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	Entrance Examination Program	

“APPROVED” by
Chair of the Admissions Committee
_____ **A.A. Turmukhambetova**
«_» _____ **20_.**

**INTERVIEW PROGRAM FOR FOREIGN CITIZENS
FOR ADMISSION TO THE MASTER’S DEGREE PROGRAM
AT NCJSC “ASTANA MEDICAL UNIVERSITY”**

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1. PURPOSE AND SCOPE

1.1 The program is intended for applicants to Master’s degree educational programs.

2. NORMATIVE REFERENCES

2. This program is based on references to the following documents:

- Order of the Minister of Education and Science of the Republic of Kazakhstan No. 600 dated October 31, 2018 “On Approval of the Model Rules for Admission to Educational Organizations Implementing Higher and Postgraduate Education Programs”.

3. MAIN PART

3.1 Brief Information

The procedure for admitting foreign citizens to educational programs at NCJSC “Astana Medical University” (hereinafter referred to as the University) is carried out in accordance with the University’s admission rules.

This Interview Program for foreign citizens defines the procedure for conducting interviews for educational programs.

Admission of foreign citizens to fee-based education is carried out based on the results of an interview conducted by the Admissions Committee of NCJSC “Astana Medical University” (hereinafter referred to as the University) throughout the calendar year. Enrollment of foreign citizens is carried out in accordance with the academic calendar, no later than 5 (five) days before the start of the next academic period.

Interview Format

The interview is conducted in order to:

- assess the level of proficiency in the language of instruction;
- determine the level of academic and professional preparation;
- identify motivation for studying;
- assess communication and personal qualities.

The interview is conducted individually, in offline and online formats.

Duration of the interview: 15–25 minutes.

Languages of the interview: Kazakh, Russian, English.

Applications for the interview are submitted online via the following link:

<https://admission.amu.kz/registration.php>.

During the interview, the applicant must present an original identification document.

If any violation is detected during the interview, the Interview Committee has the right to stop the interview and invalidate its results.

Interview Content

The interview includes:

- introduction (educational and professional background);
- assessment of academic language (terminology, argumentation);
- assessment of professional knowledge in the specialty (Appendix 1);
- assessment of research potential (analytical thinking);
- assessment of motivation (academic and career goals).

The interview is evaluated according to the grading scale (Appendix 2).

3.4 Schedule for Submission of Documents and Dates of the Interview

Table 1.

Period for Submission of Documents	Interview Period	Submission of Appeal Applications	Submission of Enrollment Documents
Throughout the year	July 1 – August 23	Until 13:00 of the next day after announcement of results	July 1 – August 25 (originals upon student arrival)

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Throughout the year	17-28 December	Until 13:00 of the next day after announcement of results	Before 6 January
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The date and time of the interview will be sent to the applicant via the email address specified in the application.

3.5 Appeal Procedure

Appeal applications shall be submitted in person by the applicant who has taken the entrance examination, addressed to the Chair of the Appeal Committee. Applications are accepted until 13:00 on the day following the announcement of the entrance examination results and are reviewed by the Appeal Committee within one day (Appendix 3).

3.6 Enrollment

Upon successful completion of the interview, an invitation letter (Admission Letter, Appendix 4) is sent to the applicant’s email address.

Foreign citizens admitted to the University shall submit the following documents to the Admissions Committee:

- 1) application addressed to the Rector of the University in the established form (Appendix 5);
- 2) copy of passport (with translation into the state or Russian language, notarized by a notary in Kazakhstan);
 - original certificate/diploma (with translation into the state or Russian language, notarized by a notary in Kazakhstan) or notarized copy of educational document;
 - document confirming diploma recognition (nostrification);
 - 6 photos sized 3×4 cm;
 - medical certificate U-075 (+ fluorography scan), vaccination record;
 - medical insurance policy;
 - document confirming financial solvency sufficient to cover living and study expenses under the agreement between the immigrant and the host educational organization, except for ethnic Kazakhs, in accordance with the procedure and amounts determined by the authorized body in the field of science and higher education in coordination with the Ministry of Internal Affairs of the Republic of Kazakhstan;
 - medical certificate confirming the absence of diseases that may prevent study in the chosen program;
 - document confirming the presence or absence of criminal record;
 - document confirming employment history (if applicable);
 - list of scientific and methodological works (if available).

3.7 Contact Information:

Astana, 49A Beibitshilik Street, NCJSC “Astana Medical University”, Admissions Committee phone: 8 (7172) 539512, mobile: +7 708 494 2179, e-mail: priyem@amu.kz.

Deputy Executive Secretary of the Admissions Committee for the admission of foreign citizens: L.I. Bilan, phone: +7 701 545 5908.

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Appendix 1

**Interview Questions for the Assessment of Professional Knowledge
for Master’s Degree Educational Programs
MEDICINE**

1. The traditional hierarchy of evidence in clinical epidemiology. Descriptive studies.
2. The traditional hierarchy of evidence in clinical epidemiology. Analytical studies.
3. The traditional hierarchy of evidence in clinical epidemiology. Experimental studies.
4. Stages of evidence-based medicine. Formulation of a clinical question.
5. Stages of evidence-based medicine. Information search and critical appraisal.
6. Databases of reliable medical information.
7. Historical stages in the development of clinical research ethics.
8. Ethical aspects of conducting clinical research.
9. Scientific article: structure and assessment of methodological quality.
10. Statistical hypotheses. Types of hypotheses. Errors in testing statistical hypotheses.

