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| 1 | Учебное заведение | ФГБОУ ВО АстГМУ  |
| 2 | Специальность | Лечебное дело. Фармация. |
| 3 | Дисциплина | Нормальная физиология |
| 4 | Автор заданий | В.Р.Горст |
| 5 | Телефон |  |
| 6 | Электронная почта |  |
| 7 | СНИЛС |  |

Таблица 2.Перечень заданий по дисциплине

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| **Вид** | **Код** | **Текст названия трудовой функции/ вопроса задания/ вариантов ответа** |
| Ф |  | Physiology of the respiratory system |
|  |  |  |
| В | 001 | What are the main stages of breathing. |
| О |  | oxygen uptake and carbon dioxide emission |
| О |  | inhale and exhale |
| О |  | external respiration, blood gas transport, internal respiration |
| О |  | air movement through the nasal passages, larynx, trachea, bronchi |
|  |  |  |
| В | 002 | What types of external respiration are there in humans? |
| О |  | superficial, normal, deep |
| О |  | normopnea, tachypnea, bradypnea |
| О |  | hyperventilation, hypoventilation |
| О |  | abdominal, thoracic, mixed |
|  |  |  |
| В | 003 | What type of breathing prevails in newborns? |
| О |  | mixed |
| О |  | costal |
| О |  | chest |
| О |  | abdominal |
|  |  |  |
| В | 004 | What type of breathing prevails in old people? |
| О |  | mixed |
| О |  | costal |
| О |  | chest |
| О |  | abdominal |
|  |  |  |
| В | 005 | What stages of respiration are external respiration? |
| О |  | tissue oxygen utilization |
| О |  | gas diffusion across the cell membrane |
| О |  | blood gas transport |
| О |  | alveolar ventilation, diffusion of gases through the alveolar wall |
|  |  |  |
| В | 006 | What factor provides ventilation of the alveoli? |
| О |  | pressure difference between alveolar and atmospheric air |
| О |  | contraction of inspiratory and expiratory muscles |
| О |  | change in transpulmonary pressure |
| О |  | change in pressure in the pleural fissure |
|  |  |  |
| В | 007 | What is the significance of the breathing process for the body? |
| О |  | lactic acid excretion |
| О |  | delivery of oxygen and carbon dioxide to organs and tissues |
| О |  | creating the optimal ratio of gases in the alveolar space |
| О |  | adaptation to the gaseous environment of the outer space |
|  |  |  |
| В | 008 | What is transpulmonary pressure? |
| О |  | pressure difference between the alveolar space and the pleural cavity |
| О |  | pressure difference between alveolar space and blood pressure |
| О |  | difference between intrapleural and atmospheric pressure |
| О |  | difference between alveolar air pressure and atmospheric pressure |
|  |  |  |
| В | 009 | How does intrapleural pressure change during inspiration? |
| О |  | rises but remains negative |
| О |  | rises and becomes positive |
| О |  | does not change |
| О |  | becomes even more negative |
|  |  |  |
| В | 010 | What is the name of the device that determines the amount of pulmonary volume? |
| О |  | spirometer |
| О |  | pneumotachometer |
| О |  | pneumograph |
| О |  | apparatus holden |
|  |  |  |
| В | 011 | What is the tidal volume? |
| О |  | 6 - 8 liters |
| О |  | 500 ml |
| О |  | 200 ml |
| О |  | 1,5 liters |
|  |  |  |
| В | 012 | How to determine the vital capacity of the lungs? |
| О |  | to take the maximum breath out of a spirometer |
| О |  | to take a maximum breath and then exhale completely into the spirometer |
| О |  | to take a litle breath and then calmly exhale into the spirometer |
| О |  | after a calm exhalation, to make a full exhalation into the spirometer |
|  |  |  |
| В | 013 | What is a "minute breathing volume"? |
