MARCH - 2013

[Marks: 70

(2)

	SECTION -	I BOTANY		
Q. 1.	. Select and write the most appropriate answer from the given alternatives for each sub-question :			3
(i)	The pattern of ecosystem in which density and distribution of species vary along a horizontal gradient is			
	(a) zonation	(b) stratification		
	(c) ecological niche	(d) speciation		
(ii)	The enzyme affecting the shell	f life of flavr savr tomato is		
	(a) galactosidase	(b) trans acetylase		
	(c) permease	(d) polygalactouran		
(iii)	In nomenclature of RENs (res	triction endo-nucleases) Hind II	I, III	
	(a) genus name	(b) species name		
	(c) order of discovery (d) strain of the organism			
(iv)				
	(a) pea (b) bean		(d) maize	
(v)	(a) glycosidic (b) hydro	se is attached to carbon no. 1 of s ogen (c) phosphodiester	(d) phosphate	
(vi)	During biogas production mic digestion is	roorganism used to bring about	the anaerobic	
	(a) Pseudomonas	(b) Rhizopus		
	(c) Methanococcus	(d) Methanobacillu	8	
(vii)	A wheat variety resistant to h	ill bunt disease is		
	(a) Pusa Shubhra	(b) Himgiri		
	(c) Pusa Gauray	(d) Pusa Sawani		
Q.2. (A)	Answer in 'ONE' sentence e	each:	(6) [1:	2]
(1)	Define the term 'leaching'.			
(2)	Give reason - 'Buttermilk is used in the dough of dhokla.'			
(3)	What is palindrome in DNA?			
(4)	What is biomagnification?			
(5)	Give application of mutation l			
(6)	What will be the length of eul	caryotic DNA segment having 19	) pairs of nucleotides ?	

Q.2. (B) Draw a neat labelled diagram of the hair pin model of t-RNA.

# **Hsc Biology Board Question 2013 Bing**

**JL Elias** 

**Hsc Biology Board Question 2013 Bing:** 

#### Hsc Biology Board Question 2013 Bing Book Review: Unveiling the Magic of Language

In an electronic era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its ability to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "**Hsc Biology Board Question 2013 Bing**," compiled by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound effect on our existence. Throughout this critique, we will delve to the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

https://staging.conocer.cide.edu/About/book-search/Documents/life%20sciences%20grade%2011%20examplar%20for%20paper1%202014.pdf

## **Table of Contents Hsc Biology Board Question 2013 Bing**

- 1. Understanding the eBook Hsc Biology Board Question 2013 Bing
  - The Rise of Digital Reading Hsc Biology Board Question 2013 Bing
  - Advantages of eBooks Over Traditional Books
- 2. Identifying Hsc Biology Board Question 2013 Bing
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Hsc Biology Board Question 2013 Bing
  - User-Friendly Interface
- 4. Exploring eBook Recommendations from Hsc Biology Board Question 2013 Bing
  - Personalized Recommendations
  - Hsc Biology Board Question 2013 Bing User Reviews and Ratings

- Hsc Biology Board Question 2013 Bing and Bestseller Lists
- 5. Accessing Hsc Biology Board Question 2013 Bing Free and Paid eBooks
  - Hsc Biology Board Question 2013 Bing Public Domain eBooks
  - Hsc Biology Board Question 2013 Bing eBook Subscription Services
  - Hsc Biology Board Question 2013 Bing Budget-Friendly Options
- 6. Navigating Hsc Biology Board Question 2013 Bing eBook Formats
  - o ePub, PDF, MOBI, and More
  - Hsc Biology Board Question 2013 Bing Compatibility with Devices
  - Hsc Biology Board Question 2013 Bing Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Hsc Biology Board Question 2013 Bing
  - Highlighting and Note-Taking Hsc Biology Board Question 2013 Bing
  - Interactive Elements Hsc Biology Board Question 2013 Bing
- 8. Staying Engaged with Hsc Biology Board Question 2013 Bing
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Hsc Biology Board Question 2013 Bing
- 9. Balancing eBooks and Physical Books Hsc Biology Board Question 2013 Bing
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Hsc Biology Board Question 2013 Bing
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Hsc Biology Board Question 2013 Bing
  - Setting Reading Goals Hsc Biology Board Question 2013 Bing
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Hsc Biology Board Question 2013 Bing
  - Fact-Checking eBook Content of Hsc Biology Board Question 2013 Bing
  - Distinguishing Credible Sources

