O‘ZBEKISTON RESPUBLIKASI
OLIY TA’LIM, FAN VA INNOVATSIYALAR VAZIRLIGI

MIRZO ULUG'BEK NOMIDAGI
O‘ZBEKISTON MILLIY UNIVERSITETI

“O‘ZBEKISTON MILLIY UNIVERSITETINING ILM-FAN RIVOJI VA JAMIYAT TARAQQIYOTIDA TUTGAN O‘RNI”

mavzusidagi xalqaro ilmiy-amaliy konferensiyasi materiallari

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“O‘zbekiston Milliy universitetining ilm-fan rivoji va jamiyat taraqqiyotida tutgan o‘rni” mavzusidagi xalqaro ilmiy-amaliy konferensiyasi ma’ruzalari to‘plami. Mas’ul muharrir: Y.Ergashov. – Toshkent: O‘zbekiston Milliy Universiteti, 2023-yil, 514 bet.

“O‘zbekiston Milliy universitetining ilm-fan rivoji va jamiyat taraqqiyotida tutgan o‘rni” mavzusidagi xalqaro ilmiy-amaliy konferensiyasi ma’ruzalari to‘plamida universitet, respublika oliy ta’lim muassalari hamda ilmiy va ishlab chiqarish tashkilotlarida ilmiy faoliyat olib borayotgan olimlar, professor-o‘qituvchilar, yosh olimlar hamda tadqiqotchilarning ilmiy tadqiqot natijalari mujassamlashgan.

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Mazkur to‘plamga kiritilgan maqola va tezislarning mazmun mohiyati, ilmiy asoslanganligi, undagi me’yoriy-huquqiy hujjatlarning to‘g‘riligi hamda tanqidiy fikr-mulohazalar va keltirilgan takliflarga mualliflarning o‘zlari mas’uldir.

ASSESSMENT OF RELIABILITY OF THE RESULTS OF SOCIO-ECONOMIC RESEARCH BY STATISTICAL METHODS

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Abstract. The article explores the possibilities of modern software for building a model of the distribution of statistics suitable for a particular experiment. This program makes it possible to find approximate solutions with high accuracy in situations that cannot be implemented by analytical methods, using computational methods and statistical modeling, to draw not only asymptotic conclusions based on modeling, but also to observe the change in the law as the sample size increases.

Key words: statistical distribution, model, numerical methods, software.

Introduction

Methods of statistical analysis of data, methods of applied mathematical statistics are widely used in the analysis of the results of stochastic experiments, mainly, in natural sciences, engineering, biology, medicine, economics, insurance, demography and social fields. The statistical systems used are not considered as tools for investigating the validity of the study. Therefore, in cases where it is not possible to determine research regularity using analytical methods, better results can be achieved using numerical methods.

But, almost all software systems do not include research validation through these quantitative methods. Professionals,who are in this field, face problems in their work in analyzing statistical data or choosing a distribution law model that adequately describes the distribution of observations. In addition, it is a problem for the representatives of the social sphere, which statistical criteria should be used in order to minimize the error in the statistical analysis of the results of the experiment.

In recent years, so many statistical methods and criterias have been proposed that even a specialist in mathematical statistics come across some difficulties to choose the right direction. There are several criterias for testing exactly one hypothesis. Naturally, several questions appear automatically: which criterion is the best? Which criterion guarantees that type 2 error is minimal for a fixed type 1 error?

Can be distinguished competing hypotheses within a given set of observations? Is it possible to use the asymptotic results of the given criterion in the size of the given observations? These questions can be answered by conducting research using computer technologies. Only when computer simulations are used, the shortcomings of statistical criteria become apparent, as they are limited in their precise field of application.

Literature review

Within the scope of the topic, in recent years, Professor B.Yu. Lemeshko and his students [1] carried out scientific research in this field and formed a scientific school on statistical analysis of data, modeling and research of probabilistic. The main research of this scientific school consists in applying the fundamental results of mathematical statistics to various issues of practice. There are many studies by professor A.I Orlov, in the field of applied statistics, specific aspects of methods, factors to be considered in their application, and correct statistical inferences.

Among them [2-3] literature plays main role. Special attention is paid to the tasks of choosing the most optimal statistical criterion, which is different from the proposed technologies, ensuring the minimization of type 1 and 2 errors when using this statistical criterion, drawing not only asymptotic conclusions based on simulation, but also observing changes in the regularity with the increase of the sample size. In addition, the regularities of the results of the stochastic experiment conducted in our republic are determined, that is, they differ from the regularities of the data of other countries.

Research methods

The main goal is to study the laws of mathematical statistics using calculation methods and statistical modeling, considering computer technology as an instrument. Technologies under development significantly complement analytical methods, help to find approximate solutions in cases that cannot be implemented by analytical methods. On the basis of simulation, it is possible not only to draw asymptotic conclusions, but also to observe changes in the law as the sample size increases, to build and model the distribution model of arbitrary statistics studied in a given situation. For this, the following tasks were performed:

1.To observe software for computer data analysis, statistical analysis of observations of one-dimensional and multi-dimensional continuous random variables, developing of methods, algorithms and softwares;

2.To Apply methods of computer analysis of statistical regularities arising in mathematical and applied statistics issues;

3.To evaluate of distribution parameters of grouped, partially grouped (both censored and ungrouped) and interval observations and testing of statistical (simple and complex) hypotheses;

4.To Improve of methods and approaches for drawing correct conclusions based on deep study of advanced international experience and extensive use of modern mathematical and software-technical equipment in macroeconomic calculations.

5.Wide application of modern information and communication technologies of statistical data collection, processing, transfer and distribution, deepening the level of automation of the processes of working with statistical data, forming a statistical data bank;

6. To ensure minimum type 1 and 2 errors;

7. To construct of a distribution model of statistics suitable for a specific experiment.

The main goal of creating a set of practical programs is the statistical analysis of the results of stochastic experiments, in particular, multidimensional numerical data obtained from experiments in natural sciences, engineering, biology, medicine, economics, insurance, demography and social fields, and the effective application of mathematical statistics

methods to them. It is known that there are statistical analysis programs created by various developed countries such as STATISTICA, SPSS, STATA, and they have their advantages and disadvantages. The advantage of the developed software is that the interface of this program is convenient for socio-economic researchers and it is available in Uzbek, Russian and English languages, and it is designed to select the best one from several statistical criteria. This provides certain convenience to the user. In addition, the set of proposed programs provides for the verification of hypotheses about the statistical validity and statistical reliability of the performed analysis, which is not available in the above-mentioned set of statistical programs, as well as providing appropriate conclusions.

