UNIT III: ARTIFICIAL KIDNEY 1. The primary indication for hemodialysis is _____ failure. a) Liver b) Kidney c) Lung d) Heart Answer: b) Kidney 2. Haemodialysis works on the principle of _____ and diffusion to remove waste products from the blood. a) Osmosis b) Ultrafiltration c) Absorption d) Filtration Answer: b) Ultrafiltration 3. The process of haemodialysis requires a semipermeable _____ to separate blood from the dialysate. a) Membrane b) Tube c) Gel d) Resin Answer: a) Membrane 4. The composition of _____ is carefully controlled to prevent imbalances in electrolytes and waste removal during dialysis. a) Plasma b) Dialysate c) Urine d) Serum Answer: b) Dialysate 5. The most commonly used membrane in modern hemodialysis machines is made of _____. a) Cellulose b) Polysulfone c) Polyvinyl chloride d) Rubber Answer: b) Polysulfone 6. The two major types of hemodialyzers are hollow fiber dialyzers and _____ dialyzers. a) Parallel plate b) Cylindrical c) Rotating d) Tubular Answer: a) Parallel plate 7. The efficiency of a hemodialyzer is determined by its surface area and _____ permeability. a) Temperature b) Pressure c) Membrane d) Electrical Answer: c) Membrane 8. _____ is an advanced dialysis system designed to be worn as a portable device for continuous treatment. a) Wearable artificial kidney b) Continuous renal replacement therapy c) Implantable hemodialyzer d) Extracorporeal circuit Answer: a) Wearable artificial kidney 9. The major advantage of a wearable artificial kidney is improved _____ compared to conventional dialysis machines. a) Size b) Portability c) Cost d) Noise Answer: b) Portability 10. In hemodialysis, uremic toxins are removed by diffusion across the _____ membrane. a) Impermeable b) Selectively permeable c) Metallic d) Non-porous Answer: b) Selectively permeable 11. The main purpose of ultrafiltration in haemodialysis is to remove excess _____ from the blood. a) Protein b) Glucose c) Fluid d) Hemoglobin Answer: c) Fluid 12. A major risk during haemodialysis is the loss of essential _____ such as sodium and potassium. a) Hormones b) Electrolytes c) Proteins d) Enzymes Answer: b) Electrolytes 13. The blood flow rate in a standard hemodialysis session typically ranges from _____ mL/min. a) 50–100 b) 200–500 c) 800–1000 d) 1000–1500 Answer: b) 200–500 14. The presence of a dialysis fistula helps provide adequate _____ access for haemodialysis. a) Arterial b) Venous c) Both arterial and venous d) Lymphatic Answer: c) Both arterial and venous 15. The effectiveness of dialysis is monitored by measuring _____ reduction ratio (URR). a) Urea b) Creatinine c) Glucose d) Albumin Answer: a) Urea 16. A significant complication of long-term dialysis is dialysis-related _____ disease affecting bones. a) Cardiovascular b) Hepatic c) Mineral d) Neurological Answer: c) Mineral 17. The primary function of the dialysate is to maintain _____ balance while removing waste products. a) Hormonal b) Electrolyte c) Oxygen d) Lipid Answer: b) Electrolyte 18. The removal of middle molecules in haemodialysis requires the use of _____ flux membranes. a) Low b) Medium c) High d) Non-porous Answer: c) High 19. Implantable artificial kidneys are being developed as a permanent alternative to _____. a) Blood transfusion b) Traditional

dialysis c) Chemotherapy d) Kidney biopsy Answer: b) Traditional dialysis 20. The primary advantage of implantable artificial kidneys is their ability to provide continuous _____. a) Blood flow b) Filtration c) Oxygenation d) Nutrient supply Answer: b) Filtration 21. One of the most common complications of hemodialysis is a sudden drop in _____. a) Heart rate b) Blood pressure c) Oxygen levels d) Blood glucose Answer: b) Blood pressure 22. Long-term dialysis can lead to _____ due to reduced kidney function and calcium imbalance. a) Anemia b) Hyperkalemia c) Bone disease d) Hypertension Answer: c) Bone disease 23. The most frequent cause of infection in hemodialysis patients is due to contamination of the _____. a) Dialysate b) Water supply c) Vascular access site d) Dialyzer Answer: c) Vascular access site 24. Excess removal of _____ during hemodialysis can lead to muscle cramps. a) Calcium b) Sodium c) Potassium d) Fluid Answer: d) Fluid 25. One of the metabolic complications of hemodialysis is _____ syndrome caused by rapid shifts in fluid and solute levels. a) Nephrotic b) Disequilibrium c) Dialysis-encephalopathy d) Uremic Answer: b) Disequilibrium 26. Hemodialysis patients are at high risk for _____ due to reduced erythropoietin production. a) Hypertension b) Anemia c) Hyperlipidemia d) Acidosis Answer: b) Anemia 27. _____ is a severe condition caused by aluminum accumulation in dialysis patients using non-purified dialysate water. a) Osteoporosis b) Dialysis dementia c) Hypercalcemia d) Nephritis Answer: b) Dialysis dementia 28. The biocompatibility of a hemodialysis membrane is measured by its ability to reduce _____ activation. a) White blood cell b) Platelet c) Red blood cell d) Enzyme Answer: a) White blood cell 29. A major concern in hemodialysis is _____ activation, which can lead to clotting issues. a) Hemoglobin b) Complement system c) Sodium pump d) Phagocytosis Answer: b) Complement system 30. Biocompatible dialysis membranes aim to minimize the release of inflammatory _____. a) Cytokines b) Hormones c) Enzymes d) Vitamins Answer: a) Cytokines 31. Synthetic dialysis membranes, such as polysulfone, have better _____ compared to cellulose-based membranes. a) Water permeability b) Toxicity c) Rigidity d) Heat resistance Answer: a) Water permeability 32. High-flux dialyzers use membranes with larger _____ to remove middle molecules more effectively. a) Thickness b) Surface area c) Pore size d) Charge density Answer: c) Pore size 33. The most promising alternative to conventional dialysis is the development of _____ kidneys. a) Wireless b) Bionic c) Optical d) External Answer: b) Bionic 34. A key advantage of bioartificial kidneys is their ability to use living _____ cells for filtration. a) Skin b) Endothelial c) Kidney d) Liver Answer: c) Kidney 35. Nanotechnology-based dialysis systems are being explored to improve _____ removal efficiency. a) Toxin b) Oxygen c) Blood flow d) Dialysate temperature Answer: a) Toxin 36. One of the major challenges in developing an implantable artificial kidney is preventing _____ formation. a) Scar b) Clot c) Biofilm d) Cancerous Answer: b) Clot 37. Wearable artificial kidneys aim to provide continuous dialysis, reducing dependence on _____ dialysis sessions. a) Weekly b) Intermittent c) Nocturnal d) Acute

