



قائمة الاسئلة

(70) الفيزياء التطبيقية - المستوى الثاني - قسم تخدير - كلية الطب والعلوم الصحية - برامج العلوم الطبية التطبيقية - الفترة الثانية - درجة الامتحان

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- 1) 1. How long would a vaporizer (filled with 200 mL volatile) deliver 2% isoflurane if total flow set at 5 L/minute?
 - 1) - A. 2.3 hours
 - 2) - B. 4.4 hours
 - 3) + C. 6.6 hours
 - 4) - D. 8.6 hours
- 2) 2. states an object at rest or moving at constant speed in a straight line will continue in that state until an external force acts upon it.
 - 1) + A. Newton's First Law.
 - 2) - B. Newton's Second Law.
 - 3) - C. Newton's third Law.
 - 4) - D. Graham's law.
- 3) 3. Contain a high concentration of solute (less water) and the water diffuses out the cell, causing the cell to shrivel :
 - 1) - A. Hypotonic Solutions.
 - 2) + B. Hypertonic Solutions.
 - 3) - C. Isotonic Solutions.
 - 4) - D. Hypobaric Solutions.
- 4) 4. Is a measure of the solute particles which do not cross the cell membrane "non-penetrating solutes"
 - 1) - A. The Osmolarity.
 - 2) + B. The tonicity.
 - 3) - C. Diffusion.
 - 4) - D. Osmosis.
- 5) 5. Is the mass per unit volume: it= mass / volume
 - 1) - A. work
 - 2) - B. velocity
 - 3) + C. density
 - 4) - D. acceleration
- 6) 6. Is the movement of molecules from an area of higher concentration to an area of lesser concentration.
 - 1) - A. The Osmolarity.
 - 2) - B. The tonicity.
 - 3) + C. Diffusion.
 - 4) - D. Osmosis.
- 7) 7. Concerning Hypertonic Solutions all true except :
 - 1) - A. contain a high concentration of solute (less water)
 - 2) - B. causing the cell to shrivel
 - 3) - C. When a cell is placed in a hypertonic solution, the water diffuses out of the cell, like slain 3%
 - 4) + D. causing the cell to swell
- 8) 8. Is defined as the action required to change or tend to change the state of rest or motion of an object
 - 1) - A. work
 - 2) - B. velocity
 - 3) - C. density
 - 4) + D. force
- 9) 9. Serum osmolarity is:
 - 1) + A. a measure of the total number of particles in solution.





- 2) - B. usually expressed in milliosmoles per kilogram.
3) - C. commonly determined by the temperature at which a solution freezes.
4) - D. proportional to the valency of the particles in solution.
- 10) 10. Is defined as the distance travelled per unit time: it $(v) = \text{distance} / \text{time}$
- 1) - A. work
2) B. velocity
3) - C. density
4) - D. force
- 11) 11. The cylinder pressure on an oxygen tank reads 700 kPa. What is the pressure in psi :
- 1) - A. 144.1
2) B. 102,9
3) - C. 101
4) - D. 73,5
- 12) 12. If the internal diameter of an intravenous catheter were doubled, flow through the catheter would be
- 1) - A. Decreased by a factor of 2
2) - B. Decreased by a factor of 4
3) - C. Increased by a factor of 8
4) D. Increased by a factor of 16
- 13) 13 . Viscosity:
- 1) - A. Is the property of a fluid that resists flow
2) B. The SI unit of dynamic viscosity is either: - newton second per square meter (N.s/m²)
3) - C. Of a gas increases with increasing temperature
4) - D. Of a Newtonian fluid is constant, regardless of its shear rate
- 14) 14. The LEAST reliable site for central temperature monitoring is the
- 1) - A. Pulmonary artery
2) B. Skin on forehead
3) - C. Distal third of the esophagus
4) - D. Nasopharynx
- 15) 15. Which of the following statements regarding the laminar fluid movement through a tube is INCORRECT?
- 1) - A. Flow is inversely proportional to the viscosity of the fluid.
2) B. Flow is directly proportional to the square of the radius of the tube.
3) - C. Flow is directly proportional to the radius to the fourth power
4) - D. Flow is directly proportional to the pressure gradient between the two ends of the tube.
- 16) 16. The reason a 40:60 mixture of helium and O₂ is more desirable than a 40:60 mixture of nitrogen and O₂ for a Spontaneously breathing patient with tracheal stenosis is
- 1) A. Helium has a lower density than nitrogen
2) - B. Helium is a smaller molecule than O₂
3) - C. Absorption atelectasis decreased
4) - D. Helium has a lower critical velocity for turbulent flow than does O₂
- 17) 17. During normal laminar airflow, resistance is dependent upon which characteristic of oxygen?
- 1) - A. Density
2) B. Viscosity
3) - C. Molecular weight
4) - D. Vapor pressure
- 18) 18. can be described as smooth and orderly with particles Moving in parallel with the walls of the tube. Flow rate is faster at the center of the tube and slower at the walls of the
- 1) A. Laminar flow
2) - B. Orifice flow
3) - C. Turbulent flow