The main goal of analyzing the results of experimental observation is to determine the distribution law that best describes the distribution of the observed random variable. How well the observed pattern corresponds to the theoretical law is checked using various criteria. The purpose of testing the hypothesis about the correspondence of the empirical (experimental) distribution to the theoretical distribution is to make sure that this model of the theoretical law does not contradict the observations, and its use does not lead to serious errors. Improper use of statistical criteria leads to incorrect decision-making or unjustified rejection of the tested hypothesis. The lack of local practical software products for statistical analysis and data analysis in the market of scientific and technical products causes many problems in the analysis of the results of experiments in the socio-economic spheres. Firstly, using almost all of the available application software requires sufficient knowledge of mathematics and mathematical statistics. Secondly, these software products do not have the ability to make the necessary changes and edits for the researcher, and it is not possible to use the full capabilities of these programs. Currently, there are a number of statistical analysis programs used in world practice. some of these programs are comprehensive, mainly, intended for a wide spectrum of statistical analysis, while some are intended to solve only certain issues. These systems provide a tool for solving various problems of statistical analysis. But the correct use of these systems depends on the skill of the user. The best used systems include arsenal classical methods of mathematical statistics. But the exact field of application of this arsenal differs in different applications. But the exact field of application of this arsenal differs in different applications. The conditions for applying statistical methods to problems that arise in practice are not fulfilled in many cases. For example, non-fulfillment of the assumption that the measurement error obeys the normal law; the fact that the number of observations is limited limits the possibility of applying asymptotic results; the form of observations (grouped, censored, interval) does not allow the use of classical statistical evaluation and hypothesis testing methods; inability to propose criteria for testing complex hypotheses using analytical methods of mathematics, etc. Overall, in practice, many problems that cannot be solved by the mathematic mechanics of applied statistics.

Numerical methods and statistical modeling techniques promote the development of mathematical statistics as a "statistical software package - a tool of the researcher". But the statistical systems used are not considered tools for researching the validity of research. Therefore, in cases where it is not possible to determine research regularity using analytical methods, better results can be achieved using numerical methods. However, almost all software systems do not include research validation through these quantitative methods. It also requires sufficient training in mathematics and mathematical statistics to use most software systems. Therefore, it is important to create a system that is convenient for researchers conducting scientific research in socio-economic fields, that creates an opportunity to choose the most optimal of several statistical methods, and offers a high-accuracy approximate solution in cases where there is no exact solution. R, which is considered the most powerful statistical programming tool today, is widely used in software development. The existing library of R is edited and extended within the framework of the above tasks. The greatest strength of R is that it can be extended as desired using various packages. That is, iterative methods can be easily included in it.

Conclusion and Recommendations

Choosing the most correct and optimal statistical criterion based on the proposed technology and modeling, ensuring the minimum of type 1 and 2 errors when using this statistical criterion, distinguishing between competing hypotheses by statistical criteria, using calculation methods and statistical modeling, looking at computer technology as an instrument, studying the laws of mathematical statistics the tasks of clarifying the conditions for applying the exact theoretical results of mathematical statistics to the study, drawing not only asymptotic conclusions based on simulation, but also observing the changes in the regularity with the increase of the sample size are solved.

As a result, correct conclusions are reached based on the results of research in socio-economic fields. It should be emphasized that obtaining statistical information quickly, collecting, recording, storing, and processing in a convenient form is a very time-consuming task, and high technologies are necessary here.

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ORGANIK BIRIKMALARNI XROMATOGRAFIK AJRATISH USULLARI

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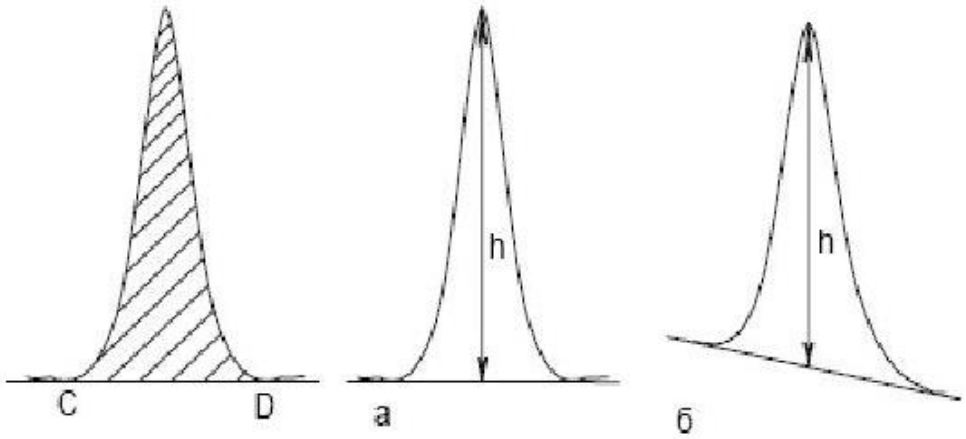
Annotatsiya. Ilk bor 1903- yilda rus botanigi L.C.SBET tomonidan organik moddalarni xromatografik ajratishning usuli yaratildi. Bu usul yuqori samari usul sifatida organik kimyoda keng qo'llanila boshladi. Xromatografiya shunday jarayonki, har xil tushuzilishga ega bo'lgan moddalarni adsorbent yuzasida (qo'zg'almas faza) yutilib qo'zg'aluvchan faza yordamida siljishi bilan ajralishidir. Ushbu maqola orqali xromatografik usullarni o'rganish va ularni qo'llashni yanada mukammalroq o'rganishdan iboratdir.

Tayanch so'zlar. Xromatografiya, adsorbsiya, desorbsiya, izoterma, qo'zg'aluvchan faza, xromatogramma, molekulyar elak, ionit, kationit, anionit, yupqa qatlam, siqib chiqaruvchi, radial, kapillyar, kamera, diffuziya, thermostat, mikroshiprits.

Kimyoviy o'zgarishlarda sianid ioni (CN^-) bir modda molekukasidan ikkinchi modda molekulasiga o'zgarmasdan o'tadi. Ratsiallar nazariyasining rivojlanishiga 1832-yilda Libix va Vyoller tomonidan olib borilgan tadqiqotlar katta ta'sir ko'rsatdi .Ular **C_7H_5CHO** tarkibiga ega bo'lgan "Achchiq bodom moyi" (hozirgi vaqtda benzaldigid **C6H5CHO** deb ataladigan) bilan o'tkazilgan kimyoviy o'zgarishlar natijasida bir qator organik birikmalar oladilar. .Ajratish jarayoni holatlariga ko'ra xromatografiyani sinflashtirish quyidagilarga bo'linadi:

1.Adsorsion xromatografiya – bu usul komponentlarning faol qattiq adsorbentga nisbatan adsorbsion moyilliklari orasidagi farqiga asoslanadi. Xromatografiyani gaz-adsorbsion va suyuqlik-adsorbsion turlari keng qo'llaniladi. Qo'zg'almas faza (adsorbent) sifatida qattiq moddalar ishlatiladi. Bu adsorbentlar maxsus yuzaga va faol markazlarega ega bo'lib, ajratilayotgan aralashma noddalar molekulari bilan o'zaro ta'sirlashuv qobiliyatiga ega bo'ladi.

2 Taqsimlanish xromatografiyasi-bu usul aralashma komponentlarini ikki aralashmaydigan suyuq fazalar orasida turlicha taqsimlanishiga asoslanadi. Taqsimlanish (absorbsion) xromatografiyada ajratilayotgan modda komponentlarining qo'zg'aluvchan faza (gaz yoki suyuqlik)dagi va inert g'ovak qo'zg'almas fazaga shimdirilgan aralashmaydigan suyuqlikdagi eruvchanligi turlicha bo'ladi.



