الهيكل الوزاري الجديد 2025 منهج بريدج الخطة 102A-M

Academic Year العام الدراسي	2024/2025
Term الفصل	3
Subject المادة	Physics/Bridge M.102A الفيزياء/ بريدج
Grade الصف	12
Stream المسار	Advanced المتقدم
Number of Questions عدد الأسئلة	SWIFT 15 Paper Part 4
Type of All Questions نوع كافة الأسئلة	SWIFT: MCQ Paper Part: FRQ
Maximum Overall Grade الدرجة القصوى الممكنة	100
Mode of Implementation - طريقة التطبيق	SwiftAssess & Paper-Based
Calculator الآلة الحاسبة	Allowed مسموحة
Exam Duration - مدة الامتحان	150 minutes

Part الجزء	Question السؤال	Learning Outcome* ناتج التعلم*	Reference(s) in the Student Book / المرجع في كتاب الطالب Example/Exercise مثال/تمرين	Page الصفحة
SWIFT	1 2	State Kirchhoff's junction rule: "The sum of the currents entering a junction must equal the sum of the currents leaving the junction" . Apply Kirchhoff's junction rule in problem solving.	As mentioned in the textbook	146
SWIFT	3 4	State and explain Kirchhoff's loop rule: 'The potential difference around a complete circuit loop must sum to zero'. Express Kirchhoff's loop rule mathematically and apply in problem solving. Recall that in a single loop circuit, the current is the same everywhere in the circuit. Analyze single loop circuits containing two sources of emf and circuit elements. Apply Kirchhoff's loop rule to single loop circuits.	As mentioned in the textbook FIGURE 6.7 - 6.8	147-150
SWIFT	5 6	Solve the system of coupled equations for the quantities of interest using various techniques, including direct substitution. Analyze Wheatstone Bridge circuits. Use appropriate relationships to find unknown values in Wheatstone Bridge circuits.	As mentioned in the textbook SOLVED PROBLEM 6.2	150-153
SWIFT	7 8	Identify that ammeters are designed to have as low resistance as possible, so they do not have an appreciable effect on the currents they measure. Identify that voltmeters are designed to have as high resistance as possible, so they have a negligible effect on the potential differences they measure. Recall that an ammeter is wired in a circuit in series. Recall that a voltmeter is wired in parallel with the component across which the potential difference is to be measured. Solve problems with ammeters and voltmeters in circuits.	As mentioned in the textbook EXAMPLE 6.3 Concept Check 6.4	153- 155
SWIFT	9 10	Identify the properties of a magnet (A magnet always has a north pole and a south pole - A single north or south pole cannot be isolated (they always come in pairs) - Opposite magnetic poles attract and like poles repel - Breaking a bar magnet in half results in two new magnets, each with a north and a south pole). Recall that a magnetic field is represented using field lines, identify that a magnetic field is a vector quantity and, thus has both magnitude and direction. Draw the magnetic field lines around a permanent magnet along with the direction of the field, and identify that the magnetic field vector is always tangent to the magnetic field lines	As mentioned in the textbook FIGURE 7.3 - 7.4 - 7.5	170-171
SWIFT	11 12	Apply the right-hand rule to determine the direction of the magnetic force vector which is always perpendicular to both the velocity vector and the magnetic field vector (for a negative charge the force will be in the opposite direction). Apply the relationship between the magnetic force , charge q, velocity , and the magnetic field B. Recall and analyze the SI unit of magnetic field strength is Tesla (T).	As mentioned in the textbook EXCERCISE 7.27	173-175 191
SWIFT	13	Apply Newton's second law, for a charged particle in uniform circular motion due to a magnetic force, to derive an expression for the orbital radius r in terms of the magnetic field magnitude B and the particle's mass m, charge magnitude |q|, and speed v ($r = \frac{mv}{\|q\|B}$).	As mentioned in the textbook	176
