ul style="list-style-type: none"> - Reagents: Sodium hydroxide, boric acid solution, standard acid/base - Dispensing: Automatic with precise volume control ($\pm 1\%$)
Receiving Flask	<ul style="list-style-type: none"> - Capacity: 250–500 mL - Material: Borosilicate glass- Positioned under condenser for trapping distillate
Titration System	<ul style="list-style-type: none"> - Type: Automatic titration unit (acid–base titration) - Detection: Potentiometric / colorimetric (burette with digital control) - Accuracy: ± 0.1 mL
Control & Display	<ul style="list-style-type: none"> - Digital LCD/LED touchscreen - Parameters: Distillation time, reagent volume, titration results - Data storage: USB/RS232 connectivity
Safety Features	<ul style="list-style-type: none"> - Over-temperature protection - Over-pressure release - Automatic stop if water supply is insufficient - Acid/alkali resistant housing
Power Supply	<ul style="list-style-type: none"> - AC220V± 10, 50/60Hz (single phase) - Power rating: 2–3 kW
Sample Crusher	<ul style="list-style-type: none"> - Material: Stainless steel or hardened steel - Particle size: ≤ 1 mm (adjustable) - Capacity: 50–200 g per batch
Digestion Furnace	<ul style="list-style-type: none"> - Temperature range: Ambient to 450–500 °C - Control: Digital PID controller - Capacity: 16 ~ 40 digestion tubes - Heating method: Electric heating block with insulation
Exhaust Gas Collection Device	<ul style="list-style-type: none"> - Material: Acid- and alkali-resistant glass or PTFE - Function: Collects acid fumes during digestion
Neutralization Device	<ul style="list-style-type: none"> - Neutralizing medium: Sodium hydroxide or similar alkaline solution - Material: Borosilicate glass or PTFE container - Efficiency: $\geq 95\%$ gas neutralization
Refrigeration Cyclor (Condenser)	<ul style="list-style-type: none"> - Type: Water-cooled or circulation-based condenser - Cooling water consumption: 2–5 L/min - Material: Borosilicate glass / quartz / PTFE
Digestive Tube Support	<ul style="list-style-type: none"> - Material: Stainless steel or ceramic-coated frame - Tube capacity: Matches digestion furnace (commonly 250 mL tubes) - Resistance: High-temperature and corrosion-resistant
Digestive Tube (40 tubes)	<ul style="list-style-type: none"> - Material: Borosilicate glass (heat- and acid-resistant) - Capacity: 250 mL standard size - Temperature resistance: Up to 500 °C
Catalytic Sheet (or	<ul style="list-style-type: none"> - Composition: Copper sulfate + potassium sulfate / selenium-

		Catalyst Tablet)	based - Function: Accelerates digestion process - Dosage: 1–3 g per sample (depending on protocol)
		Reflux Funnel	- Material: Borosilicate glass - Size: Standard joint fit (commonly 24/29 or similar) - Function: Prevents loss of volatile compounds by returning condensate during digestion
		Standard Accessories	Reagent buckets*3, Waste bucket*1, Reagent pipelines*4, Cooling water pipes*2

15	1	Desiccator ميرد زجاجي	
		Category Specification	
		Type	Standard (Non-Vacuum) Desiccator
		Body Material	Borosilicate Glass, Polycarbonate, or Acrylic (transparent, impact-resistant)
		Lid Type	Dome-shaped or flat lid with airtight seal
		Seal Mechanism	Silicone or Neoprene O-ring gasket (grease-free preferred)
		Desiccant Chamber	Lower compartment for silica gel, molecular sieve, or activated alumina
		Shelves / Trays	Removable perforated plate (porcelain, stainless steel, or plastic) for placing samples
		Size / Capacity	300 mm diameter or larger
		Transparency	Clear body for sample visibility
		Operating Temperature	Ambient to 100 °C (Polycarbonate/Acrylic); up to 120 °C for Glass types
		Chemical Resistance	Resistant to most laboratory chemicals, acids, and solvents
		Moisture Indicator	Optional silica gel with colour indicator
		Safety Features	Shatter-resistant material (for plastic types), airtight design to prevent moisture ingress
Accessories	Spare desiccant, replacement trays, optional moisture indicator window		

16	2	Peristaltic Pump مضخة تمعجية / انبوية	
		Category Specification	
		Flow Rate	Adjustable: 0.1 mL/min – 1000 mL/min
		Pressure (Head)	1–2 bar (10–20 m water head)
		Motor Type	Stepper Motor
		Speed Control	Variable (digital controller)
		Tubing Material	Silicone, Tygon, or PTFE
		Self-Priming	Yes (no pre-filling required)
		Dry Running	Allowed
		Power Supply	220V AC
		Noise Level	≤ 55 dB (quiet operation for lab use)
Maintenance	Very low (only tubing replacement for peristaltic type)		

17	1	Submersible Water Pump مضخة مياه غاطسة	
		Category	Specification
		Type	Submersible Water Pump – Solid Handling
		Application	Pump slurry, wastewater, raw water, or liquids with suspended solids
		Installation	Fully submersible (directly placed in tank/reservoir)
		Flow Rate	100 – 200 L/min
		Maximum Head (Pressure)	20 – 40 m (2–4 bar)
		Motor Type	Sealed induction motor, continuous duty, IP68
		Power Rating	1000 – 1500 W
		Voltage Supply	220–240 V AC (single phase) or 380–415 V AC (three phase, heavy duty)
		Pump Body Material	Cast Iron or Stainless Steel 316 (corrosion resistant)
		Impeller Type	Vortex or Semi-open impeller (non-clog design)
		Impeller Material	Cast Iron, Stainless Steel, or Bronze
		Solid Handling Capacity	heavy-duty models: solids up to 20–50 mm particle size
		Shaft Seal	Double mechanical seal, oil-lubricated
		Cable Length	≥ 10 m, waterproof cable
		Max. Liquid Temperature	0 – 70 °C
Protection Features	waterproofing Overload protector, thermal cut-off, dry-run protection		
Noise Level	≤ 65 dB		
Accessories	Hose connectors, lifting rope/handle, optional float switch for automatic on/off		
18	2	Digital Hot-plate magnetic stirrer سخان مغناطيسي رقمي مع محرك تقليب	
		Category	Specification
		Type	Digital Hot-Plate Magnetic Stirrer
		Applications	Heating and stirring of standard and non-standard reaction flasks (50 mL – 20 L)
		Stirring Capacity	Up to 20 Liters
		Speed Range	100 – 1500 rpm (digital adjustable)
		Speed Control	Digital, with brushless DC motor (stable, low-noise, long life, no sparking)
		Heating Temperature Range	Room Temperature +5 °C to 380 °C
		Temperature Control	PID digital control with display window
		Temperature Stability	± 1 °C (with external PT100 sensor)
		External Sensor	PT100 temperature probe included, with sensor holder
		Hotplate Material	Ceramic-coated surface (chemical-resistant, easy cleaning)
		Hotplate Size	190 × 190 mm
		Body Material	Durable techno-polymer with corrosion resistance and waterproof design
		Power Rating	600 W
		Display	Digital LCD/LED display for both speed (rpm) and temperature (°C)

		Timer Function	Digital, 0 – 99.9 hours
		Magnetic Stirring Technology	Stable at low speeds, powerful at high speeds
		Safety Features	Over-temperature protection, hot-surface warning, waterproof shell
		Power Supply	220–240 V AC, 50/60 Hz (single phase)
		Accessories	PTFE stir bars, external temperature probe with holder, support rod & clamp

19	1	Multi-rotor & Multi-speed Microtube Centrifuge	
		جهاز طرد مركزي لأنابيب الميكرو متعددة السرعات والروبوس	
		Category	Specification
		Model	2624/2 – Multi-rotor & Multi-speed Microtube Centrifuge
		Motor	Brushless induction, maintenance-free
		Display	Double LED (digital control of speed, time, and rotor)
		Speed Range	100 – 15,000 rpm (increments of 10 rpm)
		Max RCF	Up to 22,375 ×g (depending on rotor)
		Timer	1 – 99 minutes / 1 – 59 seconds
		Memory Programs	Up to 30 customizable programs
		Ramp Control	Acceleration levels: 1–9; Braking levels: 0–9
		Safety Features	Electromagnetic safety lock, emergency manual override, lid suspension system
		Cooling System	Auxiliary ventilation to protect motor and samples
		Rotor Options	- 24 × 1.5/2 mL tubes (15,000 rpm, 20,375 ×g) - 24 capillary tubes (12,000 rpm, 15,455 ×g) - 10 × 5 mL tubes (13,500 rpm, 12,920 ×g) - PCR plate rotor (14,800 rpm, 16,200 ×g) - 36 × 0.5 mL tubes (13,500 rpm, 13,250 ×g)
		Dimensions (L×W×H)	360 × 280 × 260 mm
Weight	~15–17 kg		
Power Supply	220 V, 50–60 Hz		
Power Consumption	450–600 W		

20	1	Mini centrifuge for microtubes جهاز طرد مركزي صغير لأنابيب الميكرو	
		Category	Specification
		Type	Mini Microtube Centrifuge
		Model	2507/7
		Speed	7,000 rpm (±3 %)
		Max RCF (g)	~3,260 ×g
		Rotor Options	- 8 × 1.5/2 mL microtubes (Eppendorf type), - Adapters included for 0.5 mL and 0.2 mL microtubes, - 4 strips of 8 × 0.2 mL (total: 32 × 0.2 mL tubes)
		Rotor Type	Angle rotor (interchangeable, "click" system)
		Safety Features	Safety lid device: cannot operate if lid is open
		Lid	Transparent lid for visual monitoring
		Dimensions (L×W×H)	170 × 160 × 130 mm (~15.5 × 16 × 13 cm)