HEALTHCARE MANAGEMENT

1. The concept of management and its role in modern market conditions.
2. Enterprise / firm as an economic entity.
3. Organizational structure of an enterprise and its components.
4. Basic definitions of a firm’s mission.
5. The main goal and objectives of management.
6. Characterize the internal and external environment of an organization, their main elements and specific features in healthcare.
7. Management functions: essence and types.
8. Characterize Henri Fayol’s 14 principles of management.
9. Profit as a basic criterion of organizational efficiency in a market economy.
10. What is the essence of the classical school of management?
11. Abraham Maslow’s hierarchy of needs.
12. The essence of strategic planning.
13. SWOT analysis: essence and application.
14. What is the market environment?
15. PEST analysis methodology.
16. What is the essence of the situational approach?
17. What is behaviorism in management?
18. Michael Porter’s competitive strategies.
19. Application of SMART analysis in healthcare.
20. Staff motivation in a medical organization.
21. Specific features of leadership in medicine.
22. Characterize the main types of risks in healthcare and their impact on the activities of a medical organization.
23. The concept of conflict. Causes of conflict.
24. The essence and importance of delegation of authority.
25. The behavioral approach in management.
26. What is an organization’s strategy?
27. Business plan: structure and purpose.
28. Adaptation of medical personnel.

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29. The human relations school.
30. The behavioral approach in management.
31. The essence of communication.
32. Leadership styles.
33. The concept of diversification and its goals.
34. Specific features of the healthcare system as an object of management.
35. What is HR management?
36. Intra-firm planning: definition and types.
37. The life cycle of an organization.
38. Risks in the healthcare system.
39. Quality of medical care: criteria.
40. Team building in a medical organization.
41. Professional burnout among healthcare workers.
42. Efficiency of resource utilization.
43. Advantages and disadvantages of divisional structures.
44. Centralization and decentralization of management.
45. Decision-making methods: brainstorming and decision tree.
46. Communication barriers and ways to overcome them.
47. Time management.
48. Business ethics.
49. Financial management.
50. Marketing management: the 4P concept.
51. Innovation management.
52. Risk management.
53. Marketing research of the medical services market.
54. Segmentation of the medical services market.
55. The concept and content of corporate culture.
56. Competitiveness of the healthcare system.
57. Business planning in a medical organization.
58. Types of control in management.
59. Socio-psychological methods of management.
60. Specific features and development of healthcare management in the Republic of Kazakhstan.

PUBLIC HEALTH.

1. Define the concept of the health care system.
2. Name the methods for studying morbidity.
3. What does the concept of medical activity include?
4. Define the concept of inpatient care.
5. What data are required to calculate the crude birth rate?
6. What information is needed to calculate the indicator “Number of days of temporary disability per 100 workers”?
7. In statistics, what is the indicator called: 110 beds per 10,000 population?
8. List the forms of medical care provision in accordance with the Code of the Republic of Kazakhstan “On Public Health and the Health Care System”.
9. Define the concept of social hygiene.
10. List the statistical measures of public health of the population.

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11. Define the concept of public health and health care.
12. List the main indicators of natural population movement.
13. What is the basis for assessing public health indicators?
14. What does the correlation coefficient determine?
15. What type of risk factor is physical inactivity?
16. Which diagram is used to show the dynamics of a process or phenomenon over time?
17. How is the completeness of population coverage with preventive vaccinations calculated?
18. What is the value called that divides a ranked variation series into two parts equal in number of variants?
19. What is the science of the professional conduct of a medical worker called?
20. At what intervals does the World Health Organization revise the International Statistical Classification of Diseases and Related Health Problems?
21. Explain the concept of socially significant diseases.
22. Define the concept of health.
23. Define the concept of health care.
24. What does medical demography study?
25. Define the concept of expertise in the field of health care.
26. Define the concept of a standard in the field of health care.
27. Define the concept of standardization in the field of health care.
28. Define the concept of the authorized body in the field of health care.
29. Define the term “health care organization”.
30. Define the concept of a drug formulary of a health care organization.
31. What does shared responsibility for health mean?
32. Define the concept of a donor.
33. For what purpose are mobile medical complexes used?
34. Define the concept of occupational disease.
35. Explain what a clinical trial means.
36. Explain what is included in a clinical protocol.
37. Define the concept of the Kazakhstan National Drug Formulary.
38. Define the concept of public health.
39. Explain why and for what purpose research in public health is conducted.
40. Explain what medical and social care means and how it is provided.
41. Define the concept of medical and social rehabilitation.
42. Explain what medical care includes.
43. Define the concept of quality of medical care.
44. Define the concept of medical services.
45. Explain the concept of medical rehabilitation.
46. What does nursing care consist of?
47. Define the concept of a family doctor.
48. What do screening examinations mean?
49. Define the concept of the guaranteed volume of free medical care.
50. Which regulatory document serves as the basis for the legislation of the Republic of Kazakhstan in the field of health care?
51. What are the purpose and objectives of the legislation of the Republic of Kazakhstan in the field of health care?
52. Explain what licensing of medical activity in the Republic of Kazakhstan involves.
53. Explain why a specialist certificate in the field of health care is required.
54. What is the purpose of conducting an expert assessment of the quality of medical services?

