

Subject – Math AI(Standard Level)
Topic - Function
Year - May 2021 – Nov 2022
Paper -2
Questions

Question 1

[Maximum mark: 17]

The braking distance of a vehicle is defined as the distance travelled from where the brakes are applied to the point where the vehicle comes to a complete stop.

The speed, $s \text{ m s}^{-1}$, and braking distance, $d \text{ m}$, of a truck were recorded. This information is summarized in the following table.

Speed, $s \text{ m s}^{-1}$	0	6	10
Braking distance, $d \text{ m}$	0	12	60

This information was used to create Model A, where d is a function of s , $s \geq 0$.

$$\text{Model A: } d(s) = ps^2 + qs, \text{ where } p, q \in \mathbb{Z}$$

At a speed of 6 m s^{-1} , Model A can be represented by the equation $6p + q = 2$.

- (a) (i) Write down a second equation to represent Model A, when the speed is 10 m s^{-1} .
(ii) Find the values of p and q . [4]
- (b) Find the coordinates of the vertex of the graph of $y = d(s)$. [2]
- (c) Using the values in the table and your answer to part (b), sketch the graph of $y = d(s)$ for $0 \leq s \leq 10$ and $-10 \leq d \leq 60$, clearly showing the vertex. [3]
- (d) Hence, identify why Model A may not be appropriate at lower speeds. [1]

Additional data was used to create Model B, a revised model for the braking distance of a truck.

$$\text{Model B: } d(s) = 0.95s^2 - 3.92s$$

- (e) Use Model B to calculate an estimate for the braking distance at a speed of 20 m s^{-1} . [2]
- The actual braking distance at 20 m s^{-1} is 320 m.
- (f) Calculate the percentage error in the estimate in part (e). [2]

Math Sl May 2005 Paper

Bunty Kumar, Mohit Soni



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Mathematical Reviews ,2008 **Techniques and Applications for Advanced Information Privacy and Security:**

Emerging Organizational, Ethical, and Human Issues Nemati, Hamid,2009-03-31 This book provides a thorough understanding of issues and concerns in information technology security Provided by publisher **SWE** ,2006

Competition Science Vision ,2004-11 Competition Science Vision monthly magazine is published by Pratiyogita Darpan Group in India and is one of the best Science monthly magazines available for medical entrance examination students in India Well qualified professionals of Physics Chemistry Zoology and Botany make contributions to this magazine and craft it with focus on providing complete and to the point study material for aspiring candidates The magazine covers General Knowledge Science and Technology news Interviews of toppers of examinations study material of Physics Chemistry Zoology and Botany with model papers reasoning test questions facts quiz contest general awareness and mental ability test in every monthly issue Abstracts of Papers Presented to the American Mathematical Society American Mathematical Society,2006

Trustworthy Computing Mehmet Sahinoglu,2007-07-09 This book is based on the author s advanced undergraduate or beginning graduate course Computer Security and Reliability which he has been teaching for the past six years The author takes an index based quantitative approach to the subject as opposed to the usual verbal or qualitative or subjective case histories The TWC Solver available on an accompanying CD ROM contains 10 java coded main applications and hundreds of subitems and assists the reader in understanding the numerical implementations of the book chapters SSC Chapterwise Solved Papers Mathematics 2021 Bunty Kumar,Mohit Soni,2021-02-14 1 21 Years Chapterwise Solved Papers SSC is prepared for the upcoming exam 2 This book provides Chapter Unitwise Practice questions from last 21 years 3 It deals with Mathematics subject 4 The book is divided into 31 Chapters 5 More than 5500 objective questions in arranged in each chapter 6 5 Practice sets and Solved Papers 2020 2015 for thorough practice 7 We detailed answers are provided to all the questions The Staff Selection Commission popularly acronym as SSC is a government that is responsible for the recruitment of Non Gazetted and Non Technical posts in the various Ministries Department of the Indian Government and its subordinate offices The revised edition 21 Years Chapterwise Solved Papers SSC CGL 10 2 Multitasking CPO Stenographer deals with the Mathematics subject The entire syllabus in the book is divided into 31 Chapters providing the highly useful study material in each chapter Along with the chapter theories it is provided with more than 5500 objective questions in arranged in each chapter Practice Sets and Solved Papers are given for the quick revision syllabus TOC Number System Square and Square Roots Cube and Cube Roots Surds and Indices HCF and LCM Simplification Word Problem Average Problems on Age Percentage Ratio and Proportion Partnership Mixtures and Alligation Profit and Loss Discount Simple Interest Compound Interest Time and Work Work and Wages Pipes and Cisterns Speed Distance and Time Boats and Streams Problems on Trains Algebra Coordinate Geometry Trigonometry Geometry Area and Perimeter Surface Area and Volume Statistics and Data

Interpretation Miscellaneous 5 Practice sets Solved papers 2015 2020 *Demonstratio mathematica* ,2006 Engineering in K-12 Education National Research Council,National Academy of Engineering,Committee on K-12 Engineering Education,2009-10-08 Engineering education in K 12 classrooms is a small but growing phenomenon that may have implications for engineering and also for the other STEM subjects science technology and mathematics Specifically engineering education may improve student learning and achievement in science and mathematics increase awareness of engineering and the work of engineers boost youth interest in pursuing engineering as a career and increase the technological literacy of all students The teaching of STEM subjects in U S schools must be improved in order to retain U S competitiveness in the global economy and to develop a workforce with the knowledge and skills to address technical and technological issues Engineering in K 12 Education reviews the scope and impact of engineering education today and makes several recommendations to address curriculum policy and funding issues The book also analyzes a number of K 12 engineering curricula in depth and discusses what is known from the cognitive sciences about how children learn engineering related concepts and skills Engineering in K 12 Education will serve as a reference for science technology engineering and math educators policy makers employers and others concerned about the development of the country s technical workforce The book will also prove useful to educational researchers cognitive scientists advocates for greater public understanding of engineering and those working to boost technological and scientific literacy *Understanding and Predicting the Gulf of Mexico Ocean Dynamics* Julio Sheinbaum,Eric Chassignet,Steven L. Morey,Ruoying He,2024-04-08 For the past several years a number of research programs have funded significant efforts to advance understanding of and forecasting capabilities for the Gulf of Mexico circulation including the Loop Current its associated eddies and abyssal dynamics One such program is the National Academies Understanding Gulf Ocean Systems initiative which focuses on improving forecasts of the physical dynamics of the open Gulf of Mexico in space and time scales useful for the reduction of risks to offshore energy exploration and production as well as for other challenges such as forecasting hurricane intensification and managing fisheries What has been learned how can this scientific progress be incorporated into operational models and what are the remaining gaps in knowledge impeding predictive skill **Israel Journal of Mathematics** Mo'atsah ha-le'umit le-mehkar ule-fituah (Israel),2007 **Middle School Journal** ,2007 **Groups - Canberra** 1989 L.G. Kovacs,1990-12-12 *Handbook for Achieving Gender Equity Through Education* Susan S. Klein,Barbara Richardson,Dolores A. Grayson,Lynn H. Fox,Cheris Kramarae,Diane S. Pollard,Carol Anne Dwyer,2014-05-22 First published in 1985 the Handbook for Achieving Gender Equity Through Education quickly established itself as the essential reference work concerning gender equity in education This new expanded edition provides a 20 year retrospective of the field one that has the great advantage of documenting U S national data on the gains and losses in the efforts to advance gender equality through policies such as Title IX the landmark federal law prohibiting sex discrimination in

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