Weight	~1 kg
Power Supply	220-240 V AC, 50/60 Hz (single phase)
Power Consumption	~50 W
Compact & Portable	Lightweight and compact design; ideal for small labs or mobile use

21	1	Classic 7 Orbital Digital Shaker هزاز مداري رقمي	
		Category	Specification
		Type	Digital orbital shaker
		Movement Type	Orbital, 4 mm orbit diameter
		Speed Range	100 - 800 rpm
		Timer	1 - 1,199 minutes or continuous
		Maximum Load Capacity	2.5 kg
		Display	LCD digital display for speed and time
		Motor	Brushless, maintenance-free
		Safety Features	Over-speed protection, IP21 rating
		Connectivity	RS232 output for PC control/data logging
		Included Platform	Plate with 3 support bars
		Dimensions (L × W × H)	340 × 300 × 100 mm
		Weight	15 kg
Power Supply	100-120 V or 200-240 V, 50/60 Hz		
Power Consumption	30 W		

22	1	Rotator shaker Digital 9 Discs هزاز دوّار رقمي بتسع أقراص	
		Category	Specification
		Type	Digital rotator shaker
		Movement Type	Circular/rotating disc motion
		Speed Range	10 - 80 rpm
		Timer	1 - 1,199 minutes or continuous
		Maximum Load Capacity	4 kg
		Display	LCD digital display for speed and time
		Rotation Angle	360° continuous rotation
		Discs	9 interchangeable disc platforms
		Motor	Brushless, maintenance-free
		Safety Features	Overload and over-speed protection
		Dimensions (L × W × H)	470 × 200 × 260 mm
		Weight	7 kg
Power Supply	200-240 V, 50/60 Hz		
Power Consumption	30 W		

23	1	Chemical Oxygen Demand (COD) analyzer	
		جهاز تحليل كمية الأوكسجين الكيميائي	
		Category	Specification
		Measurement Method	Closed Reflux Colorimetric Method (USEPA 410.4, ISO 15705), UV/Vis detection

Measuring Range	0–1500 mg/L COD (extendable up to 10,000 mg/L with dilution)
Accuracy & Precision	Accuracy: ±5% of reading; Repeatability: <3% RSD
Detection Limit	3–5 mg/L COD
Digestion System	Block digesters at 150 ± 2 °C; Digestion time: 2 hrs (programmable); Capacity: 12–30 vials
Optical System	Wavelengths: 420–620 nm; Light source: Tungsten-halogen/LED; Detector: Photodiode
User Interface	LCD or touchscreen; Multi-language support; Pre-programmed calibration curves
Data Handling	Memory: 500–1000 results; Connectivity: USB, RS-232, Ethernet, Bluetooth
Power Supply	100–240 V AC, 50/60 Hz; Portable models with rechargeable battery
Standards & Compliance	USEPA, ISO, DIN; CE, RoHS certified; Overheating protection

24	2	Octagonal PTFE Magnetic Stir Bars (Box of 24)																										
		قضبان تحريك مغناطيسية مثمانية الشكل من التيفلون (علبة ٢٤ قطعة)																										
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Category	Specification																			
Type	HD Clear Adjustable Safety Goggles – Wide Vision																			
Lens Material	Polycarbonate, HD clear, impact- and chemical-resistant																			
Lens Coating	Anti-fog, Anti-scratch, Anti-dust																			
UV Protection	99% UV blocking (Anti-UV)																			
Design	Wrap-around, full coverage, wide field of vision																			
Ventilation	Indirect vent / anti-fog system																			
Frame Material	Flexible, chemical-resistant PVC or thermo-plastic																			
Adjustability	Elastic, adjustable head strap for secure fit																			
Compatibility	Over-The-Glasses (OTG) – suitable for use with prescription glasses																			

		<table border="1"> <tr> <td>Resistance</td> <td>Chemical splash resistant, impact resistant, UV resistant</td> </tr> <tr> <td>Weight</td> <td>Lightweight, ≤ 120 g</td> </tr> <tr> <td>Standards Compliance</td> <td>ANSI Z87.1 (USA), EN 166 (EU), ISO 16321</td> </tr> <tr> <td>Optional Features</td> <td>Clear lens for laboratory use; tinted or shaded versions for UV/laser protection</td> </tr> </table>	Resistance	Chemical splash resistant, impact resistant, UV resistant	Weight	Lightweight, ≤ 120 g	Standards Compliance	ANSI Z87.1 (USA), EN 166 (EU), ISO 16321	Optional Features	Clear lens for laboratory use; tinted or shaded versions for UV/laser protection																								
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		Comfort Features	Soft inner surface, flexible fit, hypoallergenic, latex-free
		Weight	Lightweight (150 – 250 g per pair)
		Cleaning	Easy to wash, dishwasher safe, quick-drying
		Standards Compliance	FDA-approved (for food contact), CE certified (for safety)
		Optional Features	Extended cuff design, reinforced palm area, heat-insulated lining
		Flame Resistance	Self-extinguishing (UL 94 V-0 available on request)
		Water Resistance	Non-porous, waterproof, resistant to steam
		Certifications	RoHS compliant, REACH compliant, ISO certified production

28	1	500ml Filtration Porcelain Buchner Kit Ceramic Suction Funnel Handle Vacuum Pump	
		طقم ترشيح خزفي مع قمع بوخنر بيد ومضخة تفريغ (٥٠٠ مل)	
		Category	Specification
		Filtering Flask	500 mL capacity, thick-walled borosilicate glass, side-arm for vacuum connection
		Büchner Funnel	Porcelain (ceramic), perforated plate, diameter ~80–90 mm, chemical-resistant
		Stopper	Rubber, chemical-resistant, fits funnel and flask securely
		Vacuum Pump	Manual suction pump, with vacuum release valve, displacement ~15 mL/stroke, vacuum up to ~725 mL air removed
		Tubing	Flexible vacuum tubing, chemical-resistant rubber or silicone, inner diameter fits side-arm
		Filter Paper	Compatible with funnel size (Ø 80–90 mm), supplied with kit
		Temperature Resistance	working temperature up to 1100 °C
		Construction	Durable, acid- and alkali-resistant materials (porcelain, borosilicate glass, rubber)
		Applications	Filtration of liquids, separation of solids, analytical chemistry sample prep
		Safety	Thick glass to withstand vacuum, stable ceramic funnel, manual pump avoids need for external power
Accessories	Box of 200 flat standard qualitative paper filters of 100 mm diameter used with Bochners funnels.		

29	1	30ml Glass Filter Crucible, Sintered Disc	
		بوتقة ترشيح زجاجية بسعة ٣٠ مل بقرص مسامي	
		Category	Specification
		Type	Glass Filter Crucible, with sintered glass disc (Gooch-type)
		Material	Borosilicate glass (high chemical and thermal resistance)
		Capacity	30 mL
		Disc Type	Sintered glass filter disc (porosity grades available: G1–G5)
		Porosity Options	G1 (coarse, 100–160 µm), G2 (40–100 µm), G3 (15–40 µm), G4 (5–15 µm), G5 (0.7–1.5 µm)
		Filtration Method	Gravity or vacuum-assisted filtration
		Temperature Resistance	Up to 500 °C (gradual heating to avoid thermal shock)

		Chemical Resistance	Resistant to most acids, solvents, and alkalis (except HF and strong alkali at high temp)
		Design	Short form (low profile) for efficient filtration and easy handling
		Applications	Gravimetric analysis, residue collection, quantitative chemical analysis
		Standards Compliance	ISO, ASTM standards for laboratory glassware

30	1	Benchtop pH Meter جهاز قياس الأس الهيدروجيني المكتبي	
		Category	Specification
		Measuring Range (pH)	Typically, 0.00 – 14.00 pH
		Resolution	0.001 / 0.01 pH
		Accuracy	±0.002 pH (high precision)
		mV Range	±1999.9 mV (for ORP/ISE measurements)
		Temperature Range	0 – 135 °C (with ATC probe)
		Temperature Resolution	0.1 °C
		Temperature Accuracy	±0.2 °C
		Calibration	1–5 point calibration (supports NIST, USA, DIN standard buffers)
		Compensation	Automatic Temperature Compensation (ATC) and manual option
		Electrode Type	Replaceable glass pH electrode; supports ORP and ion-selective electrodes
		Display	Large backlit LCD or touchscreen with multi-parameter display
		Data Storage	500–1000+ sets with date/time (GLP compliant)
		Connectivity	USB, RS-232, Ethernet; some models with printer support
Power Supply	AC adapter (100–240 V, 50/60 Hz)		
Portability	Benchtop (laboratory use; stable and not portable)		
Compliance	GLP/GMP compliant, CE certified, ISO traceable calibration		

31	1	Benchtop Dissolved Oxygen (DO) Meter جهاز قياس الأوكسجين المذاب المكتبي	
		Category	Specification
		Type	Benchtop DO meter for laboratory use
		Measurement Range (DO)	0.00 – 20.00 mg/L (ppm) dissolved oxygen; 0 – 200 % saturation
		Resolution (DO)	0.01 mg/L (ppm) or 0.1 % saturation
		Accuracy (DO)	±0.1 mg/L or ±1–2 % of reading
		DO Sensor Type	Optical (luminescent, low maintenance) or Electrochemical (polarographic/galvanic)
		Temperature Range	0 – 50 °C (some advanced models up to 60 °C)
		Temperature Resolution	0.1 °C
		Temperature Accuracy	±0.2–0.3 °C (with ATC – Automatic Temperature Compensation)
		Calibration	1–2 point calibration (air-saturated water & zero-oxygen)

			solution)
		Compensation	Automatic compensation for temperature, salinity, and barometric pressure
		Display	Large LCD or digital backlit display; some models with color touchscreen
		Data Storage	1000+ data sets; USB, RS232, or Bluetooth/LIMS connectivity
		Electrode Connection	Replaceable DO probe with cable; BNC or proprietary connector
		Stirrer Integration	Some benchtop models include magnetic stirrer control for accurate calibration
		Power Supply	AC adapter (100–240 V, 50/60 Hz), with backup rechargeable battery option
		Compliance	GLP/GMP compliant, CE certified, ISO 17025 calibration certificate available
		Applications	High-precision dissolved oxygen measurement in water & wastewater labs, environmental testing, food & beverage quality control, biotechnology, and research labs