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55. For what purpose was mandatory social health insurance introduced in the Republic of Kazakhstan?
56. What does the accreditation procedure for medical organizations in the Republic of Kazakhstan include?
57. Define standardization of medical activity and explain its purpose.
58. List the indicators of the health status of the population.
59. At what levels is it generally accepted to study and analyze statistical data on public health?
60. Name the main characteristics by which population statistics are studied.

EPIDEMIOLOGY

1. Define epidemiology as a science.
2. List the three links of the epidemic process.
3. What is the “cold chain”?
4. Name the main mechanisms of infection transmission.
5. Define the concept of “anthroponosis.”
6. What is the incubation period?
7. List the types of disinfection.
8. What is specific prevention?
9. Define the term “pandemic.”
10. What is the contagiousity index?
- Level 2: Understanding (Explanation of Ideas)
11. Explain the difference between sporadic morbidity and an epidemic.
12. What is the essence of epidemiological surveillance?
13. Describe the role of vectors in the vector-borne mechanism of transmission.
14. Explain the mechanism of action of live and inactivated vaccines.
15. What is the biological essence of parasitism?
16. Explain the significance of herd immunity for a population.
17. What is the difference between ongoing disinfection and terminal disinfection?
18. Describe the structure of the National Immunization Schedule.
19. How do natural factors influence the intensity of the epidemic process?
20. Explain the concept of “infection control” in hospitals.
- Level 3: Application (Use of Knowledge in New Situations)
21. How can the case fatality rate be calculated during a specific outbreak?
22. What measures should be taken when a patient suspected of having cholera is identified?
23. How should an epidemiological investigation be organized in a scarlet fever focus?
24. Describe the tactics of vaccination according to epidemic indications.
25. How can GIS technologies be used in zoonosis monitoring?
26. Apply personal hygiene rules to justify the prevention of intestinal infections.
27. How would you develop a deratization plan in a rural area?
28. What statistical methods would you use to evaluate vaccine effectiveness?
29. How would you prepare an annual report on the dynamics of infectious morbidity?
30. Describe the algorithm of actions in the event of an emergency involving blood exposure and HIV risk.
- Level 4: Analysis (Identifying Relationships)
31. Compare the epidemiological characteristics of waterborne and foodborne outbreaks.
32. Analyze the reasons for the increase in antimicrobial resistance in hospitals.
33. Identify the relationship between migration processes and the spread of tuberculosis.

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34. Analyze the strengths and weaknesses of the healthcare-associated infection registration system in the Republic of Kazakhstan.
35. Compare the study designs of case-control and cohort studies.
36. Identify the risk factors for the development of healthcare-associated infections in an intensive care unit.
37. Analyze the structure of viral hepatitis morbidity depending on the route of transmission.
38. What errors in cold chain management most often lead to the deterioration of medical products?
39. Analyze the impact of climate change on the ranges of natural focal infections.
40. Identify the relationship between vaccination coverage and the cyclicity of measles epidemics.
- Level 5: Synthesis (Creation of New Ideas)
41. Develop a model for infection prevention at a major transport hub.
42. Formulate a hypothesis about the causes of a new emerging infection.
43. Propose a plan for integrating artificial intelligence into the epidemiological surveillance system.
44. Develop a public information leaflet on the prevention of tick-borne encephalitis.
45. Prepare a draft “Clean Hands” program for a multidisciplinary clinic.
46. Propose a strategy to combat the “infodemic” and anti-vaccination attitudes.
47. Design a biosafety system for a microbiological laboratory.
48. Develop a questionnaire to identify risk factors for salmonellosis.
49. Propose an innovative method for collecting morbidity data in hard-to-reach areas.
50. Formulate a concept for training students in digital epidemiology.
- Level 6: Evaluation (Justification of Judgments)
51. Evaluate the effectiveness of the current vaccine prevention system in the Republic of Kazakhstan.
52. Justify the choice of a disinfectant for surface treatment in an operating room.
53. Critically evaluate the role of the WHO in controlling the COVID-19 pandemic.
54. Assess the economic burden of influenza morbidity at the national level.
55. Justify the ethical aspects of compulsory isolation of patients with especially dangerous infections.
56. Evaluate the reliability of official statistics on the registration of healthcare-associated infections.
57. What is your position regarding the use of genetically modified vaccines?
58. Assess the significance of the One Health program for global security.
59. Justify the priority of funding programs aimed at combating HIV/AIDS.
60. Evaluate the prospects for the complete eradication of poliomyelitis worldwide.

