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# FULL MEMORANDUM GRADE 12 PHYSICS 2022 FINAL

This question paper consists of 18 pages and 3 data sheets.

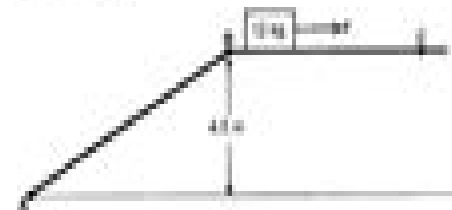
(QUESTION 6 (Start on a new page.)

A 12 kg block is initially at rest at point A at the bottom of a ROUGH inclined plane. The block is pulled up the incline by a constant force  $F$  acting parallel to the incline. The block reaches point B, which is at a vertical height of 4.0 m above the horizontal, with a speed of 2.0 m s<sup>-1</sup>. See the diagram below.



- 6.1 Define the term non-conservative force.
- 6.2 Draw a labelled free-body diagram for the block when it is pulled up the incline.
- 6.3 Calculate the total work done on the block by the NON-CONSERVATIVE forces when the block moves from point A to point B. (5)

The same constant force  $F$  now moves the block at a CONSTANT VELOCITY across a rough horizontal surface from point B to point C, as shown below. Force  $F$  acts parallel to the horizontal surface.



The magnitude of the constant frictional force acting on the block while moving from point B to point C is 40 N, 40% of the magnitude of the constant frictional force acting on the block when it moves from point A to point B.

- 6.4 Calculate the distance from point A to point B. (5)

(10)

# Physical Science Paper1 November 2013 Memorandum

**Florin Diacu**



## Physical Science Paper1 November 2013 Memorandum:

*TSPSC Group 4 : Paper 1 (General Knowledge) Exam Prep Book | Telangana State Public Service Commission | 10 Full Practice Tests* EduGorilla Prep Experts, 2023-07-06 Best Selling Book in English Edition for TSPSC Group 4 Paper 1 Exam with objective type questions as per the latest syllabus given by the Telangana State Public Service Commission Compare your performance with other students using Smart Answer Sheets in EduGorilla's TSPSC Group 4 Paper 1 Exam Practice Kit TSPSC Group 4 Paper 1 Exam Preparation Kit comes with 10 Practice Tests with the best quality content Increase your chances of selection by 16X TSPSC Group 4 Paper 1 Exam Prep Kit comes with well structured and 100% detailed solutions for all the questions Clear exam with good grades using thoroughly Researched Content by experts *The Case for Pandora* James Essig, Steve McCarter, 2016-12-19 This book is about building craft for space travel space travel that is not in the distant future but in the immediate future There is no question that we have the technology to build and power large craft capable of traversing the galaxy and for now this book will focus on achieving the goal of intragalactic travel We will describe various methods of power generation and propulsion delineate the materials and technology for construction discuss the building of the spacecraft from the outside in and show what is required to sustain life on the craft for extended periods of time While we will go into some detail on each of these pointing out advantages and disadvantages to components and methods this is not nor is it intended to be a highly technical book to be used by specialists Rather it is intended to inform the general readership about what is possible and perhaps what is not in building and operating spacecraft for long distance and long duration travel with current and available means Nonlinear Stability of Ekman Boundary Layers in Rotating Stratified Fluids Hajime Koba, 2014-03-05 A stationary solution of the rotating Navier Stokes equations with a boundary condition is called an Ekman boundary layer This book constructs stationary solutions of the rotating Navier Stokes Boussinesq equations with stratification effects in the case when the rotating axis is not necessarily perpendicular to the horizon The author calls such stationary solutions Ekman layers This book shows the existence of a weak solution to an Ekman perturbed system which satisfies the strong energy inequality Moreover the author discusses the uniqueness of weak solutions and computes the decay rate of weak solutions with respect to time under some assumptions on the Ekman layers and the physical parameters The author also shows that there exists a unique global in time strong solution of the perturbed system when the initial datum is sufficiently small Comparing a weak solution satisfying the strong energy inequality with the strong solution implies that the weak solution is smooth with respect to time when time is sufficiently large Relative Equilibria in the 3-Dimensional Curved n-Body Problem Florin Diacu, 2014-03-05 Considers the 3 dimensional gravitational n body problem  $n \geq 2$  in spaces of constant Gaussian curvature  $k \neq 0$  i.e on spheres  $S^{n-1}$  for  $n \geq 3$  and on hyperbolic manifolds  $H^{n-1}$  for  $n \geq 3$  **Large Deviations for Additive Functionals of Markov Chains** Alejandro D. de Acosta, Peter Ney, 2014-03-05 **Title Announcement Bulletin**, 1956 Near Soliton Evolution for Equivariant Schrodinger Maps in Two Spatial

Dimensions Ioan Bejenaru, Daniel Tataru, 2014-03-05 The authors consider the Schrödinger Map equation in  $2+1$  dimensions with values into  $\mathbb{S}^2$ . This admits a lowest energy steady state  $Q$  namely the stereographic projection which extends to a two dimensional family of steady states by scaling and rotation. The authors prove that  $Q$  is unstable in the energy space  $\dot{H}^1$ . However in the process of proving this they also show that within the equivariant class  $Q$  is stable in a stronger topology  $X \subset \dot{H}^1$ . Energy Research Abstracts, 1978 Physical Science, 1981

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