32	٢	Glass Cuvette (1 mm Light Path) كُوَيْبَة زجاجية بمسار ضوئي ١ مم	
		Category	Specification
		Material	Optical glass (BK7 or equivalent); some models available in quartz (UV-Vis)
		Optical Path Length	1 mm (light path)
		External Dimensions	~12.5 × 12.5 × 45 mm (standard cuvette size)
		Volume	~0.35 – 0.5 mL (depends on wall thickness and path length)
		Wavelength Range	Glass: 340 – 2500 nm (visible to near IR) Quartz: 190 – 2500 nm (UV-Vis)
		Transmission	>82% (visible range for optical glass)
		Optical Windows	2 polished windows (for spectrophotometry), 2 frosted sides for handling
		Tolerance	Path length accuracy ±0.01 mm (high quality models)
		Cap Type	Open top (standard) or with PTFE stopper/cap (optional)
		Temperature Range	–40 °C to +90 °C (glass); up to 200 °C for quartz
		Chemical Resistance	Resistant to most aqueous solutions; not suitable for strong acids/alkalis
Applications	Low-volume spectrophotometry, DNA/RNA/protein concentration measurement, high absorbance samples		

33	8	Laboratory Bottle-Top Dispenser موزع سوائل مختبري يُركب على الزجاجاة	
		Category	Specification
		Dispensing Ranges	0.5 – 5.0 mL (adjustable in small increments, e.g., 0.1 mL steps) 1.0 – 10.0 mL (adjustable, usually in 0.25- or 0.5-mL increments) 2.5 – 25.0 mL (adjustable, typically in 0.25 / 0.5 mL increments) 5.0 – 50.0 mL (adjustable, usually in 0.5- or 1.0-mL increments)

	increments)
Accuracy	±0.5% of set volume (ISO 8655 compliant; varies slightly by manufacturer)
Precision (CV)	≤0.1–0.2% (depending on volume setting)
Volume Adjustment	Analog adjustment knob or digital control with clear volume scale
Bottle Compatibility	Standard screw thread GL 32 (with adapters for GL 28, 38, 40, 45 provided)
Wetted Materials	PTFE, FEP, Borosilicate glass, Platinum-iridium Spring (high chemical resistance)
Chemical Resistance	Resistant to strong acids, bases, salts, and many organic solvents
Autoclavability	Fully or partially autoclavable at 121 °C, 15 psi, 20 min
Safety Features	Anti-drip discharge tube with cap, recirculation valve (to avoid reagent waste during priming)
Operating Temperature	10 – 40 °C (standard lab conditions)
Applications	Accurate and safe dispensing of liquid reagents, buffers, acids, alkalis, and solvents

34 9 Single Channel Variable Volume Pipette ماصة مفردة القناة ذات حجم متغير

A. General Specifications (Common to All Models)

Category	Specification
Type	Single-channel, variable volume micropipette
Mechanism	Air-displacement
Adjustment	Analog micrometer dial or digital display
Tip Ejection	Ergonomic, one-hand operation ejector
Material	Chemically resistant polymer housing with stainless steel piston
Autoclavability	Fully autoclavable at 121 °C, 15 psi, 20 min
Ergonomics	Lightweight, low plunger force, fatigue-free handling
Compliance	ISO 8655, CE certified
Applications	Accurate and precise liquid handling across a wide range of lab applications

B. Specific Differences by Model

Model (Range)	Resolution (Increment)	Accuracy (±%)	Precision (CV%)	Compatible Tips
0.1 – 2.5 µL	0.002 – 0.01 µL	2.0 – 5.0%	≤2.0%	10 µL ultra-fine tips
0.5 – 10 µL	0.01 µL	1.0 – 2.0%	≤1.0%	10 µL universal tips
2 – 20 µL	0.02 µL	0.8 – 1.5%	≤0.5%	200 µL tips
5 – 50 µL	0.1 µL	0.8 – 1.2%	≤0.4%	200 µL tips
10 – 100 µL	0.1 µL	0.6 – 1.0%	≤0.3%	200 µL tips
20 – 200 µL	0.2 µL	0.6 – 1.0%	≤0.3%	200 µL tips
100 – 1000 µL (P1000)	1 µL	0.6 – 0.8%	≤0.2 – 0.3%	1000 µL tips
500 – 5000 µL (5 mL)	10 – 50 µL	0.6 – 0.8%	≤0.2 – 0.3%	5 mL (macro tips)

		500 – 10000 µL (10 mL)	50 – 100 µL	0.6 – 0.8%	≤0.2 – 0.3%	10 mL (macro tips)																																																								
35	8	Single Channel Fixed Volume Pipette ماصة مفردة القناة ذات حجم ثابت A. General Specifications (Common to All Models) <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Single-channel, fixed volume micropipette</td> </tr> <tr> <td>Mechanism</td> <td>Air-displacement</td> </tr> <tr> <td>Volume Setting</td> <td>Fixed (factory-calibrated, non-adjustable)</td> </tr> <tr> <td>Tip Ejection</td> <td>Ergonomic ejector, one-hand operation</td> </tr> <tr> <td>Material</td> <td>Chemically resistant polymer housing, stainless steel piston</td> </tr> <tr> <td>Autoclavability</td> <td>Fully autoclavable (121 °C, 15 psi, 20 min)</td> </tr> <tr> <td>Ergonomics</td> <td>Lightweight, low plunger force, fatigue-free handling</td> </tr> <tr> <td>Compliance</td> <td>ISO 8655, CE certified</td> </tr> <tr> <td>Applications</td> <td>Routine pipetting with constant volume, high repeatability, QC labs</td> </tr> </tbody> </table> B. Specific Differences by Model <table border="1"> <thead> <tr> <th>Model (Fixed Volume)</th> <th>Accuracy (±%)</th> <th>Precision (CV%)</th> <th>Compatible Tips</th> </tr> </thead> <tbody> <tr> <td>10 µL</td> <td>±1.0 – 2.0%</td> <td>≤1.0%</td> <td>10 µL tips</td> </tr> <tr> <td>20 µL</td> <td>±1.0 – 1.5%</td> <td>≤0.8%</td> <td>200 µL tips</td> </tr> <tr> <td>25 µL</td> <td>±1.0 – 1.5%</td> <td>≤0.8%</td> <td>200 µL tips</td> </tr> <tr> <td>50 µL</td> <td>±0.8 – 1.2%</td> <td>≤0.6%</td> <td>200 µL tips</td> </tr> <tr> <td>100 µL</td> <td>±0.8 – 1.0%</td> <td>≤0.5%</td> <td>200 µL tips</td> </tr> <tr> <td>200 µL</td> <td>±0.8 – 1.0%</td> <td>≤0.4%</td> <td>200 µL tips</td> </tr> <tr> <td>500 µL</td> <td>±0.6 – 0.8%</td> <td>≤0.3%</td> <td>1000 µL tips</td> </tr> <tr> <td>1000 µL (1 mL)</td> <td>±0.6 – 0.8%</td> <td>≤0.3%</td> <td>1000 µL tips</td> </tr> </tbody> </table>					Category	Specification	Type	Single-channel, fixed volume micropipette	Mechanism	Air-displacement	Volume Setting	Fixed (factory-calibrated, non-adjustable)	Tip Ejection	Ergonomic ejector, one-hand operation	Material	Chemically resistant polymer housing, stainless steel piston	Autoclavability	Fully autoclavable (121 °C, 15 psi, 20 min)	Ergonomics	Lightweight, low plunger force, fatigue-free handling	Compliance	ISO 8655, CE certified	Applications	Routine pipetting with constant volume, high repeatability, QC labs	Model (Fixed Volume)	Accuracy (±%)	Precision (CV%)	Compatible Tips	10 µL	±1.0 – 2.0%	≤1.0%	10 µL tips	20 µL	±1.0 – 1.5%	≤0.8%	200 µL tips	25 µL	±1.0 – 1.5%	≤0.8%	200 µL tips	50 µL	±0.8 – 1.2%	≤0.6%	200 µL tips	100 µL	±0.8 – 1.0%	≤0.5%	200 µL tips	200 µL	±0.8 – 1.0%	≤0.4%	200 µL tips	500 µL	±0.6 – 0.8%	≤0.3%	1000 µL tips	1000 µL (1 mL)	±0.6 – 0.8%	≤0.3%	1000 µL tips
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Material	High-quality medical-grade virgin polypropylene (PP), free from additives																																																													
Design	Tapered, low-retention, smooth inner surface to reduce sample loss																																																													
Graduations	Molded volume graduations for accuracy (on selected sizes)																																																													
Sterility Options	Sterile (γ-irradiated) or non-sterile																																																													
Filter Options	With filter (aerosol barrier) or without filter																																																													
DNase/RNase-Free	Certified free from DNase, RNase, and human DNA																																																													
Pyrogen-Free	Endotoxin-free for sensitive molecular biology work																																																													
Packaging	Bulk bag, rack (autoclavable racks), or refill system																																																													
Autoclavability	Tips and racks autoclavable at 121 °C, 15 psi, 20 min																																																													
Compatibility	Compatible with major brands: Eppendorf, Gilson, Thermo, Sartorius, DragonLab, etc.																																																													
Color Options	Natural (clear), yellow (≤200 µL), blue (200–1000 µL), larger																																																													

