

A Sample Examination For Technicians

The following list of questions was compiled by surgeons in the Northern Mid-West region as information they would like their trainees to know before they become full-fledged technicians. It is **not** a complete examination but it is a step closer to a board examination and registry.

Portions of this examination are used in the training program at the University of Minnesota. It is suggested that all technicians attempt to complete his sample test and either have it corrected or correct it themselves by searching out the answers.

This is printed with the intention of stimulating interest in the compiling of a comprehensive examination and any suggestions or questions should be submitted to regional chairman or a national officer.

When answering the following questions, be specific and avoid generalities or meaningless verbiage:

1. Discuss briefly some of the differences between the normal human circulation and an extracorporeal circuit.
2. Briefly describe a few of the presently available oxygenators. What would you consider an ideal "oxygenator"?
3. Describe 3 or more different types of pumps with their advantages and disadvantages.
4. Define total body hypothermia and its purpose in the extracorporeal circuit. Discuss some of the advantages and disadvantages of hypothermia.
5. Describe the actions of the pump-oxygenator (the unit with which you are familiar) that require constant attention (reservoir levels, etc.) and why they are closely monitored by the technician. Give "trouble-shooting" data.
6. Define antiseptics and asepsis. Describe methods used for sterilization of pump oxygenator equipment. Define thermal and gas sterilization and chemical disinfection with present methods.
7. What is hemodilution and why is it used?

Cite some of the advantages and disadvantages of hemodilution.

8. Describe the use of the following drugs and solutions:
 - a) Digitalis
 - b) Isuprel
 - c) Pronestyl
 - d) Roe solution
 - e) Low Molecular Weight Dextran
 - f) 5% Dextrose in H₂O
 - g) Calcium Chloride
 - h) Potassium Chloride
 - i) Sodium Bicarbonate
 - j) Tham
 - k) Mannitol
 - l) Heparin
 - m) Protamine
 - n) Dibenzaline
9. What are the blood chemistry changes following cardiopulmonary bypass? Why do these changes occur? Why is heparinized blood preferred for priming of the pump oxygenator? Why not citrate or EDTA bank blood?
10. What is the purpose of a millipore filter, and where is it used?
11. What are the sources of hemolysis in the extracorporeal circuit? Which, do you feel, is the greatest?
12. What are the different factors determine the perfusion rate.
13. What is the purpose of obtaining both esophageal and rectal temperatures? Which is the core temperature?
14. What is the purpose of Ani-foam? What danger can arise from its usage?
15. Define coronary perfusion and its purpose. Name and describe four types of cannulae used.
16. List six types of cardiac valvular prostheses and give the outstanding characteristic of each.
17. Name three types of flexible tubing used in extracorporeal circuits and list the physical properties of each.
18. List at least four properties that materials used in extracorporeal circuits must possess.
19. Describe in detail the Kolff artificial kidney system.
20. Describe in detail the Kiiil artificial kidney system.

21. What are the differences between single-pass and recirculating both systems? Give the advantages and disadvantages of each.
22. What is an artificial "placenta" and why is it called that?
23. Define the following:
 - a) Ultra-filtration
 - b) osmolality
 - c) regional heparinization
 - d) isotonicity
 - e) pH
 - f) PO₂ and pCO₂
 - g) A-V difference
 - h) oliguria
 - i) dyspnea
 - j) hyper (and hypo) capnea
 - k) acidosis
 - l) alkalosis
 - m) osmotic pressure
 - n) ethylene oxide
 - o) benzalkonium chloride
 - p) polyvinyl chloride
 - q) dimethylsiloxane
 - r) heat exchanger
 - s) helix
 - t) heliarc welding
 - u) tissue perfusion
 - v) oxygen debt
 - w) IASD
 - x) hyperbaric oxygen therapy
 - y) systolic and diastolic pressure
 - z) titanium
 - aa) atherosclerosis
 - bb) aneroid manometer
 - cc) necrosis
 - dd) autolysis
 - ee) acute and chronic
 - ff) B.U.N.
 - gg) plasma hemoglobin
 - hh) pyrogenic
 - ii) SGOT
 - jj) hematocrit
 - kk) pulmonary edema
 - ll) ion
 - mm) electrolyte
 - nn) fibrillation
 - oo) endocarditis
 - pp) nephritis and glomerulonephritis
 - qq) A.C. and D.C.
 - rr) rectifier circuit
 - ss) gram
 - tt) micron
 - uu) stenosis
 - vv) aneurysm
 - ww) coarctation
 - xx) hypertension
 - yy) cardiac catheterization
 - zz) embolism