UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION

OCTOBER 2025 SEMESTER SESSION

SUBJECT CODE	:	**LGD11503**
SUBJECT TITLE	:	**ENGINEERING SCIENCE**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**DIPLOMA OF ENGINEERING TECHNOLOGY (NAVAL ARCHITECTURE SHIPBUILDING)**
TIME / DURATION	:	**2.00 PM - 5.00 AM (3 HOURS)**
DATE	:	**27 JANUARY 2026**

INSTRUCTIONS TO CANDIDATES

1. Please read **CAREFULLY** the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of **ONE (1)** section; Section A.
4. Answer **FOUR (4)** questions **ONLY**.
5. Please write your answers on this answer booklet provided.
6. Answer **ALL** questions in English language **ONLY**.
7. Answer should be written in blue or black ink except for sketches, graphics and illustrations.

THERE ARE 5 PAGES OF QUESTIONS, INCLUDING THIS COVER PAGE.

SECTION A (Total: 100 marks)

INSTRUCTION: Answer FOUR (4) questions ONLY.

Please use the answer booklet provided.

Question 1

a) State the SI unit for the derived quantity below

Derived Quantity	SI Unit
Volume	
Density	
Force	
Velocity	
Acceleration	

(5 Marks)

b) A concrete slab has the dimension as shown in Figure 1. The mass of the slab is 300 grams. Determine

i. The mass of the slab in unit kg

(2 Marks)

ii. The volume in unit m^3

(5 Marks)

iii. The density in SI Unit

(2 Marks)

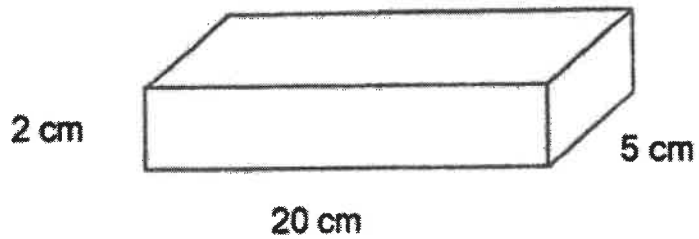

Figure 1 : Concrete slab dimension

c) The Figure 2 below shows a graph of velocity against time of a moving object. Determine

i. Acceleration of the object at t = 5 seconds

(1 Marks)

ii. Acceleration of the object from t = 12 seconds to t = 20 seconds

(2 Marks)

iii. Total distance travelled by the object

(8 Marks)