- 13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
- 14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

#### **Hsc Biology Board Question 2013 Bing Introduction**

In this digital age, the convenience of accessing information at our fingertips has become a necessity. Whether its research papers, eBooks, or user manuals, PDF files have become the preferred format for sharing and reading documents. However, the cost associated with purchasing PDF files can sometimes be a barrier for many individuals and organizations. Thankfully, there are numerous websites and platforms that allow users to download free PDF files legally. In this article, we will explore some of the best platforms to download free PDFs. One of the most popular platforms to download free PDF files is Project Gutenberg. This online library offers over 60,000 free eBooks that are in the public domain. From classic literature to historical documents, Project Gutenberg provides a wide range of PDF files that can be downloaded and enjoyed on various devices. The website is user-friendly and allows users to search for specific titles or browse through different categories. Another reliable platform for downloading Hsc Biology Board Question 2013 Bing free PDF files is Open Library. With its vast collection of over 1 million eBooks, Open Library has something for every reader. The website offers a seamless experience by providing options to borrow or download PDF files. Users simply need to create a free account to access this treasure trove of knowledge. Open Library also allows users to contribute by uploading and sharing their own PDF files, making it a collaborative platform for book enthusiasts. For those interested in academic resources, there are websites dedicated to providing free PDFs of research papers and scientific articles. One such website is Academia.edu, which allows researchers and scholars to share their work with a global audience. Users can download PDF files of research papers, theses, and dissertations covering a wide range of subjects. Academia.edu also provides a platform for discussions and networking within the academic community. When it comes to downloading Hsc Biology Board Question 2013 Bing free PDF files of magazines, brochures, and catalogs, Issuu is a popular choice. This digital publishing platform hosts a vast collection of publications from around the world. Users can search for specific titles or explore various categories and genres. Issuu offers a seamless reading experience with its user-friendly interface and allows users to download PDF files for offline reading. Apart from dedicated platforms, search engines also play a crucial role in finding free PDF files. Google, for instance, has an advanced search feature that allows users to filter results by file type. By specifying the file type as "PDF," users can find websites that

offer free PDF downloads on a specific topic. While downloading Hsc Biology Board Question 2013 Bing free PDF files is convenient, its important to note that copyright laws must be respected. Always ensure that the PDF files you download are legally available for free. Many authors and publishers voluntarily provide free PDF versions of their work, but its essential to be cautious and verify the authenticity of the source before downloading Hsc Biology Board Question 2013 Bing. In conclusion, the internet offers numerous platforms and websites that allow users to download free PDF files legally. Whether its classic literature, research papers, or magazines, there is something for everyone. The platforms mentioned in this article, such as Project Gutenberg, Open Library, Academia.edu, and Issuu, provide access to a vast collection of PDF files. However, users should always be cautious and verify the legality of the source before downloading Hsc Biology Board Question 2013 Bing any PDF files. With these platforms, the world of PDF downloads is just a click away.