		(clear/blue)																										
		Lengths Standard, extended length (for deep tubes/microplates)																										
37	1	<p>Imhoff Cone for Sedimentation with Closed Tip (1000 ml) مخروط إيمهوف للترسيب بقاعدة مغلقة (١,٠٠٠ مل)</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Imhoff sedimentation cone (for suspended solids and sedimentation analysis)</td> </tr> <tr> <td>Capacity</td> <td>1000 mL (1 L)</td> </tr> <tr> <td>Graduations</td> <td>Clear, molded graduations (0–1000 mL; sediment scale from 0–1 mL at cone tip)</td> </tr> <tr> <td>Material</td> <td>Transparent polycarbonate (PC), PMP, or borosilicate glass</td> </tr> <tr> <td>Tip Type</td> <td>Closed tip (no drainage outlet, designed for visual sediment measurement only)</td> </tr> <tr> <td>Cone Angle</td> <td>Standard 60° conical angle for proper sedimentation</td> </tr> <tr> <td>Accuracy</td> <td>Graduated with tolerance according to ISO standards for sediment cones</td> </tr> <tr> <td>Stand Compatibility</td> <td>Requires cone stand (metal or plastic) for vertical holding</td> </tr> <tr> <td>Autoclavability</td> <td>Autoclavable at 121 °C (for PC/PMP or glass versions)</td> </tr> <tr> <td>Chemical Resistance</td> <td>Resistant to most acids, bases, and aqueous solutions</td> </tr> <tr> <td>Applications</td> <td>Wastewater treatment, environmental testing, suspended solids determination, sedimentation rate studies</td> </tr> </tbody> </table>	Category	Specification	Type	Imhoff sedimentation cone (for suspended solids and sedimentation analysis)	Capacity	1000 mL (1 L)	Graduations	Clear, molded graduations (0–1000 mL; sediment scale from 0–1 mL at cone tip)	Material	Transparent polycarbonate (PC), PMP, or borosilicate glass	Tip Type	Closed tip (no drainage outlet, designed for visual sediment measurement only)	Cone Angle	Standard 60° conical angle for proper sedimentation	Accuracy	Graduated with tolerance according to ISO standards for sediment cones	Stand Compatibility	Requires cone stand (metal or plastic) for vertical holding	Autoclavability	Autoclavable at 121 °C (for PC/PMP or glass versions)	Chemical Resistance	Resistant to most acids, bases, and aqueous solutions	Applications	Wastewater treatment, environmental testing, suspended solids determination, sedimentation rate studies		
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38	1	<p>Imhoff Cone for Sedimentation with Glass Stopcock (1000ml) مخروط إيمهوف للترسيب بصنوبر زجاجي (١,٠٠٠ مل)</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Imhoff sedimentation cone (for suspended solids and sedimentation analysis)</td> </tr> <tr> <td>Capacity</td> <td>1000 mL (1 L)</td> </tr> <tr> <td>Graduations</td> <td>Clear, molded graduations (0–1000 mL; fine sediment scale at cone tip 0–1 mL)</td> </tr> <tr> <td>Material</td> <td>Borosilicate glass (high clarity, high chemical resistance)</td> </tr> <tr> <td>Tip Type</td> <td>Open tip with glass stopcock for controlled sediment drainage</td> </tr> <tr> <td>Stopcock</td> <td>Precision glass stopcock, chemical-resistant, leak-proof design</td> </tr> <tr> <td>Cone Angle</td> <td>Standard 60° conical angle for accurate sedimentation</td> </tr> <tr> <td>Accuracy</td> <td>Calibrated according to ISO standards for sediment cones</td> </tr> <tr> <td>Stand Compatibility</td> <td>Requires cone stand (metal or plastic) for vertical holding</td> </tr> <tr> <td>Autoclavability</td> <td>Fully autoclavable at 121 °C</td> </tr> <tr> <td>Chemical Resistance</td> <td>Excellent resistance to acids, bases, solvents</td> </tr> <tr> <td>Applications</td> <td>Wastewater treatment, environmental monitoring, suspended solids analysis, recovery and measurement of sediments</td> </tr> </tbody> </table>	Category	Specification	Type	Imhoff sedimentation cone (for suspended solids and sedimentation analysis)	Capacity	1000 mL (1 L)	Graduations	Clear, molded graduations (0–1000 mL; fine sediment scale at cone tip 0–1 mL)	Material	Borosilicate glass (high clarity, high chemical resistance)	Tip Type	Open tip with glass stopcock for controlled sediment drainage	Stopcock	Precision glass stopcock, chemical-resistant, leak-proof design	Cone Angle	Standard 60° conical angle for accurate sedimentation	Accuracy	Calibrated according to ISO standards for sediment cones	Stand Compatibility	Requires cone stand (metal or plastic) for vertical holding	Autoclavability	Fully autoclavable at 121 °C	Chemical Resistance	Excellent resistance to acids, bases, solvents	Applications	Wastewater treatment, environmental monitoring, suspended solids analysis, recovery and measurement of sediments
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39	50	<p>Volumetric Flask with Stopper, class A دورق حجمي زجاجي بسدادة زجاجية من الفئة أ</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Volumetric flask with ground glass stopper</td> </tr> <tr> <td>Class</td> <td>Class A (highest accuracy, ISO / ASTM certified)</td> </tr> <tr> <td>Material</td> <td>Borosilicate glass 3.3 (high chemical & thermal resistance) or PMP (plastic option)</td> </tr> <tr> <td>Capacity Range</td> <td>5 mL – 1000 mL (common sizes: 5, 10, 20, 25, 50, 100, 250, 200, 500, 1000 mL)</td> </tr> <tr> <td>Tolerance (Accuracy)</td> <td>Conforms to Class A standards (e.g., ±0.03 mL for 50 mL, ±0.08 mL for 100 mL, ±0.30 mL for 1000 mL)</td> </tr> <tr> <td>Calibration</td> <td>Calibrated to contain (TC, "In") at 20 °C</td> </tr> <tr> <td>Graduation Mark</td> <td>Single, sharp graduation ring (etched or printed)</td> </tr> <tr> <td>Stopper Type</td> <td>Interchangeable ground glass stopper or high-quality polyethylene stopper</td> </tr> <tr> <td>Neck Design</td> <td>Narrow neck for precise meniscus reading</td> </tr> <tr> <td>Autoclavability</td> <td>Autoclavable at 121 °C (glass); plastic versions depend on material</td> </tr> <tr> <td>Compliance</td> <td>ISO 1042, ASTM E288, DIN standards</td> </tr> <tr> <td>Applications</td> <td>Preparation of standard solutions, accurate dilutions, and volumetric analysis in analytical chemistry</td> </tr> </tbody> </table>	Category	Specification	Type	Volumetric flask with ground glass stopper	Class	Class A (highest accuracy, ISO / ASTM certified)	Material	Borosilicate glass 3.3 (high chemical & thermal resistance) or PMP (plastic option)	Capacity Range	5 mL – 1000 mL (common sizes: 5, 10, 20, 25, 50, 100, 250, 200, 500, 1000 mL)	Tolerance (Accuracy)	Conforms to Class A standards (e.g., ±0.03 mL for 50 mL, ±0.08 mL for 100 mL, ±0.30 mL for 1000 mL)	Calibration	Calibrated to contain (TC, "In") at 20 °C	Graduation Mark	Single, sharp graduation ring (etched or printed)	Stopper Type	Interchangeable ground glass stopper or high-quality polyethylene stopper	Neck Design	Narrow neck for precise meniscus reading	Autoclavability	Autoclavable at 121 °C (glass); plastic versions depend on material	Compliance	ISO 1042, ASTM E288, DIN standards	Applications	Preparation of standard solutions, accurate dilutions, and volumetric analysis in analytical chemistry
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40	49	<p>Glass Graduated Cylinder – Class A أسطوانة مدرجة زجاجية - فئة (أ)</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Graduated measuring cylinder (Class A, high-accuracy)</td> </tr> <tr> <td>Material</td> <td>Borosilicate glass 3.3 (chemically and thermally resistant)</td> </tr> <tr> <td>Capacity Range</td> <td>5 mL – 5000 mL (common: 5, 10, 20, 25, 50, 100, 200, 250, 500, 1000, 2000, 5000 mL)</td> </tr> <tr> <td>Graduations</td> <td>Clear, permanent graduations (printed or engraved, high contrast)</td> </tr> <tr> <td>Class</td> <td>Class A (highest accuracy, per ISO / ASTM / DIN standards)</td> </tr> <tr> <td>Tolerance (Accuracy)</td> <td>Conforms to Class A tolerance (e.g., ±0.1 mL for 10 mL, ±0.25 mL for 50 mL, ±1.0 mL for 500 mL, ±2.0 mL for 1000 mL)</td> </tr> <tr> <td>Calibration</td> <td>Calibrated to deliver (TD, Ex) at 20 °C</td> </tr> <tr> <td>Base</td> <td>Hexagonal or round reinforced base for stability</td> </tr> <tr> <td>Spout</td> <td>With pouring spout for easy transfer</td> </tr> <tr> <td>Autoclavability</td> <td>Fully autoclavable at 121 °C</td> </tr> <tr> <td>Compliance</td> <td>ISO 4788, ASTM E1272, DIN standards</td> </tr> <tr> <td>Applications</td> <td>Accurate measurement of liquid volumes in analytical, chemical, and biological labs</td> </tr> </tbody> </table>	Category	Specification	Type	Graduated measuring cylinder (Class A, high-accuracy)	Material	Borosilicate glass 3.3 (chemically and thermally resistant)	Capacity Range	5 mL – 5000 mL (common: 5, 10, 20, 25, 50, 100, 200, 250, 500, 1000, 2000, 5000 mL)	Graduations	Clear, permanent graduations (printed or engraved, high contrast)	Class	Class A (highest accuracy, per ISO / ASTM / DIN standards)	Tolerance (Accuracy)	Conforms to Class A tolerance (e.g., ±0.1 mL for 10 mL, ±0.25 mL for 50 mL, ±1.0 mL for 500 mL, ±2.0 mL for 1000 mL)	Calibration	Calibrated to deliver (TD, Ex) at 20 °C	Base	Hexagonal or round reinforced base for stability	Spout	With pouring spout for easy transfer	Autoclavability	Fully autoclavable at 121 °C	Compliance	ISO 4788, ASTM E1272, DIN standards	Applications	Accurate measurement of liquid volumes in analytical, chemical, and biological labs
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41	59	<p>Tall Form Glass Beaker بيكر زجاجي طويل الشكل</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Tall form (Berzelius type) glass beaker</td> </tr> <tr> <td>Material</td> <td>Borosilicate glass 3.3 (high chemical & thermal resistance)</td> </tr> <tr> <td>Capacity Range</td> <td>5 mL – 2000 mL (common: 5, 10, 25, 50, 100, 150, 250, 400, 600, 1000, 2000 mL)</td> </tr> </tbody> </table>	Category	Specification	Type	Tall form (Berzelius type) glass beaker	Material	Borosilicate glass 3.3 (high chemical & thermal resistance)	Capacity Range	5 mL – 2000 mL (common: 5, 10, 25, 50, 100, 150, 250, 400, 600, 1000, 2000 mL)																		
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Form (Shape)	Tall, cylindrical with straight sides, taller than Griffin beaker
Height/Ø Ratio	Height approximately 1.4–1.6 × diameter
Graduations	White, easy-to-read graduations; approximate ($\pm 5\%$)
Spout	Reinforced beaded rim with pouring spout
Tolerance	Not a Class A measuring instrument (graduations for estimation only)
Temperature Resistance	Up to 300 °C (borosilicate); thermal shock resistance up to 160 °C
Autoclavability	Fully autoclavable at 121 °C
Compliance	ISO 3819, DIN 12331 standards
Applications	Solution preparation, mixing, heating, boiling, titration work where a taller vessel is preferred