Answer: b) Intermittent 38. CRRT (Continuous Renal Replacement Therapy) is typically used for patients with _____ kidney injury. a) Acute b) Chronic c) Inherited d) Genetic Answer: a) Acute 39. Future artificial kidney designs are exploring the use of _____ energy sources to enhance portability. a) Solar b) Thermal c) Battery-powered d) Kinetic Answer: c) Battery-powered 40. A major advantage of implantable artificial kidneys over traditional dialysis is the elimination of _____ fluid exchange. a) Plasma b) Peritoneal c) Heparinized d) Saline Answer: b) Peritoneal 41. The efficiency of hemodialysis is measured by the clearance of _____. a) Sodium b) Creatinine c) Urea d) Albumin Answer: c) Urea 42. The standard measure of dialysis adequacy is the _____ ratio. a) Urea Reduction b) Hemoglobin c) Sodium-Potassium d) Calcium-Phosphate Answer: a) Urea Reduction 43. _____ is the most commonly used parameter to assess dialysis efficiency. a) KT/V b) Blood Pressure c) Urine Output d) Blood Sugar Level Answer: a) KT/V 44. High-flux dialyzers improve toxin removal by increasing the _____. a) Filtration speed b) Dialysate volume c) Membrane permeability d) Blood pressure Answer: c) Membrane permeability 45. Dialysis clearance depends on blood flow rate, dialysate flow rate, and _____ area. a) Dialyzer membrane b) Patient skin c) Stomach lining d) Liver tissue Answer: a) Dialyzer membrane 46. Dialysis disequilibrium syndrome occurs due to a rapid change in _____ concentration. a) Oxygen b) Sodium c) Urea d) Glucose Answer: c) Urea 47. An ideal dialyzer should have high permeability for toxins but low permeability for _____. a) Electrolytes b) Water c) Proteins d) Carbon dioxide Answer: c) Proteins 48. Patients on hemodialysis should restrict their intake of _____ to prevent hyperkalemia. a) Sodium b) Potassium c) Calcium d) Iron Answer: b) Potassium 49. Dry weight in dialysis patients refers to the weight after removing excess _____. a) Protein b) Fluid c) Glucose d) Urea Answer: b) Fluid 50. Hemodialysis patients are often prescribed erythropoietin to prevent _____. a) Dehydration b) Anemia c) High blood sugar d) Hypokalemia Answer: b) Anemia 51. The preferred vascular access for long-term hemodialysis is a/an _____. a) Central venous catheter b) Arteriovenous fistula c) Peripheral IV line d) Subclavian catheter Answer: b) Arteriovenous fistula 52. Patients undergoing peritoneal dialysis require regular monitoring for signs of _____. a) Dehydration b) Infection c) Anemia d) Hypercalcemia Answer: b) Infection 53. A major dietary recommendation for dialysis patients is to limit _____ to prevent fluid overload. a) Fiber b) Sugar c) Salt d) Fat Answer: c) Salt 54. Patients on hemodialysis should avoid excessive consumption of _____ due to phosphorus retention. a) Dairy products b) Green leafy vegetables c) Citrus fruits d) Lean meats Answer: a) Dairy products 55. Dialysis patients require regular monitoring of _____ levels to maintain bone health. a) Potassium b) Phosphorus c) Sodium d) Albumin Answer: b) Phosphorus 56. The main advantage of wearable artificial kidneys is the ability to provide _____ dialysis. a) Continuous b) Monthly c) Intermittent d) Emergency Answer: a) Continuous 57. Implantable artificial kidneys aim to eliminate the need for _____ access. a) Dialysis

machine b) Catheter-based c) Blood pressure d) Insulin Answer: b) Catheter-based 58. The major challenge in wearable kidney technology is ensuring adequate _____ removal. a) Protein b) Oxygen c) Water d) Toxin Answer: d) Toxin 59. Bioartificial kidneys incorporate living _____ cells to improve filtration. a) Liver b) Kidney c) Bone marrow d) Skin Answer: b) Kidney 60. The wearable dialysis device operates by mimicking the function of a _____. a) Dialyzer b) Nephron c) Heart pump d) Ventilator Answer: b) Nephron 61. A major benefit of an artificial kidney over traditional dialysis is a reduced risk of _____. a) Infection b) High blood pressure c) Urinary retention d) Low oxygen levels Answer: a) Infection 62. Nanotechnology is being explored in artificial kidney research to develop ultra-thin _____ filters. a) Polycarbonate b) Silicon c) Copper d) Glass Answer: b) Silicon 63. A key component in the future development of implantable artificial kidneys is the use of _____-powered systems. a) Solar b) Battery c) Nuclear d) Wireless Answer: b) Battery 64. One of the major goals of artificial kidney research is to reduce patient dependence on _____. a) Dialysis centers b) Antibiotics c) Blood transfusions d) Insulin therapy Answer: a) Dialysis centers 65. Hemofiltration in artificial kidney devices focuses on the removal of _____ instead of diffusion. a) Proteins b) Electrolytes c) Solutes d) Water Answer: d) WaterModule 1.1 : HEART-LUNG MACHINE AND ARTIFICIAL HEART 1. The primary function of a Heart-Lung Machine (HLM) is to provide _____ and _____ to the patient's blood during cardiac surgery. a) Oxygenation, Circulation b) Cooling, Heating c) Compression, Relaxation d) Filtration, Absorption Answer: a) Oxygenation, Circulation 2. Oxygenators in heart-lung machines are classified into two types: _____ and _____. a) Hollow fiber, Bubble b) Pneumatic, Hydraulic c) Electrical, Magnetic d) Synthetic, Natural Answer: a) Hollow fiber, Bubble 3. The two main types of blood pumps used in heart-lung machines are _____ and _____. a) Roller, Centrifugal b) Axial, Rotary c) Hydraulic, Pneumatic d) Linear, Rotary Answer: a) Roller, Centrifugal 4. In a pulsatile pump, blood flow mimics the natural _____ of the heart. a) Contraction b) Relaxation c) Rhythmic beating d) Filtering Answer: c) Rhythmic beating 5. Continuous-flow pumps create a _____ flow of blood instead of pulsatile flow. a) Rhythmic b) Constant c) Irregular d) High-pressure Answer: b) Constant 6. The process of temporarily redirecting blood flow around a blocked artery is called _____. a) Shunting b) Hemodialysis c) Ventilation d) Coagulation Answer: a) Shunting 7. A primary indication for cardiac transplantation is _____ heart failure that is unresponsive to medical therapy. a) Acute b) Chronic c) Mild d) Secondary Answer: b) Chronic 8. The driving mechanism for an artificial heart can be _____ or _____. a) Pneumatic, Electric b) Thermal, Optical c) Magnetic, Hydraulic d) Chemical, Mechanical Answer: a) Pneumatic, Electric 9. Blood handling systems in artificial hearts must prevent _____ to avoid clot formation. a) Hemolysis b) Coagulation c) Cavitation d) Turbulence Answer: b) Coagulation 10. The schematic for a temporary bypass of the left ventricle involves connecting the left atrium to the _____ for blood circulation. a) Aorta b)

Pulmonary vein c) Right atrium d) Vena cava Answer: a) Aorta 11. The Heart-Lung Machine takes over the function of the _____ and _____ during open-heart surgery. a) Liver, Kidney b) Heart, Lungs c) Stomach, Intestines d) Arteries, Veins Answer: b) Heart, Lungs 12. The oxygenation process in a heart-lung machine removes _____ from venous blood and adds _____. a) Oxygen, Carbon Dioxide b) Carbon Dioxide, Oxygen c) Nitrogen, Oxygen d) Oxygen, Nitrogen Answer: b) Carbon Dioxide, Oxygen 13. The bubble oxygenator allows blood to interact directly with _____. a) Nitrogen gas b) Oxygen gas c) Carbon monoxide d) Helium gas Answer: b) Oxygen gas 14. Hollow fiber oxygenators improve oxygenation by using a _____ membrane. a) Porous b) Non-porous c) Rigid d) Solid Answer: a) Porous 15. Centrifugal pumps in heart-lung machines work based on the principle of _____. a) Positive displacement b) Magnetic induction c) Rotational energy d) Direct compression Answer: c) Rotational energy 16. One of the major concerns in using an artificial heart is preventing _____ formation, which can lead to stroke. a) Blood clot b) Red blood cell c) Hemoglobin d) Electrolyte Answer: a) Blood clot 17. _____ is a key parameter monitored during heart-lung machine operation to ensure adequate tissue perfusion. a) Sodium concentration b) Blood pressure c) Lung capacity d) Liver function Answer: b) Blood pressure 18. The major disadvantage of a pulsatile pump in artificial hearts is its _____ size and complexity. a) Small b) Large c) Lightweight d) Transparent Answer: b) Large 19. The primary function of a left ventricular assist device (LVAD) is to pump blood from the _____ to the aorta. a) Right atrium b) Left ventricle c) Pulmonary vein d) Superior vena cava Answer: b) Left ventricle 20. A fully implantable artificial heart requires an external _____ to power it wirelessly. a) Battery b) Generator c) Pump d) Valve Answer: a) Battery 21. The primary function of the heart-lung machine is to temporarily replace the function of the _____ and _____ during cardiac surgery. a) Liver, Kidneys b) Brain, Spinal cord c) Heart, Lungs d) Intestines, Stomach Answer: c) Heart, Lungs 22. The main types of oxygenators used in heart-lung machines are _____ and _____. a) Bubble, Membrane b) Mechanical, Hydraulic c) Positive, Negative d) None of the above Answer: a) Bubble, Membrane 23. In a centrifugal pump, blood is propelled by _____ force instead of direct mechanical compression. a) Gravitational b) Centrifugal c) Magnetic d) Static Answer: b) Centrifugal 24. The artificial heart is primarily used as a _____ therapy before heart transplantation. a) Temporary b) Permanent c) Minor d) Preventive Answer: a) Temporary 25. The artificial heart must prevent excessive _____ to avoid damaging blood cells. a) Temperature rise b) Shear stress c) Oxygen saturation d) Platelet count Answer: b) Shear stress 26. The schematic for a temporary bypass of the left ventricle includes a connection between the _____ and the aorta. a) Left atrium b) Right ventricle c) Pulmonary artery d) Left ventricle Answer: d) Left ventricle 27. The major limitation of pulsatile artificial hearts is their increased _____. a) Efficiency b) Size and complexity c) Blood clot prevention d) Durability Answer: b) Size and complexity 28. A major risk in using a heart-lung machine is