## **FAQs About Hsc Biology Board Question 2013 Bing Books**

What is a Hsc Biology Board Question 2013 Bing PDF? A PDF (Portable Document Format) is a file format developed by Adobe that preserves the layout and formatting of a document, regardless of the software, hardware, or operating system used to view or print it. How do I create a Hsc Biology Board Question 2013 Bing PDF? There are several ways to create a PDF: Use software like Adobe Acrobat, Microsoft Word, or Google Docs, which often have built-in PDF creation tools. Print to PDF: Many applications and operating systems have a "Print to PDF" option that allows you to save a document as a PDF file instead of printing it on paper. Online converters: There are various online tools that can convert different file types to PDF. How do I edit a Hsc Biology Board Question 2013 Bing PDF? Editing a PDF can be done with software like Adobe Acrobat, which allows direct editing of text, images, and other elements within the PDF. Some free tools, like PDFescape or Smallpdf, also offer basic editing capabilities. How do I convert a Hsc Biology Board Question 2013 Bing **PDF to another file format?** There are multiple ways to convert a PDF to another format: Use online converters like Smallpdf, Zamzar, or Adobe Acrobats export feature to convert PDFs to formats like Word, Excel, JPEG, etc. Software like Adobe Acrobat, Microsoft Word, or other PDF editors may have options to export or save PDFs in different formats. How do I password-protect a Hsc Biology Board Question 2013 Bing PDF? Most PDF editing software allows you to add password protection. In Adobe Acrobat, for instance, you can go to "File" -> "Properties" -> "Security" to set a password to restrict access or editing capabilities. Are there any free alternatives to Adobe Acrobat for working with PDFs? Yes, there are many free alternatives for working with PDFs, such as: LibreOffice: Offers PDF editing features. PDFsam: Allows splitting, merging, and editing PDFs. Foxit Reader: Provides basic PDF viewing and editing capabilities. How do I compress a PDF file? You can use online tools like Smallpdf, ILovePDF, or desktop software like Adobe Acrobat to compress PDF files without

significant quality loss. Compression reduces the file size, making it easier to share and download. Can I fill out forms in a PDF file? Yes, most PDF viewers/editors like Adobe Acrobat, Preview (on Mac), or various online tools allow you to fill out forms in PDF files by selecting text fields and entering information. Are there any restrictions when working with PDFs? Some PDFs might have restrictions set by their creator, such as password protection, editing restrictions, or print restrictions. Breaking these restrictions might require specific software or tools, which may or may not be legal depending on the circumstances and local laws.

#### Find Hsc Biology Board Question 2013 Bing:

## life sciences grade 11 examplar for paper1 2014

liheap income guidelines 2014

lifecycle 9500hr user guide

lifesciences march 2paper1

lift master 1260lm owners manual

## lifes little detours 5lessons to find and hold onto happiness

light harness toyota camry diagram

life sciences paper1 final examination 2014 grade10 memorandum

life sciences p1 september 2014 memo limpopo

liftmoore crane manual

## light on a dark road

lilian spengane nursing

life sciences p2 grade 1 november 2013 memo

lifes a jokeenglish edition

life span development

## **Hsc Biology Board Question 2013 Bing:**

manual del instructor para ser utilizado con cómo administrar un - Jan 16 2023

web manual del instructor para usar con cómo administrar un museo manual práctico Índice 1 introducción 1 1 el uso de cómo administrar un museo en la formación y el

manual practico de museos pdf epub doc para leer online - Nov 02 2021

manual de normas tc3a9cnicas para museos - Mar 06 2022

web jun 25 2023 manual practico de museos manuales de museistica 2 8 downloaded from uniport edu ng on june 25 2023 by guest new world saw a huge influx of exotic

manual practico de museos manuales de museistica - Jun 09 2022

web oct 9 2020 leer en linea manual práctico de museos manuales de museística patrimonio y turismo cultural de andrés gutiérrez usillos libro pdf epub mobile

manual práctico de museos request pdf researchgate - Oct 13 2022

web 11 00 20 00 edición añadir al carrito en este manual el autor esta ble ce una serie de diá lo gos entre los dife ren tes ele men tos del museo arqui tec tu ras obje tos usua rios

manual práctico de museos 1 manuales de museística - Jun 21 2023

web manual práctico de museos 1 manuales de museística patrimonio y turismo cultural de gutiérrez usillos andrés en iberlibro com isbn 10 8497046196 isbn 13

#### manual practico de museos manuales de museistica - Sep 12 2022

web manual de historia de la museología 9 manuales de museística patrimonio y turismo cultural lorente jesús pedro amazon es libros

manual de historia de la museología 9 manuales de museística - Jul 10 2022

web lee un libro manual práctico de museos manuales de museística patrimonio y turismo cultural de andrés gutiérrez usillos libros gratis

manual práctico de museos book 2012 worldcat org - Feb 17 2023

web get this from a library manual práctico de museos andrés gutiérrez usillos

manual práctico de museos ediciones trea - Aug 11 2022

web manual practico de museos manuales de museistica manual práctico de museología museografía y técnicas expositivas mar 08 2023 entre la ecología la técnica y la