NUTRITION

Interview Questions

1. What does the discipline “Nutrition Science” study?
2. What does the body mass index (BMI) indicate?
3. What is the recommended daily protein intake for an adult?
4. Which nutrients are classified as macronutrients in the human diet?
5. Which macronutrient is the main source of energy for the human body?
6. Which food substances are classified as micronutrients?
7. What are the main functions of proteins in the human body?
8. Name the fat-soluble vitamins.
9. What is hidden fat in food products?

10. What is the scientific definition of the glycemic index of food products?
11. Why is excessive sugar consumption considered harmful to human health?
12. What is the physiological role of dietary fiber in the human body?
13. Why is vitamin D an important nutrient for the human body?
14. Why is protein deficiency considered dangerous for the body?
15. What is the biological role of fats in human nutrition?
16. Why is adequate water intake necessary for normal body functioning?
17. Why are elderly people at increased risk of developing malnutrition?
18. What is the role of iron in the human body?
19. Why does excessive salt intake have an adverse effect on health?
20. Explain the relationship between nutrition and the functioning of the immune system.
21. What are the main principles of nutrition in diabetes mellitus?
22. What are the main principles of nutrition in obesity?
23. What foods are recommended for inclusion in the diet for iron-deficiency anaemia?
24. What dietary recommendations are appropriate for constipation?
25. In which food products is hidden fat most commonly found?
26. What dietary changes are necessary in arterial hypertension?
27. How should nutrition be adjusted in vitamin D deficiency?
28. Which foods should be excluded in lactose intolerance?
29. What type of nutrition is recommended for children under 6 months of age?
30. At what age is the introduction of complementary feeding recommended for children?
31. What are the main factors contributing to the development of obesity in the adult population?
32. What are the most common causes of iron deficiency in the body?
33. What consequences can result from long-term adherence to a low-protein diet?
34. What are the most common causes of vitamin D deficiency?
35. Which key factors are considered risk factors for the development of type 2 diabetes mellitus?
36. What disorders can result from systematic excessive fat consumption?
37. What are the main causes of dehydration?
38. What is associated with the increased risk of sarcopenia with age?
39. What metabolic consequences are characteristic of a diet with excessive sugar content?
40. Why can hidden fat lead to excessive calorie intake?
41. Is it beneficial to consume large amounts of sugar every day?
42. Why is it necessary to include vegetables in the daily diet?
43. Is it beneficial to skip meals and disrupt the eating schedule?
44. Can fats be completely excluded from the diet?
45. What are the potential consequences of drinking sugary energy drinks every day?
46. Why is daily water intake necessary?
47. What consequences may frequent consumption of fast food have for the body?
48. What are the consequences of excessive intake of simple sugars for the body?
49. Why is dietary variety important?
50. Why is a regular meal schedule important for health?
51. How do you understand the term ‘superfoods’?
52. Define the term ‘essential fatty acids’
53. What are the consequences of excessive sodium intake for the body?
54. Analyse the role of a protein’s amino acid composition in determining its biological value
55. Explain the role of trans fatty acids in the development of cardiovascular diseases
56. Describe the main sources of ‘hidden fats’ in the human diet
57. Explain the concept of ‘diet-related diseases’ and describe their main types
58. Draw up a general diet plan for an athlete.

59. Explain the concept of the ‘physical activity coefficient (PAC)’ and describe its significance in determining energy requirements
60. Describe current international approaches to the care of infants in their first year of life.

GERONTOLOGY

1. What is the subject of study of gerontology?
2. How is the aging process defined in a scientific context?
3. What is geriatrics as a medical discipline?
4. What is the scientific definition of sarcopenia?
5. What is meant by polymorbidity?
6. What do cognitive impairments include?
7. How is dementia defined in medicine?
8. What is osteoporosis from the point of view of pathophysiology?
9. What does the term “geroprotection” mean?
10. How is the functional independence of an elderly person defined?
11. Why does muscle mass decrease with age?
12. Why does the frequency of falls increase among elderly people?
13. Why does memory deteriorate with age?
14. Why does the risk of fractures increase among elderly people?
15. Why is decreased appetite often observed in elderly people?
16. Why does polymorbidity develop in old age?
17. Why does vision deteriorate with age?
18. Why is physical activity especially important in old age?
19. Why is social activity of great importance for elderly people?
20. Why is rational nutrition especially important in old age?
21. What recommendations are appropriate for elderly people at increased risk of falls?
22. What measures can prevent or slow the development of sarcopenia?
23. What measures are appropriate in case of memory decline in old age?
24. How can bone health be maintained in elderly people?
25. What measures help improve sleep in old age?
26. What is recommended for elderly people who experience loneliness?
27. What measures help reduce the risk of developing dementia?
28. What recommendations are given to elderly people with general weakness?
29. How can dehydration be prevented in old age?
30. What measures should be taken in case of depressive symptoms in elderly people?
31. What are the main causes of frequent falls among elderly people?
32. What factors are considered the main risk factors for developing dementia?
33. Name the main causes of sarcopenia.
34. What causes underlie the development of osteoporosis?
35. What are the main causes of depression in old age?
36. What factors contribute to memory deterioration in old age?
37. What are the causes of reduced mobility among elderly people?
38. What factors increase the risk of dehydration among elderly people?
39. Why does polymorbidity often develop in old age?
40. What factors lead to a deterioration in quality of life in old age?
41. Is physical activity beneficial in old age?
42. Is it necessary to control nutrition in old age?
43. Is social interaction important for elderly people?