42 134 Clear Graduated Bottle زجاجة زجاجية شفافة مدرجة

Category	Specification
Type	Clear graduated laboratory storage bottle
Material	Borosilicate glass 3.3 (high chemical & thermal resistance)
Capacity Range	50 mL – 10,000 mL (common: 50, 100, 250, 500, 1000, 2000, 5000, 10000 mL)
Neck Standard	ISO standard GL thread (e.g., GL32 for 50 mL, GL45 for 100 mL – 10 L)
Graduations	White or blue enamel graduations, approximate ($\pm 5\%$)
Tolerance	Approximate (not a Class A measuring instrument)
Cap Type	Screw cap (PP, PBT, or HDPE), autoclavable, often supplied with pouring ring
Closure Seal	Leak-proof with optional PTFE liner or vented cap
Temperature Resistance	Up to 500 °C (dry heat), thermal shock up to 160 °C
Autoclavability	Fully autoclavable at 121 °C
Compliance	ISO 4796 standard, CE certified, GLP/GMP compatible
Applications	Storage of solutions, media, reagents, and buffers; preparation of chemical solutions

43 3 Glass Graduated Burette – Class AS with Straight Stopcock

سحاحة زجاجية مدرجة – فئة AS بصنوبر مستقيم

Category	Specification
Type	Graduated glass burette with straight stopcock
Material (Tube)	Borosilicate glass 3.3, high chemical and thermal resistance
Capacity Range	10 mL – 100 mL (common: 10mL, 25 mL, 50 mL, 100 mL)
Graduations	High-contrast, permanent graduations; 0.1 mL or 0.05 mL subdivisions
Class	Class AS (high accuracy, fast delivery; certified according to ISO / DIN)
Tolerance (Accuracy)	Class AS tolerance (e.g., ± 0.02 mL for 25 mL; ± 0.03 mL for 50 mL; ± 0.05 mL for 100 mL)
Calibration	Calibrated “to deliver” (TD, Ex) at 20 °C with fast delivery
Stopcock Type	Straight bore glass stopcock (precise, smooth flow control, chemical resistant)

		<table border="1"> <tr> <td>Tip</td> <td>Fine delivery tip for accurate titration</td> </tr> <tr> <td>Zero Point</td> <td>At the top (filling from zero mark downward)</td> </tr> <tr> <td>Autoclavability</td> <td>Autoclavable at 121 °C</td> </tr> <tr> <td>Compliance</td> <td>ISO 385, DIN standards</td> </tr> <tr> <td>Applications</td> <td>Accurate titration and volumetric analysis in analytical, chemical, and educational labs</td> </tr> </table>	Tip	Fine delivery tip for accurate titration	Zero Point	At the top (filling from zero mark downward)	Autoclavability	Autoclavable at 121 °C	Compliance	ISO 385, DIN standards	Applications	Accurate titration and volumetric analysis in analytical, chemical, and educational labs																		
Tip	Fine delivery tip for accurate titration																													
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44	10	<p>Plastic Wash Bottle زجاجة غسيل بلاستيكية</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Squeeze-type laboratory wash bottle</td> </tr> <tr> <td>Material</td> <td>High-quality plastic (LDPE – Low Density Polyethylene, HDPE, or PP)</td> </tr> <tr> <td>Capacity Range</td> <td>125 mL – 1000 mL (common: 250 mL, 500 mL)</td> </tr> <tr> <td>Design</td> <td>Cylindrical body with narrow neck and dispensing nozzle</td> </tr> <tr> <td>Nozzle/Spout</td> <td>Angled, fine-tip nozzle for controlled liquid flow</td> </tr> <tr> <td>Closure Cap</td> <td>Leak-proof, screw cap with integrated nozzle</td> </tr> <tr> <td>Graduations</td> <td>Molded or printed graduations (optional, for volume estimation only)</td> </tr> <tr> <td>Chemical Resistance</td> <td>Resistant to most aqueous solutions, acids, alkalis, and organic solvents (depends on material)</td> </tr> <tr> <td>Labeling</td> <td>Available with printed chemical names/safety icons (e.g., Water, Ethanol, Acetone, Methanol)</td> </tr> <tr> <td>Temperature Range</td> <td>-50 °C to +80 °C (LDPE); higher resistance with PP</td> </tr> <tr> <td>Autoclavability</td> <td>LDPE bottles generally not autoclavable; PP versions autoclavable at 121 °C</td> </tr> <tr> <td>Compliance</td> <td>Conforms to laboratory safety standards</td> </tr> <tr> <td>Applications</td> <td>Rinsing glassware, dispensing solvents, washing precipitates, general lab use</td> </tr> </tbody> </table>	Category	Specification	Type	Squeeze-type laboratory wash bottle	Material	High-quality plastic (LDPE – Low Density Polyethylene, HDPE, or PP)	Capacity Range	125 mL – 1000 mL (common: 250 mL, 500 mL)	Design	Cylindrical body with narrow neck and dispensing nozzle	Nozzle/Spout	Angled, fine-tip nozzle for controlled liquid flow	Closure Cap	Leak-proof, screw cap with integrated nozzle	Graduations	Molded or printed graduations (optional, for volume estimation only)	Chemical Resistance	Resistant to most aqueous solutions, acids, alkalis, and organic solvents (depends on material)	Labeling	Available with printed chemical names/safety icons (e.g., Water, Ethanol, Acetone, Methanol)	Temperature Range	-50 °C to +80 °C (LDPE); higher resistance with PP	Autoclavability	LDPE bottles generally not autoclavable ; PP versions autoclavable at 121 °C	Compliance	Conforms to laboratory safety standards	Applications	Rinsing glassware, dispensing solvents, washing precipitates, general lab use
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45	50	<p>Complete Clear Glass Vial, (100 ml) with Rubber Septum and Aluminum Capsule قارورة زجاجية شفافة كاملة (١٠٠ مل) بغطاء مطاطي وكبسولة ألومنيوم</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Type</td> <td>Clear glass vial with closure (complete set: vial + cap + septum/stopper)</td> </tr> <tr> <td>Material (Vial)</td> <td>Neutral borosilicate glass (USP Type I, highly resistant to chemicals & thermal shock)</td> </tr> <tr> <td>Transparency</td> <td>Clear (flint) glass for easy visual inspection of contents</td> </tr> <tr> <td>Capacity</td> <td>100 mL</td> </tr> <tr> <td>Neck Type</td> <td>Crimp neck, screw thread, or snap-cap finish (depending on type)</td> </tr> <tr> <td>Closure System</td> <td>Aluminum crimp cap, plastic screw cap, or snap cap with PTFE/silicone septa or rubber stopper</td> </tr> <tr> <td>Graduations</td> <td>Optional (usually plain, but can be graduated for approximate volume)</td> </tr> <tr> <td>Sterility</td> <td>Available sterile or non-sterile, depyrogenated for pharmaceutical use</td> </tr> <tr> <td>Chemical Resistance</td> <td>Resistant to most solvents, acids, and alkalis (depending on closure type)</td> </tr> </tbody> </table>	Category	Specification	Type	Clear glass vial with closure (complete set: vial + cap + septum/stopper)	Material (Vial)	Neutral borosilicate glass (USP Type I, highly resistant to chemicals & thermal shock)	Transparency	Clear (flint) glass for easy visual inspection of contents	Capacity	100 mL	Neck Type	Crimp neck, screw thread, or snap-cap finish (depending on type)	Closure System	Aluminum crimp cap, plastic screw cap, or snap cap with PTFE/silicone septa or rubber stopper	Graduations	Optional (usually plain, but can be graduated for approximate volume)	Sterility	Available sterile or non-sterile, depyrogenated for pharmaceutical use	Chemical Resistance	Resistant to most solvents, acids, and alkalis (depending on closure type)								
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48	5	<p>Blue Square Bottle with Pipette Dropper Screw Cap زجاجة زرقاء مربعة بغطاء مع قطارة</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>Bottle Type</td> <td>Square reagent/storage bottle (blue)</td> </tr> <tr> <td>Material (Bottle)</td> <td>Glass (usually soda-lime or borosilicate), cobalt blue color for light protection</td> </tr> <tr> <td>Capacity</td> <td>30 mL</td> </tr> <tr> <td>Shape</td> <td>Square form – stable, space-saving in storage</td> </tr> <tr> <td>Color</td> <td>Blue (protects light-sensitive solutions from UV & visible light)</td> </tr> <tr> <td>Neck/Thread</td> <td>18 mm screw neck (ISO standard)</td> </tr> <tr> <td>Closure Type</td> <td>Screw cap with integrated pipette dropper</td> </tr> <tr> <td>Dropper Material</td> <td>Glass or plastic pipette with rubber/silicone bulb</td> </tr> <tr> <td>Pipette Length</td> <td>Sized to reach near bottom of 30 mL bottle (typically 60–70 mm)</td> </tr> <tr> <td>Graduations (Pipette)</td> <td>Optional graduation marks on dropper (e.g., 0.25 mL, 0.5 mL, 1.0 mL)</td> </tr> <tr> <td>Seal</td> <td>Leak-proof screw closure, airtight</td> </tr> <tr> <td>Chemical Resistance</td> <td>Suitable for aqueous solutions, essential oils, light-sensitive reagents</td> </tr> <tr> <td>Autoclavability</td> <td>Bottle autoclavable (if borosilicate); dropper cap usually not autoclavable</td> </tr> <tr> <td>Applications</td> <td>Storage & dispensing of essential oils, tinctures, pharmaceuticals, cosmetics, and lab reagents</td> </tr> </tbody> </table>	Category	Specification	Bottle Type	Square reagent/storage bottle (blue)	Material (Bottle)	Glass (usually soda-lime or borosilicate), cobalt blue color for light protection	Capacity	30 mL	Shape	Square form – stable, space-saving in storage	Color	Blue (protects light-sensitive solutions from UV & visible light)	Neck/Thread	18 mm screw neck (ISO standard)	Closure Type	Screw cap with integrated pipette dropper	Dropper Material	Glass or plastic pipette with rubber/silicone bulb	Pipette Length	Sized to reach near bottom of 30 mL bottle (typically 60–70 mm)	Graduations (Pipette)	Optional graduation marks on dropper (e.g., 0.25 mL, 0.5 mL, 1.0 mL)	Seal	Leak-proof screw closure, airtight	Chemical Resistance	Suitable for aqueous solutions, essential oils, light-sensitive reagents	Autoclavability	Bottle autoclavable (if borosilicate); dropper cap usually not autoclavable	Applications	Storage & dispensing of essential oils, tinctures, pharmaceuticals, cosmetics, and lab reagents
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Standard	Manufactured according to ISO specifications
Material (Bottle)	High-quality borosilicate glass 3.3 (clear, transparent)
Capacity Range	Common sizes: 250 mL, 500 mL, 1000 mL, 2000 mL, 5000 mL
Neck/Thread	GL80 wide neck (screw thread, ISO standard)
Closure System	GL80 screw cap with sealing ring (PTFE, silicone, or ETFE) for airtight, leak-proof closure
Cap Material	Polypropylene (PP) or Polybutylene Terephthalate (PBT), autoclavable
Transparency	Clear glass for full visibility of contents
Graduations	Printed (white/blue enamel) volume graduations in mL & L
Temperature Resistance	-40 °C to +140 °C (continuous use); up to 200–250 °C (short-term, dry heat)
Chemical Resistance	Resistant to most acids, alkalis, solvents, and thermal shock
Autoclavability	Fully autoclavable (cap and ring materials resistant to 121 °C)
Compliance	ISO, DIN standards; GLP/GMP compliant
Applications	Storage and handling of culture media, reagents, solvents, aqueous solutions

