Academic Year العام الدراسي	2024/2023
Term الفصل	3rd
Subject الموضوع	Physics(Bridge) الفيـــــزياء
Grade الصف	11
Stream المسار	Advanced/المتقدم
Code	PHY-C-101
Number Of MCQ عدد الأسئلة الموضوعية	15
Markes of MCQ درجة كل سؤال	4
Number of FRQ عدد الأسئلة المقالية	4
Marks Per FRQ درجة كل سؤال	8-12
Type of All Questions نوع كافة الأسئلة	MCQ الأسئلة الموضوعية FRQ/ الأسئلة المقالية
Maximum Overall Grade العلامة النهائية	100
Exam Duration	150 min.
Mode of Implementation طريقة التطبيق	Swift Assess & Paper-Based
Calculator	Allowed

Question* السؤال*		Learning Outcome/Performance Criteria** ناتج التعلم/ معايير الأداء**	المرجع في كتاب الطالب (النسخة الانجليزية) Reference(s) in the Student Book (English Version) Example/Exercise/مثال/تمرين	Page/صفحة
MCQ/الأسئلة الموضوعية	1.	(1) Define the center of mass as the point at which all the mass of an object appears to be concentrated. (2) Recall that center of gravity is equivalent to center of mass in situations where the gravitational force is constant everywhere throughout the object.	Student Book (S.B)	226
	2.	Describe that the location of the center of mass is a fixed point relative to the object or system of objects and does not depend on the location of the coordinate system used to describe it.	Student Book (S.B) S.B/Figure 8.2 Concept Check 8.1	227
	3.	(1) Define the polar coordinate system as a two-dimensional coordinate system such that a point on a plane is defined by its distance r from the origin and the angle θ measured. (2) Express the Cartesian coordinates (x, y) in terms of the polar coordinates (r, θ) and vice versa. (3) Convert polar coordinates to Cartesian coordinates and vice versa.	Student Book (S.B) S.B/Figure 9.3/9.4 Example 9.1	255-256 256
	4.	Relate the arc length (s), to the radius (r) of the circular path and the angle (θ), measured in radians.	S.B/Figure 9.3 Student Book (S.B)	255 257
	5.	Apply the relation for the magnitude of angular velocity in terms of frequency and period of rotation	Example 9.3 Additional Exercises/Q. 9.61.(a)	260 282
	6.	Relate the magnitudes of linear (tangential) and angular velocities for circular motion as, and explain that this relation does not hold for tangential and angular velocity vectors which point in different directions.	Exercises/Q. 9.44	281
	7.	Relate the magnitude of the net acceleration in circular motion to the tangential acceleration and centripetal acceleration	Exercises/Q. 9.44 (f) Exercises/Q. 9.46 Additional Exercises/Q. 9.63	281 282
	8.	Identify that the centripetal force, necessary for circular motion, can be provided by different forces such as the force of friction, tension, gravitational force, Coulomb force, or the normal force..	Student Book (S.B) Exercises/Q. 9.50	264 281
	9.	Apply the kinematic relationships for circular motion with constant angular acceleration to calculate angular position, angular displacement, angular velocity, angular acceleration, or time.	Example 9.6 Example 9.7 Exercises/Q. 9.35	264 271 280
	10.	Convert angle measurements between degrees and radians.	Student Book (S.B)	256
	11.	Sketch the path taken in circular motion (uniform and non-uniform) and explain the velocity and acceleration vectors (magnitudes and directions) during the motion	S.B/Figure 9.12 S.B/MCQ/Q.9.4	262 278
	12.	Identify that for an object in circular motion with a given angular velocity, the centripetal force increases with the distance from the center	Student Book (S.B) Example 9.8	264 273
	13.	Express the linear acceleration vector for an object in circular motion as $\vec{a}(t)=a_t\hat{t}-a_c\hat{r}$	Student Book (S.B) Exercises/Q. 9.46	262 281
	14.	Distinguish between tangential acceleration and radial acceleration, specifying the cause and direction of each.	Student Book (S.B) Exercises/Q. 9.46/9.43	261 281
	15.	Apply Newton's laws of motion and/or energy conservation principles to analyze circular motion in a vertical or horizontal plane (motion in vertical loop of an amusement park ride, rotating cylinder, moving through a levelled or banked curve,...)	S.B/Figure 9.18/9.19 S.B/Figure 9.20 S.B/MCQ/Q.9.11	266 268 278
FRQ - الأسئلة المقالية	16	(1) Identify that the linear velocity, , of a particle in circular motion always points tangential to the circular path (circumference) and is always perpendicular to the position vector, which points in the radial direction. (2) Sketch the path taken in circular motion (uniform and non-uniform) and explain the velocity and acceleration vectors (magnitudes and directions) during the motion. (3) Explain that for uniform circular motion, where the angular velocity is constant, the tangential acceleration is zero, but the velocity vector still changes direction continuously as the object moves in its circular path. (4) Relate the magnitudes of linear (tangential) and angular velocities for circular motion.	Exercises/Q. 9.46 Exercises/Q. 9.47.(a) Exercises/Q. 9.50	281
	17	(1) Apply Newton's laws of motion and/or energy conservation principles to analyse circular motion in a vertical or horizontal plane (motion in vertical loop of an amusement park ride, rotating cylinder, moving through a levelled or banked curve...). (2) Determine the location of the center of mass of two or several particles or extended objects with uniform mass distribution (the object can be divided into simple geometric figures, each of which can be replaced by a particle at its center) by applying suitable mathematical equations	Solved Problem (9.1) Conceptual Questions (9.20) Exercises/Q. 9.55 Additional Exercises/Q. 9.60	266 279 281 282
	18	(1) Apply the kinematic relationships for circular motion with constant angular acceleration to calculate angular position, angular displacement, angular velocity, angular acceleration, or time. (2) Solve problems related to rotation with constant angular acceleration. (3) Relate the magnitude of the net acceleration in circular motion to the tangential acceleration and centripetal acceleration.	Exercises/Q. 9.35 Exercises/Q. 9.44 Additional Exercises/Q. 9.63	280 281 282
	19	Apply Newton's laws of motion and/or energy conservation principles to analyse circular motion in a vertical or horizontal plane (motion in vertical loop of an amusement park ride, rotating cylinder, moving through a levelled or banked curve...).	Solved Problem /Q.9.4 Exercises/Q. 9.59	275 282

* Questions might appear in a different order in the actual exam, or on the exam paper./قد تظهر الأسئلة بترتيب مختلف في الامتحان الفعلي، أو على ورقة الامتحان.

** As it appears in the textbook, LMS, and (Main_IP)./كما وردت في كتاب الطالب وLMS والخطة الفصلية.