the formation of _____ in the bloodstream. a) Plaque b) Blood clots c) Calcium deposits d) Bacteria Answer: b) Blood clots 29. The driving mechanism of an artificial heart is typically powered by _____ energy. a) Chemical b) Pneumatic or electrical c) Hydraulic d) Thermal Answer: b) Pneumatic or electrical 30. During a cardiac transplant, the heart is preserved in a _____ solution before implantation. a) Cold b) Warm c) Neutral d) Saline Answer: a) Cold Module 1.1: CARDIAC ASSIST DEVICES 31. Cardiac assist devices are primarily used to support patients with _____. a) Liver disease b) Kidney failure c) Heart failure d) Lung infections Answer: c) Heart failure 32. Right and Left Ventricular Bypass Pumps are designed to assist the function of the _____ and _____. a) Lungs, Liver b) Right Ventricle, Left Ventricle c) Arteries, Veins d) Kidneys, Lungs Answer: b) Right Ventricle, Left Ventricle 33. The auxiliary ventricle functions as a _____ support system for the heart. a) Permanent b) Temporary c) Non-functional d) Reactive Answer: b) Temporary 34. Open chest cardiac assist devices require a _____ to be surgically opened. a) Small incision b) Large vein c) Thoracic cavity d) Arterial graft Answer: c) Thoracic cavity 35. Intra-aortic balloon pumping (IABP) helps improve myocardial oxygen supply by inflating during _____. a) Systole b) Diastole c) Contraction d) Resting phase Answer: b) Diastole 36. Prosthetic cardiac valves are used to replace damaged _____ valves. a) Heart b) Lung c) Kidney d) Liver Answer: a) Heart 37. The principle of external counterpulsation (ECP) is to enhance _____ blood flow during diastole. a) Coronary b) Pulmonary c) Venous d) Arterial Answer: a) Coronary 38. Intra-aortic balloon pumps work by inflating during _____ and deflating during _____. a) Inspiration, Expiration b) Diastole, Systole c) Contraction, Relaxation d) Venous return, Arterial flow Answer: b) Diastole, Systole 39. The function of an open-chest ventricular assist device is to provide mechanical support to the _____. a) Liver b) Kidneys c) Lungs d) Heart Answer: d) Heart 40. The primary goal of cardiac assist devices is to reduce the workload on the _____ and improve circulation. a) Lungs b) Kidneys c) Heart d) Liver Answer: c) Heart 41. The right ventricular assist device (RVAD) supports blood flow from the right ventricle to the _____. a) Lungs b) Aorta c) Kidneys d) Brain Answer: a) Lungs 42. Intra-aortic balloon pumping reduces the workload of the heart by _____ myocardial oxygen demand. a) Increasing b) Reducing c) Stabilizing d) Reversing Answer: b) Reducing 43. An auxiliary ventricle is used as a temporary support system in patients with _____ failure. a) Kidney b) Heart c) Liver d) Lung Answer: b) Heart 44. The main purpose of a prosthetic heart valve is to restore normal _____ function. a) Kidney b) Liver c) Cardiac d) Respiratory Answer: c) Cardiac 45. Open-chest cardiac assist devices require direct surgical access to the _____. a) Brain b) Heart c) Lungs d) Liver Answer: b) Heart 46. In external counterpulsation therapy, inflatable cuffs are placed around the _____. a) Chest b) Arms c) Legs d) Head Answer: c) Legs 47. The intra-aortic balloon pump inflates during _____ to improve coronary perfusion. a) Systole b) Diastole c) Expiration d) Contraction Answer: b) Diastole 48. The closed-chest type of ventricular

assist device is inserted through a _____. a) Open-heart surgery b) Catheter c) Transplant d) Mechanical valve Answer: b) Catheter 49. External counterpulsation (ECP) helps to increase _____ flow to ischemic heart tissue. a) Coronary b) Venous c) Pulmonary d) Lymphatic Answer: a) Coronary 50. A ventricular assist device (VAD) is often used as a _____ before heart transplantation. a) Final treatment b) Bridge therapy c) Permanent solution d) Minor intervention Answer: b) Bridge therapy 51. The left ventricular assist device (LVAD) helps pump blood from the _____ to the rest of the body. a) Right ventricle b) Left ventricle c) Pulmonary artery d) Right atrium Answer: b) Left ventricle 52. A ventricular assist device (VAD) is used as a _____ therapy in patients waiting for heart transplantation. a) Curative b) Palliative c) Bridge d) Non-essential Answer: c) Bridge 53. The intra-aortic balloon pump (IABP) is inflated during _____ to increase coronary perfusion. a) Systole b) Diastole c) Expiration d) Contraction Answer: b) Diastole 54. The right ventricular assist device (RVAD) assists in pumping blood to the _____. a) Liver b) Lungs c) Brain d) Kidneys Answer: b) Lungs 55. External counterpulsation therapy uses _____ cuffs to improve coronary circulation. a) Air-filled b) Water-filled c) Mechanical d) Magnetic Answer: a) Air-filled 56. The prosthetic cardiac valve replaces a malfunctioning heart valve to restore proper _____ function. a) Pulmonary b) Circulatory c) Digestive d) Nervous Answer: b) Circulatory 57. A major complication of cardiac assist devices is the risk of _____ due to foreign material in the bloodstream. a) Infection b) Hypertension c) Edema d) Diabetes Answer: a) Infection 58. Intra-aortic balloon pumps (IABPs) improve cardiac function by reducing _____ load. a) Left ventricular b) Right ventricular c) Pulmonary d) Atrial Answer: a) Left ventricular 59. Open-chest cardiac assist devices are typically used in _____ surgeries. a) Brain b) Liver c) Cardiac d) Orthopedic Answer: c) Cardiac 60. A fully implantable artificial heart must include a _____ power source to operate continuously. a) Wireless b) External c) Portable d) Limited Answer: a) WirelessVentilator Types and Mechanisms 1. A ventilator is a machine that supports or replaces _____ function in patients who cannot breathe adequately. a) Cardiac b) Liver c) Respiratory d) Renal Answer: c) Respiratory 2. The primary function of a ventilator is to ensure adequate _____ exchange. a) Blood b) Oxygen and carbon dioxide c) Food d) Hormone Answer: b) Oxygen and carbon dioxide 3. Intermittent Positive Pressure Ventilation (IPPV) provides air to the lungs by applying _____ pressure during inhalation. a) Negative b) Positive c) Neutral d) Equal Answer: b) Positive 4. Intermittent Positive Pressure Breathing (IPPB) units are mainly used for patients with difficulty in _____. a) Eating b) Walking c) Breathing d) Sleeping Answer: c) Breathing 5. Negative pressure ventilators work by creating a vacuum around the chest, simulating normal _____. a) Passive expiration b) Active expiration c) Passive inspiration d) Active inspiration Answer: c) Passive inspiration 6. Positive pressure ventilators push air into the lungs, whereas negative pressure ventilators work by _____ the chest cavity. a) Expanding b) Compressing c)

