

**NATIONAL
 SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2021

PHYSICAL SCIENCES P1

MARKS: 150

TIME: 3 hours

The question paper consists of 15 pages, including 3 data sheets

QUESTION 10: POTENTIAL ENERGIES

10. The kinetic energy of a car moving at velocity v is K . The velocity of the car changes to $3v$. What is the new kinetic energy of the car?

- A. $16K$
- B. $18K$
- C. $2K$
- D. $4K$

(2)

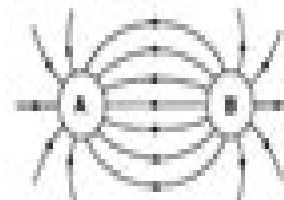
10. A sound source approaches a stationary observer at constant velocity.

Which ONE of the following describes how the observed frequency and wavelength differ from that of the sound source?

	Observed wavelength	Observed frequency
A	Greater than	Greater than
B	Less than	Less than
C	Less than	Greater than
D	Greater than	Less than

(2)

10. The electric field pattern between two charged spheres, A and B, is shown below.



Which ONE of the following statements regarding the charge on spheres A and B is CORRECT?

- A. Sphere A is negatively charged, and sphere B is positively charged.
- B. Sphere A is positively charged, and sphere B is negatively charged.
- C. Spheres A and B are both positively charged.
- D. Spheres A and B are both negatively charged.

(2)

Physical Science P1 September 2013 Memorandum

JR Anderson



Physical Science P1 September 2013 Memorandum:

The Case for Pandora James Essig, Steve McCarter, 2016-12-19 This book is about building craft for space travel a 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 *Weighted Bergman Spaces*

Induced by Rapidly Increasing Weights Jose Angel Pelaez, Jouni Rattya, 2014-01-08 This monograph is devoted to the study of the weighted Bergman space $A_{p,\omega}$ of the unit disc $\mathbb{D}$ that is induced by a radial continuous weight ω satisfying $\lim_{r \rightarrow 1} \int_r^1 \omega(s) ds = 0$ Every such $A_{p,\omega}$ lies between the Hardy space H_p and every classical weighted Bergman space $A_{p,\alpha}$ Even if it is well known that H_p is the limit of $A_{p,\alpha}$ as $\alpha \rightarrow 1$ in many respects it is shown that $A_{p,\omega}$ lies closer to H_p than any $A_{p,\alpha}$ and that several finer function theoretic properties of $A_{p,\alpha}$ do not carry over to $A_{p,\omega}$ Scientific and Technical Aerospace Reports, 1987 Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database

GPS Guochang Xu, Yan Xu, 2016-07-29 This reference and handbook describes theory algorithms and applications of the Global Positioning System GPS Glonass Galileo Compass It is primarily based on source code descriptions of the KSGsoft program developed at the GFZ in Potsdam The theory and algorithms are extended and verified for a new development of a multi functional GPS Galileo software Besides the concepts such as the unified GPS data processing method the diagonalisation algorithm the adaptive Kalman filter the general ambiguity search criteria and the algebraic solution of variation equation reported in the first edition the equivalence theorem of the GPS algorithms the independent parameterisation method and the alternative solar radiation model reported in the second edition the modernisation of the GNSS system the new development of the theory and algorithms and research in broad applications are supplemented in this new edition Mathematically rigorous the book begins with the introduction the basics of coordinate and time systems and satellite orbits as well as GPS observables and deals with topics such as physical influences observation equations and their parameterisation adjustment and filtering ambiguity resolution software development and data processing and the determination of perturbed orbits International Tables for Crystallography

