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 compiling 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 antisepsis and asepsis. Describe methods used for sterilization of pump oxygenator equipment.
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) Prostynyl
   d) Roc 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 the milipore 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 Anifom? 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 Kiil 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) helic arc 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) pyrogenic
   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