Squeezing d) Deflating Answer: a) Expanding 7. A ventilator that delivers a set volume of air during each breath is called a _____ ventilator. a) Volume-cycled b) Pressure-cycled c) Time-cycled d) Flow-cycled Answer: a) Volume-cycled 8. A ventilator mode that allows spontaneous breathing by the patient while providing necessary support is called _____. a) Controlled Ventilation b) Assisted Ventilation c) Intermittent Ventilation d) BiPAP Answer: b) Assisted Ventilation Breathing Apparatus and Operating Sequence 9. The breathing cycle consists of two main phases: _____ and _____. a) Inspiration, Expiration b) Inhalation, Filtration c) Compression, Relaxation d) Intake, Absorption Answer: a) Inspiration, Expiration 10. The normal respiratory rate in an adult at rest is about _____ breaths per minute. a) 6-10 b) 12-20 c) 24-30 d) 30-40 Answer: b) 12-20 11. The oxygen concentration delivered by a ventilator is measured in terms of _____. a) VO_2 max b) PEEP c) FiO_2 d) Tidal Volume Answer: c) FiO_2 12. A ventilator must monitor and regulate tidal volume, respiratory rate, and _____ pressure. a) Blood b) Airway c) Cardiac d) Intravenous Answer: b) Airway 13. PEEP (Positive End-Expiratory Pressure) is used to prevent _____ of alveoli at the end of expiration. a) Overexpansion b) Collapsing c) Blood clotting d) Oxygen accumulation Answer: b) Collapsing 14. A humidifier is often used in a ventilator circuit to prevent _____ of the airway. a) Drying b) Swelling c) Infection d) Spasms Answer: a) Drying 15. The fraction of oxygen in inhaled air (FiO_2) is typically set between _____ in ventilated patients. a) 0.21 to 1.0 b) 1.2 to 2.5 c) 0.1 to 0.5 d) 2.0 to 3.0 Answer: a) 0.21 to 1.0 Electronic IPPB Unit and Monitoring Parameters 16. Electronic IPPB units provide controlled breaths and monitor respiratory parameters such as tidal volume and _____. a) Oxygen demand b) Blood circulation c) Hemoglobin level d) Pressure settings Answer: d) Pressure settings 17. Inspiratory pressure in an IPPB unit helps in determining the volume of air delivered per _____. a) Minute b) Breath c) Hour d) Cycle Answer: b) Breath 18. An important feature of an electronic IPPB unit is the ability to adjust _____ sensitivity to match patient effort. a) Humidity b) Flow c) Pressure d) Temperature Answer: c) Pressure 19. An alarm in a ventilator system alerts caregivers when parameters such as tidal volume, pressure, or _____ deviate from normal. a) Oxygen supply b) Blood flow c) Respiratory rate d) Heart rate Answer: c) Respiratory rate 20. The sensitivity setting of an IPPB machine helps detect the patient's attempt to _____. a) Sleep b) Exhale c) Inhale d) Hold breath Answer: c) Inhale 21. A critical advantage of electronic ventilators over mechanical ventilators is real-time _____. a) Humidity control b) Data monitoring c) Oxygen absorption d) Blood pressure regulation Answer: b) Data monitoring 22. An advanced ventilator mode that automatically adjusts breath support based on patient effort is called _____. a) Volume-Controlled Ventilation b) Pressure-Controlled Ventilation c) Adaptive Support Ventilation d) Time-Cycled Ventilation Answer: c) Adaptive Support Ventilation 23. In emergency conditions, a transport ventilator is used for patients requiring mechanical ventilation during _____. a) Dialysis b) Surgery c) Movement between locations d) MRI scan Answer:

c) Movement between locations 24. Non-invasive ventilation (NIV) is preferred over invasive methods to reduce the risk of _____. a) Anemia b) Lung infection c) Hypoxia d) Pneumothorax Answer: b) Lung infection 25. A BiPAP machine differs from CPAP because it provides two levels of _____. a) Temperature b) Oxygen supply c) Air pressure d) Tidal volume Answer: c) Air pressure 26. A high-pressure alarm on a ventilator is triggered when there is an obstruction in the _____. a) Blood vessel b) Airway c) Oxygen tank d) Dialysate Answer: b) Airway 27. The most common cause of a low-pressure alarm on a ventilator is a _____. a) Blocked endotracheal tube b) Disconnected circuit c) Excessive airway pressure d) Oxygen toxicity Answer: b) Disconnected circuit 28. A high tidal volume alarm may indicate that the ventilator is delivering _____ air than required. a) More b) Less c) No d) Cold Answer: a) More 29. A low exhaled volume alarm on a ventilator may indicate a _____. a) Leak in the system b) Normal breath cycle c) Decreased heart rate d) Oxygen deficiency Answer: a) Leak in the system 30. If a patient on a ventilator is experiencing hypoxia, the first step is to check the _____ supply. a) Food b) Oxygen c) Blood d) Dialysate Answer: b) Oxygen 31. A PEEP malfunction in a ventilator can lead to alveolar collapse, causing decreased _____. a) Blood pressure b) Oxygenation c) Carbon dioxide levels d) Heart rate Answer: b) Oxygenation 32. The most common sign of endotracheal tube displacement in a ventilated patient is sudden _____. a) Increase in blood pressure b) Decrease in oxygen saturation c) Decrease in heart rate d) Increase in urine output Answer: b) Decrease in oxygen saturation 33. Auto-PEEP occurs when the patient is unable to fully _____ before the next breath. a) Inhale b) Exhale c) Cough d) Sleep Answer: b) Exhale 34. A sudden increase in airway resistance can be caused by a buildup of _____ in the endotracheal tube. a) Blood b) Mucus c) Water vapor d) Carbon dioxide Answer: b) Mucus 35. Apnea alarms are used in ventilators to detect the absence of _____. a) Heart rate b) Blood flow c) Breathing d) Oxygen supply Answer: c) Breathing 36. Ventilators are commonly used in patients with Acute Respiratory Distress Syndrome (ARDS) to prevent _____. a) Kidney failure b) Organ transplantation c) Lung collapse d) Dialysis Answer: c) Lung collapse 37. The primary goal of mechanical ventilation is to maintain adequate _____ exchange. a) Heat b) Oxygen and carbon dioxide c) Electrolyte d) Nutrient Answer: b) Oxygen and carbon dioxide 38. Invasive mechanical ventilation requires the use of an endotracheal or _____ tube. a) Nasogastric b) Tracheostomy c) Peripheral d) Catheter Answer: b) Tracheostomy 39. A ventilator mode that allows the patient to breathe spontaneously while providing support is known as _____. a) Assist-Control Mode b) Spontaneous Ventilation c) Pressure-Control Mode d) Synchronized Intermittent Mandatory Ventilation (SIMV) Answer: d) Synchronized Intermittent Mandatory Ventilation (SIMV) 40. In emergency situations, ventilators are essential for maintaining airway patency in patients with _____. a) Liver disease b) Heart failure c) Respiratory failure d) Kidney stones Answer: c) Respiratory failure 41. Non-invasive ventilation (NIV), such as CPAP and

