

SUMY STATE UNIVERSITY

APPROVE

Head of organizational methodological
management

_____ Volodymyr Yuskaev

_____ 2023

EXAMINATION TASK

Unified State Qualification Exam: Stage 2

(the Objective Structured Clinical Exam)

State certification at the education qualification level «Magister»

in the specialty 222 «Medicine»

Discipline «**Hygiene. Social medicine, health care organization and economics**»

Variant № 1

Station 5 «**Hygiene**»

As a result of examination of conditions of inpatients in wards on 4 beds of department of pulmonary pathology following results were obtained. The total floor area of the chambers is 30 m², the height of the chamber is 3.3 m. The windows of the chambers face the north-east. LR (light ratio) = 1/6, NLR (natural light ratio) - 0.8%. 60 watt incandescent bulbs are used for artificial lighting.

Distance from floor, m	Points of temperature examination, °C		
	Near out wall	In center of ward	Near inner wall
0,1	16	17	19
0,8	17	18	19
1,5	17	19	20

1. Assess the conditions of stay of inpatients in the ward and determine the nature of the microclimate and what mechanisms of physical thermoregulation in this case will support homeostasis?
2. What type of insolation regimen will be in ward and how does it correspond to the nature of the disease?
3. Assess the condition of the hospital environment. Determine the required multiplicity of air moving in the ward.
4. Evaluate the effectiveness of the UV-remediation of the air in the manipulation area of 15 sq.m. and 3.3 m high when using a bactericidal bulb BUV-30 in presence of patients.
5. What are the risks of adverse effects associated with exposure to UV rays if the operating conditions are not observed?

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Variant № 2

Station 5 «**Hygiene**»

During medical examination of physical and biological development of 12-year-old girl following results revealed: height - 145 cm, weight - 35 kg, chest circumference 65.5 cm, skin warm, moist. Heart tones are rhythmic, loud; Heart rate - 110 beats per minute. Blood pressure - 130/50 mm Hg

1. Assess physical development of girl with method of sigma deviation of body length

Indexes of physical develop.	Girl of 12 y.o	standard		Difference between current and standard indexes	Index of sigma deviance	Assess of develop.l evel
		<i>M</i>	σ			
Body length, cm		149	6,8			

2. Assess physical development of girl with method of sigma deviation of body weight

Indexes of physical develop.	Girl of 12 y.o	standard		Difference between current and standard indexes	Index of sigma deviance	Assess of develop .level
		<i>M</i>	σ			
Body mass, kg		40,4	7,08			

3. Assess physical development of girl with method of sigma deviation of chest circumference

Indexes of physical develop.	Girl of 12 y.o	standard		Difference between current and standard indexes	Index of sigma deviance	Assess of develop.l evel
		<i>M</i>	σ			

Chest circumference, cm		69,8	5,02			
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4. Give a general assessment of the degree of girl physical development.
5. Determine the harmonious development of the girl.

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Variant № 3

Station 5 «**Hygiene**»

A 10-year-old girl who lived in a mountain area for a long time (Transcarpathia), and now moved with her parents to the central part of Ukraine, was sent to a pediatrician due to difficulties in concentrating attention and reducing school performance ability. According to the record of the pediatrician, the girl has lost weight since her previous visit 6 months earlier (about 2.5 kg). On examination, it is determined that the girl has physical development below average. Heart tones are rhythmic, loud: heart rate - 110 beats per minute, blood pressure - 130/50 mm Hg The thyroid gland is noticeable on examination, deforming the anterior surface of the neck. The girl constantly feels weak, has low physical endurance, discomfort in the heart, frequent headache.

1. Make the most likely diagnosis
2. Name the possible main causes of the disease
3. What is an endemic disease
4. Select the most appropriate preventative remedy from the list below
5. What should be the diet to prevent the development of this disease

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Variant № 4

Station 5 «**Hygiene**»

Potatoes and carrots are temporarily absent in food warehouse of the military garrison. The daily norm portion of vegetables for lunch: borsch (70 g cabbage, onion 20 g, beet 30 g), sauerkraut salad (100 g) with onions (50 g). The first dish is served immediately after cooking. Additionally, each soldier receives a multivitamin medicine containing 25 mg of ascorbic acid. Vitamin C content per 100 g: cabbage 36.6 mg; onions 5 mg; beet 8mg; sauerkraut 14.7 mg.