Mois I. Aroyo, 2021-07-06 This sixth edition of what was previously known as the Brief Teaching Edition of Volume A provides

an introduction to the basic crystallographic data for space groups found in Volume A for symmetry relations between space groups in Volume A1 and for subperiodic groups in Volume E of International Tables for Crystallography to magnetic space groups and to the symmetry database that forms part of International Tables Online at <https://it.iucr.org> It is designed for graduate students and young researchers who are new to the field of crystallographic symmetry and includes many illustrative examples to help readers to understand and use these different kinds of information Selected tables of symmetry data from the full volumes in the series are also included making this a handy aid for classroom teaching References are also provided to further specialized sources for those who need to go deeper into the subject and to textbooks for those who need more background information

Thin Film Solar Cells K. L. Chopra, S. R. Das, 2013-11-11 You 0 Sun are the eye of the world
 You are the soul of all embodied beings You are the source of all creatures You are the discipline of all engaged in work
 Translated from Mahabharata 3rd Century BC Today energy is the lifeline and status symbol of civilized societies All nations have therefore embarked upon Research and Development programs of varying magnitudes to explore and effectively utilize renewable sources of energy Albeit a low grade energy with large temporal and spatial variations solar energy is abundant cheap clean and renewable and thus presents a very attractive alternative source The direct conversion of solar energy to electricity photovoltaic effect via devices called solar cells has already become an established frontier area of science and technology Born out of necessity for remote area applications the first commercially manufactured solar cells single crystal silicon and thin film CdS Cu₂S were available well over 20 years ago Indeed all space vehicles today are powered by silicon solar cells But large scale terrestrial applications of solar cells still await major breakthroughs in terms of discovering new and radical concepts in solar cell device structures utilizing relatively more abundant cheap and even exotic materials and inventing simpler and less energy intensive fabrication processes No doubt this extraordinary challenge in R D has led to a virtual explosion of activities in the field of photovoltaics in the last several years

Energy Research Abstracts ,1978
Physical Science ,1981 *Macmillan Physical Science* Denise Eby,1986

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web surface finish also known as surface texture or surface topography is the nature of a surface as defined by the three characteristics of lay surface roughness and waviness it comprises the small local deviations of a surface from the perfectly flat ideal a true plane

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web understanding surface roughness symbols symbols that indicate the surface texture of machined and structural parts are used in industrial diagrams the pictorial representation using these symbols is defined in iso 1302 2002 this section will explain how to write these symbols to indicate surface textures

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web surface finish symbols are graphical callouts to indicate surface texture and surface roughness for design parts

manufactured by various manufacturing processes the surface finish graphical symbol usage is defined in iso 1302 2002

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web the symbol indicates the surface finish requirements and shows a machining allowance requirement of 3mm on all surfaces symbol for surface texture all component surfaces the symbol indicates that all of the component surfaces are to be machined location of surface texture symbols

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web may 28 2023 published by gayamadhusanka on may 28 2023 surface finish symbols are needed to represent the surface texture requirement to manufacturers if you are working on cnc machining parts or some other manufacturing process then you need to specify the surface finish requirement to manufacture

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web 1 positions of auxiliary symbols for surface symbol a surface roughness value cut off value or reference length machining method grain direction surface undulation etc are indicated around the surface symbol as shown in fig 1 below fig 1 positions of auxiliary symbols a ra value b machining method c cut off value evaluation length

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web nov 11 2021 the ra surface finish chart shows the arithmetic average of surface heights measured across a surface as already mentioned there are three basic components of a surface roughness waviness and lay therefore different factors are affecting the characteristics of surface geometry

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web iso and ansi standards provide guidelines and symbols for surface finish specifications ensuring clear communication between designers and manufacturers a detailed explanation of surface finish units from ra to rz ra average roughness

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web may 12 2020 it is suggested to indicate the surface roughness on drawing by symbols the bis recommended symbols for indicating the surface finish are shown in table a for the roughness values greater than 25µm the symbol is used for roughness value less than 25µm the equilateral triangular symbol is used

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web surface finish symbols callouts and standards in the united states surface finish is usually specified using the asme y14 36m standard the rest of the world commonly uses international organization for standardization iso 1302