BiPAP, is used primarily in patients with _____. a) Sleep apnea b) Kidney failure c) Liver cirrhosis d) Cardiac arrest Answer: a) Sleep apnea 42. A pressure-controlled ventilator is commonly used for patients with stiff lungs, such as those with _____. a) Pulmonary fibrosis b) Asthma c) Diabetes d) Anemia Answer: a) Pulmonary fibrosis 43. Tidal volume in a ventilator is adjusted based on the patient's _____ size and lung capacity. a) Age b) Body weight c) Blood group d) Oxygen level Answer: b) Body weight 44. The primary benefit of a high-frequency ventilator is its ability to deliver very small tidal volumes at a _____ rate. a) Slow b) High c) Irregular d) Fixed Answer: b) High 45. Prone positioning in ventilated patients improves oxygenation by redistributing _____. a) Carbon dioxide b) Lung perfusion c) Tidal volume d) Blood sugar Answer: b) Lung perfusion 46. A high-pressure alarm on a ventilator is usually triggered by _____. a) Disconnected tubing b) Airway obstruction c) Low tidal volume d) Leaks in the system Answer: b) Airway obstruction 47. A low-pressure alarm on a ventilator can indicate a _____ in the breathing circuit. a) Blockage b) Leak c) Blood clot d) Decreased oxygen demand Answer: b) Leak 48. If a ventilator's apnea alarm is activated, it means the patient has _____. a) Increased heart rate b) Stopped breathing c) High oxygen saturation d) Reduced airway resistance Answer: b) Stopped breathing 49. A low exhaled tidal volume alarm suggests that the patient is receiving _____ air than expected. a) More b) Less c) The same amount of d) Increased oxygen Answer: b) Less 50. A high respiratory rate alarm may indicate that the patient is experiencing _____. a) Hypoventilation b) Hyperventilation c) Stable breathing d) Decreased CO_2 levels Answer: b) Hyperventilation 51. A patient on a ventilator suddenly develops low oxygen saturation. The first step in troubleshooting should be to check the _____. a) Oxygen flow b) Heart rate c) Patient's glucose level d) Room temperature Answer: a) Oxygen flow 52. If a ventilator's power failure alarm is activated, the healthcare provider should immediately switch to a _____. a) Manual resuscitator (Ambu bag) b) CPAP machine c) High-flow nasal cannula d) Oxygen concentrator Answer: a) Manual resuscitator (Ambu bag) 53. A high peak inspiratory pressure (PIP) alarm may indicate increased airway resistance due to _____. a) Fluid retention b) Bronchospasm c) Decreased lung compliance d) Increased blood circulation Answer: b) Bronchospasm 54. A circuit disconnection is most likely to trigger a _____ alarm on a ventilator. a) High-pressure b) Low-pressure c) Apnea d) Battery failure Answer: b) Low-pressure 55. If a ventilator's oxygen alarm is triggered, it means the FiO_2 level is outside the _____ range. a) 0.1 - 0.2 b) 0.21 - 1.0 c) 1.5 - 2.0 d) 2.0 - 3.0 Answer: b) 0.21 - 1.0 56. Mechanical ventilation is commonly required in patients with severe _____ failure. a) Kidney b) Liver c) Respiratory d) Cardiac Answer: c) Respiratory 57. Non-invasive ventilation (NIV), such as CPAP or BiPAP, is preferred in patients with _____. a) Acute respiratory distress syndrome (ARDS) b) Sleep apnea c) Cardiac arrest d) Brain stroke Answer: b) Sleep apnea 58. Ventilators play a crucial role in managing patients with Acute Respiratory Distress

Syndrome (ARDS) by maintaining adequate _____. a) Blood pressure b) Oxygenation c) Digestion d) Muscle tone Answer: b) Oxygenation 59. Pressure-controlled ventilation (PCV) is used in cases where maintaining airway _____ is crucial. a) Resistance b) Pressure c) Flow d) Temperature Answer: b) Pressure 60. Volume-controlled ventilation (VCV) is preferred when the goal is to ensure a fixed _____ per breath. a) Tidal volume b) Pressure c) CO_2 level d) Lung expansion Answer: a) Tidal volume 61. High-frequency ventilation (HFV) is used primarily in patients with _____ lungs. a) Normal b) Collapsed c) Stiff or damaged d) Inflated Answer: c) Stiff or damaged 62. The main advantage of Adaptive Support Ventilation (ASV) is that it automatically adjusts based on the patient's _____. a) CO_2 levels b) Breathing effort c) Tidal volume d) Heart rate Answer: b) Breathing effort 63. Weaning from a ventilator involves gradually reducing ventilatory support to allow the patient to resume _____ breathing. a) Artificial b) Spontaneous c) Assisted d) Controlled Answer: b) Spontaneous 64. Intubation and mechanical ventilation are most commonly required in patients undergoing major _____ surgeries. a) Orthopedic b) Cardiac c) Skin graft d) Dental Answer: b) Cardiac 65. Tracheostomy ventilation is preferred for patients requiring long-term mechanical ventilation due to _____. a) Minor infections b) Chronic respiratory failure c) Diabetes d) Temporary lung collapse Answer: b) Chronic respiratory failure 66. Synchronized Intermittent Mandatory Ventilation (SIMV) allows the patient to breathe _____ between mandatory ventilator breaths. a) Normally b) Spontaneously c) With difficulty d) Under pressure Answer: b) Spontaneously 67. Pressure Support Ventilation (PSV) is commonly used to assist patients during _____ from mechanical ventilation. a) Weaning b) Surgery c) Intubation d) Oxygen therapy Answer: a) Weaning 68. High-flow nasal cannula (HFNC) therapy provides heated, humidified oxygen and is an alternative to _____. a) Invasive ventilation b) Intravenous therapy c) Blood transfusion d) Chemotherapy Answer: a) Invasive ventilation 69. Proportional Assist Ventilation (PAV) automatically adjusts support based on the patient's _____ demand. a) Oxygen b) Ventilatory c) Nutritional d) Hydration Answer: b) Ventilatory 70. Closed-loop ventilation systems use real-time monitoring and _____ to optimize respiratory support. a) AI-based algorithms b) Manual settings c) Physician intervention d) Blood transfusions Answer: a) AI-based algorithms Advanced Ventilator Technologies and Future Trends 21. The latest ventilator models incorporate closed-loop systems that automatically adjust settings based on real-time _____. a) Blood glucose b) Oxygen demand c) Blood flow d) Nutrient levels Answer: b) Oxygen demand 22. Adaptive Support Ventilation (ASV) automatically adjusts _____ to optimize patient comfort. a) Humidity b) Tidal volume c) Blood pressure d) FiO_2 Answer: b) Tidal volume 23. A wearable portable ventilator is designed for patients with chronic respiratory failure, such as those with _____. a) Hypertension b) COPD c) Diabetes d) Arthritis Answer: b) COPD 24. Smart ventilators use artificial intelligence to predict and prevent respiratory _____. a) Failure b) Infection c) Inflammation d) Paralysis

Answer: a) Failure 25. The integration of telemedicine with ventilators allows remote monitoring of _____ patients. a) Intubated b) Dialysis c) Non-ventilated d) Cardiac arrest Answer: a) IntubatedTypes of Deafness 1. Conductive hearing loss occurs due to problems in the _____. a) Inner ear b) Middle or outer ear c) Auditory nerve d) Brainstem Answer: b) Middle or outer ear 2. Sensorineural hearing loss is caused by damage to the _____. a) Eardrum b) Ossicles c) Cochlea or auditory nerve d) External ear canal Answer: c) Cochlea or auditory nerve 3. Mixed hearing loss is a combination of _____ and _____ hearing loss. a) Conductive, Sensorineural b) Neural, Conductive c) Auditory, Peripheral d) Genetic, Acquired Answer: a) Conductive, Sensorineural 4. Noise-induced hearing loss is an example of _____ hearing loss. a) Conductive b) Sensorineural c) Central d) Temporary Answer: b) Sensorineural 5. Otosclerosis is a condition that leads to _____ hearing loss due to abnormal bone growth in the middle ear. a) Sensorineural b) Conductive c) Central d) Mixed Answer: b) Conductive 6. The primary function of a hearing aid is to _____ sound. a) Block b) Reduce c) Amplify d) Transmit Answer: c) Amplify 7. The three main components of a hearing aid are the microphone, _____ and receiver. a) Speaker b) Amplifier c) Battery d) Electrode Answer: b) Amplifier 8. Behind-the-Ear (BTE) hearing aids are commonly used for _____ hearing loss. a) Mild b) Moderate c) Severe to profound d) Temporary Answer: c) Severe to profound 9. Completely-in-the-Canal (CIC) hearing aids are best suited for individuals with _____ hearing loss. a) Profound b) Moderate to severe c) Mild to moderate d) Total Answer: c) Mild to moderate 10. In-the-Ear (ITE) hearing aids fit completely inside the outer ear and are suitable for _____ hearing loss. a) Mild to severe b) Profound c) Temporary d) Conductive Answer: a) Mild to severe 11. The SISI test is used to detect _____ hearing loss. a) Conductive b) Neural c) Sensorineural d) Temporary Answer: c) Sensorineural 12. A positive SISI test result indicates a lesion in the _____. a) Middle ear b) Cochlea c) External auditory canal d) Tympanic membrane Answer: b) Cochlea 13. The SISI test is based on the ability to detect _____ increments in sound intensity. a) 1 dB b) 5 dB c) 10 dB d) 15 dB Answer: a) 1 dB 14. If a patient scores more than 75% in the SISI test, it suggests _____. a) Conductive hearing loss b) Normal hearing c) Cochlear damage d) Auditory nerve dysfunction Answer: c) Cochlear damage 15. Masking is used in audiometry to prevent the _____ ear from detecting sound presented to the test ear. a) Left b) Right c) Non-test d) Damaged Answer: c) Non-test 16. The most commonly used masking noise in audiometry is _____ noise. a) White b) Pink c) Narrow-band d) Brown Answer: c) Narrow-band 17. Effective masking is achieved when the masking noise is sufficient to prevent _____ conduction of sound. a) Air b) Bone c) Neural d) Vibration Answer: b) Bone 18. Over-masking occurs when the masking noise level is too _____. a) Low b) High c) Balanced d) Mild Answer: b) High 19. Under-masking results in the patient responding to sound detected through _____. a) Air conduction b) Bone conduction c) Electric stimulation d) External noise Answer: b) Bone conduction 20. Cochlear implants are used in patients with