53	2	6-Place Automatic Pipettes Stand حامل ماصات أوتوماتيكي لـ ٦ ماصات	
		Category	Specification
		Type	Pipette stand / holder for 6 pipettes (single or multichannel, variable or fixed volume)
		Capacity	Holds up to 6 micropipettes simultaneously
		Compatibility	Universal design, compatible with most major brands of automatic pipettes
		Design	Vertical, carousel or linear design (space-saving and stable)
		Material	High-quality ABS / Acrylic / Polycarbonate (chemically resistant, durable)
		Base	Wide and stable base to prevent tipping
		Placement	Benchtop, easy access and organization of pipettes
		Protection	Prevents damage, contamination, or misplacement of pipettes
		Portability	Lightweight and easy to move
		Cleaning	Easy to clean with disinfectants, ethanol, or mild detergents
		Applications	Safe storage and organization of pipettes in research, clinical, and educational labs

54	3	Pipette Pump Filler مضخة تعبئة ماصات	
		Category	Specification
		Type	Manual pipette pump filler / pipette controller
		Compatibility	For glass or plastic serological pipettes (typically 1 mL - 100 mL)
		Operation	Thumb wheel for aspiration & dispensing, quick-release valve for fast emptying
		Volume Range	Accepts pipettes of multiple sizes (commonly 1 mL, 2 mL, 5 mL, 10 mL, 25 mL, up to 100 mL)
		Material	Chemically resistant ABS / PP plastic body with silicone rubber adapter
		Grip	Ergonomic, lightweight design for comfortable handling
		Color Coding	Available in different colors for easy volume identification
		Sterilization	Easy to clean; some models can be autoclaved (up to 121 °C)

		Accuracy	Provides controlled, reproducible aspiration and dispensing
		Applications	Suitable for microbiology, chemistry, clinical labs, and educational labs

55	2	Analytical Balance Digital Lab Scale ميزان تحليلي رقمي بدقة عالية	
		Category	Specification
		Name	Precision / Analytical Balance (5 kg capacity)
		Maximum Capacity	5,000 g (5 kg)
		Readability / Resolution	0.01 g (10 mg) – or better, e.g. 0.001 g depending on design
		Repeatability (Typical)	±0.02 g (depending on load)
		Linearity	±0.04 g or better
		Display	LCD / backlit display, unit display (g, oz, etc.)
		Pan Size	~ 180 × 140 mm (depends on model)
		Weighing Modes	Weighing, Tare, Percentage, Parts counting, Dynamic weighing
		Stabilization Time	≤ 2–3 seconds
		Calibration	Internal automatic calibration (Auto-Cal) or external calibration (with standard weights)
		Draft Shield	Optional or built-in draft shield for high precision use
		Power Supply	AC adapter (e.g. 110–240 V) + optional battery / rechargeable
		Housing / Material	Stainless steel weighing pan, anti-static housing, robust construction
		Interface / Connectivity	RS-232, USB, optional Bluetooth / Ethernet
		Operating Conditions	Temp: ~10–30 °C; Humidity: non-condensing
		Units of Measurement	g, mg, oz, lb, ct, etc. (selectable)
		Tare Range	Full capacity (e.g. –5,000 g)
		Certifications	ISO / NIST traceability, calibration certificates, OIML (if required)

56	2	Analytical / Micro Balance with 3-Door Glass Draft Shield	
		ميزان تحليلي/ميكروي مزود بدرع زجاجي ثلاثي الأبواب	
		Category	Specification
		Name	Analytical Balance with 3-Door Glass Draft Shield
		Maximum Capacity	e.g. 100 g, 200 g, 300 g (depending on model)
		Readability / Resolution	0.0001 g (0.1 mg) or better; some micro balances 0.00001 g (10 µg)
		Repeatability	±0.0001 g (typical)
		Linearity / Deviation	±0.0002 g or better
		Pan Size	~ 90 mm diameter or square ~ 85 × 85 mm (varies by model)
		Draft Shield / Glass Doors	Three sliding glass doors (front, left, right) to minimize air currents
		Stabilization Time	~ 1–3 s (depending on sensitivity)
		Calibration	Internal automatic calibration (Auto-Cal) or external weight adjustment
		Display	Backlit LCD / LED display, showing weight, stability indicator, unit

		<table border="1"> <tr> <td>Weighing Modes / Functions</td> <td>Weigh, Tare, Percent, Dynamic / Subtraction, Comparison, Density determination (in some models)</td> </tr> <tr> <td>Interface / Connectivity</td> <td>RS-232, USB, optional Ethernet / Bluetooth</td> </tr> <tr> <td>Housing / Material</td> <td>Stainless steel pan; electrostatic shielding; anti-vibration base</td> </tr> <tr> <td>Operating Conditions</td> <td>Temperature ~ 18-28 °C, humidity non-condensing, minimal drafts</td> </tr> <tr> <td>Units / Conversions</td> <td>g, mg, oz, ct, etc. selectable</td> </tr> <tr> <td>Tare Range</td> <td>Full capacity (e.g. -100 g)</td> </tr> <tr> <td>Certifications</td> <td>ISO / GLP / NIST traceability; calibration certificate included</td> </tr> <tr> <td>Power Supply</td> <td>AC adapter (e.g. 100-240 V) or internal rechargeable battery (in portable units)</td> </tr> <tr> <td>Accessories</td> <td>Inert gas purge kit (optional), density kit, anti-vibration table, gloves, weight set</td> </tr> </table>	Weighing Modes / Functions	Weigh, Tare, Percent, Dynamic / Subtraction, Comparison, Density determination (in some models)	Interface / Connectivity	RS-232, USB, optional Ethernet / Bluetooth	Housing / Material	Stainless steel pan; electrostatic shielding; anti-vibration base	Operating Conditions	Temperature ~ 18-28 °C, humidity non-condensing, minimal drafts	Units / Conversions	g, mg, oz, ct, etc. selectable	Tare Range	Full capacity (e.g. -100 g)	Certifications	ISO / GLP / NIST traceability; calibration certificate included	Power Supply	AC adapter (e.g. 100-240 V) or internal rechargeable battery (in portable units)	Accessories	Inert gas purge kit (optional), density kit, anti-vibration table, gloves, weight set
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Interface / Connectivity	RS-232, USB, optional Ethernet / Bluetooth																			
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Power Supply	AC adapter (e.g. 100-240 V) or internal rechargeable battery (in portable units)																			
Accessories	Inert gas purge kit (optional), density kit, anti-vibration table, gloves, weight set																			
57	2	<p>PC Core i7 / 16 GB RAM / SSD512/ HDD 1T/19" LED Monitor / mouse / keyboard (DELL/HP)</p> <p>حاسوب مكتبي (Core i7) / ذاكرة ١٦ غيغابايت / قرص SSD بسعة ٥١٢ غيغابايت / قرص HDD بسعة ١ تيرابايت / شاشة LED مقاس ١٩ بوصة / فأرة ولوحة مفاتيح – DELL أو (HP)</p>																		

مشروع نموذج عقد

لشراء المنقولات

أنه في يوم الموافق تم إبرام هذا العقد بين كل من :-

أولاً : ومقرها بصفتها المتعاقد وهي الجهة المعنية / المستفيدة من عملية :.....