1. Calculate the vitamin C content in the diet of the serviceman, taking into account the loss of the vitamin in the cooking process and during time of dispensing ready-made food after its preparation.
2. Determine the amount of ascorbic acid that needs to be added to the daily diet, taking into account the requirement of vitamin C.
3. Calculate what amount of rose tincture with ascorbic acid content of 110 mg% should be given daily to soldiers to cover the daily deficit of vitamin C.
4. Specify the factors of life of military personnel that affect the need for vitamins.
5. List the symptoms arising from ascorbic acid deficit.

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Variant № 5

Station 5 «**Hygiene**»

When conducting sanitary examination, the occupational health doctor, examining the results of laboratory studies, found that the content of formaldehyde in the air of the thermoplastic casting area exceeds the MPC by 15 times (MPC 0.5 mg / m³), carbohydrates (5 times) at MPC 300 mg / m³).

1. What classes of toxicity do these chemical compounds belong to?
2. What diseases can workers have under these conditions?
3. What should the occupational health doctor do in this situation?
4. What documents are drawn up in such cases?
5. What preventive measures should be taken?

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Variant № 6

Station 5 «**Hygiene**»

In the kindergarden for lunch as a collation, eggplant paste was served; before serving it was not thermally treated. In 7 hours, two children had vomiting, abdominal pain, weakness, difficult swallowing, uneven expansion of the pupils. Later, symptoms such as lowering of the eyelid, hoarseness, crowding appeared. Body temperature remained normal, with tachycardia. The children were hospitalized in the neurological ward with diagnoses of bulbar poliomyelitis and diphtheria polyneuritis. Despite the treatment, both children died within a day. For another five children with similar complaints, which became apparent after 12-48 hours, a medical commission was organized, which included infectious disease doctor, neurologist and pediatrician. The commission diagnosed food poisoning of a microbial nature. It was found that all sick children received eggplant paste from one can during lunch. As a result of the treatment, the last five children were rescued.

1. Analyze the described case of food poisoning using history and clinic data. Justify the diagnosis.
2. Specify any additional laboratory tests that are necessary to clarify the diagnosis.
3. What products are forbidden to be used in childcare facilities without heat treatment?
4. What should be the immediate assistance to the suffered children
5. Suggest specific measures to prevent poisoning of this etiology.

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Variant № 7

Station 5 «**Hygiene**»

In the aseptic assistant room - the amount of air entering for 1 hour equals 120 m³. The amount of air removed from the room in 1 hour is 80 m³. The volume of the room is 40 m³.

1. Determine the multiplicity of air exchange by the inflow of air.
2. Compare the results of air exchange on the inflow of air with the normative values.
3. Determine the multiplicity of air exchange by air extraction.
4. Compare the results of air exchange on the exhaust air with the normative values.
5. Give recommendations for improving ventilation.

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Variant № 8

Station 5 «**Hygiene**»

There is artificial exhaust ventilation in the pharmacy hall volume of 15 m² and 3.5 m in height. The room air is removed through a 20 cm x 30 cm rectangular ventilation with a velocity of 0.6 m / s.

1. Give a general hygienic assessment of the ventilation systems
2. Determine the amount of air that is removed from the room per hour according to the condition of the assignment.
3. Determine the real multiplicity of the air exchange.
4. Compare the actual multiplicity of air exchange with the required in accordance with hygienic standards.
5. Provide recommendations for improving room ventilation.

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Variant № 9

Station 5 «**Hygiene**»

The following foodstuffs were delivered to the Summer Camp for 350 children up to August 20, 2019:

- milk packaged in plastic bags of 0.5 liters. The packaging shows "best before 08/20/19" On examination found that the milk is white with a yellowish tinge of uniform consistency;
- fresh-frozen fish (hake) in the form of briquettes packed in cardboard boxes, which have no external defects and damage;
- chicken eggs packed in cardboard boxes and packed in layers in corrugated form. On the boxes there is a date of hatching of eggs "05.08.19";
- beef meat in the form of frozen carcass without mark. On external inspection, the meat is red, the fat is yellow with no foreign odor

1. Make a sanitary examination of the products you have received.
2. What helminthoses can be transmitted through fish?
3. Name infectious diseases, the source of which may be meat.
4. What food poisonings can most often occur when eating meat products and eggs?
5. List the main preventative measures to prevent food poisoning in the camp.