| О |  | the amount of oxygen that passed through the alveolar wall in 1 minute |
| О |  | the amount of air that passed through the alveolar wall in 1 minute |
| О |  | the amount of air entering the lungs in 1 minute |
| О |  | the amount of air entering the alveoli in 1 minute |
|  |  |  |
| В | 014 | What is the minute volume of breathing at rest? |
| О |  | 80-100 liters |
| О |  | 8 - 10 liters |
| О |  | 500 ml |
| О |  | 2.5 - 3 liters |
|  |  |  |
| В | 015 | What is pneumothorax? |
| О |  | strong breath |
| О |  | condition that occurs after maximum exhalation |
| О |  | chest type of breathing |
| О |  | air in the pleural cavity |
|  |  |  |
| В | 016 | What factors determine the diffusion capacity of the lungs? |
| О |  | tissue metabolic rate |
| О |  | thickness of the alveolar wall, the difference between the partial pressure in the alveolar air and the voltage of the gases in the blood |
| О |  | the magnitude of the main pulmonary volumes and capacities, the parameters of the dynamic indicators of external respiration |
| О |  | depth and frequency of respiration |
|  |  |  |
| В | 017 | What is the thickness of the alveolar wall? |
| О |  | 4-6 nm |
| О |  | 1-2 microns |
| О |  | 0.5 mm |
| О |  | 30-50 microns |
|  |  |  |
| В | 018 | What is the area of the alveoli?  |
| О |  | 50-100 m2 |
| О |  | 100 cm2 |
| О |  | 10 m2 |
| О |  | 1,5 m2 |
|  |  |  |
| В | 019 | What is the main function of the surfactant? |
| О |  | reduces surface tension |
| О |  | increases surface tension coefficient |
| О |  | has an antitoxin effect |
| О |  | has a bactericidal effect |
|  |  |  |
| В | 020 | What does Fick's law of diffusion mean? |
| О |  | the ratio of ventilation and blood supply to the lungs |
| О |  | the ratio of absorbed oxygen and carbon dioxide |
| О |  | the degree of ventilation of the alveoli |
| О |  | the amount of gas passing through the alveolar wall per minute |
|  |  |  |
| В | 021 | What gas characteristic affects the Krog diffusion coefficient? |
| О |  | solubility in liquids and molecular weight |
| О |  | degree of thermal expansion |
| О |  | compression ratio with increasing pressure |
| О |  | air speed |
|  |  |  |
| В | 022 | What is the percentage of oxygen and carbon dioxide in the air? |
| О |  | oxygen 21%, carbon dioxide 0.03% |
| О |  | oxygen 5%, carbon dioxide 0.03% |
| О |  | oxygen 70%, carbon dioxide 29% |
| О |  | oxygen 21%, carbon dioxide 1% |
|  |  |  |
| В | 023 | What is the partial pressure of oxygen and carbon dioxide in the air? |
| О |  | oxygen 80 mm Hg, carbon dioxide 0.8 mm Hg |
| О |  | oxygen 159 mm Hg, carbon dioxide 10 mm Hg. |
| О |  | oxygen 159 mm Hg, carbon dioxide 0.2 mm Hg. |
| О |  | oxygen 100 mm Hg, carbon dioxide 0.2 mm Hg |
|  |  |  |
| В | 024 | What is the percentage of oxygen and carbon dioxide in the alveolar gas environment? |
| О |  | oxygen 5%, carbon dioxide 0.03% |
| О |  | oxygen 21%, carbon dioxide 4.5% |
| О |  | oxygen 14%, carbon dioxide 5.6% |
| О |  | oxygen 10%, carbon dioxide 21% |
|  |  |  |
| В | 025 | What is the partial pressure of oxygen in the alveolar gas medium? |
| О |  | 80 mm Hg |
| О |  | 159 mm Hg  |
| О |  | 100 mm Hg  |
| О |  | 10 mm Hg  |
|  |  |  |
| В | 026 | What is the partial pressure of carbon dioxide in the alveolar gas environment? |
| О |  | 40 mm Hg |
| О |  | 10 mm Hg  |
| О |  | 0.8 mm Hg |
| О |  | 0.2 mm Hg  |
|  |  |  |
| В | 027 | What is the oxygen tension in venous blood? |
| О |  | 40 mm Hg |
| О |  | 100 mm Hg  |
| О |  | 10 mm Hg |
| О |  | 0.8 mm Hg |
|  |  |  |
| В | 028 | What is the oxygen tension in arterial blood? |