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44. Is it necessary to treat chronic diseases in elderly patients in a timely manner?
45. Is maintaining a daily routine beneficial in old age?
46. Is it necessary to monitor body weight in old age?
47. What is the importance of adequate sleep for elderly people?
48. Is it necessary to drink water regularly in old age?
49. Why is it important to maintain daily physical activity?
50. Are preventive medical examinations necessary in old age?
51. Propose a fall prevention program for elderly people.
52. Prepare recommendations for ensuring active longevity.
53. Develop a sarcopenia prevention plan.
54. Propose a program to support and preserve memory in old age.
55. Develop an action plan to improve the quality of life of elderly people.
56. Prepare an osteoporosis prevention program.
57. Propose a program for the prevention and correction of depressive conditions in elderly people.
58. Prepare a general care plan strategy for an elderly patient.
59. Develop a healthy aging program.
60. Propose geroprotective measures.

BIOLOGICAL SAFETY

1. Define the concept of “biological safety.”
2. What is “biological risk”?
3. List the main pathogenicity groups of microorganisms according to the WHO classification.
4. Name the biosafety levels of laboratories: BSL-1–BSL-4.
5. What are “biosafety” and “biosecurity”?
6. List the main components of personal protective equipment (PPE) used in a laboratory.
7. What are pathogenicity and virulence?
8. Which international conventions regulate issues related to biological weapons?
9. What are “zoonotic infections”?
10. Name the main methods of sterilization and disinfection.
11. Explain the difference between an infectious agent and a toxic agent.
12. What is the principle of “dual use” in biological research?
13. Describe the mechanism of transmission of vector-borne infections.
14. Explain the importance of the “cold chain” system for storing biological agents.
15. What is the role of the regulatory and legal framework of the Republic of Kazakhstan in ensuring biological safety?
16. Explain the concepts of “vertical” and “horizontal” gene transfer.
17. Describe the structure and functions of biological filters, including HEPA filters.
18. What are the specific features of working in Class II biological safety cabinets?
19. Explain the importance of deratization and disinsection for the control of natural foci of infection.
20. Describe the principle of zoning laboratory premises into “clean” and “contaminated” zones.
21. How should biological risk assessment be conducted when working with an unknown strain?
22. Describe the algorithm of actions in the event of an accidental spill of biological material.
23. How should a disinfectant be selected for a specific group of pathogens?
24. Propose a scheme for the disposal of Class B and Class C medical waste.
25. How should the safe transportation of pathogenic biological agents be organized?
26. Describe the procedure for putting on and taking off an anti-plague suit.

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27. How can the effectiveness of an autoclave be checked under laboratory conditions?
28. What rapid diagnostic methods can be used when an outbreak of especially dangerous infections is suspected?
29. How can the required concentration of a working antiseptic solution be calculated?
30. Prepare a checklist for assessing the readiness of a laboratory to work with microorganisms of pathogenicity group II.
31. Analyze the relationship between global warming and the expansion of the ranges of dangerous infections.
32. Identify the main risk factors for the leakage of pathogenic biological agents from research centers.
33. Compare the requirements for BSL-2 and BSL-3 laboratories.
34. Analyze the impact of synthetic biology development on biosafety threats.
35. Identify the causes of antimicrobial resistance in the natural environment.
36. Compare the effectiveness of different methods for decontaminating laboratory wastewater.
37. Analyze the structure of the national response plan for biological threats.
38. Identify the weaknesses of modern systems for monitoring zoonotic infections.
39. Analyze the role of wild migratory birds in the spread of avian influenza.
40. Compare approaches to ensuring biosafety in medicine and veterinary practice.
41. Develop a project for an internal biosafety control system at a university.
42. Propose a model for predicting the spread of infection in a metropolitan area.
43. Formulate an action plan for eliminating an anthrax focus.
44. Develop a training program for personnel on biosafety rules.
45. Propose an innovative method for controlling access to pathogen collections.
46. Design an algorithm for interaction between veterinary and medical services within the One Health approach.
47. Develop a strategy for informing the population in the event of a bioterrorism threat.
48. Propose a system of indicators for assessing the biological security of a region.
49. Formulate a concept for implementing digital technologies into the epidemiological surveillance system.
50. Create a scheme for a multi-level protective barrier system for a mobile laboratory.
51. Assess the adequacy of existing control measures for GMOs in food products.
52. Justify the choice between a centralized and decentralized epidemiological surveillance system.
53. Assess the risks associated with publishing genomic data on dangerous viruses.
54. Critically analyze the readiness of the healthcare system for a new “Disease X” pandemic.
55. Justify the ethical aspects of conducting gain-of-function research.
56. Assess the socio-economic consequences of introducing quarantine restrictions.
57. What is your position on the use of bacteriophages instead of antibiotics?
58. Assess the effectiveness of international cooperation in the field of biosafety and biosecurity.
59. Justify the priority of investments in protection against natural or intentional biological threats.
60. Evaluate the viability of the One Health concept under conditions of globalization.

