الهيكل الوزاري الجديد 2025 منهج بريدج الخطة 102-C

Academic Year العام الدراسي	2024/2025
Term الفصل	3
Subject	Physics/Bridge C.102
المادة	الفيزياء/ بريدج C.102
Grade الصف	12
Stream	Advanced
المسار	المتقدم
Number of MCQ عدد الأسئلة الموضوعية	15
Marks per MCQ الدرجات لكل سؤال	4
Number ofFRQ عدد الأسئلة المقالية	4
*** Type of All Questions نوع كافة الأسئلة	Part(1) MCQ Part (2) FRQ
* Maximum Overall Grade *الدرجة القصوى الممكنة	100
Exam Duration - مدة الامتحان	150 minutes
Mode of Implementation -طريقة التطبيق	SwiftAssess & Paper-Based
Calculator	Allowed
الآلة الحاسبة	مسموحة

	Question السؤال	Learning Outcome/ Peformance indicator (Topic) ناتج التعلم / مؤشر الأداء (عنوان)	Reference(s) in the Student Book المرجع في كتاب الطالب Example/Exercise مثال/تمرين	Page الصفحة
MCQ الأسئلة الموضوعية	1	Describe Faraday's experiments to show that changing magnetic field inside a conducting loop induces a current in the loop.	As mentioned in the textbook FIGURE 9.2 - 9.3 - 9.4 - 9.5	226-227
	2 3	Describe, based on the equation of Faraday's Law, that potential difference could be induced in a loop either by varying the magnetic field 'B' with time (A and ϴ are constant), changing the area 'A' of the loop with time (B and ϴ are constant), or changing the angle 'ϴ' between the magnetic field and the normal to the loop with time (A and B are constant), and demonstrate that by mathematical equations. Calculate the magnetic flux ϕ B through a given surface.	As mentioned in the textbook FIGURE 9.7	227-229
	4 5	State Lenz's Law as: 'An induced current in a loop will have a direction such that the magnetic field due to the induced current opposes the change in the magnetic flux that induces the current. Induced Potential Difference on a Wire Moving in a Magnetic Field. Solve problems related to Lenz's Law, and motional emf.	As mentioned in the textbook FIGURE 9.7 EXAMPLE 9.4	232-238
	6 7	Identify electric generators and electric motors as everyday applications of electromagnetic induction and electromagnetic force. Describe how direct and alternating potential differences are induced in a DC and an AC generator through different connections between the rotating loop and theexternal circuit. Describe the working of a DC and an AC generator. Describe the working of a DC motor.	As mentioned in the textbook FIGURE 9.19	239-240
	8	Apply Faraday's law and the work done on an electric charge in an electric field to relate the electric field induced along a closed path to the rate of change of themagnetic flux encircled by the path.	As mentioned in the textbook	240-241
	9	Identify that inductance is a measure of the flux linkage produced by a solenoid per unit of current, and express it in equation form $(L = \frac{N\phi_B}{i} = \frac{(nl)(\mu_0 n i)(A)}{i} = \mu_0 n^2 lA)$.	As mentioned in the textbook	241
	10	Define self-induction and mutual induction. Solve problems related to self-induction and mutual induction	As mentioned in the textbook FIGURE 9.23- 9.24	242-244
	11 12	Describe an AC circuit as a circuit that consists of circuit elements and a source of emf (power source) that provides a time-varying voltage. Describe the alternating sinusoidal current, induced in a circuit containing a sinusoidal time varying source of emf, as $i = I_{max}\sin(\omega t - \phi)$ where I_{max} is the amplitude of the current, ω is the angular frequency of the power source, and ϕ is the phase constant. Describe the sinusoidal voltage provided by a time varying emf as $V_{emf} = V_{max}\sin\omega t$ where ω is the angular frequency of the emf, and V_{max} is the amplitude or the maximum output voltage. Derive an expression for the current (i_R) across the resistor, in a circuit consisting of a resistor and a source of time varying emf, as $i_R = \frac{v_R}{R} = \frac{V_R}{R}\sin(\omega t) = I_R \sin(\omega t)$ where I_R is the current amplitude.	As mentioned in the textbook FIGURE 10.8	264-265
	13	Recall Maxwell's Equations Describing Electromagnetic Phenomena.	As mentioned in the textbook Table 11.1	290-293
	14 15	Identify that all electromagnetic waves, in vacuum, travel at the speed of light. Relate the wavelength, frequency, and speed of electromagnetic waves in vacuum through the equation ($c = \lambda f$). List the various types of electromagnetic waves that form the electromagnetic spectrum and their respective characteristics. Describe some applications of the various types of electromagnetic waves.	As mentioned in the textbook FIGURE 11.10 Exercices 11.33	297-298 318
		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		
FRQ الأسئلة المقالية	1	Describe, based on the equation of Faraday's Law, that potential difference could be induced in a loop either by varying the magnetic field 'B' with time (A and ϴ are constant), changing the area 'A' of the loop with time (B and ϴ are constant), or changing the angle 'ϴ' between the magnetic field and the normal to the loop with time (A and B are constant), and demonstrate that by mathematical equations. Solve problems related to induced electric field by changing magnetic flux.	As mentioned in the textbook Example 9.1	227-230
	2	Identify an RL circuit as a single-loop circuit that contains a source of emf connected to a resistor and an inductor. Express the solution for the differential equation for current as function of time for an RL circuit after the switch is closed, as $i(t) = \frac{V_{emf}}{R}(1 - e^{-t/(L/R)}) = i_0(1 - e^{-t/(L/R)})$ and verify the current at the moment the switched is closed, t = 0, and after the switch has been closed for a long time, t ⟶∞ . Define the time constant τ_{RL} of an RL circuit as the division of the inductance by the resistance ($\tau_{RL} = L/R$). Express the solution for the differential equation for current as a function of time for an RL circuit when the switch is suddenly opened, after being closed for a long time, as $i(t) = \frac{V_{emf}}{R}e^{\frac{-t}{\tau_{RL}}} = i_0 e^{\frac{-t}{\tau_{RL}}}$ and verify the current at the moment the switched is opened, t = 0, and after a long time, t ⟶∞ . Solve problems related to RL circuit	As mentioned in the textbook FIGURE 9.28 Example 9.3	244-248
	3	Solve problems related to LC oscillator showing the variations of charge, current, energy stored in electric field, and energy stored in magnetic field. Recall that the energy stored in the electric field of a capacitor of capacitance C, at any instant, is given by $U_E = \frac{1}{2}\frac{q^2}{C}$ Recall that the energy stored in the magnetic field of an inductor with inductance L, at any instant, is given by $U_B = \frac{1}{2}Li^2$	As mentioned in the textbook FIGURE 10.2 Exercices 10.27 Exercices 10.28 Exercices 10.29 Exercices 10.30	258-260 285
	4	Solve problems related to Lenz's Law. Differentiate between step-up and step-down transformers. Apply the ideal transformer equation ($\frac{I_S}{I_P} = \frac{V_P}{V_S} = \frac{N_P}{N_S}$) to solve numerical problems.	As mentioned in the textbook FIGURE 10.34 Exercices 10.57	279-281 287