| О |  | 40 mm Hg  |
| О |  | 100 mm Hg  |
| О |  | 10 mm Hg  |
| О |  | 0.8 mm Hg |
|  |  |  |
| В | 029 | What is the tension of carbon dioxide in venous blood? |
| О |  | 46 mm Hg |
| О |  | 39 mm Hg |
| О |  | 100 mm Hg |
| О |  | 10 mm Hg |
|  |  |  |
| В | 030 | What is the tension of carbon dioxide in arterial blood? |
| О |  | 40 mm Hg |
| О |  | 30 mm Hg |
| О |  | 100 mm Hg  |
| О |  | 10 mm Hg  |
|  |  |  |
| В | 031 | What is the average oxygen stress gradient on both sides of the aerogematic barrier? |
| О |  | 60 mm Hg |
| О |  | 30 mm Hg |
| О |  | 10 mm Hg |
| О |  | 0.5 mm Hg |
|  |  |  |
| В | 032 | What on average is the carbon dioxide stress gradient on both sides of the airborne barrier? |
| О |  | 60 mmHg |
| О |  | 30 mmHg |
| О |  | 10 mmHg |
| О |  | 0.4 mmHg |
|  |  |  |
| В | 033 | How much oxygen passes through the airborne barrier per minute at rest? |
| О |  | 8 l |
| О |  | 300 ml |
| О |  | 2 ml |
| О |  | 0.5 l |
|  |  |  |
| В | 034 | How much carbon dioxide passes through the aerogematic barrier per minute at rest? |
| О |  | 8 l |
| О |  | 240 ml |
| О |  | 2 ml |
| О |  | 0.5 l |
|  |  |  |
| В | 035 | What is the maximum oxygen consumption? |
| О |  | 3-6 l |
| О |  | 100 l |
| О |  | 10 l |
| О |  | 1,5 l |
|  |  |  |
| В | 036 | What parts of the lung are better ventilated with calm breathing? |
| О |  | root |
| О |  | medium |
| О |  | basal |
| О |  | apical |
|  |  |  |
| В | 037 | What parts of the lung are better supplied with blood when the body is upright at rest? |
| О |  | root |
| О |  | medium |
| О |  | basal |
| О |  | apical |
|  |  |  |
| В | 038 | In which sections of the lung are the optimal perfusion and ventilation ratios? |
| О |  | in the apical |
| О |  | in basal |
| О |  | at the level of the 3rd rib |
| О |  | all over the lung |
|  |  |  |
| В | 039 | What is the dependence of blood flow on ventilation of the alveoli? |
| О |  | blood flow independent of alveolar ventilation |
| О |  | blood flow increases in well-ventilated alveoli |
| О |  | blood flow increases in poorly ventilated alveoli |
| О |  | blood flow decreases in well-ventilated alveoli |
|  |  |  |
| В | 040 | What is the normal percentage of oxyhemoglobin in arterial blood? |
| О |  | 100 |
| О |  | 78 |
| О |  | 50 |
| О |  | 98-99 |
|  |  |  |
| В | 041 | What is the main form of oxygen transport by blood? |
| О |  | in the form of reduced hemoglobin |
| О |  | in the form of oxyhemoglobin |
| О |  | in freely dissolved form |
| О |  | as deoxyhemoglobin |
|  |  |  |
| В | 042 | What is the main form of blood carbon dioxide transport? |
| О |  | In the form of salts of carbonic acid and carbohemoglobin |
| О |  | in the form of reduced hemoglobin |
| О |  | in freely dissolved form |
| О |  | as deoxyhemoglobin |
|  |  |  |
| В | 043 | What is meant by an oxyhemoglobin dissociation curve? |
| О |  | Dependence of the amount of oxyhemoglobin on the partial pressure of oxygen in the alveoli |
| О |  | Dependence of the amount of oxyhemoglobin on the oxygen tension in the blood |
| О |  | Dependence of the amount of oxyhemoglobin on the number of red blood cells |
| О |  | Dependence of the amount of oxyhemoglobin on the amount of color indicator of blood |
|  |  |  |
| В | 044 | What factors shift the oxyhemoglobin dissociation curve to the right? |
| О |  | temperature drop |
| О |  | pH increase |
| О |  | carbon dioxide reduction |
| О |  | carbon dioxide increase |
|  |  |  |
| В | 045 | What factors shift the oxyhemoglobin dissociation curve to the left? |
| О |  | temperature increase |
| О |  | temperature drop |
| О |  | pH reduction |
