

ENGINEERING SCIENCE N4 TUTORIAL ASSIGNMENT

1.1. Two vehicles move simultaneously. vehicle P moves at 220 km/h east while vehicle Q moves at 220 km/h in a direction W30° N. Calculate the velocity of vehicle P relative to Q. (4)

1.2.

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (3.1–3.4) in the ANSWER BOOK.

The minute arm of a tower clock is 1.8 m long. It took 35 minutes to move from 2 to 9.

1.2.1 The angular displacement of the minute arm is ...

- A. 2,345 rad.
- B. 3,665 rad.
- C. 3,345 rad.
- D. 2,665 rad.

1.2.2 The arc length produced by the tip of the minute arm is ...

- A. 4,835 m.
- B. 5,524 m.
- C. 6,597 m.
- D. 4,524 m.

1.2.3 The angular velocity of the minute arm is ...

- A. $2,327 \times 10^{-3}$ rad.
- B. $1,745 \times 10^{-3}$ rad.
- C. $2,117 \times 10^{-3}$ rad.
- D. $1,227 \times 10^{-3}$ rad.

1.2.4 The linear velocity/tangential velocity of the minute arm is:

- A. $2,447 \times 10^{-2}$ m/s.
- B. $4,189 \times 10^{-2}$ m/s.
- C. $4,447 \times 10^{-2}$ m/s.
- D. $3,141 \times 10^{-2}$ m/s.

(4 × 2)

[8]

1.3. A priest is in a rested motorcar, with a mass of 780 kg, at the top of a slope of 80%. When he releases the brakes of the motorcar, it moves freely down for 25 m due to gravitational force to the bottom of the slope and then immediately onto a horizontal road until it comes to a rest at the bottom of the slope. Calculate the following:

1.3.1 The velocity of the motorcar at the bottom of the slope. (3)

1.3.2 The deceleration of the motorcar on the horizontal road, if it took 12 seconds to travel on the horizontal road. (2)

1.3.3 What is the kinetic energy of the motorcar after 12 seconds on the horizontal road? (1)

1.4. The plunger of a hydraulic press has a diameter of 90 mm with a stroke length of 480 mm while the diameter of the ram is 180 mm. The mechanical advantage of the plunger is 18. Calculate:

1.4.1. The force to be applied to the lever to lift a load of 4.2 Mg if efficiency is 96%. (5)

1.4.2. The number of the pumping strokes needed to lift the load of 220 mm at efficiency of 96%. (4)

1.5. The plunger of a two-cylinder pump has a diameter of 150 mm and a stroke length of 250 mm. Calculate:

1.5.1 The volume delivered in l/s. (4)

1.5.2. The slip% if the volume delivered is 16.789 l/s. (2)

TUTORIAL 2

2.1. A stone is thrown at a velocity of 29 m/s at an angle of 35° to the horizontal.

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Publications of the National Bureau of Standards, 1986 Catalog United States. National Bureau of Standards,1987

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Sessional Papers Great Britain. Parliament. House of Commons,1904

Cooperative Information Systems Mohamed Sellami,Maria-Ester Vidal,Boudewijn van Dongen,Walid Gaaloul,Hervé Panetto,2023-10-24 This book constitutes the refereed proceedings of the 29th International Conference on Cooperative Information Systems CoopIS 2023 held in Groningen The Netherlands during October 30 November 3 2023 The 21 regular papers and 10 work in progress papers included in this book were carefully reviewed and selected from 100 submissions They were organized in topical sections as follows Knowledge Engineering Deployment and Migration in CISs Security and Privacy in CISs Process Modeling Process Analytics Human Aspects and Social Interaction in CISs and Work in Progress

Parliamentary Papers Great Britain. Parliament. House of Commons,1904

Scientific and Technical Aerospace Reports ,1995

Science and Art of Mining ,1913

Engineering Science N4 J. F. De Villiers,1998

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