SWIFT	14	Apply the equation ($\vec{F}_B = i\vec{L}\times\vec{B}$; Force magnitude $F_B = iLB\sin\theta$) to determine the magnetic force on a current-carring wire in a uniform magnetic field or other unknown physical quantities, where θ is the angle between the direction of the current flow and the direction of the magnetic field . Apply the right-hand rule to find the direction of the magnetic force on a current-carrying wire placed in a magnetic field. Solve problems related to magnetic force on a current-carrying wire.	As mentioned in the textbook MULTIPLE-CHOICE QUESTIONS 7.10	182-184 190
SWIFT	15	Apply the equation ($\tau = NiAB\sin\theta$) to calculate the magnitude of the net torque τ on a current-carrying coil in a magnetic field (or any other unknown quantity), where N is the number of turns, i is the current, A is the area of each turn, B is the magnitude of the magnetic field, and θ is the angle between the normal vector $\vec{n}$ and the magnetic field vector. Solve problems related to torque on a current-carrying loop .	As mentioned in the textbook	184-185
		Important note: Please pay attention to specifying the units of measurement when solving problems, as grades will be calculated based on the units. Drawing relationships between variables, identifying and drawing the best fit line connecting the points, and finding values from the graph. ملاحظة هامة: يرجى ضرورة الاهتمام بتحديد وحدات القياس عند حل المسائل، حيث سيرصد درجات على الوحدات كما يرجى تدريب الطلبة على رسم العلاقات بين متغيرات وتحديد أفضل خط يصل بين النقاط وايجاد قيم من الرسم البياني		
Paper part	1	Recall and apply Ohm's Law (i=ΔV/R). Solve problems on multiloop circuits. Analyze multiloop circuits by applying both Kirchhoff's loop rule and Kirchhoff's junction rule. Write a system of coupled equations in several unknown variables by applying both the Kirchhoff's rules. Solve the system of coupled equations for the quantities of interest using various techniques, including direct substitution. Express Kirchhoff's loop rule mathematically and apply in problem solving Identify that ammeters are designed to have as low resistance as possible, so they do not have an appreciable effect on the currents they measure. Identify that voltmeters are designed to have as high resistance as possible, so they have a negligible effect on the potential differences they measure.	As mentioned in the textbook FIGURE 6.12 - 6.13 FIGURE 6.18	150-155
Paper part	2	Apply the relationship giving the charge as a function of time for a capacitor in a charging RC circuit ($q(t) = q_{max}(1-e^{-t/\tau})$) Apply the relationship giving the charge as a function of time for a capacitor in a discharging RC circuit ($q(t) = q_{max}e^{-t/\tau}$) Identify RC circuits as circuits that contain capacitors, sources of emf, and resistors and have currents that vary with time. Describe the charging and discharging of a capacitor. Determine the capacitor's charge and potential difference at the start of the process (t = 0) and then a long time later (t = ∞) for a charging RC circuit and a discharging RC circuit .	As mentioned in the textbook As mentioned in EXAMPLE 5.4 EXAMPLE 6.3 EXCERCISE 6.45 - 6.46 - 6.47	155-158 166
Paper part	3	Apply the relationship between the magnetic force , charge q, velocity , and the magnetic field B. Apply Newton's second law, for a charged particle in uniform circular motion due to a magnetic force, to derive an expression for the orbital radius r in terms of the magnetic field magnitude B and the particle's mass m, charge magnitude q, and speed v. Apply the equation to calculate the orbital radius r for a charged particle in a unifrom mgnetic field or other unknown physical quantites	As mentioned in the textbook FIGURE 7.16 EXCERCISE 7.24 - 7.25 - 7.36	173-176 191
Paper part	4	Apply the equation ($\vec{F}_B = i\vec{L}\times\vec{B}$; Force magnitude $F_B = iLB\sin\theta$) to determine the magnetic force on a current-carring wire in a uniform magnetic field or other unknown physical quantities, where θ is the angle between the direction of the current flow and the direction of the magnetic field . Apply the right-hand rule to find the direction of the magnetic force on a current-carrying wire placed in a magnetic field. Solve problems related to magnetic force on a current-carrying wire.	As mentioned in the textbook Concept Check 7.3 EXCERCISE 7.40	182-184 192