- 4) - D. Stenotic flow
- 19) 19. Is the number of cycles per second The SI unit is the hertz
- 1) - A. work
 - 2) - B. velocity
 - 3) - C. density
 - 4) + D. frequency
- 20) 20. Under what conditions are real gases most likely to deviate from ideal gas behavior ?
- 1) - A. High temperatures and high pressures
 - 2) - B. High temperatures and low pressures
 - 3) - C. Low temperatures and low pressures
 - 4) + D. Low temperatures and high pressures
- 21) 21. Which of the following statements about turbulent gas flow is INCORRECT?
- 1) - A. Flow rate above the critical number is required for turbulent flow to exist.
 - 2) - B. A higher Reynolds number is predictive of turbulent flow.
 - 3) + C. Gas viscosity is more important than gas density in turbulent flow.
 - 4) - D. Constriction in the flow tubing can cause turbulent flow.
- 22) 22. The pressure gauge on a size "E" compressed-gas cylinder containing O₂ reads 1200 psi. How long could O₂ be delivered from this cylinder at a rate of 4L/min?
- 1) - A. 120 minutes
 - 2) - B. 140 minutes
 - 3) + C. 260 minutes
 - 4) - D. 490 minutes
- 23) 23. A 58-year-old patient has severe shortness of breath and "wheezing." On examination, the patient is found to have inspiratory and expiratory stridor. Further evaluation reveals marked extrinsic compression of the mid trachea by a tumor. The type of airflow at the point of obstruction within the trachea is
- 1) - A. Laminar flow
 - 2) + B. Turbulent flow
 - 3) - C. Undulant flow
 - 4) - D. Stenotic flow
- 24) 24. Related of Laminar flow all true except.
- 1) - A. can be described as smooth and orderly .
 - 2) - B. Flow rate is faster at the center of the tube and slower at the walls.
 - 3) - C. described by the Hagen–Poiseuille equation.
 - 4) + D. density is the important property for laminar flow.
- 25) 25. Large syringe [2ml] produced pressure in KPA :
- 1) + A. 100 KPA
 - 2) - B. 200 KPA
 - 3) - C. 400 KPA
 - 4) - D. 500 KPA
- 26) 26. Related of Turbulent flow all true except.
- 1) - A. Flow is proportional to the square root of pressure.
 - 2) - B. Flow is proportional to the radius squared.
 - 3) - C. Flow is inversely proportional to the square root of the tube length
 - 4) + D. Flow is inversely proportional to the fluid density
- 27) 27. Regarding of Reynold's number all true except.
- 1) + A. proportions inversely of viscosity.
 - 2) - B. proportions inversely of density.
 - 3) - C. a number that can be calculated in order to identify the types of fluid flow.
 - 4) - D. number above 1,500 is generally associated with turbulent flow.