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Variant № 10

Station 5 «**Hygiene**»

When sowing air from operating room, with aspiration-sedimentation method by Krotov on Petri dish with meat-peptone agar, a day later, 98 colonies of microbial bodies grew in the thermostat. After the sanitization of the air by 4 UV lamps BUV-30 for 6 hours, secondary sowing was done. Sowing conditions in both cases are identical - aspiration rate and 10 l / min for 5 min. After re-sowing 6 colonies grew. Assess the cleanliness of the operating room air before and after redevelopment.

1. How a microbial number is determined
2. How is the degree of effectiveness of the bactericidal action of ultraviolet radiation determined?
3. Determine the microbial number in the air sampling tests
4. Determine the microbial number in the air samples after the remediation
5. Evaluate the effectiveness of the remediation by the degree and the coefficient of efficiency.

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Variant № 11

Station 5 «**Hygiene**»

Determination of the volume of ventilation air is carried out according to carbon dioxide amount. Calculate the required volume of ventilation for one adult, if concentration of CO₂ in the air in the hospital ward should not exceed 1 l / m³ (0.1%).

1. The purpose of ventilation.
2. In which case the method of determining the volume of ventilation air by carbon dioxide is used?
3. The purpose of the method of determining the volume of ventilation air by carbon dioxide.
4. Provide an algorithm for solving the problem.
5. Calculate the required ventilation volume for this task.

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Variant № 12

Station 5 «**Hygiene**»

Determine the illumination level by "WATT" method: The area of the study room is 40 m², illuminated with 4 incandescent lamps 100 W each, voltage is 220 V. Is the illumination in the study room sufficient?

1. Indicate the algorithm for calculating the illumination level determined by "WATT" method.
2. What determines the magnitude of the specific light output?
3. Calculate the illumination by "WATT" method.
4. Is there enough light for the study room?
5. What are the suggestions for this illumination of the study room?

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Variant № 13

Station 5 «**Hygiene**»

Give hygienic assessment of natural light in the class, which is 7.2 m long, 6.4 m wide. The room has three windows with a window opening size of 2 x 1.5 m. The distance from the top eaves of the window to the floor is 2.8 m. The outdoor illumination in front of the school is 4000 lx. Indoor illumination (in the exam room), determine with a light meter.

1. Explain the method of determining the illumination with a light meter.
2. Calculate the coefficient of natural light (CNL).
3. Determine the light factor (LF).
4. Determine the immersion factor.
5. Give an overall assessment of the natural light of the room.

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Variant № 14

Station 5 «**Hygiene**»

Conclude the suitability of the canned meat for consuming as part of the soldier's dry ration. In the study of canned food there were following results: canned food is covered with a protective oil, after which the rust spots are found, after which shell-form spots (traces of corrosion with a rough surface) are left with a dry cloth. The tightness of the cans is not changed. There is a swelling of the can, when pressed it is easily bent inside, and there are dents with blunt edges. On the lid of the jar there is a marking: 18, 11 19 502 1 M 192 After opening the jar, the contents were placed on the plate. The inner surface of the jars is covered with dark brown spots and stripes (marbling), with no yellow color. Look, color, smell, contents of jars correspond to the product, taste, acidity within normal limits.

1. Assess the suitability for consuming of canned meat.
2. Describe the types of can swelling. What kind of swelling is described in this task? Can the deformation of the banks described in the problem be the cause of the rejection?
3. How can canned foods be treated if they have "false swelling" and rust?
4. What is meant by the presence of "marbling" and the absence of yellow color?
5. What is the hygienic conclusion for aforementioned canned food?

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Variant № 15

Station 5 «**Hygiene**»

On inspection of conditions of patients' staying in the hospital the following has been established: the area of a single-bed ward is 6 m², an average air temperature — 18° C, humidity — 60 %, speed of air movement — 0,18 m/sec.

1. Give a hygienic assessment of the microclimate in the ward.
2. Specify the relative humidity of the hospital ward in accordance with hygiene requirements.
3. List the main types of microclimate.
4. What device is used to measure humidity.
5. Which device measures the speed of air movement in the room.

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