



Training 1
Course Code: BME390
Spring Semester Exam.



BME Program - Level 300
Exam Date: 10-5- 2018
Allowed Time: 2 Hours

Attempt all questions. Assume any missed data. Full mark is 50.

Q.1) Correct the errors, if any, in each of the following statements [15 Marks]

- i. Flow Cytometry is one principle used for hematology analyzers.
- ii. Antigen is used to identify and neutralize foreign objects.
- iii. Clinical engineer interacts with doctors in medical requirements.
- iv. Each medical device should be identified and tracked by its serial number.
- v. The purchase contract document is prepared by the financial department and reviewed by TAWG.
- vi. Medical technology life cycle is subdivided into two sub-cycles based on the sequence of the stages.
- vii. Technology management is one step of strategic planning of medical equipment management.
- viii. Meet specific standard could be one requirement for medical equipment acquisition.
- ix. Hematology department is the largest one in clinical laboratories.
- x. Prothrombin time test is carried out in clinical chemistry lab.
- xi. One disadvantage of in-house service is limited resources in terms of staff and equipment.
- xii. Replacement policy based on the expected life time of medical equipment follows capital budget cycle.
- xiii. The light source of visible spectrophotometer is a hydrogen lamp.
- xiv. The detector is used to convert radiant energy into electrical signal.
- xv. Laboratory oven temperature is 37° C.

Q.2.a) Write short notes on each of the following [20 Marks]

- i. The core functions of clinical engineering department?
- ii. Coulter's principle for automatic counting (Use neat sketches).
- iii. Possible usages of scrapped medical equipment?
- iv. Types of service contract.

Q.2.b) A particular sample of colored solution which obeys Beer's law shows 80% Transmittance when measured in a cell 1.0 cm breadth. Find: [5 Marks]

- a. The percent transmittance for the same solution of twice this concentration in the same cell.
- b. The absorptivity (a) of the solution if the original concentration was 0.005%

Q.3) Choose the best answer in each of the following

[10 Marks]

- 1- 3-part differential white cell counting include
 - a) Granulocytes, Lymphocytes, and Monocytes
 - b) Neutrophils, Basophils, and Eosinophil
 - c) Neutrophils, Monocytes, and Lymphocytes
- 2- Lambert's law relates the absorption of light to
 - a) Concentration of colored solution
 - b) Thickness of colored solution
 - c) Viscosity of colored solution
- 3- Of the following service modalities, free software upgrading for medical equipment is not available in
 - a) Contracted service
 - b) In-house service
 - c) Maintenance insurance
- 4- Name of the device, brand, and model must be mentioned in
 - a) Request for proposal.
 - b) Purchase contract.
 - c) General specifications.
- 5- The following is not considered a wavelength selector
 - a) Diffraction grating
 - b) Prism
 - c) Focusing lens
- 6- The maintenance actions that should be carried on a device are
 - a) Maintenance procedures
 - b) Maintenance frequencies
 - c) Maintenance categories
- 7- In laboratories, the refrigerators are working within temperature range
 - a) 2- 6 °C
 - b) 2- 8 °C
 - c) 4- 8°C
- 8- Compliance with specifications should be carried out in
 - a) Acquisition
 - b) Monitoring of use
 - c) Incoming inspection
- 9- In ELISA technique, the conjugate is
 - a) Enzyme labeled antibody
 - b) Antibody
 - c) Antigen
- 10- Increasing number of tests and decreasing mounts of samples and reagents are advantages of
 - a) Centrifuge
 - b) Automated chemistry analyzer
 - c) Microtome

☺My best wishes to all of you☺

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