- 28) 28. Is the movement of water through a semi permeable membrane:
- 1) - A. The Osmolarity.
 - 2) - B. The tonicity.
 - 3) - C. Diffusion.
 - 4) + D. Osmosis.
- 29) 29. All are active humidifiers except:
- 1) - A. Passover H.
 - 2) - B. Cascade H.
 - 3) + C. H.M.E.
 - 4) - D. Nebulizers.
- 30) 30. Dew point is a:
- 1) - A. Pressure at which ambient air is fully saturated.
 - 2) - B. Temperature at which ambient air is partially saturated.
 - 3) + C. Temperature at which ambient air is fully saturated.
 - 4) - D. It measures relative humidity in the operating room.
- 31) 31. Core temperature may be reliably measured in the
- 1) - A. external auditory canal
 - 2) - B. axilla
 - 3) + C. lower third of the oesophagus
 - 4) - D. oral cavity
- 32) 32. The likelihood of the onset of the turbulent flow is predicted by all except:
- 1) - A. the density of the fluid in kg/m³
 - 2) + B. the viscosity of the fluid in pascals
 - 3) - C. the velocity of the flow
 - 4) - D. the square root of the driving pressure
- 33) 33. The properties of a gas that influence the resistance during laminar flow include
- 1) + A. viscosity
 - 2) - B. density
 - 3) - C. critical temperature
 - 4) - D. diffusion rate
- 34) 34. Blood cells placed into pure water will:
- 1) + A. Swell, because they are hypertonic to pure water.
 - 2) - B. Shrink, because they are hypertonic to pure water.
 - 3) - C. Swell, because they are hypotonic to pure water.
 - 4) - D. Shrink, because they are hypotonic to pure water.
- 35) 35. The pressure gauge on a size "H" compressed-gas cylinder containing O₂ reads 1000 psi. How long could O₂ be delivered from this cylinder at a rate of 4 L/min?
- 1) - A. 900 minutes
 - 2) - B. 1400 minutes
 - 3) - C. 2333 minutes
 - 4) + D. 3500 minutes
- 36) 36. Related Boyle's Law incorrect.
- 1) - A. Pressure and volume are inversely related
 - 2) - B. constant temperature
 - 3) - C. when the pressure on a gas is increased, the volume of the gas decreases
 - 4) + D. doubling the temperature of a gas will double its pressure
- 37) 37. Related Charles' Law
- 1) - A. constant of the temperature
 - 2) - B. constant of the volume





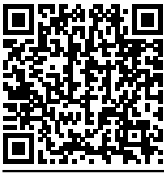
- 3) C. constant of the pressure
4) D. constant of the flow
- 38) 38. According to Gay-Lussac's law
1) A. when the pressure on a gas is increased, the volume of the gas decreases
2) B. if the pressure is doubled, the volume decreases by half
3) C. Reducing the temperature of a gas to 75% of its original value will also reduce the pressure to 75% of its original value
4) D. The pressure and absolute temperature (K) of a gas are directly related
- 39) 39. Avogadro's Principle
1) A. Equal volumes of gases contain equal numbers of moles
2) B. at constant temperature only
3) C. true for any gas
4) D. 1 mole of any gas at STP = 22.4 L
- 40) 40. Is performed when a force moves an object: $W = \text{force} \times \text{distance}$ The SI unit is joule
1) A. work
2) B. velocity
3) C. density
4) D. force
- 41) 41. Concerning Atmospheric Pressure [barometric] PB all true except
1) A. Atmospheric pressure is pressure in the surrounding air at - or "close" to - the surface of the earth.
2) B. The atmospheric pressure varies with temperature and altitude above sea level
3) C. AT Aden city = 760 mmHg
4) D. AT Sanaa town = 760 mmHg
- 42) 42. The mechanical pressure gauge includes except
1) A. Bourdon gauge
2) B. Aneroid gauge
3) C. Diaphragm gauge
4) D. saline manometer
- 43) 43. Concerning Hypotonic Solutions all true except
1) A. contain a low concentration of solute (more water)
2) B. causing the cell to shrivel
3) C. When a cell is placed in a hypotonic solution, the water diffuses into the cell,
4) D. Like Dextrose 5%
- 44) 44. Have the Lower specific gravity as that of the cerebrospinal fluid (CSF) :
1) A. Hypotonic Solutions
2) B. Hypertonic Solutions.
3) C. Isotonic Solutions.
4) D. Hypobaric Solutions.
- 45) 45. The filling ratio of N₂O is
1) A. 0,67
2) B. 0,58
3) C. 0,77
4) D. 0,84
- 46) 46. The VAPOR PRESSURE PER ML OF LIQUID of isoflurane at room temperature is
1) A. 190 ML
2) B. 188ML
3) C. 200ML
4) D. 195ML