## descargar manual práctico de museos manuales de museística - Apr 07 2022

web jun 16 2023 manual practico de museos manuales de museistica 1 9 downloaded from uniport edu ng on june 16 2023 by guest manual practico de museos manuales

lee un libro manual práctico de museos manuales de museística - Feb 05 2022

web libro manual practico de museos pdf twittear en este libro el autor establece una serie de diálogos entre los diferentes elementos del museo arquitectura objetos usuarios y

cómo administrar un museo manual básico centro - Dec 15 2022

web jan 1 2012 request pdf on jan 1 2012 andres gutierrez usillos published manual práctico de museos find read and cite all the research you need on researchgate

cómo administrar un museo manual práctico international - Mar 18 2023

web description gestión del museo gestión de colecciones climatología práctica museística exposición presentación conservación gestión de los riesgos visitante seguridad

manual practico de museos manuales de museistica - Dec 03 2021

# manual practico de museos manuales de museistica pdf - Jan 04 2022

cómo administrar un museo manual práctico unesco - Jul 22 2023

web cómo administrar un museo manual práctico corporate author international council of museums corporate author unesco office havana and regional bureau for culture

vista completa manual práctico de museos - Apr 19 2023

web a manuales de museística patrimonio y turismo cultural v 1 500 a contiene índice 504 a contiene bibliografía 588 a descripción basada en recurso en línea título de la

# manual práctico de gestión de museos bibliopos - Nov 14 2022

web manual practico de museos manuales de museistica auxiliares administrativos del cabildo de tenerife supuestos preticos jan 07 2020 qua del mdico pretico v 2 jun

#### manual práctico de museos 1 manuales de museística - Aug 23 2023

web manual práctico de museos 1 manuales de museística patrimonio y turismo cultural tapa blanda 2 abril 2012 en este manual el autor establece una serie de diálogos

descargar manual práctico de museos manuales de blogger - May 08 2022

web mar 11 2020 descargar gratis manual práctico de museos manuales de museística patrimonio y turismo cultural de andrés gutiérrez usillos pdf epub mobi gratis

libro manual práctico de museos manuales de museística - May 20 2023

web libro manual práctico de museos manuales de museística patrimonio y turismo cultural andrés gutiérrez usillos isbn 9788497046190 comprar en buscalibre ver

## mckinley s anatomy and physiology an integrative approach laboratory - Sep 27 2022

web sep 14 2023 add to cart category anatomy and physiology description lab manual to accompany mckinley s anatomy physiology main version 4th edition by kyla ross author leslie day author joseph comber author christine eckel author

publisher mcgraw hill 4th edition january 27 2021 language english

# anatomy physiology an integrative approach amazon com - Oct 09 2023

web jan 7 2015 mckinley o loughlin bidle anatomy physiology an integrative approach 2e brings multiple elements of the study of a p together in ways that maximize understanding text discussions provide structural details in the context of their functional significance to integrate coverage of anatomy and physiology in each chapter

anatomy physiology an integrative approach amazon com - May 04 2023

web jan 5 2018  $\,$  mckinley o loughlin bidle s anatomy and physiology an integrative approach 3e brings multiple elements of the study of a p together in unique ways that maximize understanding

anatomy physiology an integrative approach mcgraw hill - Jul 06 2023

web mckinley o loughlin bidle s anatomy and physiology an integrative approach 4th edition brings many elements of the study of a p together in unique ways to maximize understanding anatomy and physiology are covered within each chapter emphasizing the interdependence of body systems by weaving prior coverage of one system into textual lab manual to accompany mckinley s anatomy physiology main - Mar 02 2023

web jan 27 2021 description anatomy physiology an integrative approach laboratory manual fourth edition continues to serve as a resource for students both in and out of the lab providing a how to guide for learning anatomy and physiology laboratory manual main version for mckinley s anatomy - Jun 05 2023

web may 14 2015 the study of human anatomy and physiology really comes to life in the anatomy and physiology laboratory where students get hands on experience with human cadavers and bones classroom models preserved and fresh animal organs histology slides of human tissues and learn the process of scientific discovery through physiology