3 Ionalmashinish xromatografiyasi-bu usulda adsorbent sifatida ionalmashinuvchi smolalar (ionitlar) qo'llaniladi. Ionitlar suvda va organik erituvchilarda amalda erimaydigan yuqori molekulali tarkibida asos xossaga ega (-SO3H;-COOH; -SH) guruhlar mavjud bo'lgan birikmalar bo'lib, ion almashtirish xususiyatiga ega bo'ladi. Ionitlar kationitlar va anionitlarga bo'linadi. Yupqa qatlam xromatografiyasida ishlatiladigan bog'lovchi moddalar, birinchi navbatda mustahkamlangan qatlam hosil qilish uchun ayrim adsorbentlarga 5-20% bog'lovchi modda qo'shiladi. Bog'lovchi modda komponentlarining ajralish tartibiga sezilarli ta'sir etmasligi kerak . Gips, kraxmal, karboksibent qatlami mustahkamligini oshirib beradi. Gips yoki kalsiy sulfat, gips ko'pincha silikagelga qo'shiladi U CaSO4*2H2O ni 110 gradusda 12 soat davomida qizdirish yo'li bilan tayyorlanadi. Olingan gips yoki alebaster elakdan o'tkaziladi va 200meshli fraksiyasi ajratib olinadi. Gips adsorbentga 5% qo'shilganda qatlam juda yumshoq bo'ladi. Tayyorlangan plastinkalar 110 gradusda 30 daqiqa davomida quritiladi, agar 2 soat quritilsa, gips mustaxkamlovchi xususiyatini yo'qotadi. Kraxmal –bog'lovchi sifatida ishlatilganda ancha mustahkam qatlam olish mumkin. Bir xil erituvchi qo'llanilganda, kraxmal qo'shilgan qatlamda gips qo'shilgan qatlamga nisbatan moddalarning ajralishi tezroq ketadi. Kraxmal plastinkalarda komponentlarni aniqlash uchun konsentirlangan meniral kislotalarni ham qo'llash mumkinligi aniqlangan. Karboksimetilsellyuloza. Adsorbentga karboksimetilsillyuzaning N70 markli hili 2,5-5% miqdorda qo'shiladi. Tayyorlangan mustahkam qatlamlar kraxmal qo'shilgan qatlamlarga nisbatan yorilishga moyil bo'ladi. Taqsimlanish xromatografiyasi- ajratilayotgan aralashma komponentlarning o'zaro aralashmaydigan qo'zg'almas faza inert qattiq tashuvchi yuzasida yutilish kuchlari ta'sirda ushlab turiadi. Qo'zg'almas faza sifatida ko'pincha suv ishlatidadi, ba'zan boshqa erituvchilardan ham foydalaniladi. Qattiq tashuvchining tabiati va suyuq qo'zg'almas fazaning xususyatlati , xromatografiyaning bajarish usuliga qarab taqsimlanish xromatografiysining uch xil turi farqlanadi: kolonkali, qog'oz va yupqa qatlam taqsimlanish xromatografiyasi. Kolonkali xromatografiya-moddalarni bu usul xromatografik analiz qilish uchun uzunligi 10-150 sm, diametrik 0,5-10 sm o'lchamdagishish kolonkadan foydalaniladi. Adsorbent miqdori ajratilayotgan aralshma miqdoridan 50-100 marta ko'p olinadi. Dastlab kolonka adsorbent yoki tashuvchi bilan to'ldiriladi va erituvchi bilan yuviladi. Taqsimlanish xromatografiyasida qattiq tashuvchi erituvchi-suyuq holdagi qo'zg'almas faza bilan ezilib aralashtiriladi. So'ngra ikkinchi

erituvchida (qo'zg'aluvchan fazada)suspenziya holida keltiriladi. Hosil bo'lgan suyuq bo'tqasimon qorishma kolonkaga bir tekisda joylashtiriladi. Tashuvchining yuza qismida doim erituvchi bo'lishi kerak. Xromatografik usullarni qo'llash bilan:1) moddalarning bir xilligi va tozaligini aniqlash mumkin; 2)ma'lum bir namunaga taqqoslab aynan bir xil ekanligini tasdiqlash mumkin ; 3)ko'p komponentli aralashmani alohida tarkibiy qismlarga ajratish; 4) reaksiya mahsulotlarini sifat va miqdoriy tahlil qilish 5) moddalarni suyultirilgan eritmalardan konsentrlab, ajratib olish; 6) ko'p hollarda moddaning tuzilishini aniqlash; 7) moddani yuqori darajada toza holda ajratib olish mumkin 8) texnologik jarayonlarni tekshirish va boshqarish kabi masalalar hal qilinadi. Bu usul ilk marotaba M.C.Svet tomonidan o'simlik pigmentlarini ajratishda qo'llangan. Adsorbent sifatida kalsiy karbonat bilan to'ldirilgan kolonkada bo'yalgan qavatlar qatori hosil bo'lishini aniqlagan va bu yangi usulni muallif xromatografiya deb atalgan. Xromatografiya so'zi grekcha bo'lib , <<rangni yozish>> degan ma'noni beradi. Moddalar aralashmasi inert gaz yoki suyuqlik (qo'zg'aluvchan faza) oqimida adsorbent (qo'zg'almas faza) yuzasida surilganda turli tabiatga tezlikda harakat qiladilar. Bu tezlik moddalarning qo'zg'aluvchan va qo'zg'almas faza bilan o'zaro ta'sir qiluvchi kuchlarga bog'liq .Xromatografiya usullari qariyb bir asr mobaynida o'zining qulayligi , qo'llanish doirasining kengligi, o'ta sezgirchanligi, yechilish kerak bo'lgan muammoga qarab, ularni osonlik bilan hal qilish mumkinligi sababli kimyogarlar tomonidan keng qo'llanib kelinmoqda. Sintetik va tabiiy organic birikmalarni, kam uchuvchan va beqaror moddalarni tekshirishda, kimyoviy reaksiyalarni olib borishda reaksiya aralashmasi tarkibini, uning borishini, organic moddalarning tozalik darajasini aniqlashda ilmiy tadqiqot ishlarida, organik sinteznig sanoat jarayonini sifat va miqdoriy jihatdan analiz qilishda xromatografiya usullari boshqa usullarga nisbatan afzal hisoblanadi va qo'llaniladi.Xromatografiyani sinflashtirishda turli belgilar asos qilib oilnadi: a) fazaning agregat holati; b) elementar akt(hodisa)ning tabiati ; v) fazalarning nisbiy siljish usuli ; g) jarayonning apparatura jihozini rasmiylashtirish usuli; d) jarayonning olib borishining maqsadi. Fazalarning agregat holatlari bo'yicha xromatografiya turlichadir. 1. Adsorbsion – molekulyar xromatografiyada suyuq yoki gazsimon moddalarni ajratishda ajratilayotgan aralashma komponentlarini qattiq faza (adsorbent) yuzasidagi yutilish moyilliklari har xilligidan foydalaniladi. Bunday xromatografiyada ajralaytotgan modda molekularning tarkibida qutbli guruhlarning bo'lishi katta rol o'ynaydi.2. Ion almashinish xromatografiyasi. Bu xromatografiyada o'zaro ta'sirlashuv qattiq faza va eritmadagi ionlar o'rtasida bo'ladi. Eritmadagi ionlar aralashmasining ajralishi bu ionlarning qattiq fazadagi ionlar bilan almashinuviga asoslanadi. Qattiq faza sifatida o'zidagi ionlarni aralashtira oladigan moddalar ionalmashtirgichlar yoki ionitlar qo'llaniladi.Tekshirilayotgan aralashma esa faqat eritmada bo'ladi. Ajratiladigan eritmadagi ionlarning ionitdagi ionlar bilan almashinuvchi har xilligiga asoslanadi. Demak, bu usulda doim ikkita xromatogramma olinishi lozim. Bulardan biri odatdagi analiz bo'lsa, ikkinchisi ximiko –xromatografik analiz hisoblanadi. Chunki kimyoviy reaksiya bilan xromatografik analiz birgalikda olib boriladi. Bu usul bilan uglevodorodlar reaktordagi silikagelga shimdirilgan konsentrlangan sulfat kislotaga yutuladilar. Keyin boshqa uglevodorodlar ajralib, xromatogrammada yoziladilar. Bu usul yordamida turli moddalarning tanlangan reagentlarda yutilib qolish xususiyatlaridan foydalanib, aralashmalar tarkibidagi moddalarning tuzilishlarini aniqlash mumkin.