_____ hearing loss. a) Conductive b) Sensorineural c) Mixed d) Temporary Answer: b) Sensorineural 21. A Bone Anchored Hearing Aid (BAHA) is most suitable for patients with _____ hearing loss. a) Conductive b) Neural c) Sensorineural d) Temporary Answer: a) Conductive 22. Middle ear implants are recommended for individuals who cannot wear _____ hearing aids. a) Cochlear b) In-the-Ear (ITE) c) Behind-the-Ear (BTE) d) Completely-in-the-Canal (CIC) Answer: c) Behind-the-Ear (BTE) 23. Hearing assistive devices such as FM systems and infrared systems help improve hearing in _____ environments. a) Quiet b) Noisy c) Water-based d) Underwater Answer: b) Noisy 24. Personal Sound Amplification Products (PSAPs) are different from hearing aids because they are not intended for _____ use. a) Medical b) Recreational c) Digital d) Wireless Answer: a) Medical 25. The main advantage of digital hearing aids over analog hearing aids is _____ processing of sound signals. a) Manual b) Automatic c) Electric d) Non-amplified Answer: b) Automatic 26. Cochlear implants are used to treat individuals with _____ hearing loss. a) Conductive b) Sensorineural c) Mixed d) Temporary Answer: b) Sensorineural 27. The main components of a cochlear implant include an external speech processor, a transmitter, and an _____. a) Electrode array b) Microphone c) Amplifier d) Hearing aid Answer: a) Electrode array 28. The electrode array of a cochlear implant is inserted into the _____. a) Tympanic membrane b) Auditory nerve c) Cochlea d) Middle ear Answer: c) Cochlea 29. Cochlear implants work by bypassing the damaged hair cells and directly stimulating the _____. a) Middle ear bones b) External ear c) Auditory nerve d) Brainstem Answer: c) Auditory nerve 30. The external speech processor of a cochlear implant is responsible for _____. a) Converting sound into electrical signals b) Amplifying sound c) Filtering noise d) Increasing pitch Answer: a) Converting sound into electrical signals 31. The power source for a cochlear implant is typically a _____. a) Rechargeable battery b) Solar cell c) Capacitor d) Inductive coil Answer: a) Rechargeable battery 32. Cochlear implants provide sound perception by stimulating the auditory nerve with _____. a) Electrical impulses b) Magnetic waves c) Sound waves d) Mechanical vibrations Answer: a) Electrical impulses 33. Bimodal hearing refers to using a cochlear implant in one ear and a _____ in the other ear. a) Middle ear implant b) Hearing aid c) Bone-anchored hearing aid d) FM system Answer: b) Hearing aid 34. Digital signal processing (DSP) in hearing aids helps improve _____. a) Sound quality b) Sound distortion c) Battery consumption d) Device weight Answer: a) Sound quality 35. The main advantage of digital hearing aids over analog hearing aids is the ability to _____. a) Amplify all sounds equally b) Filter background noise c) Reduce power consumption d) Work without batteries Answer: b) Filter background noise 36. Noise reduction algorithms in hearing aids help in reducing _____ noise. a) Background b) Speech c) Electrical d) Mechanical Answer: a) Background 37. Directional microphones in hearing aids help in _____. a) Amplifying background noise b) Reducing speech clarity c) Focusing on sounds from a specific direction d) Increasing echo Answer: c) Focusing on sounds from a specific

direction 38. Frequency transposition in digital hearing aids is used to shift _____ frequencies to a more audible range. a) Low b) High c) Medium d) Variable Answer: b) High 39. Automatic gain control (AGC) in hearing aids prevents _____ sounds from being uncomfortably loud. a) Soft b) High-pitched c) Sudden loud d) Background Answer: c) Sudden loud 40. Speech enhancement algorithms in hearing aids are designed to improve _____. a) Background noise levels b) Speech clarity c) Sound amplification d) Battery life Answer: b) Speech clarity 41. Bluetooth-enabled hearing aids allow direct audio streaming from _____. a) FM radio b) Landline phones c) Smartphones and televisions d) Power banks Answer: c) Smartphones and televisions 42. The main advantage of wireless hearing aids is improved _____. a) Battery life b) Connectivity to external devices c) Analog signal processing d) Echo generation Answer: b) Connectivity to external devices 43. Telecoils (T-coils) in hearing aids help users hear better in environments with _____. a) Wireless signals b) Loop induction systems c) Background noise d) Low frequency sounds Answer: b) Loop induction systems 44. FM systems in hearing aids are commonly used in _____. a) Noisy classrooms b) Quiet environments c) Underwater activities d) Mobile communication Answer: a) Noisy classrooms 45. Near-field magnetic induction (NFMI) technology is used in hearing aids for _____. a) Short-range wireless communication b) Long-distance signal transmission c) Speech processing d) Frequency transposition Answer: a) Short-range wireless communication 46. Rechargeable hearing aids use _____ batteries instead of traditional disposable ones. a) Lithium-ion b) Alkaline c) Nickel-cadmium d) Lead-acid Answer: a) Lithium-ion 47. AI-powered hearing aids use machine learning algorithms to adapt to _____. a) Different listening environments b) Battery voltage c) Static noise levels d) FM signals Answer: a) Different listening environments 48. Remote programming in modern hearing aids allows audiologists to adjust settings via _____. a) Mobile apps b) Physical tuning knobs c) Wired connections d) External speakers Answer: a) Mobile apps 49. Hearing aids with cloud connectivity allow users to store and access their settings via _____. a) Internet-based servers b) Local storage c) FM radio d) Infrared signals Answer: a) Internet-based servers 50. Bone conduction hearing aids are mainly used for individuals with _____. a) Sensorineural hearing loss b) Conductive hearing loss c) Temporary hearing impairment d) Tinnitus Answer: b) Conductive hearing loss 51. The primary function of a digital signal processor (DSP) in a hearing aid is to _____ sound signals. a) Digitally amplify b) Convert to analog c) Remove all noise d) Increase frequency Answer: a) Digitally amplify 52. Adaptive noise reduction (ANR) in hearing aids helps to minimize _____. a) Speech signals b) Background noise c) Microphone sensitivity d) Battery consumption Answer: b) Background noise 53. The spectral subtraction method is used in digital hearing aids to reduce _____ noise. a) Impulse b) White c) Stationary d) Reverberation Answer: c) Stationary 54. Time-frequency analysis in speech processing helps hearing aids distinguish between _____ and