## anatomy physiology 4th edition textbook solutions bartleby - Aug 27 2022

web textbook solutions for anatomy physiology 4th edition mckinley and others in this series view step by step homework solutions for your homework ask our subject experts for help answering any of your homework questions

# mckinley chapter 1 the sciences of anatomy and physiology quizlet - Jul 26 2022

web 1 area superior to plane abdominal cavity contains most of digestive system organs kidneys and most of uterers 2 area inferior and between hip bones pelvic cavity contains distal large intestine rest of uterers and urinary bladder and **anatomy physiology an integrative approach mckinley** - Jun 24 2022

web apr 13 2021 mckinley o loughlin bidle s anatomy and physiology an integrative approach 4th edition brings many elements of the study of a p together in unique ways to maximize understanding anatomy and physiology are covered within each chapter emphasizing the interdependence of body systems by weaving prior coverage of one

human anatomy by mckinley 4th edition chapter 1 flashcards - May 24 2022

web muscular system produces body movement generates heat when muscles contract nervous system a regulatory system that controls all other systems in the body responds to sensory stimuli responsible for consciousness intelligence memory endocrine system consist of glands and cell clusters that secrete hormones

# mckinley lab anatomy - Feb 18 2022

web a laboratory textbook of anatomy and physiology human anatomy combo laboratory manual for mckinley s anatomy physiology with phils 3 0 4 0 access card pig version laboratory manual fetal pig version for mckinley s anatomy physiology directory of commercial and college laboratories understanding anatomy

# anatomy and physiology mcgraw hill higher education - Sep 08 2023

web anatomy physiology revealed anatomy physiology revealed offers a full educational experience for all students including realistic dissections anatomical and 3d models animations histology and imaging in an engaging easy to navigate platform accessible anytime anywhere

lab manual to accompany mckinley s anatomy physiology - Aug 07 2023

web anatomy physiology an integrative approach laboratory manual fourth edition continues to serve as a resource for students both in and out of the lab providing a how to guide for learning anatomy and physiology

## human anatomy and physiology mckinley mcgraw hill - Mar 22 2022

web structure and function of the human body topics fundamentals of anatomy physiology 9th edition f martini and j nath isbn 13 978 0321709332 this pdf book include human anatomy and physiology martini 9th edition conduct to download free bio 202 human anatomy and physiology ii you need to register

## human anatomy mcgraw hill - Feb 01 2023

web human anatomy human anatomy 6th edition isbn10 1260251357 isbn13 9781260251357 by michael mckinley valerie o loughlin and elizabeth pennefather o brien 2021 purchase options lowest price ebook from 54 00 print from 70 00 connect from 130 86 mcgraw hill ebook 180 days rental expires 4 28 2024

lab manual to accompany mckinley s anatomy physiology - Dec 31 2022

web jan 27 2021 product details about the author leslie day earned her b s in exercise physiology from university of massachusetts at lowell an m s in applied anatomy physiology from boston university and a ph d in biology from northeastern university with her research on the kinematics of locomotion

lab manual to accompany mckinley s anatomy physiology - Oct 29 2022

web jan 27 2021 amazon com lab manual to accompany mckinley s anatomy physiology main version 9781264265442 ross kyla day leslie comber joseph eckel christine books books new used rental textbooks science mathematics buy new 149 95 list price 186 48 save 36 53 20 free delivery wednesday

# anatomy physiology an integrative approach amazon com - Apr 03 2023

web jan 9 2018 mckinley o loughlin bidle anatomy physiology an integrative approach 3e brings multiple elements of the study of a p together in ways that maximize understanding text discussions provide structural details in the context of their functional significance to integrate coverage of anatomy and physiology in each chapter