ويمثلها قانونا في التوقيع على هذا العقد بصفته

ويفوض عنه في التوقيع على هذا العقد (السيد / السيدة) بصفته / بصفتها الوظيفة..... بموجب التفويض

(طرف أول مشتري)

الصادر بالقرار رقم الصادر في

ثانياً : الكائن مقرها : وشكلها القانوني والمصنفة سجل تجارى رقم بطاقة

ضريبية رقم تليفون رقم فاكس رقم بريد الإلكتروني ويمثلها (السيد / السيدة)

..... بطاقة رقم قومی بصفته / بصفتها بموجب بصفته / بصفتها المتعاقد معه ،

(طرف ثانى بائع)

تمهيد

- حيث أن الطرف الأول ابدى رغبته في على شراء وذلك لغرض تلبية احتياجاته بما يمكنه من تحقيق أهدافه بكفاءة وفاعلية ويتضمن انتظام سير العمل ، ووفقا لما تم تخصيصه من اعتمادات مالية ، وحيث أبدى الطرف الثانى استعداداه للقيام بذلك وإتمامه وفقا للشروط والمواصفات و أية متطلبات أخرى وكما هو منصوص عليه بكراسة الشروط والمواصفات و (العطاء / العرض) المقدم منه والذي قبله الطرف الأول .
- وفي ضوء اعتماد السلطة المختصة المفوض عنه بالقرار رقم () الصادر في لإجراءات طرح العملية رقم بتاريخ وفقا لأحكام قانون تنظيم التعاقدات التي تبرمها الجهات العامة الصادر بالقانون رقم ١٨٢ لسنة ٢٠١٨ م ولائحته التنفيذية الصادرة بقرار وزير المالية رقم ٦٩٢ لسنة ٢٠١٩ (الاعلان / الدعوة / الطلب / عرض السعر) وكراسة الشروط والمواصفات المنشورة على بوابة التعاقدات العامة بتاريخ بشأن المناقصة (العامة / المحدودة / المحلية / ذات المرحلتين) الممارسة (العامة / المحدودة) الاتفاق المباشر رقم لسنة للتعاقد على
- ووفقا لما تضمنته كراسة الشروط والمواصفات الخاصة بموضوع هذا العقد وما أوصت به (لجنة البت في المناقصة / الممارسة / لجنة الاتفاق المباشر) بجلستها المعقودة يوم الموافق / / من قبول (العطاء / العرض) المقدم من الطرف الثانى بمبلغ (.....) فقط (.....). والذي تمت الترسية بناء عليه ، باعتباره الأفضل شروطا والأقل سعرا والذي تم ترجيحه بنظام النقاط ومطابقته للشروط والمواصفات الفنية واعتماد السلطة المختصة لتوصية اللجنة بتاريخ وبعد أن أقر الطرفان بأهليتهما وصفتهما للتعاقد اتفاقا على الاتى :-

البند الأول

يعتبر التمهيد السابق وكراسة الشروط والمواصفات و (العطاء / العرض) المقدم من الطرف الثانى وكافة المكاتبات والمستندات المتبادلة بين الطرفين ومحاضر (لجنة البت في المناقصة / الممارسة / لجنة الاتفاق المباشر) رقم (..... لسنة) وأمر التوريد المؤرخ / / جزء لا يتجزأ من هذا العقد ومتما ومكملا لأحكامه .

البند الثاني

تعتبر الملاحق التالية والمرفقة بهذا العقد جزءاً لا يتجزأ منه

ملحق (١) : وصف موضوع العقد .

ملحق (٢) : الاشتراطات الخاصة .

ملحق (٣) : التزامات طرفي التعاقد .

البند الثالث

يلتزم الطرف الثاني بتنفيذ محل هذا العقد وفقاً للممارسات الجيدة و أفضل المعايير المتعارف عليها وطبقاً للمواصفات الفنية والكميات والأسعار الموضحة بعد وبقيمة إجمالية قدرها (.....) فقط وقدره (.....) شامل كافة الضرائب والرسوم والتكاليف والنفقات ذات الصلة وذلك على النحو التالي :-

رقم البند	الصف	الوحدة	الكمية	سعر الوحدة	القيمة الإجمالية
.....
إجمالي ثمن الشراء مبلغ وقدره (.....) فقط (.....) (شاملة ضريبة القيمة المضافة / غير شامل ضريبة القيمة المضافة)					

البند الرابع

سدد الطرف الثاني مبلغ إجمالياً مقداره (.....) فقط وقدره (.....) بما يعادل نسبة (٥ %) من إجمالي هذا العقد كتأمين نهائي ، وذلك (بخطاب الضمان بحساب الطرف الأول رقم بينك) / خصماً من مستحقاته الصالحة للصرف من عملية أخرى لدى الطرف الأول في الوقت المحدد للسداد / خصماً من مستحقاته الصالحة للصرف لدى بموجب خطاها رقم المؤرخ المقدم في الوقت المحدد للسداد / حجز من مستحقاته في حالة الاتفاق المباشر ويظل هذا التأمين سارياً طوال مدة العقد بما فيها مدة الضمان .

(إذا كان الطرف الأول قد قام بسداد دفعة مقدمة ، يكون البند على النحو التالي وتستكمل البيانات المطلوبة فيه)

قام الطرف الأول بسداد دفعة مقدمة بمبلغ إجمالي مقداره (.....) فقط وقدره (.....) بما يعادل نسبة (..... %) من قيمة التعاقد مقابل خطاب ضمان بنكي معتمد صادر من بنك ، وغير مقترن بأي قيد أو شرط بالقيمة والعملية ذاتها قدمه الطرف الثاني للطرف الأول .

البند الخامس

(إذا كان التوريد مرة واحدة ، يكون البند على النحو التالي وتستكمل البيانات المطلوبة فيه)

يلتزم الطرف الثاني بتوريد الكميات والأصناف محل العقد بمخازن وعنوانها وعلى نفقته الخاصة على أن يتم التوريد خلال مدة تبدأ من (اليوم التالي لإخطاره بأمر التوريد) كما يلتزم بأن يقدم فاتورة الأصناف الموردة من أصل وصورتين وفي حالة إخطاره بتسليم الأصناف في غير هذا العنوان يلتزم بأن يرفق مع الفواتير مستندات تثبت قيمة مصروفات النقل الإضافية التي تحملها فعلياً لردّها إليه .

(إذا كان التوريد على دفعات يكون البند على النحو التالي وتستكمل البيانات المطلوبة فيه)

يلتزم الطرف الثاني بتوريد الكميات والأصناف محل العقد خلال مدة تبدأ من اليوم التالي لإخطاره بأمر التوريد) وذلك على نفقته الخاصة وطبقاً للبرنامج الزمني التالي :

الكمية	تاريخ التوريد	مكان التوريد
.....

البند السادس

حدد الطرف الأول يوم الموافق في تمام الساعة موعداً لأنعقاد اجتماع لجنة فحص الأصناف الموردة من الطرف الثاني ، وإذا رفضت اللجنة صنفاً أو أكثر من الأصناف الموردة أو وجدت فيها نقص أو مخالفة للمواصفات أو المتطلبات أو العينات المعتمدة وجب على الطرف الأول إخطار الطرف الثاني بأسباب الرفض كتابة .

ويلتزم الطرف الثاني بسحب الأصناف المرفوضة وتوريد بدل منها خلال مدة لا تتجاوز سبعة أيام من تاريخ اليوم التالي لإخطاره فإذا تأخر في سحبها فيحق للطرف الأول تحصيل مصروفات تخزين منه بواقع (٥ %) من قيمة الأصناف المرفوضة عن كل أسبوع تأخير أو جزء منه ويحدد أقصاه أربعة أسابيع وبعد انتهاء تلك المدة يحق للطرف الأول اتخاذ إجراءات بيعها لحساب الطرف الثاني ويخصم من الثمن ما يكون مستحقاً للطرف الأول ويكون البيع وفقاً لأحكام قانون تنظيم التعاقدات التي تبرمها الجهات العامة الصادر بالقانون رقم ١٨٢ لسنة ٢٠١٨م ولائحته التنفيذية الصادرة بقرار وزير المالية رقم (٦٩٢) لسنة ٢٠١٩ .

البند السابع

يلتزم الطرف الأول باستلام الأصناف محل هذا العقد في المواعيد المحددة وذلك حال مطابقتها للمواصفات والشروط المتفق عليها ، ويحق للطرف الثاني حال تقاعس الطرف الأول عن الاستلام التقدم بطلب للسلطة المختصة لتشكيل لجنة محايدة لدراسة أسباب التقاعس ، وصورة منه لمكتب شكاوى التعاقدات العمومية وذلك للمتابعة .