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PHARMACY

Pharmaceutical Chemistry

1. Steroid Compounds (Gestagens, Androgens, Anabolic Steroids, Estrogens): Classification and general physicochemical properties. Methods of identification (including color reactions specific to the steroid nucleus) and quantitative determination (spectrophotometry, chromatography).

2. Esters of p-Aminobenzoic Acid (Local Anesthetics): Chemical structure and its influence on anesthetic activity. General and specific identification methods, azo dye formation reaction, and nitritometric analysis method.

3. Derivatives of Phenylalkylamines and Oxyphenylalkylamines (Catecholamines and Their Analogues): Acid-base and redox properties. Tests for the absence of oxo compounds, stability issues in solutions, and approaches to their stabilization (use of stabilizers and antioxidants).

4. Sulfonamides: History of development and classification based on pharmacokinetics. Selection of chemical and physicochemical methods (bromatometry, nitritometry, UV spectrophotometry) for quality control.

5. Derivatives of Pyrazolone and Pyrazolidinedione: Their importance in the development of anti-inflammatory and analgesic drugs. Methods of synthesis and general reactions (formation of colored complexes with heavy metal salts).

6. Derivatives of Pyridine-3-carboxylic Acid, Isonicotinic Acid, and Pyridinemethanol: Properties, methods of synthesis, and quantitative determination (acid-base titration in non-aqueous media, complexometric titration, refractometry).

7. Derivatives of Benzylisoquinoline and Phenanthreneisoquinoline (Morphinans): Relationship between chemical structure and pharmacological activity (structural fragments responsible for analgesic effects). Quality requirements, specific storage conditions (List A / controlled narcotic substances), and dispensing regulations.

8. Derivatives of Barbituric Acid (Pyrimidine-2,4,6-trione): Acidic properties and salt formation. Methods of synthesis and differential analysis of acidic and salt forms (argentometric titration, non-aqueous titration).

9. Purine Derivatives (Xanthines): Amphoteric properties. General analytical methods based on salt formation with heavy metals, the murexide test, and quantitative determination (alkalimetry in alcoholic media).

10. Derivatives of 1,4-Benzodiazepine: Influence of substituents (halogen atoms, phenyl group) on pharmacological activity (tranquilizing and anticonvulsant effects). Synthesis scheme, identification tests (including hydrolysis), and quantitative determination.

Pharmaceutical Management and Economics

1. Basic principles of the State drug policy

2. Regulatory and legal requirements for licensing pharmaceutical activities and the procedure for obtaining a license.

3. Key regulatory legal acts and orders governing the functioning of pharmaceutical organizations and controlling the quality, safety, and circulation of medicinal products.

4. Specific features of pharmaceutical economics compared to general economics and their impact on price formation and the accessibility of medicinal products in the pharmaceutical market.

5. Factors influencing the pricing of medicinal products (cost price, markup, government regulation, marketing expenses).

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6. Gross income of a pharmacy organization, factors influencing its amount, and its planning.

7. Describe the planning of labor indicators and the payroll fund in pharmaceutical organizations.

8. Describe the organizational management processes in wholesale and retail pharmaceutical organizations and their specific features.

9. The main functions of management (planning, organizing, motivation) and their implementation in pharmaceutical practice.

10. The use of marketing strategies in pharmaceutical organizations (pricing strategies, assortment strategy, promotion strategies (advertising, PR), branding).

Pharmaceutical Technology

1. How do milling and mixing processes affect dose uniformity in complex powders, and which technological parameters must be controlled to prevent segregation of the mixture?

2. Compare technological approaches to the production of granules and dragees: which factors determine the choice of method, and how do they influence drug release?

3. In which cases is it preferable to use triturated tablets instead of compressed ones, and how do technological features affect their quality and stability?

4. What methods are used to determine and adjust ethanol concentration in medicinal solutions, and how do deviations in concentration affect the stability of the product?

5. How does the choice of solvent and extraction method influence the composition and pharmacological activity of the obtained extracts?

6. What are the main stages of standardization of biologically derived medicinal products that ensure their safety and reproducibility of action?

7. What advantages does microencapsulation of drugs offer compared to conventional dosage forms, and what technological challenges arise in its implementation?

8. How does the choice of base for ointments and suppositories affect drug bioavailability, and which methods are used for quality evaluation?

9. What are the key GMP requirements for the production of sterile injectable products, and how does cleanroom classification influence process organization?

10. What anatomical features of the eye must be considered in the development of ophthalmic preparations, and how do modern therapeutic systems improve their effectiveness?

CLINICAL PSYCHOLOGY

These questions take into account the requirements of the master’s research project, the difficulties of transitioning to a new professional field, and the specific nature of working in the healthcare system. They aim to assess the applicant’s motivation, research maturity, and self-organization skills.

Assessment of Prior Experience, Career Orientation, and Maturity of Professional Motivation

1. Why have you decided to apply specifically to a specialized master’s program in Clinical Psychology rather than limit yourself to practical work or short-term training courses?

2. What exactly do you see as your long-term professional goal in the work of a clinical psychologist within the healthcare system?