- 47) 47. The layer adjacent to the surface is warmed by conduction & moved up create. Convection current carries heat away.
- 1) A. Convection
 - 2) B. radiation
 - 3) C. evaporation
 - 4) D. respiration
- 48) 48. Mechanisms activated by cold stimulation includes all except .
- 1) A. Shivering.
 - 2) B. Hunger
 - 3) C. decreased voluntary activity
 - 4) D. Increased secretion of norepinephrine and epinephrine
- 49) 49. A cylinder of oxygen has an internal volume of 6 L and a pressure of 1700 psi. How many liters of oxygen will this tank supply at sea level?
- 1) A. 660 L
 - 2) B. 680 L
 - 3) C. 694 L
 - 4) D. 706 L
- 50) 50. Small syringe [2ml] produced pressure in KPA :
- 1) A. 100 KPA
 - 2) B. 200 KPA
 - 3) C. 400 KPA
 - 4) D. 500 KPA
- 51) 51. Types of Latent Heat all true except.
- 1) A. melting
 - 2) B. crystallization
 - 3) C. degradation
 - 4) D. condensation
- 52) 52. A cylinder of gas has a pressure of 4.40 atm at 25°C. At what temperature in °C will it reach a pressure of 6.50 atm?
- 1) A. 330. K
 - 2) B. 580. K
 - 3) C. 440. K
 - 4) D. 400. K
- 53) 53. Mechanisms activated by heat stimulation includes all except .
- 1) A. Increased heat loss
 - 2) B. Cutaneous vasodilation
 - 3) C. Sweating
 - 4) D. Hunger
- 54) 54. Which temperature scale begins at absolute zero?
- 1) A. The Fahrenheit scale
 - 2) B. The Celsius scale
 - 3) C. The Kelvin scale
 - 4) D. The ideal gas scal
- 55) 55. Preventive measures of hypothermia intra operation all true except.
- 1) A. control. ambient temperature.& humidity
 - 2) B. Enclose exposed viscera & Warm mattres
 - 3) C. Warming of IV & Low flow anesthesia
 - 4) D. maintaining operation room temperature less than 20 C
- 56) 56. Heat Loss in Human Body most commonly by:





- 1) - A. Convection,
2) B. radiation
3) - C. evaporation
4) - D. respiration
- 57) 57. concerning Ignition of 1 g of fat food produce.
1) A. 9 kcal
2) - B. 9,5 kcal
3) - C. 5,5 kcal
4) - D. 4 kcal
- 58) 58. The expression that for a fixed mass of gas at constant temperature, the product of pressure and volume is constant is known as
1) - A. law Gay-Lussac's
2) B. Boyle's law
3) - C. Dalton's law
4) - D. Charles' law
- 59) 59. Critical pressure incorrect
1) - A. is the pressure at which a gas liquefies at its critical temperature
2) - B. is the pressure of saturated vapour at critical temperature
3) - C. for nitrous oxide is about 73 bar
4) D. is directly dependent on the temperature of the gas
- 60) 60. Related Boyle's Law
1) A. constant of the temperature
2) - B. constant of the volume
3) - C. constant of the pressure
4) - D. constant of the flow