Назарий к,исм учун тавсия етиладиган адабийотлар руйхати

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МУНДАРИЖА

1. **POSSIBILITIES OF TEACHING PROGRAMS OF SIMULATION OF PHYSICAL PROCESSES IN PHYSICS CLUBS.**
Abdikarimov X., Nurmetov J., Djoldasboev M ., Olimboyev M., To`rayeva G. 5
2. **THE ROLE OF PHYSICS AND MATHEMATICS IN THE DEVELOPMENT OF SCIENCE AND EDUCATION.**
Abdulkhalikova N. 6
3. **NUMERICAL MODELING OF THE TWO-DIMENSIONAL THERMOELASTIC CONNECTION PROBLEM FOR A TRANSVERSE ISOTROPIC BODY AND ITS SOFTWARE.**
Abduraimov D. 9
4. **PROBLEMS OF CREATING A SCIENTIFIC AND PRODUCTION SPHERE IN THE REPUBLIC OF UZBEKISTAN.**
Abdurakhmanova M. 14
5. **PHILOSOPHY OF JUSTICE: THE SEARCH FOR JUSTICE IN THE MODERN WORLD.**
Agzamkhodjaeva S., Isroilova Sh 18
6. **GENDER AND SOCIO-CULTURAL FACTORS: HOW TRADITIONS AND CUSTOMS AFFECT GENDER EQUITY.**
Agzamkhodjaeva S.,Tuganova L 21
7. **THE SEARCH FOR SPIRITUAL IDEALS: A REFLECTION OF THE CULTURAL WEALTH OF COUNTRIES.**
Agzamkhodzhaeva S 24
8. **ON VARIETY OF RELATIONSHIPS BETWEEN OBJECTS IN SPACES FROM LATENT FEATURES ON THE BASIS OF GENERALIZED ESTIMATES.**
Akbarov B.Kh. 27
9. **AMODEL FOR DETECTING AREAS WITH CHANGED LIGHT INTENSITY IN A VIDEO IMAGE.**
Akhatov A, Tojiev M 31
10. **CARATHEODORY AND KOBAYASHI METRICS FOR CLASSICAL DOMAINS.**
Akhmatova Sh. 34
11. **LUMINESCENCE OF NEUTRON-IRRADIATED QUARTZ CRYSTALS.**
Akhmedov A., Mustafakulov N., Juraeva U., Tojimurodovna A. 39
12. **TEMPERATURE FIELD DISTRIBUTION IN LAYERED PLATES.**
Akhmedov A.B., Ibodulloev Sh.R., Kuldibaeva L.A. 43
13. **LIGHT CURVES OF THE GRAVITATIONALLY LENSED QUASARS.**
Akhunov T, Bekov D, Alimova N, Burkhonov O. 48
14. **STUDY OF THE SEISMIC STATE OF THE CHOTKOL-KURAMA AREA.**
Allamberdiev I.S., Islomova D.A. 51
15. **CONNECTIVITY OF MULTIVALUED REFLECTION GRAPHS IN COMPLEX DOMAINS.**
Amirova D. 53
16. **SELF-SIMILAR SOLUTION FOR A DOUBLE NONLINEAR PARABOLIC EQUATION IN NON-DIVERGENCE FORM WITH SOURCE TERM.**
Aripov M., Bobokandov M. 56
17. **AIR TEMPERATURE ANALYSIS IN THE CITIES NAMANGAN, QARSHI AND URGENCH.**
Arzikulov M. 63
18. **LIE ALGEBRA OF DIVERGENCE-FREE VECTOR FIELDS AND SOLENOIDALITY OF KILLING VECTOR FIELDS.**
Aslonov J. 66
19. **PROSPECTS FOR THE PALEOZOIC OIL AND GAS POTENTIAL OF THE WESTERN TIEN- SHAN.**
Atabaev D.Kh., KHUSANBAEV D.D., Abdullaev N.K., Atabaev B.D., Atabaeva N.E., Tukhtasinov A.Kh. 71
20. **CHOP ETILGAN ILMIY ISHLARNI TAHLIL QILGAN HOLDA BAZAGA YIG'IB BORUVCHI TIZIM HAQIDA.**
Avliyoqulov A. 75
21. **LITIY VA UNING BIRIKMALARINING ISHLATILISH SOHALARI VA AHAMIYATI.**
Axmedova U.R., Qutlimurotova N.H. 75
22. **PREPARATION OF GRAPE MOLLY AND DETERMINATION OF THE AMOUNT OF VITAMINS.**
Azimova A., Turakulov A., Zhalmurodova D., Ishimov U. Fazliddinov Sh.,Islamov A. 77
23. **DETERMINATION OF THE RELIABILITY COEFFICIENT USING MATHEMATICAL STATISTICS FOR THE PREDICTION OF WORM DISEASE.**
Bahramov R.R., Abdurakhmonov R.P., Malikov M. 80
24. **IKKI O`LCHOVLI TERMOPLASTIK BOG`LIQ MASALANING SONLI YECHIMI.**
Baltabayeva N. I. 83