| О |  | carbon dioxide increase |
|  |  |  |
| В | 046 | What reflex is by mechanoreceptors of the lungs? |
| О |  | Parin reflex |
| О |  | Holtz reflex |
| О |  | Goering-Breyer reflex |
| О |  | Bainbridge reflex |
|  |  |  |
| В | 047 | What is hypercapnia? |
| О |  | increased lung ventilation due to a change in the tension of carbon dioxide in the blood |
| О |  | increase in oxygen in the blood |
| О |  | increase in carbon dioxide in the blood |
| О |  | decrease in oxygen in the blood |
|  |  |  |
| В | 048 | What is hypoxia? |
| О |  | reduction of oxygen tension in tissues |
| О |  | increased oxygen in the blood |
| О |  | decrease in oxygen tension in the blood |
| О |  | decrease in hemoglobin in the blood |
|  |  |  |
| В | 049 | What is hypoxemia? |
| О |  | subjective feeling of lack of air |
| О |  | increased oxygen in the blood |
| О |  | decrease in oxygen tension in the blood |
| О |  | decrease in hemoglobin in the blood |
|  |  |  |
| В | 050 | Where are the peripheral chemoreceptors involved in the regulation of respiration? |
| О |  | skeletal muscle |
| О |  | medulla |
| О |  | carotid sinuses |
| О |  | alveoli |
|  |  |  |
| В | 051 | What protective breathing reflexes do you know? |
| О |  | nictitating |
| О |  | emetic |
| О |  | defensive |
| О |  | coughing, sneezing |
|  |  |  |
| В | 052 | What types of chemoreceptors are involved in the regulation of respiration? |
| О |  | fabric and organ |
| О |  | central and peripheral |
| О |  | arterial and venous |
| О |  | alveolar and bronchial |
|  |  |  |
| В | 053 | What are stimuli for of the lungs strech receptors? |
| О |  | increased pressure in the pulmonary circulation |
| О |  | dust particles in inhaled air |
| О |  | degree and speed of lung stretching |
| О |  | admixture of corrosive chemicals in inhaled air |
|  |  |  |
| В | 054 | What changes in blood composition cause irritation of central chemoreceptors? |
| О |  | oxygen reduction |
| О |  | increased carbon dioxide tension in the blood |
| О |  | increase in lactic acid |
| О |  | decrease in blood pH |
|  |  |  |
| В | 055 | What is hypocapnia? |
| О |  | reduction of carbon dioxide in the blood |
| О |  | increase in oxygen in the blood |
| О |  | decrease in oxygen in the blood |
| О |  | decrease in lung ventilation due to changes in the tension of carbon dioxide in the blood |
|  |  |  |
| В | 056 | Where are the irritant receptors located? |
| О |  | on the skin |
| О |  | in blood vessels |
| О |  | between the smooth muscle cells of the bronchi |
| О |  | between epithelial cells of the bronchi |
|  |  |  |
| В | 057 | What do irritant receptors respond to? |
| О |  | on the oxygen content in the air |
| О |  | for nitrogen in the air |
| О |  | for chemical and mechanical impurities in the air |
| О |  | for carbon dioxide in the air |
|  |  |  |
| В | 058 | What oxygen tension causes chemoreceptors saturation? |
| О |  | 500 mmHg  |
| О |  | 5 mmHg  |
| О |  | 200 mmHg |
| О |  | 100 mmHg  |
|  |  |  |
| В | 059 | Which of the Russian scientists studied the respiratory center? |
| О |  | P. Anokhin and K. Sudakov |
| О |  | N. Mislavsky and M. Sergievsky |
| О |  | I. Pavlov and I. Sechenov |
| О |  | I. Mechnikov and V. Bekhterev |
|  |  |  |
| В | 060 | Which of the scientists was the first to indicate brain involvement in respiration? |
| О |  | Hippocrates |
| О |  | Harvey |
| О |  | Galen |
| О |  | Avicenna |
|  |  |  |
| В | 061 | Where is the respiratory center located? |
| О |  | in the medulla oblongata |
| О |  | in the larynx |
| О |  | in the bronchi |
| О |  | in alveoli |