3. How will this master’s program affect your current professional trajectory?

Research Competencies and Readiness for Academic Work

4. Describe your previous most challenging research experience (e.g., term paper, thesis,

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applied project). Which stages of data work caused you the greatest difficulty? How do you intend to cope with the requirements of the master’s research project, including statistical analysis and reporting results according to evidence-based medicine standards?

Time Management, Resilience, and Adaptability

5. Studying in our master’s program combines intensive classroom work, clinical practice, and conducting your own research. Many students experience stress due to this shift in activity. How do you plan to balance academic studies, research work, professional activity, and personal life during the master’s program?

Assessment of Academic Maturity and Frustration Tolerance

6. A research project requires consistency, discipline, and the ability to handle criticism. How do you usually respond to feedback or negative comments?

7. Tell us about a past situation where your plan “fell apart” and you had to change your approach to solving a problem. How did you act, and what would you do differently now?

Motivation to Fill Gaps in Clinical Training

8. Name two specific topics in clinical psychology (e.g., pathopsychological syndromology, basics of psychosomatics) where you feel least competent, and describe your strategy for filling these gaps by the end of the first semester so that they do not interfere with your research project.

9. What research topics in clinical psychology or mental health do you consider most relevant today for society and the healthcare system?

Checking Realism of Expectations and Level of Self-Reflection

10. Name one quality that, based on your experience, makes you resilient to setbacks in learning (for example, does perfectionism help or hinder you?). Also name another quality that you want to develop specifically while working on your master’s thesis in order to become an effective clinical psychologist and researcher. Why did you choose these particular qualities?

NURSING

1. Why do you want to study for a master’s degree, and what scientific or practical problem do you want to investigate?

2. What research question in your professional field do you consider most important today?

3. How do you understand the relationship between scientific research and the improvement of healthcare quality?

4. What role, in your opinion, should a Master of Medicine or Nursing play in the development of clinical practice?

5. How do you respond to professional criticism and feedback?

6. Describe how a systematic review is conducted in scientific research.

7. What is a cohort study and how does it differ from a clinical study?

8. What problem in the organization of nursing care do you consider underestimated?

9. How do qualitative and quantitative research methods differ, and how can they be applied in medicine?

10. How can the quality of a scientific article be assessed?

11. Do you have experience participating in scientific publications? If yes, please describe it.

12. What is the role of statistics in scientific research?

13. How do you assess the reliability of scientific data presented in publications?

14. What are the main principles of ethics in medical scientific research?

15. How do you assess the role of a nurse as a leader in a healthcare team?

16. How do you feel about the introduction of new technologies (digitalization, AI) into nursing practice?

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17. In your opinion, what is the difference between a Bachelor and a Master of Nursing in terms of competencies?
18. What does “patient-centered care” mean to you?
19. What is evidence-based medicine, and how does it influence medical practice?
20. What levels of evidence exist in evidence-based medicine?
21. Which information sources are most reliable for supporting medical recommendations?
22. What are the main principles and methods of critical appraisal of scientific data in evidence-based medicine?
23. What are clinical guidelines, and how can nurses use them in practice?
24. What professional goals do you set for yourself after completing your master’s degree?
25. How do you understand the process of implementing scientific evidence into clinical practice, and what barriers may arise in this process?

BIOLOGY

1. Biological macromolecules: proteins. Classification of proteins. Features of the spatial organization of proteins. Functions and properties of proteins.
2. Nucleic acids. Features of the spatial organization of DNA. Structural features of mitochondrial DNA.
3. Nucleic acids. Types of RNA in the cell. Functions of RNA types. Structure of RNA nucleotides.
4. Viruses as pre-cellular life forms. Features of the genetic apparatus of viruses. RNA and DNA viruses. Bacteriophages.
5. The cell as the most important structural and functional unit of life. Cell theory. Structural features of prokaryotic and eukaryotic cells.
6. Molecular structure of the cell membrane. Membrane lipids and proteins. Functions and properties of the cell membrane.
7. Transport of low-molecular-weight substances across the membrane: active and passive transport.
8. Transport of high-molecular-weight substances across the membrane: endocytosis and exocytosis. Types. Concept of vesicular transport.
9. DNA replication. Formation of the replication complex. Stages of replication. Features of leading and lagging strand synthesis.
10. Features of telomeric DNA replication. The role of telomeres and telomerase in DNA replication. Functions of telomeres.
11. Fundamentals of genetic engineering. Genetic engineering technologies. Main stages and methods. Cloning of organisms.
12. The genetic apparatus of the cell. Chromosomes. Morphological classification of chromosomes. Karyotype. Euchromatin and heterochromatin.
13. Molecular genetic research methods: DNA isolation, PCR, amplification, electrophoresis, sequencing.
14. Bioinformatics. Goals and objectives of bioinformatics. Electronic databases and biomedical websites.
15. Protein biosynthesis. Stages and characteristics of transcription and translation. Features in prokaryotes and eukaryotes. Post-transcriptional modification of mRNA. Genetic code: concept and properties.
16. Mutation. Classification of mutations. Mutagenesis and mutagenic factors. Classification of mutagenic factors.