25. MODERN MACHINE TRANSLATION AND MATHEMATICAL MODELS OF ENGLISH SENTENCES.
Bekova V.G'., Makhmudov M.A. 84
26. ANALYSIS OF INHERITANCE OF FIBER LENGTH AND COLOR TRAITS IN NEW RECOMBINANT INBRED LINES IN UPLAND COTTON.
Boboyev S., Sattorova Z. 87
27. USING EFFECTIVE CRYPTOGRAPHIC KEYS TO PROTECT INFORMATION.
Bozorov A.X. 90
28. ASSESSMENT OF HYDROCARBON POTENTIAL OF KULTAK AREA USING GEOPHYSICAL METHODS.
Buziyev B ., Abdullayev M. 92
29. MODERN SITUATION OF SECONDARY METALLURGY IN UZBEKISTAN.
Daminov G.N., Abdurakhmanov B.M. 95
30. NON-STANDARD METHODS OF SOLVING MATHEMATICAL PROBLEMS.
Djanizokov U.A. 98
31. CREATION OF AN AUTOMATED MODERN DEVICE FOR DETERMINING THE MOISTURE CONTENT OF RAW COTTON.
Djunayeva L., Kuliyev T,. JumaniyazovK., Akhmedov A. 101
32. POS TAGGING OF UZBEK TEXTS USING HIDDEN MARKOV MODELS (HMM) AND VITERBI ALGORITHM.
Elov B., Hamroyeva Sh., Xusainova Z., Xudayberganov N., Yodgorov U., Yuldashev A. 104
33. FIZIKA VA BIOLOGIYANI O'QITISHDA INTEGRATSION YONDASHUV TUSHUNCHASI VA METODIKASI.
Ergashev A. J., Begmatova D.A., Abdullayev N.Q. 116
34. KOSONSOY ADIR VA ADIR OLDI HUDUDLARIDA YER OSTI ICHIMLIK SUVLARIGA ISTIQBOLLI HUDUDLARNI ANIQLASHDA ELEKTRORAZVEDKA VA ELEKTROTOMOGRAFIYA USULLARINING QO'LLANISHI.
Ergashov A., Ziyabov Sh., Qodirov M 117
35. PROSPECTS FOR IMPROVING E-GOVERNMENT IN NEW UZBEKISTAN.
Erkinov I.E. 124
36. SURKHONDARYA REGION CITIES AND TOWNS SOCIAL PRIORITY AREAS OF INFRASTRUCTURE DEVELOPMENT.
Ernazarov Sh. 128
37. DYNAMICS OF TRAJECTORIES OF THE COMPOSITION OF LOTKA–VOLTERRA MAPPINGS ACTING IN TWO-DIMENSIONAL AND THREE-DIMENSIONAL SIMPLEX.
Eshmamatova D., Yusupov F. 130
38. DEGENERATE CASES OF LOTKA-VOLTERRA MAPPINGS ACTING IN THE THREE-DIMENSIONAL SIMPLEX.
Ganikhodzhaev R. N., Eshmamatova D. B., Muminov U.R., Masharipov S.I. 138
39. SYNTHESIS AND PROPERTIES OF COMPLEX COMPOUNDS OF THIOSEMICARBAZONE METHYLETHYLKETONE WITH MOLYBDENUM.
Gulboev Ya.I., Kholmuminova D.A., Khamidov S.Kh. 142
40. TECHNOLOGY OF THE SYNTHESIS COMPLEXES RUTIN WITH DEOXYPEGANINE.
Hoshimov F.F. 146
41. STUDY OF THE SOLUBILITY OF IRON(II) SULPHATE COMPLEXES WITH QUERCETIN 3-RUTINOSIDE.
Hoshimov F.F. 150
42. RESULTS OF THE ANALYTICAL STUDY OF THE GROWTH, DEVELOPMENT, GRAIN YIELD AND QUALITY OF MUNG BEAN VARIETIES UNDER THE CONDITIONS OF GRASSY SWAMPY SOILS.
Idrisov Kh. 153
43. CRITICAL APPROACHES TO THE STUDY OF THE IMAGE OF WOMEN IN ENGLISH LITERATURE.
Irsaliyeva M. 156
44. THE CHEMICAL COMPOSITION OF COMPLEX FERTILIZERS WITH MANGANESE.
Isakova O., Makhkamova D., Turayev Z. 159
45. COMPOSITION AND ORE PRESENCE OF KERSANTITE DIKES IN THE "YANGI UMID" DEPOSIT OF THE KARAKUTAN ORE FIELD (WESTERN UZBEKISTAN).
Ishbayev Kh, Djumaniyazov D, Kosbergenov K, Akhmedjonov B 162
46. GEOLOGICAL STRUCTURE OF THE CHAKYL KALYAN MOUNTAINS AND YAKHTON DEPOSIT.
Islomova D. 168
47. PETROGRAPHIC AND MINERALOGICAL FEATURES OF ORE-BEARING ROCKS OF THE ALMALYK ORE-FIELD.

Islomova D., Yusupov U. 173
48. **PURIFICATION OF SPENT METHYLDIETHANOLAMINE SOLUTIONS WITH ACTIVATED CARBON FK-SHK.**
Isokov Y, Iskova O, Yodgorov N. 177
49. **CLEANING OF SULFUR COMPOUNDS IN DIESEL FUEL WITH ACTIVATED CARBON.**
Isokov Yu.X., Nabiyev A.A., Isokov O.T. 180
50. **ALGORITHM OF RECULTIVATION OF SOILS AROUND INDUSTRY.**
Jabbarov Z.A., Abdrakhmanov T., Jobborov B.T., Nomozov U., Toyimbaeva D. 184
51. **PHYSICOCHEMICAL PROPERTIES OF POLYMER IMPLANT-FILMS BASED ON CARBOXYMETHYLCELLULOSE AND SILVER NANOPARTICLES FOR HEALING BURN WOUNDS.**
Jalilov J., Yunusov H., Sarymsakov A., Rashidova S. 187
52. **O‘QUVCHILARNI FIZIKA OLIMPIADALARIGA TAYYORLASH METODIKASI.**
Jo‘rayev F.I. 191
53. **ISOLATION AND QUANTITATIVE DETERMINATION OF PHYSALIS ALKEKENGI PLANT FLAVONOIDS.**
Kadirova Z., Tashmukhamedova Sh. 194
54. **ON PLURISUBHARMONICITY AND PLURIHARMONICITY OF $(B)sh_m$ FUNCTIONS.**
Kalandarova D.A. 198
55. **IDENTIFICATION METHODS OF COUNTERFEIT AND FALSIFIED MEDICINES.**
Karimqulov Q., Jabborkhonova N. 201
56. **SPIRITUAL AND MORAL ALIENATION OF YOUNG PEOPLE IN CYBERSPACE AND PRIORITIES FOR ITS ELIMINATION.**
Khakimov D.A. 204
57. **MOVEMENT OF POLYELECTROLYTE BIOPOLYMERS IN GRADIENT FIELDS.**
Khakkulov J.M., Temirov Z.Sh., Sultonov A.P. 207
58. **STUDY OF RELATIONSHIP OF RAW MATERIAL AMOUNT AND CURRENT DENSITY ON POTASSIUM CHLORIDE ELECTROLYSIS EFFICIENCY.**
Khamidov A.G.,Nabiev A.A.,Kayumov A.A. 211
59. **THEORETICAL INVESTIGATION OF SODIUM ALGINATE STRUCTURE IN THE GAUSSIAN PROGRAM.**
Khaydarova S.S., Khaitbayev A.Kh. 214
60. **HYDROLOGICAL REGIME AND WATER RESOURCES OF MOUNTAIN RIVERS UNDER CLIMATE CHANGE CONDITIONS (BY THE EXAMPLE OF THE RIVERS OF ZERAFSHAN BASIN).**
Khikmatov F., Haydarov S., Khikmatov B., Ziyaev R., Erlapasov N 216
61. **ELECTROCHEMICAL AND ELECTROPHYSICAL BASIS OF OBTAINING NANOCOMPOSITE POLYMER COATINGS.**
Khodjaeva N., Kholmuminov A. 222
62. **PREVENTION OF SOIL SALINITY USING DENGIZKUL COLLECTOR WATERS.**
Khodjaeva Z.F. 228
63. **SILICON DOPED WITH ZINC OXIDE AND ITS FEATURES REVEALED BY X-RAY DIFFRACTION ANALYSIS.**
Khojiev Sh.T, Kosimov I.O, Kholikov U.X. 231
64. **THE PROBLEM OF INTERDISCIPLINARY INTEGRATION IN ASTRONOMY PROBLEM SOLVING IN UNIVERSAL EDUCATION SCHOOLS.**
Khotamov J. 233
65. **INTERPOLYMERIC COMPLEX FOR PROTECTION OF THE BIOSPHERE.**
Komilov K. U., Eshburieva Z., Turdiyeva H., Eserkepova E Mukhamedov G.I. 236
66. **MEMBRANE ACTIVITY AND CHEMICAL STABILITY OF DIACYL DERIVATIVES OF DIBENZO-18 CROWN-6.**
Komilova N., Lyubov K. Kozinskaya, Tashmuhamedova A.K., Abramov A.Yu., Mirkhodjaev U.Z. 239
67. **QUANTUM-CHEMICAL CALCULATIONS OF MEMBRANE-ACTIVE DIACYL DERIVATIVES OF DIBENZO-18 CROWN-6.**
Komilova N.R., Kozinskaya L.K., Tashmuhamedova A.K., Mirkhodjaev U.Z. 239
68. **INTERACTION BETWEEN THE POLITICAL ELITE AND CIVIL SOCIETY: FINDING A BALANCE IN THE MODERN POLITICAL PROCESS.**
Kubatov Sh. 240
69. **TO THE QUESTION OF TEACHING THE SECTION OF PHYSICS "OSCILLATIONS AND WAVES".**
Kulboev Z.Kh. 244
70. **HYDROGEOLOGICAL AND ENGINEERING-GEOLOGICAL CONDITIONS OF THE GUZHUMSAY DEPOSIT.**
Kurbanov E.Sh. 247