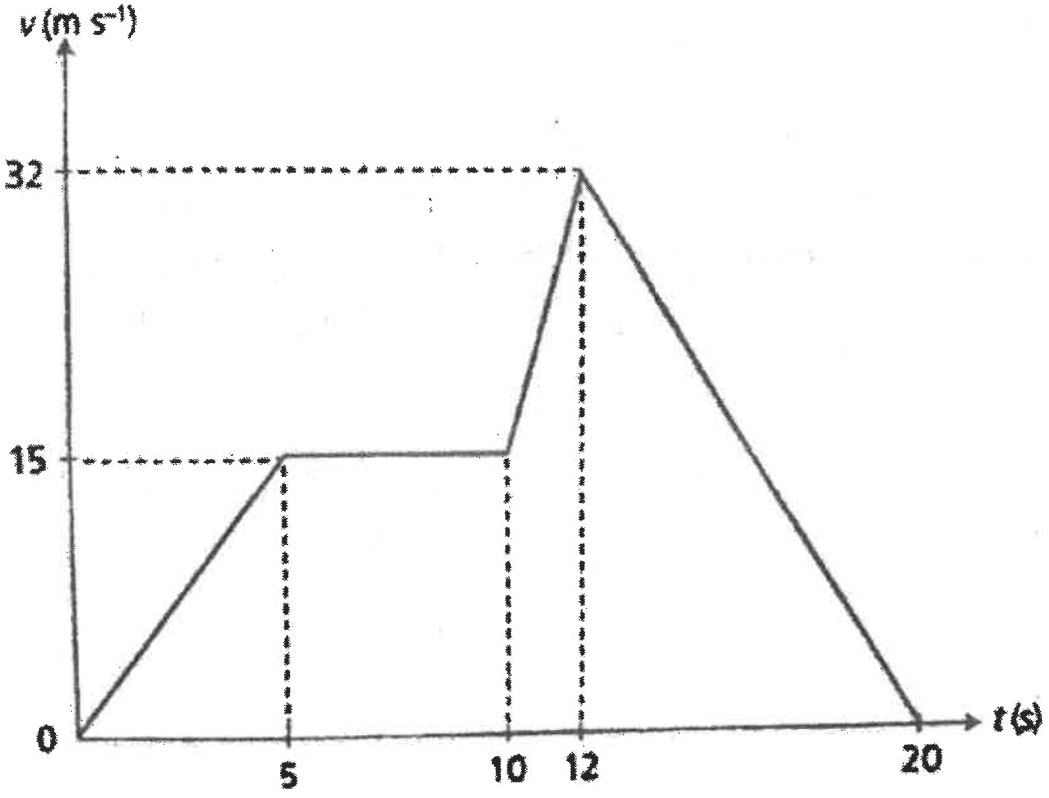

Figure 2 : Table velocity vs time

Question 2

a) A 10 kg box is pulled along a horizontal surface by a force of 40 N applied at 30^{O} from horizontal. The coefficient of kinetic friction is 0.15.

i. Draw its free body diagram

(5 Marks)

ii. Calculate its acceleration

(20 Marks)

Question 3

Two persons are pulling a boat onto the shore using two cables as shown in Figure 3. Determine

a) The x-component and y-component of the forces

(16 Marks)

b) The magnitude of the the resultant force

(6 Marks)

c) Direction of the boat

(3 Marks)

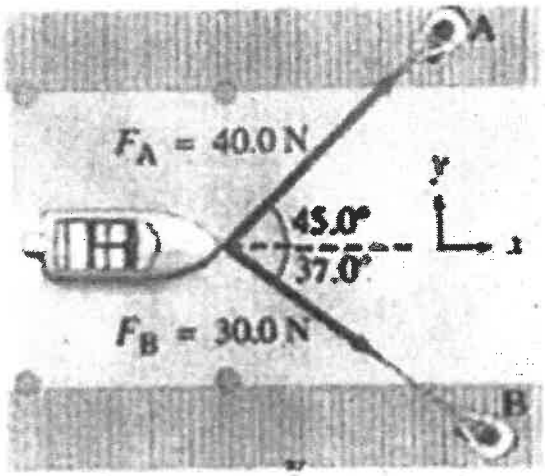

Figure 3 : Boat pulled by two persons

Question 4

a) Briefly describe the term below

i. Kinetic Energy

(2 Marks)

ii. Potential Energy

(2 Marks)

b) A car starts from rest and accelerates uniformly. After 10 s, its displacement is 25 m. Calculate

i. the acceleration of the car at 10 s.

(7 Marks)

ii. the velocity of the car at 10 s.

(6 Marks)

iii. the displacement in the next 10 s if the car continues its motion with the same acceleration.

(8 Marks)

Question 5

A person pushes a 14 kg lawn mower as shown in Figure 4 with a force of 88N at the angle of 45^{O}.

a) Draw a free body diagram of all the forces.

(6 Marks)

b) Determine the normal Force, F_n

(6 Marks)

c) Determine the force required to push the mower from rest to a speed of 1.5m/s in 2.5 seconds if the coefficient of friction is 0.2

(13 Marks)

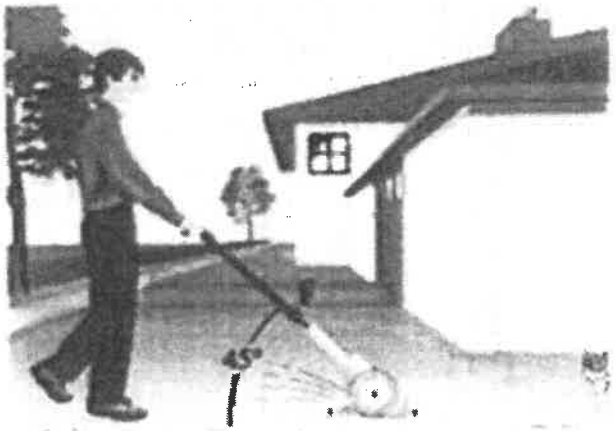

Figure 4 : Lawn mower pushed at an angle

END OF QUESTION PAPER