|  |  |  |
| В | 062 | In which section of the central nervous system is the respiratory rhythm generator located? |
| О |  | spinal cord |
| О |  | medulla |
| О |  | hypothalamus |
| О |  | cerebral cortex |
|  |  |  |
| В | 063 | What neurons in the respiratory center are affected by chemoreceptors? |
| О |  | motor neurons |
| О |  | gamma inspiratory |
| О |  | beta inspiratory |
| О |  | alpha inspiratory |
|  |  |  |
| В | 064 | Which neurons in the respiratory center are affected by pulmonary receptors? |
| О |  | motor neurons |
| О |  | gamma inspiratory |
| О |  | beta inspiratory |
| О |  | alpha inspiratory |
|  |  |  |
| В | 065 | What parts of the spinal cord innervate the diaphragm? |
| О |  | sacral |
| О |  | lumbar |
| О |  | chest |
| О |  | cervical |
|  |  |  |
| В | 066 | What role do alpha inspiratory neurons play in respiration? |
| О |  | stimulate diaphragm motor neurons |
| О |  | stimulate chemoreceptors |
| О |  | inhibit beta-inspiratory neurons |
| О |  | block signals from lung mechanoreceptors |
|  |  |  |
| В | 067 | What is the function of the pneumotactic center? |
| О |  | stimulates beta inspiratory neurons |
| О |  | stimulates alpha inspiratory neurons |
| О |  | facilitates the transition of inspiration to exhalation |
| О |  | facilitates the transition of exhalation to inhalation |
|  |  |  |
| В | 068 | What is the function of the apneisis center? |
| О |  | stimulates beta inspiratory neurons |
| О |  | stimulates alpha inspiratory neurons |
| О |  | facilitates the transition of inspiration into exhalation |
| О |  | facilitates the transition of exhalation to inhalation |
|  |  |  |
| В | 069 | What is the function of the hypothalamus in the regulation of respiration? |
| О |  | regulates breathing when body temperature changes |
| О |  | provides arbitrary breath control |
| О |  | forms conditioned reflexes of the respiratory system |
| О |  | forms a gamma afferent ring |
|  |  |  |
| В | 070 | What is the function of the limbic center in the regulation of respiration? |
| О |  | regulates breathing in emotional states |
| О |  | provides arbitrary breathing control |
| О |  | forms conditioned reflexes of the respiratory system |
| О |  | forms a gamma afferent ring |
|  |  |  |
| В | 071 | What is the function of the cortex hemisphere in the regulation of respiration? |
| О |  | this free breathing regulation |
| О |  | regulates breathing when body temperature changes |
| О |  | provides a change of respiratory phases |
| О |  | forms a gamma afferent ring |
|  |  |  |
| В | 072 | What are the processes in the respiratory system that the spinal cord can provide autonomously? |
| О |  | respiratory rate regulation |
| О |  | change of respiratory phases |
| О |  | aperture compression force adjustment |
| О |  | airway diameter regulation |
|  |  |  |
| В | 073 | What is the function of gamma afferent control in the respiratory system plays? |
| О |  | regulates airway clearance |
| О |  | enhances contraction of intercostal muscles |
| О |  | enhances aperture reduction |
| О |  | controls gas exchange in the lungs |
|  |  |  |
| В | 074 | How does breathing change when cut above the Varoliev bridge? |
| О |  | ventilation reduced |
| О |  | there is an increase in ventilation |
| О |  | doesn't change at rest |
| О |  | breathing stops |
|  |  |  |
| В | 075 | How will respiration change when transected between the medulla oblongata and the spinal cord? |
| О |  | respiratory rate will increase |
| О |  | depth of breath will increase |
| О |  | breathing slows down |
| О |  | breath will stop |
|  |  |  |