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17. Cell proliferation. Cell cycle. Phases of the cell cycle. Mitosis. Cytogenetic characteristics of mitosis.
18. Concept of the gene. Structural organization of prokaryotic genes. Structural organization of eukaryotic genes. Classification of genes.
19. Concept of the genome. Prokaryotic and eukaryotic genomes. Organization of the human genome.
20. Molecular mechanisms of gene expression in prokaryotes. Operon theory. Functioning of operons regulated by induction and repression mechanisms.
21. Functional regions of DNA in eukaryotes. Cluster genes. Regulation of gene expression in eukaryotes.
22. General characteristics of intercellular signaling substances. Signaling molecules. Hormones. Neurotransmitters. Histohormones.
23. Regulation of the cell cycle. The role of cyclins and cyclin-dependent kinases in cell cycle regulation. Concept of the mitosis-promoting factor (MPF). Checkpoints.
24. General concept of apoptosis. Morphological characteristics of apoptosis. Intrinsic apoptosis. Extrinsic apoptosis. Apoptotic machinery. Caspases. Endonucleases.
25. Antimutational barriers of the cell. DNA repair. Types of DNA repair.
26. Types of inheritance of traits. Nuclear inheritance. Cytoplasmic inheritance.
27. Chromosomal theory of inheritance. T. Morgan. Patterns of linked inheritance.
28. Gene interactions. Allelic and non-allelic gene interactions and their types.
29. Fundamentals of population genetics. Human populations. Demographic indicators. Genetic indicators. Hardy–Weinberg law.
30. Ecogenetics. Induced mutational process. Epigenetics. DNA methylation. Histone modification. Mechanisms.

Grading Scale

MASTER’S DEGREE (100 points)

Criterion 1. Academic Language (0–25 points)

Level	Points	Description
High	20–25	Professional speech, precise terminology
Good	15–19	Minor inaccuracies allowed
Medium	8–14	Simplified speech
Low	0–7	Difficulty in expression

Criterion 2. Professional Knowledge (0–35 points)

Level	Points	Description
High	30–35	In-depth knowledge, analytical ability
Good	22–29	Confident knowledge
Medium	15–21	Superficial knowledge
Low	0–14	Insufficient preparation

Criterion 3. Research Potential (0–20 points)

Level	Points	Description
High	16–20	Analytical thinking, interest in science
Good	10–15	Limited analytical skills
Medium	5–9	Weak skills
Low	0–4	No understanding of research

Criterion 4. Motivation (0–20 points)

Level	Points	Description
High	16–20	Clear goals, well-reasoned choice
Good	10–15	General understanding
Medium	5–9	Weak justification
Low	0–4	No understanding of choice

Final Result:

85–100 — Recommended

65–84 — Conditionally Recommended

Below 65 — Not Recommended

Procedure for Determining the Final Score

Each member of the committee assigns scores for all criteria.

The final score is calculated as the arithmetic mean.

The results are documented in a protocol.

Final decision: recommend for admission; do not recommend for admission.

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Full name of the applicant _____

IIN _____

APPEAL APPLICATION

I request a review of the interview results assigned to me,
as _____

_____ (indicate the reason for submitting the appeal — incorrectness of the task, etc.).

Date of announcement of results _____

/_____/_____/_____/

Signature Full name Date

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LETTER OF INVITATION

NCJSC “Astana Medical University” hereby confirms that _____ (Full Name), Passport No. _____, Date of Birth _____, has been admitted to the University in the specialty/program “_____” for the _____ academic year. The duration of study is _____ years.

The tuition fee for the _____ academic year amounts to _____. The amount of tuition fees may be revised by the University due to changes in the cost of education no more than once per year, as well as in accordance with the inflation rate determined by the authorized state body of the Republic of Kazakhstan. Any change in the tuition fee shall be formalized by an additional agreement to this Contract.

Payment for the first year of study shall be made by the Student or the Guarantor in a lump sum (100%) prior to the beginning of the first semester of the current academic year. Tuition fees may be transferred directly to the University account indicated below:

NCJSC “Astana Medical University”
 33 Saryarka Avenue, Nur-Sultan, Republic of Kazakhstan
 Halyk Bank, Nur-Sultan, Kazakhstan
 Account No.: KZ986010111000160561 (USD)
 BIN: 080940008218
 BIC: HSBKKZKX

Payment for tuition at NCJSC “Astana Medical University” shall be converted in accordance with the official exchange rate of the National Bank of the Republic of Kazakhstan (USD/KZT) applicable on the date/year of payment.

Vice-Rector

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To the Chairman of the Management Board – Rector
of NCJSC “Astana Medical University”

Surname _____

First Name _____

Patronymic _____

Residential Address: _____

Home Phone: 8 () _____

Mobile Phone: 8 () _____

APPLICATION

I kindly request that I be admitted to NCJSC “Astana Medical University” to the educational program _____ on a tuition-fee basis.

Language of instruction: _____

Information about parents (legal representative):

Father’s (Legal Representative’s) Full Name _____

Place of Employment _____

Position _____

Residential Address _____

Contact Phone Number _____

Mother’s Full Name _____

Place of Employment _____

Position _____

Residential Address _____

Contact Phone Number _____

“ ___ ” _____ 20___ Signature _____