background noise. a) Music b) Speech c) Echo d) Feedback Answer: b) Speech 55. Feedback cancellation systems in modern hearing aids use _____ techniques. a) Digital phase inversion b) Mechanical dampers c) Sound reflection d) Frequency distortion Answer: a) Digital phase inversion 56. Beamforming technology in hearing aids is used to enhance sound coming from _____. a) Any direction b) A specific direction c) Multiple speakers d) Background noise Answer: b) A specific direction 57. The Lombard effect refers to the automatic increase in speech loudness in response to _____. a) Loud environments b) Silent environments c) High frequencies d) Low energy signals Answer: a) Loud environments 58. Automatic Environment Classification (AEC) in hearing aids helps in adjusting settings based on _____. a) The user's age b) The surrounding environment c) The battery level d) Bluetooth connectivity Answer: b) The surrounding environment 59. Machine learning algorithms in hearing aids can adapt to different sound environments by using _____. a) Pre-set programs b) User feedback data c) Random adjustments d) Frequency inversion Answer: b) User feedback data 60. Multi-band compression is used in digital hearing aids to adjust amplification for different _____. a) Background noise levels b) Frequency bands c) Distortion levels d) Signal directions Answer: b) Frequency bands 61. Binaural synchronization in hearing aids helps to improve _____. a) Battery efficiency b) Stereo perception c) Single-ear hearing d) Low-frequency filtering Answer: b) Stereo perception 62. Echo cancellation in hearing aids is crucial for improving speech clarity in _____ environments. a) Quiet b) Large rooms c) Noisy outdoor d) Industrial Answer: b) Large rooms 63. Frequency-lowering technology in hearing aids helps individuals with severe _____ hearing loss. a) High-frequency b) Low-frequency c) Mid-frequency d) Conductive Answer: a) High-frequency 64. Real-time directional microphone switching allows hearing aids to automatically focus on the _____. a) Closest voice b) Background noise c) Louder sound d) All noises equally Answer: a) Closest voice 65. Dynamic range compression (DRC) in hearing aids prevents sounds from becoming _____. a) Too weak b) Uncomfortably loud c) Too high in pitch d) Delayed Answer: b) Uncomfortably loud 66. AI-powered hearing aids can automatically recognize and adjust for different _____. a) Speech accents b) Battery levels c) Temperature changes d) Hearing loss types Answer: a) Speech accents 67. Tele-audiology allows hearing aid users to receive remote assistance via _____. a) Bluetooth speakers b) Mobile apps c) FM radio d) Infrared signals Answer: b) Mobile apps 68. Directional microphones in hearing aids are most beneficial in _____. a) One-on-one conversations b) Crowded environments c) Quiet bedrooms d) Low-frequency sounds Answer: b) Crowded environments 69. Wireless streaming hearing aids allow users to receive sound directly from _____. a) Smart TVs b) Power sources c) Telephones d) Both a & c Answer: d) Both a & c 70. Hearing aids with tinnitus masking features generate _____ to help reduce tinnitus perception. a) Echoes b) White noise c) Digital delays d) Low-frequency waves Answer: b) White noise 71. Bone conduction hearing devices are

mainly used for people with _____ hearing loss. a) Sensorineural b) Conductive c) Temporary d) Mild Answer: b) Conductive 72. The use of cloud-based hearing aid software allows users to store _____. a) Personalized hearing settings b) Battery statistics c) Audio recordings d) Sound waves Answer: a) Personalized hearing settings 73. Rechargeable lithium-ion hearing aids have an average battery life of _____ hours per charge. a) 3-5 b) 12-24 c) 48-72 d) 100 Answer: b) 12-24 74. In-the-ear (ITE) hearing aids are different from behind-the-ear (BTE) models because they are _____. a) Smaller and fit inside the ear canal b) Larger with external components c) Less expensive d) Connected by wires Answer: a) Smaller and fit inside the ear canal 75. Hearing aids integrated with smart assistants can be controlled using _____. a) Voice commands b) Hand gestures c) Infrared signals d) Manual switches Answer: a) Voice commands1. Transcutaneous Electrical Nerve Stimulator (TENS) 1. TENS therapy is primarily used for _____ management. a) Blood pressure b) Pain c) Heart rate d) Digestion Answer: b) Pain 2. TENS works by delivering electrical pulses to the skin to stimulate _____. a) Muscles b) Nerve endings c) Bone marrow d) Blood vessels Answer: b) Nerve endings 3. The two main types of TENS stimulation are conventional TENS and _____ TENS. a) High-intensity b) Low-frequency c) Acupuncture-like d) Direct current Answer: c) Acupuncture-like 4. The main function of TENS is to block pain signals from reaching the _____. a) Spinal cord b) Brain c) Muscles d) Skin surface Answer: b) Brain 5. TENS devices work based on the _____ theory of pain modulation. a) Endorphin b) Gate control c) Frequency shifting d) Heat transfer Answer: b) Gate control 6. A major contraindication for TENS therapy is in patients with _____. a) High blood pressure b) Cardiac pacemakers c) Diabetes d) Muscle spasms Answer: b) Cardiac pacemakers 7. The most common frequency range used in TENS therapy is between _____ Hz. a) 1-10 b) 50-100 c) 200-500 d) 10,000-50,000 Answer: b) 50-100 8. The placement of TENS electrodes should be near the _____. a) Heart b) Pain source c) Spine d) Lungs Answer: b) Pain source 9. Biofeedback therapy helps individuals control physiological functions such as _____. a) Digestive enzyme secretion b) Blood sugar levels c) Heart rate and muscle tension d) Eye movement Answer: c) Heart rate and muscle tension 10. Electromyography (EMG) biofeedback measures the activity of _____. a) Neurons b) Muscles c) Blood vessels d) Skin cells Answer: b) Muscles 11. Electroencephalography (EEG) biofeedback is also known as _____ training. a) Muscle b) Brainwave c) Thermal d) Acoustic Answer: b) Brainwave 12. A common application of biofeedback is the treatment of _____. a) Fractures b) Chronic pain and stress c) Diabetes d) Bacterial infections Answer: b) Chronic pain and stress 13. The process of biofeedback involves using _____ to help patients understand their physiological functions. a) Computer software b) Electrical impulses c) Sound waves d) Manual stimulation Answer: a) Computer software 14. Thermal biofeedback monitors _____ to assess stress and circulation. a) Brain activity b) Skin temperature c) Heart rate d) Breathing pattern Answer:

b) Skin temperature 15. Heart rate variability (HRV) biofeedback is commonly used to improve _____. a) Blood sugar levels b) Cardiovascular health c) Digestion speed d) Body temperature Answer: b) Cardiovascular health 16. Galvanic Skin Response (GSR) biofeedback measures changes in _____. a) Brain waves b) Skin conductivity c) Muscle tone d) Blood pressure Answer: b) Skin conductivity 17. Point-of-care (POC) testing refers to diagnostic testing performed _____. a) In centralized laboratories b) Near the patient c) Only in hospitals d) By radiologists Answer: b) Near the patient 18. One of the main advantages of POC testing is _____. a) Faster results b) Higher complexity c) Larger equipment d) Increased sample requirements Answer: a) Faster results 19. A commonly used point-of-care diagnostic tool for diabetes is _____. a) ECG machine b) Blood glucose monitor c) MRI scanner d) Spirometer Answer: b) Blood glucose monitor 20. POC testing is especially useful in _____ settings. a) Remote and emergency b) Only in research labs c) Highly urbanized areas d) Dental clinics Answer: a) Remote and emergency 21. The main limitation of POC diagnostic devices compared to laboratory tests is their _____. a) Speed b) Accuracy and sensitivity c) Ease of use d) Availability Answer: b) Accuracy and sensitivity 22. Microfluidic lab-on-a-chip technology in POC testing allows for _____. a) Large sample processing b) Miniaturized chemical analysis c) MRI scans d) Long-term storage Answer: b) Miniaturized chemical analysis 23. Rapid antigen tests are commonly used for the detection of _____. a) Heart rate b) Infectious diseases c) Blood clotting disorders d) Diabetes Answer: b) Infectious diseases 24. A major benefit of wearable diagnostic devices is their ability to provide _____. a) Real-time monitoring b) Genetic analysis c) Complex tissue imaging d) Drug formulation Answer: a) Real-time monitoring 25. Portable ultrasound devices are an example of point-of-care testing for _____. a) Neurological disorders b) Imaging soft tissues c) Blood glucose monitoring d) Genetic screening Answer: b) Imaging soft tissues 26. The main goal of TENS therapy is to provide _____ pain relief. a) Permanent b) Temporary c) Surgical d) Invasive Answer: b) Temporary 27. TENS is most commonly used for treating _____ pain conditions. a) Acute b) Chronic c) Neuropathic d) All of the above Answer: d) All of the above 28. In TENS, the frequency range for acute pain relief is typically _____ Hz. a) 1-5 b) 10-20 c) 80-130 d) 500-1000 Answer: c) 80-130 29. The effectiveness of TENS therapy depends on factors such as _____ and electrode placement. a) Frequency b) Skin color c) Age d) Body weight Answer: a) Frequency 30. High-frequency TENS is thought to work by stimulating the release of _____. a) Adrenaline b) Cortisol c) Endorphins d) Serotonin Answer: c) Endorphins 31. The duration of a TENS therapy session typically lasts between _____ minutes. a) 1-5 b) 10-60 c) 100-120 d) 180-240 Answer: b) 10-60 32. TENS should not be applied to areas with _____. a) Muscle stiffness b) Open wounds c) Joint pain d) Swollen tissues Answer: b) Open wounds 33. The main objective of biofeedback is to help patients gain control over _____. a) Their breathing b) Their physiological responses c) Their movement coordination