71. STUDY ON THE INFLUENCE Γ-60CO GAMMA RADIATION ON THE ELECTROPHYSICAL PROPERTIES OF "KOMOLOT-79" COTTON FIBERS.
Mamadalimov A., Khakimova N., Norbekov Sh., Almardonov Sh. 251

72. EVALUATION OF THE ERROR OF THE APPROXIMATE SOLUTIONOF THE BUBNOV-GALERKIN METHOD FOR ONE NON-CLASSICAL MIXED PROBLEM OF PARABOLIC TYPE.
Mamatov A.Z., Narjigitov X., Jamuratov K., Dushabayev O.N., Nafasov G.A., Dustnazarova I.I. 254

73. CALLIPTAMUS ITALICUS.L TARKIBIDAN KIMYOVIY USULDA N-ATSETIL D- GLUKOZAMIN BIOPOLIMERINI AJRATIB OLISH.
Maxkamova N.O., Xaitbaev A X. 257

74. N-ATSETIL D- GLUKOZAMIN BIOPOLIMERINI CALLIPTAMUS ITALICUS.L TARKIBIDAN KIMYOVIYUSULDA AJRATIB OLISH.
Maxkamova N.O., Xaitbaev A X. 259

75. SYNTHESIS AND PROPERTIES OF STABLE ZINC OXIDE NANOPARTICLES IN THE SOLUTION OF SODIUM-CARBOXYMETHYLCELLULOSE.
Mirkholisov M., Yunusov H., Sarymsakov A., Rashidova S. 259

76. NEW CHELATING POLYMERIC MATERIALS AND THEIR APPLICATION FOR THE SORPTION OF THE HEAVY METAL IONS.
Mukhamediev M., Bekchanov D. 264

77. EFFECT OF ISOQUINOLINE ALKALOID F-14 ON THE ACTIVITY OF THE ATP-DEPENDENT K+-CHANNEL OF THE LIVER AND HEART OF RATS.
Muratova D., Asrarov M. 268

78. THE GEOMETRY OF THE ORBITS OF KILLING VECTOR FIELDS.
Narmanov A.Y. 271

79. PRODUCTION OF PP- FERTILIZERS BASED ON SIMPLE SUPERPHOSPHATE.
Nazirova R.M, Kucharov B.Kh, Zakirov B.S 274

80. GENERALIZED ARGUMENT PRINCIPLE FOR $A(z)$ -ANALYTIC FUNCTIONS.
Ne'matillayeva M. 277

81. DETERMINING AND ANALYZING THE EFFECTIVENESS OF EDUCATION IN CHEMISTRY THROUGH QUALITATIVE METHODS.
Nizamova S.A, Khasanova N.Kh, Shukurova N.R 280

82. FIZIKANI FANLARARO INTEGRATSIYASINI AMALGA OSHIRISH METODIKASI.
Norsoatov Sh.S., Begmatova D.A., Abdullayev N.Q., Kosberganov E. 283

83. EVALUATION OF LANDFILL LOCATION USING GIS AND MULTI-CRITERIA DECISION-MAKING METHODS.(IN THE EXAMPLE OF NUKUS CITY LANDFILL).
Nuratdinov A, Xudaybergenov Y, Bekanov K, Kannazarov Z, ... 285

84. DFT CALCULATION OF CATION SUBSTITUED HALIDE PEROVSKITES.
Nurgaliev I., Marasulov M., Ashurov N., Rashidova S. 290

85. MINKOWSKI DIFFERENCE OF ELLIPSES.
Nuritdinov J. 295

86. DATA ANALYSIS OF SPACE OBSERVATIONS OF GLOBULAR CLUSTERS.
Nuritdinov S. N., Turaev S.J., Rastortguev A.S., Rashidov D.A. 302

87. DIFFERENT APPROACHES TO THE PRODUCTION OF BIOPEAT PRODUCTS BASED ON PLANT WASTE.
Odiljonova S., Kamalov A. 307

88. REGIONAL CHARACTERISTICS OF THE EMPLOYMENT OF THE POPULATION OF SURKHANDARO REGION.
Pardayev N.S. 309

89. OLIMPIADALARGA QIZIQUVCHI TALABALAR UCHUN O'ZGARUVCHAN MASSALI JISMLARDA SIOLKOVSKIY TENGLAMASI RO'LI.
Pardayeva E.Sh., Abdullayev N.Q. 311

90. NUMERICAL SIMULATION OF A NON-STATIONARY HEAT TRANSFER PROCESS IN CONTACT INTERACTION WITH THE SURROUNDING MEDIUM.
Polatov A., Ikramov A., Pulatov S. 314

91. MOLYAR MASSA TUSHUNCHASINI O`QITISHGA OID USLUBIY KO`RSATMALAR.

Qosimov A. A, Qo'ziboyev Sh.T, Abduraxmonov U 320

92. **THE IMPORTANCE OF BLOCKCHAIN TECHNOLOGY IN THE DEVELOPMENT OF THE DIGITAL ECONOMY (IN THE BANKING SECTOR AS AN EXAMPLE).**
Rakhimberdiev K. 322

93. **INTERBAND ONE- AND TWO-PHOTON ABSORPTION OF POLARIZED LIGHT IN NARROW-GAP CRYSTALS.**
Rasulov V, Rasulov R, Isomaddinnova U, Muminov I. 326

94. **KIMYODAN PISA TESTLARIDAN FOYDALANIB MISOL VA MASALALARNI YECHISHDA MANTIQIY FIKRLASHNING RIVOJLANTIRISH.**
Raxmonov Sh.T. Ixtiyarova G.A. 337