# editions of human anatomy by michael mckinley goodreads - Apr 22 2022

web jan 8 2014 by michael mckinley valerie o loughlin human anatomy second 2nd edition published january 7th 2009 by 2nd edition hardcover more details want to read rate this book 1 of 5 stars 2 of 5 stars 3 of 5 stars 4 of 5 stars 5 of 5 stars mckinley lab anatomy - Nov 29 2022

web 4 mckinley lab anatomy 2022 07 07 the ninth edition of a laboratory textbook of anatomy and physiology provides students with an accessible comprehensive introduction to a p it is specifically designed for the laboratory portion of a one or two term course in anatomy and physiology

# volkswagen workshop repair owners manuals 100 free - Sep 25 2022

web the volkswagen online owner s manual we ve made it easy to access your owner s and radio navigation manuals online for model year 2012 and newer volkswagen

volkswagen golf repair service manuals 306 pdf s - Dec 29 2022

web view and download volkswagen golf gti manuals for free golf gti instructions manual

## workshop manuals for the vw golf mk1 - Oct 07 2023

web generation 1 1974 1983 the first gen golf also known as the mk1 was a hit right out of the gate and within only two years had sold more than a million units while the vw

## volkswagen workshop service and repair manuals - Jun 03 2023

web putting belt on pull the buckle slowly and smoothly across your che st and hip sand push it into the lock part fitted on the seat until buckle engages auciibly pull belt to check the

## volkswagen golf gti free pdf manuals download manualslib - Aug 25 2022

web volkswagen workshop service and repair manuals for golf mk1 running gear find technical data about wheels and tyres get access to a free online auto repair manual

volkswagen owners manuals official vw digital resources - May 22 2022

view topic service workshop manual the mk1 golf owners club - Jul 24 2022

web the vw golf mk1 workshop is a manual that provides detailed instructions for performing maintenance and repair tasks on the volkswagen golf mk1 the manual covers all

# volkswagen golf free workshop and repair manuals - Sep 06 2023

web oct 31 2023 vw golf i cabrio gti rabbit service and repair manuals looking for a vw golf i cabrio gti or rabbit service manual explore here workshop manuals for

volkswagen golf pdf service workshop and repair - Feb 28 2023

web usa manual volkswagen vw golf jetta 1993 1998 haynes owners service repair manual covers golf gti and jetta 4 cylinder models engines covered 1 8 litre

# volkswagen golf mk1 wheels tyres workshop manuals - Apr 20 2022

vw golf mk1 pdf workshop service repair manual 1974 1983 - Jul 04 2023

web volkswagen vw golf mk1 cabriolet 1985 1993 workshop repair manual vw cabriolet including scirocco 16v engine covered 1 8l water

# vw golf i cabrio gti rabbit service and repair manuals tmb - Aug 05 2023

web every single element of service repair and maintenance is included in this fully updated workshop manual from simple procedures to a full engine rebuild every procedure is

volkswagen workshop service and repair manuals - Jun 22 2022

## volkswagen golf owner s manual manual directory - Nov 27 2022

web apr 17 2019 hi does anybody there have any manual haynes bentley for diesel to share i have managed to get poor richards but it doesnt cover diesel so well of

# volkswagen vw golf mk1 cabriolet 1985 1993 - May 02 2023

web updated august 23 we have 306 volkswagen golf manuals covering a total of 44 years of production in the table below you can see 13 golf workshop manuals 0 golf

# golf mk1 manual pdf seat belt mechanical fan scribd - Jan 30 2023

web how to download an volkswagen workshop service or owners manual for free click on your volkswagen car below for example the golf on the next page select the specific

# volkswagen golf repair and workshop manual - Oct 27 2022

web golf mk1 power unit 4 cyl carburetor engine mechanics 1 5 1 6 and 1 8 litre engine exhaust system removing and installing parts of exhaust system removing and

volkswagen golf pdf workshop and repair manuals - Apr 01 2023

web manual directory com download volkswagen golf owner s manuals free of charge in pdf format for the years 1992 to

2024 view the volkswagen golf manual online print

vw golf mk1 workshop manual pdf download pdffiller - Feb 16 2022

volkswagen golf mk1 wikipedia - Mar 20 2022