d) Their genetic makeup Answer: b) Their physiological responses 34. Biofeedback can be useful for managing conditions such as _____. a) Hypertension b) Anxiety c) Chronic pain d) All of the above Answer: d) All of the above 35. A key component of biofeedback training involves monitoring and adjusting _____. a) Genetic markers b) Physiological signals c) Body weight d) Muscle mass Answer: b) Physiological signals 36. The physiological signals most commonly measured in biofeedback therapy include muscle activity, heart rate, and _____. a) Hair growth b) Skin conductivity c) Bone density d) Body temperature Answer: b) Skin conductivity 37. A common technique used in biofeedback to reduce stress and anxiety is _____ training. a) Soundwave b) Neurofeedback c) Muscle relaxation d) Resistance Answer: c) Muscle relaxation 38. In biofeedback, a person receives real-time information about their physiological state through _____. a) Electrical impulses b) Visual or auditory cues c) Chemical signals d) Genetic testing Answer: b) Visual or auditory cues 39. One of the primary benefits of biofeedback is that it helps reduce dependence on _____. a) Physical therapy b) Medications c) Exercise d) Diet plans Answer: b) Medications 40. Point-of-care (POC) testing allows for faster medical decisions because results are obtained in _____ time. a) Immediate b) Delayed c) 24-hour d) 7-day Answer: a) Immediate 41. A common example of a POC testing device is a _____ monitor. a) Blood glucose b) MRI c) CT scan d) X-ray Answer: a) Blood glucose 42. The primary advantage of point-of-care testing is its ability to provide diagnostic results with minimal _____. a) Equipment b) Accuracy c) Cost-effectiveness d) Patient involvement Answer: a) Equipment 43. Portable ECG monitors help in detecting _____ disorders outside clinical settings. a) Respiratory b) Neurological c) Cardiac d) Gastrointestinal Answer: c) Cardiac 44. The accuracy of point-of-care tests can be affected by _____ errors. a) Technical b) Environmental c) Operator d) All of the above Answer: d) All of the above 45. Wearable biosensors used for real-time monitoring often measure parameters such as _____. a) Blood oxygen levels b) Muscle size c) Weight gain d) Genetic changes Answer: a) Blood oxygen levels 46. One of the key components of point-of-care lab-on-a-chip technology is _____. a) Microfluidics b) Ultrasound waves c) X-ray beams d) Magnetic resonance Answer: a) Microfluidics 47. Rapid antigen tests are often used for diagnosing _____. a) Blood disorders b) COVID-19 and influenza c) Skin diseases d) Neurological conditions Answer: b) COVID-19 and influenza 48. The most important requirement for a point-of-care testing device is that it must be _____. a) Large and complex b) User-friendly and portable c) Expensive and hospital-based d) Heavy and automated Answer: b) User-friendly and portable 49. Handheld ultrasound devices are increasingly used in _____ settings for quick imaging. a) Remote and emergency b) Laboratory c) Cardiac surgery d) Genetic testing Answer: a) Remote and emergency 50. A wearable electrocardiogram (ECG) monitor helps in detecting _____ abnormalities. a) Liver b) Heart rhythm c) Skin d) Kidney Answer: b) Heart rhythm 51. TENS therapy primarily works by stimulating _____ to block pain

signals. a) Nerves b) Muscles c) Blood vessels d) Bones Answer: a) Nerves 52. The two main types of TENS stimulation are _____ and low-frequency. a) High-frequency b) Medium-frequency c) Low-voltage d) Variable-frequency Answer: a) High-frequency 53. The placement of TENS electrodes should be over or near the _____. a) Heart b) Painful area c) Bone structure d) Large blood vessels Answer: b) Painful area 54. TENS therapy should be avoided by individuals with _____ implants. a) Cochlear b) Pacemaker c) Dental d) Knee replacement Answer: b) Pacemaker 55. The sensation produced by TENS therapy is often described as a _____ feeling. a) Sharp pain b) Tingling c) Burning d) Numbness Answer: b) Tingling 56. TENS therapy can help reduce the use of _____ for pain management. a) Antibiotics b) Painkillers c) Vitamins d) Anti-inflammatory creams Answer: b) Painkillers 57. The effect of TENS therapy lasts for _____ after treatment stops. a) Minutes to hours b) Several days c) Weeks d) Permanently Answer: a) Minutes to hours 58. Biofeedback therapy is used to treat conditions related to _____ control. a) Involuntary physiological functions b) Genetic disorders c) Physical trauma d) Viral infections Answer: a) Involuntary physiological functions 59. One of the most commonly measured parameters in biofeedback is _____. a) Blood type b) Skin temperature c) Hormone levels d) Bone density Answer: b) Skin temperature 60. The technique used to measure muscle activity in biofeedback is called _____. a) Electroencephalography (EEG) b) Electromyography (EMG) c) Electrocardiography (ECG) d) Spirometry Answer: b) Electromyography (EMG) 61. Biofeedback therapy can be used to treat conditions like _____. a) Hypertension b) Insomnia c) Chronic pain d) All of the above Answer: d) All of the above 62. Neurofeedback is a specialized form of biofeedback that focuses on _____ activity. a) Muscle b) Brain wave c) Heart rate d) Lung capacity Answer: b) Brain wave 63. During a biofeedback session, a patient receives feedback in the form of _____. a) Visual or auditory cues b) Medication prescriptions c) Physical therapy exercises d) Dietary recommendations Answer: a) Visual or auditory cues 64. Biofeedback can be an effective non-drug treatment for _____. a) Migraines b) High blood pressure c) Anxiety d) All of the above Answer: d) All of the above 65. A commonly used biofeedback technique for stress management is _____. a) Deep breathing b) High-intensity exercise c) Antibiotic therapy d) Radiation therapy Answer: a) Deep breathing 66. Point-of-care (POC) testing is designed to provide rapid results at or near the _____. a) Laboratory b) Patient's location c) Pharmacy d) Research center Answer: b) Patient's location 67. A portable glucose meter is an example of a _____ diagnostic device. a) Hospital-based b) Point-of-care c) Laboratory-dependent d) High-tech Answer: b) Point-of-care 68. POC devices are widely used in emergency care because they provide results in _____. a) Days b) Hours c) Minutes d) Weeks Answer: c) Minutes 69. One major advantage of point-of-care testing is the reduction in _____ time. a) Cost b) Diagnosis c) Treatment d) Both b & c Answer: d) Both b & c 70. Wearable biosensors help in real-time monitoring of physiological

parameters such as _____. a) Blood pressure b) Oxygen saturation c) Heart rate d) All of the above Answer: d) All of the above 71. A key component of lab-on-a-chip technology used in POC testing is _____. a) X-ray imaging b) Microfluidics c) MRI scanning d) Radiation therapy Answer: b) Microfluidics 72. Portable ECG monitors are mainly used for detecting _____ abnormalities. a) Heart rhythm b) Blood sugar c) Kidney function d) Brain activity Answer: a) Heart rhythm 73. Point-of-care testing in rural areas improves healthcare by providing _____. a) Faster diagnosis b) Less accurate results c) Delayed treatment d) Limited patient monitoring Answer: a) Faster diagnosis 74. Handheld ultrasound devices allow for quick imaging in _____ settings. a) Remote and emergency b) Surgery c) Cancer treatment d) Dental clinics Answer: a) Remote and emergency 75. A key requirement for POC devices is that they must be _____. a) Large and complex b) Portable and easy to use c) Expensive and slow d) Heavy and automated Answer: b) Portable and easy to use