95. **EKSPERIMENTAL DIABET NEGIZIDA OSHQOZON OSTI BEZIDAGI MIKROSKOPIK O'ZGARISHLAR.**
Rohimova Sh., Abdullayev A. 339

96. **MARRIAGE PROCESSES IN THE GEODEMOGRAPHIC DEVELOPMENT OF THE REPUBLIC OF UZBEKISTAN.**
Sabirova M., Jaloliddinov N. 340

97. **DYNAMICS OF GLACIATION IN THE SOUTHERN REGIONS OF UZBEKISTAN (BASINS OF THE KASHKADARYA AND SURKHANDARYA RIVERS).**
Sabitov T, Sabitova N 345

98. **COLLOID-CHEMICAL PROPERTIES OF CARBOXYMETHYLSTARCH AND SURFACTANT SYSTEMS..**
Samandarov Sh.K., Makhkamov R.R. 351

99. **CREATION AND USE OF NEW CYTOGENETIC TOOLS IN CYTOGENETIC STUDIES OF COTTON.**
Sanamyan M.F., Bobokhujayev Sh.U. 354

100. **SYNTHESIS OF POROUS GAS MATERIALS FOR A SEMICONDUCTOR CARBON(II) OXIDE SENSOR AND THEIR INVESTIGATION.**
Sidykova Kh.G., Muminova N.I., Sultanov M.M. 360

101. **ULNERABLE LOCAL MEDICINAL LEECHES AND RECOMMENDATIONS FOR THEIR INCLUSION IN THE RED DATA BOOK OF THE REPUBLIC OF UZBEKISTAN.**
Solijonov H, Umarov F, Izzatullaev Z 362

102. **LAND RESOURCES, THEIR CLASSIFICATION AND EVALUATION..**
Tajidinov B. 366

103. **ISSUES OF DEMOGRAPHIC EDUCATION AND DEMOGRAPHIC DEVELOPMENT IN UZBEKISTAN.**
Tajiyeva Z.N. 370

104. **WATER RESOURCES OF UZBEKISTAN IMPROVEMENT OF IRRIGATION SYSTEMS AND THEIR QUALITY IMPACT ON THE NOSOGEOGRAPHICAL SITUATION..**
Tillyakhojaeva Z., Agzamov F.S. 373

105. **IDENTIFICATION ON THE HEXANE EXTRACTS OF BASAL TERMITE ANACANTHOTERMES TURKESTANICUS.**
Tilyabaev Z, Togaev U.R, Turageldiev Sh, Khaitbaev Kh 376

106. **MEDICINE USES OF THE FLOWER.**
To'raqulov A.U., Azimova A.Q., Jalmurodova D.Dj., Islomov A.X. 376

107. **ISSUES OF GEODEMOGRAPHIC DEVELOPMENT OF FERGANA REGION.**
Tojieva Z.N., Qoraboyev A.A. 379

108. **MODELING THE MOTION OF AN OBJECT THROWN AT AN ANGLE TO THE HORIZON IN C# DIRECTION:2.**
Tojiyev A.H., To'rabekov M. A. 383

109. **ASSESSMENT OF SEISMOTECTONIC POTENTIAL OF UZBEKISTAN BY MMAX.**
Tokhtasinov A. , Khusanbaev D. , Atabaev D., Jovliev K. 386

110. **THE VOLUME OF THE QUATERNARY SYSTEM IN VARIOUS CHRONOLOGICAL SCALES AND THE PROSPECTS OF MAGNETOSTRATIGRAPHIC STUDIES OF THE QUATERNARY DEPOSITS OF UZBEKISTAN.**
Toychiev Kh., Stelmakh A., Tajibayeva N., Abdullaeva M. 391

111. **ALGORITHM FOR DETERMINING THE SIMILARITY OF VECTORS BASED ON THE ANALYSIS OF PAIRS OF POSITIONS AND VALUES OF ELEMENTS.**
Tukhtasinov M. 395

112. **THE SIGNIFICANCE OF USING CONTEMPORARY KNOWLEDGE ON THE ESSENTIAL ISSUES OF THEORETICAL GEOLOGY IN TEACHING PRACTICE.**
Turamuratov I. Togayev I. 398

113. **SYNTHESIS, STRUCTURE, AND PROPERTIES OF STABLE SELENIUM NANOPARTICLES IN A SODIUM-CARBOXYMETHYLCELLULOSE POLYMERIC SUBSTANCE.**

Turaqulov F.M., Yunusov Kh.E., Sarymsakov A.A., Rashidova S.Sh. 401

114. STUDY METHODOLOGY OF PHYSICS DEPARTMENT "ELECTRICITY AND MAGNETISM" BASED ON VENN DIAGRAMS METHOD.
Tursunmetov K., Kholboyev Y., Fayzullayev A. 407

115. REASONS FOR THE FORMATION OF SMALL (POINT) OPTICAL DISTORTION ON WINDSHIELDS AND THE METHOD OF THEIR ELIMINATION.
Tursunov Sh..... 411

116. DIFFERENCE SCHEMES OF HIGHER ACCURACY FOR A FOURTH ORDER OPERATOR DIFFERENTIAL EQUATION.
Utebaev B., Utebaev D., Kazimbetova M..... 415

117. DEVELOPMENT OF REFERENCE MATERIALS OF PHYSIC-MECHANICAL PROPERTIES OF COTTON FIBER.
Yakubova Y.D., Quliyev T.M., Jumaniyazov K., Akhmedov A..... 418

118. FIZIKA FANIDA VIRTUAL LABORATORIYA MASHG'ULOTLARINING AHAMIYATI.
Yo'lchiyev Sh., Mamasodiqova S..... 422

119. ASSESSMENT OF RELIABILITY OF THE RESULTS OF SOCIO-ECONOMIC RESEARCH BY STATISTICAL METHODS.
Yodgarov U.S..... 424

120. ORGANIK BIRIKMALARNI XROMATOGRAFIK AJRATISH USULLARI.
Yorbekov A.D[1], Abdug'aniyeva S.Y, Xudoyberdiyeva S.Sh..... 426

121. PHYSICOCHEMICAL CHARACTERISTICS OF TEXTILE BIOMATERIALS FROM CELLULOSE FIBER AND SILVER NANOPARTICLES.
Yunusov Kh.E., Mirxolisov M.M., Sarymsakov A.A., Rashidova S.Sh. 428

122. OQSILLARNING TUZILISHI.
Yunusova N. A..... 432

123. MICROMINERALOGY OF ORES IN PESCHANOE MINE AND CHARACTERISTICS OF BASIC MINERALS IN THE PROCESS OF GOLD ORES (AUMINZATAU).
Yusupov A., Sadirov R..... 434

124. DEVELOPING STUDENTS' LOGICAL THINKING IN THE PROCESS OF TEACHING PROBABILITY THEORY AND MATHEMATICAL STATISTICS.
Yusupova A.K..... 440

125. MOBIL ILOVALARNI YARATISHDA FIREBASE TEHNOLOGIYASIDAN FOYDALANISHNING AFZALLIKLARI VA KAMCHILIKLARI.
Yusupova N..... 442