البند الثامن

يضمن الطرف الثاني الأصناف الموردة محل هذا العقد وذلك لمدة تبدأ من تاريخ ضد عيوب الصناعة أو

البند التاسع

- يلتزم الطرف الأول بأن يسدد للطرف الثاني ثمن الأصناف الموردة فعلياً خلال مدة لا تتجاوز (٣٠) يوماً تحسب من تاريخ الفحص والقبول والاعتماد وذلك على حسابه رقم بالبنك
- في حالة عدم وفاء الطرف الأول بالمبالغ المستحقة في المواعيد المحددة يلتزم بأن يؤدي للطرف الثاني ما يعادل تكلفة التمويل لقيمة المطالبة عن فترة التأخير وفقاً لسعر الائتمان والخصم المعلن عنه من البنك المركزي وقت المحاسبة شريطة تقديم الطرف الثاني مستندات رسمية بالمبالغ المطالب به .

البند العاشر

للطرف الأول زيادة أو نقص الكميات المتعاقد عليها بما لا يتجاوز (١٥ %) من كمية كل بند بذات الشروط والمواصفات والأسعار.

البند الحادى عشر

لا يجوز للطرف الثاني أثناء تنفيذ هذا العقد أن يقوم بتغيير من عهد إليهم ووافق عليهم الطرف الأول بتنفيذ بعض بنوده من الباطن دون موافقة الطرف الأول .

ويظل الطرف الثاني وحده مسئولاً عن أية أفعال أو أعمال أو أخطاء في تنفيذ العقد . كما يلتزم باطلاع من عهد إليهم بتنفيذ بعض بنود العملية من الباطن على ما يخصهم من شروط العقد .

البند الثانى عشر

كلف الطرف الأول (السيد / السيدة /) بصفته / بصفتها الوظيفية بموجب القرار رقم الصادر في مسئولاً / مسئولة عن إدارة هذا العقد .

البند الثالث عشر

أقر الطرف الثاني بحق الطرف الأول في أن يقوم بنفسه أو بواسطة أى شخص أو جهة يحددها الطرف الأول وبحسب طبيعة العملية المرور أو التفتيش أو مر اقية التنفيذ على محل هذا وفي أى وقت دون حاجة إلى أخطار أو أذن مسبق .
وفي حالة اكتشاف مخالفة الطرف الثاني لأى التزام يحق للطرف الأول توقيع أى من الإجراءات المنصوص عليهما في البند العشرون من هذا العقد .

البند الرابع عشر

إذا تأخر الطرف الثاني في تنفيذ هذا العقد عن الميعاد المحدد به لأسباب خارجة عن إرادته يجوز للطرف الأول إعطائه مهلة بما لا يجاوز من المدة الإصلية للتنفيذ دون توقيع مقابل تأخير ، وفي حالة تأخره لأسباب راجعة إليه فية قعه عليه مقابل تأخير يحسب من بداية المهلة وفقا للآتى :
ولا يخل توقيع مقابل التأخير بحق الطرف الأول في الرجوع على الطرف الثاني بكامل التعويض المستحق عما أصابه من أضرار بسبب التأخير .

البند الخامس عشر

يحظر على الطرف الثاني التنازل عن العقد كلياً أو جزئياً.

البند السادس عشر

أقر الطرف الثاني عند توقيعه على هذا العقد بعدم صدور أحكام نهائية ضده في إحدى الجرائم المنصوص عليها في الباب الرابع من الكتاب الثاني من قانون العقوبات أو في جرائم التهريب الضريبي أو الجمركي .

البند السابع عشر

يلتزم الطرف الثاني والعاملين لديه بالمحافظة على سرية وخصوصية ما يحصلون عليه من بيانات أو مستندات أيا كانت طبيعتها تكون متعلقة بالعقد ويتعهد بعدم إفشائها للغير وذلك طوال مدة سريان العقد أو بعد انتهاءه أو إنهائه أو فسخه ويعد الإخلال بمبدأ السرية والخصوصية بمثابة إخلالا جسيما بشروط العقد ودون الإخلال بأية عقوبة مقررة في هذا الشأن .

البند الثامن عشر

يلتزم الطرف الثاني بتحمل كافة الضرائب والرسوم وغيرها التي تستحق على هذا العقد من تاريخ توقيعه وسدادا في مواعيدها المحددة قانونا

البند التاسع عشر

أتفق الطرفان على بذل أقصى جهد للألتزام بينود التعاقد طوال مدة تنفيذه طبقا لما اشتمل عليه وبطريقة تتفق مع ما يوجبه حسن النية ، وفي حالة حدوث خلاف بينهما أثناء تنفيذه يتم عقد اجتماع مع مسئول إدارة العقد أو ممثل الجهة الإدارية بحسب الأحوال خلال مدة خمسة عشر يوما من تاريخ ظهور الخلاف وذلك لمناقشته و اتخاذ الإجراءات الآتية :

١. فحص شروط التعاقد بكل دقة واتخاذ الحل المناسب للمشكلة

٢. قيام إدارة التعاقدات بإعداد تصور عن موضوع الخلاف وتقديم رأى فنى ومالى وقانونى للسلطة المختصة ويجوز لها الاستعانة باستشارى متخصص للمساعدة في دراسة الخلاف وبتقديم الرأى

٣. تسوية الخلاف الذى نشأ بالطرق الودية بما لا يخل بحقوق والتزامات طرفى العقد وإذا ترتب على التسوية الودية أى اعباء مالية فيتم

عرضها على السلطة المختصة للموافقة عليها يهد تقديم كافة المستندات والبيانات والمبررات لتسوية الخلاف

وفي جميع الحالات يلتزم طرفى العقد بالاستمرار في تنفيذ التزامهما الناشئة عن هذا العقد .

البند العشرون

في حالة إخلال الطرف الثاني بأى شرط جوهرى من شروط التعاقد ، يحق للطرف الأول فسخ العقد أو تنفيذه على حساب الطرف الثاني وفي الحالتين يكون التأمين النهائى من حق الطرف الأول كما يكون له أن يخصم ما يستحقه وقيمة كل خسارة تلحق به من أى مبالغ مستحقه أو تستحق للطرف الثاني لدية ، وفي حالة عدم كفايتها يحق للطرف الأول خصمها من مستحقاته لدى أية جهة إدارية أخرى أيا كان سبب الاستحقاق ، دون حاجة إلى اتخاذ أية إجراءات قضائية وذلك كله مع عدم الإخلال بحق الطرف الأول في الرجوع على الطرف الثاني قضائيا بما لم يتمكن من استيفائه من حقوق بالطريق الإداري ، ولا يحق للطرف الثاني المطالبة باسترداد ما سبق سداه للطرف الأول .

البند الواحد والعشرون

يفسخ هذا العقد تلقائيا في الحالات الآتية :-

١. إذا تبين أن الطرف الثاني استعمل بنفسه أو بواسطة غيره الغش أو التلاعب في تعامله مع الطرف الأول أو في حصوله على العقد
٢. إذا تبين وجود تواطؤ أو ممارسات احتيالية أفساد أو احتكار من قبل الطرف الثاني
٣. إذا أفلس الطرف الثاني أو أعسر

البند الثاني والعشرون

يسرى على هذا العقد أحكام قانون تنظيم التعاقدات التي تبرمها الجهات العامة الصادر بالقانون رقم ١٨٢ لسنة ٢٠١٨ ولائحته التنفيذية الصادرة بقرار وزير المالية رقم ٦٩٢ لسنة ٢٠١٩ وذلك فيما لم يرد بشأنه نص خاص في هذا العقد.

البند الثالث والعشرون

يتم تسوية النزاعات والخلافات التي تنشأ أثناء التنفيذ وفقا للطرق والشروط والاحكام المنصوص عليها في المادة (٩١) من قانون تنظيم التعاقدات التي تبرمها الجهات العامة الصادر بالقانون رقم ١٨٢ لسنة ٢٠١٨ مع مراعاة ضرورة الحصول على موافقة الوزير المختص في حالة اللجوء إلى التحكيم

(في حالة اللجوء إلى تسوية النزاع قضائيا وكان المتعاقد معه شخصا اعتباريا خاصا يكون البند على النحو التالي)

تختص محاكم مجلس الدولة دون غيرها بالفصل في أى نزاع ينشأ عن تنفيذ هذا العقد

(في حالة اللجوء إلى تسوية النزاع قضائيا وكان المتعاقد معه شخصا اعتباريا عاما يكون البند على النحو التالي)

تختص الجمعية العمومية لقسى الفتوى والتشريع بمجلس الدولة بالفصل في كافة المنازعات التي قد تنشأ عن تنفيذ أو تفسير هذا العقد .

البند الرابع والعشرون

أقر الطرفان بأن العنوان المبين قرين كل منهما بصدر هذا العقد هو المحل المختار لهما ، وأن جميع المكاتبات والمراسلات والاعلانات والاضطرابات التي توجه أو ترسل أو تعلن أو تخطر عليه تكون صحيحة ومنتجة لكافة أثارها القانونية ، وفي حالة تغيير أحد الطرفين لعنوانه يتعين عليها إخطار الطرف الآخر بهذا العنوان الجديد خلال خمسة عشرة يوما ، بخطاب مسجل بعلم الوصول ، إلا اعتبرت مكاتباته ومراسلاته وإعلاناته وإخطاراته على هذه العنوان صحيحة ومنتجة لكافة أثارها القانونية

البند الخامس والعشرون

حرر هذا العقد من أصل وأربعة نسخ سلمت إحداها للطرف الثاني واحتفظ الطرف الأول بالأصل والنسخ الأخرى للعمل بمقتضاها عند اللزوم.

الطرف الثاني البائع

الطرف الأول المشتري

..... / الأسم

..... / الأسم

..... / الصفة

..... / الصفة

..... / التوقيع

..... / التوقيع

..... / التاريخ

..... / التاريخ