126. GRAPHICAL SOLUTION OF PHYSICAL PROBLEMS BASED ON DIGITAL TECHNOLOGIES.
Zakhidova M., Giyasova Z..... 443

127. SOME GEOMETRICAL PROPERTIES OF CONFORMAL SUBMERSION.
Zoyidov A.N. 446

128. АММИАКНИ АНИҚЛОВЧИ СЕНСОР ГАЗСЕЗГИР МАТЕРИАЛИ ХОССАЛАРИГА ТУРЛИ ФАКТОРЛАРНИНГ ТАЪСИРИ.
Абдурахманов И.Э., Кучкоров О.А., Эрданов Ф.Ф., Турсунова Г.Х., Абдурахмонов Э. 448

129. КРЕМНИЙЛИ ҒОВАК МАТЕРИАЛАРНИНГ СИНТЕЗИ ВА УЛАРНИНГ ХУСУСИЯТЛАРИНИ ЎРГАНИШ.
Абдурахманов Э., Султанов М.М., Эшқобилова М.Э., Сидикова Х.Г. 450

130. ГЕОЛОГИЧЕСКОЕ СТРОЕНИЕ И КРАТКАЯ ХАРАКТЕРИСТИКА ДЖАСАГИНСКАЯ ПЛОЩАДЬ.
Акбарова З..... 451

131. ЎЗБЕКИСТОНДА ЎСАДИГАН КИЙИК ЎТ ЎСИМЛИГИ АСОСИДА ОЗИҚ –ОВҚАТ ҚЎШИЛМАЛАРИНИ ЯРАТИШ.
Асқаров И.Р, Акбарова М.М, Сманова З.А. 454

132. ИК-СПЕКТРОСКОПИЧЕСКИЙ АНАЛИЗ СУБСТАНЦИИ ТИОЦИНА.
Жумабаев Ф.Р., Хайруллаев Д.Х., Шарипов А.Т..... 455

133. ПРИМЕНЕНИЕ МЕТОДОВ ДИСТАНЦИОННОГО ЗОНДИРОВАНИЯ ЗЕМЛИ ДЛЯ ОПРЕДЕЛЕНИЯ СТРУКТУРНОЙ ЗАВИСИМОСТИ ПОЛЕЙ МИНЕРАЛИЗАЦИИ НА МЕСТОРОЖДЕНИИ ТУРБАЙ, САРЫТОВ-САУТБАЙСКИЙ РУДНЫЙ УЗЕЛ.
Зайниддинов Ф.А., Турапов М. К., Тогаев И С., Зайниддинов Ҳ., Умаров А. 456

134. ҚАРШИ ШАҲРИ ҲУДУДИНИНГ ГЕОЛОГИК ЎРГАНИЛГАНЛИГИ СЕЙСМИК РИСКНИ БАҲОЛАШ МЕТОДОЛОГИЯСИ.

Зайниддинов Х, Бахтиёрович Ш, Махмадиёрович Э. 461

135. ШЎРЛАНГАН ТУПРОҚЛАР УНУМДОРЛИГИНИ ОШИРИШДА РЕСУРСТЕЖАМКОР АГРОБИОТЕХНОЛОГИЯНИНГ ЎРНИ.

Махкамова Д.Ю. 464

136. РАХМАТБОБО МАЙДОНИНИНГ ТУЗУЛИШИНИ ОЙДИНЛАШТИРИШДА УЧН-3D УСУЛИДАН ФОЙДАЛАНИШНИНГ САМАРАДОРЛИГИ.

Мухамаджанов А.А., Қорёғдиев А.Ш. 465

137. СТАНОВЛЕНИЕ И РАЗВИТИЕ ЭКОНОМИЧЕСКОЙ И СОЦИАЛЬНОЙ ГЕОГРАФИИ В НАЦИОНАЛЬНОМ УНИВЕРСИТЕТЕ УЗБЕКИСТАНА.

Назаров М.И., Курбанов Ш.Б., Федорко В.Н. 468

138. МАРВАРИД МАЙДОНИДАГИ НЕФТ-ГАЗГА ИСТИҚБОЛЛИ ЁТҚИЗИҚЛАРНИ 3D СЕЙСМОРАЗВЕДКА УСУЛЛАРИ БИЛАН ЎРГАНИШ.

Олимов Ш, Жовлиев Ҳ, Олимов Ж. 475

139. ЮРТИМИЗ, ГЕОЛОГИЯ, ҚАДИМИЙ КОНЧИЛИК ВА МИЛЛИЙ УНИВЕРСИТЕТ ТАРИХИ Т.Н.ДОЛИМОВ ИЛМИЙ ФАОЛИЯТИДА.

Пирназаров М, Умаров А, Шукуров А, Акбарова З, Зияева П 478

140. ЎЗБЕКИСТОН ГЕОЛОГИЯ МУЗЕЙИ ЭКСПОНАТЛАРИНИНГ ТАЪЛИМ ТИЗИМИДА ТУТГАН ЎРНИ.

Хайдаров М, Миракбаров М. 481

141. НЕФТ ВА ГАЗ КОНЛАРИ ЕР УСТКИ ҚИСМИНИ ВЕРТИКАЛ ҲАРАКАТЛАРИНИ ЗАМОНАВИЙ ГЕОДЕЗИК АСБОБ-УСКУНАЛАР БИЛАН ЎРГАНИШДАГИ АҲАМИЯТИ.

Ходжиметов А., Тўхтамешов Ф., Ўралова М., Ашуров У. 483

142. GOSSYPIUM L ТУРЛАРИДА ПОЛИПЛОИДИЗАЦИЯ ХРОМОСОМА ДУПЛИКАЦИЯСИ ВА ИНВЕРСИЯЛАРИ.

Холова М Д, Эрназарова Д.К. 487

143. ФЛОТАЦИЯ ВА ГАЛУРГИК УСУЛЛАРНИ СОЛИШТИРИШ (ДЕҲҚОНОБОД КАЛИЙЛИ ЎҒИТЛАР ЗАВОДИ МИСОЛИДА).

Ҳайдаров Б.Ҳ., Абдуримов А.С., Шомуродов Д.Д. 489

144. ДЕХҚОНОБОД КАЛИЙЛИ ЎҒИТЛАР ЗАВОДИ УНИТАР КОРХОНАСИ КЎИЧ ЦЕХИ.

Ҳайдаров Б.Ҳ., Ҳайдарова С.Р., Хусанова Ш.А., Маратова М.Б. 491

145. ПЕДАГОГИКАНИ ТАШКИЛ ЭТАЁТГАН АЙРИМ ТУШУНЧАЛАРНИНГ МАЗМУНИ ВА МОҲИЯТИ.

Шакуров Р.Р. 493

146. СВОДНЫЙ КАТАЛОГ ДВОЙНЫХ ГАЛАКТИК И ИХ СТАТИСТИЧЕСКИЙ АНАЛИЗ.

Шамшиев Ф.Т., Зокирова М.У. 496

147. "GENE PYRAMIDING" ТЕХНОЛОГИЯСИНИНГ ҚИШЛОҚ ХЎЖАЛИГИДАГИ АҲАМИЯТИ.

Эрназарова Д.К, Азимова Л.А, Кушанов Ф.Н 499

148. ОЛМАЗОР ТУМАНИГА УМУМИЙ ИҚТИСОДИЙ ГЕОГРАФИК ТАВСИФ.

Яхшимуротова Д.Қ. 501