Assignment 04
The due date for submitting this assignment has passed. Due on 2018-03-08, 00:00 IST.

Submitted assignment

1) As Temperature increases Dielectric constant value will
   - Decrease
   - Increase
   - First increases then decrease
   - None of the above

   **No, the answer is incorrect.**
   Score: 0
   Accepted Answers: Decrease

2) Capacitance probe performance is sensitive to
   - Particle shape and diameter
   - Humidity
   - Temperature
   - All the above

   **No, the answer is incorrect.**
   Score: 0
   Accepted Answers: All the above

3) What is the is solid concentration for measured voltage output at actual condition
   - $C_s = C_{pb} \frac{V - V_g}{V_{pb} - V_g}$
   - $C_s = C_{pb} \frac{V_{pb} - V_g}{V - V_g}$
   - $C_s = C_{pb} \frac{V - V_{pb}}{V_{pb} - V_g}$
   - None of the above

   **No, the answer is incorrect.**
   Score: 0
   Accepted Answers: $C_s = C_{pb} \frac{V - V_g}{V_{pb} - V_g}$

4) In Needle type conductance probe, the needle works as
   - $C_s = C_{pb} \frac{V - V_g}{V_{pb} - V_g}$
   - $C_s = C_{pb} \frac{V_{pb} - V_g}{V - V_g}$

   **No, the answer is incorrect.**
   Score: 0
   Accepted Answers: $C_s = C_{pb} \frac{V - V_g}{V_{pb} - V_g}$

https://onlinecourses.nptel.ac.in/noc18_ch18/unit?unit=100&assessment=101
5) Which of the following is correct regarding reflection type optical probe?  

- Emission and detection fibres are placed at the same side  
- Emission and detection fibres are placed opposite to each other  
- Emission fiber also works as detection fiber  
- None of the above

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
Sensing electrode

6) In optical fiber probes, what is time average volume fraction for a particular position

\[ < \varepsilon(x, t) > = \frac{1}{2T} \int_{t-\frac{T}{2}}^{t+\frac{T}{2}} M(x, t) \, dt \]

\[ < \varepsilon(x, t) > = \frac{1}{T} \int_{t-T}^{t} M(x, t) \, dt \]

\[ < \varepsilon(x, t) > = \frac{1}{T} \int_{t-\frac{T}{2}}^{t+\frac{T}{2}} M(x, t) \, dt \]

None of the above

No, the answer is incorrect.  
Score: 0  
Accepted Answers:

\[ < \varepsilon(x, t) > = \frac{1}{T} \int_{t-\frac{T}{2}}^{t+\frac{T}{2}} M(x, t) \, dt \]

7) In ECT, total number of measurements performed for n number of electrodes used in the experiment

\[ \frac{n - 1}{2} \]

\[ \frac{n + 1}{2} \]

\[ n \left\lfloor \frac{n - 1}{2} \right\rfloor \]

\[ n \left\lfloor \frac{n + 1}{2} \right\rfloor \]

No, the answer is incorrect.  
Score: 0  
Accepted Answers:
8) Which of the following is not an Image reconstruction algorithm?  
   - Linear Back Projection  
   - Algebraic Reconstruction Technique  
   - Filtered Back Projection Technique  
   - Monte Carlo  
   **No, the answer is incorrect.**  
   **Score: 0**  
   **Accepted Answers:**  
   - Monte Carlo

9) Out of these tomography techniques, which technique is having higher temporal resolution and lower spatial resolution?  
   - Electrical Capacitance Tomography  
   - X-Ray Tomography  
   - Positron Emission Tomography  
   - MRI  
   **No, the answer is incorrect.**  
   **Score: 0**  
   **Accepted Answers:**  
   - Electrical Capacitance Tomography

10) In a gas (air)-solid fluidized bed densitometry experiment source, detector and experimental set were arranged as shown in the figure. The experiment is performed at $2 \ U_{mf}$ velocity in which gas was passed through the bottom of the column and solids was in batch. The data is acquired at the center of the column (at $r=0$) where $r$ is the radial location.

Photon count recorded on the detector per unit time for an empty column is 9125, for packed bed is 6375 (assume packed bed void fraction is 0.4) and during the experiment is 8375. The linear attenuation coefficient of air is $10^{-5}$ cm$^{-1}$. Calculate the following:  
Find the linear attenuation coefficient of the solid in cm$^{-1}$

   - 1.24  
   - 0.15  
   - 0.012  
   - 0.005  
   **No, the answer is incorrect.**  
   **Score: 0**  
   **Accepted Answers:**  
   - 0.012

11) What will be the solid fraction of solid for the experimental condition

   - 0.055  
   - 0.142  
   - 0.263  
   **Score: 0**  
   **Accepted Answers:**  
   - 0.055
12. Find the mass attenuation coefficient (m²/kg) if the density of solid is 2500 kg/m³

- 0.192
- 0.142
- 4.76 x 10⁻⁶
- 9.55 x 10⁻⁶
- 6.55 x 10⁻⁶
- 1.04 x 10⁻⁶

No, the answer is incorrect.
Score: 0
Accepted Answers:
4.76 x 10⁻⁶

13. CT image detail can be affected by

- Size of detector
- Type of filter algorithm
- Medium attenuation
- All are correct

No, the answer is incorrect.
Score: 0
Accepted Answers:
All are correct

14. X-rays and Gamma rays have significant penetrating power due to their

- Shorter wavelength
- Wide range of wavelength
- Long wavelength
- Medium wavelength

No, the answer is incorrect.
Score: 0
Accepted Answers:
Shorter wavelength

15. X-ray generators produce radiation through

- Bremsstrahlung processes
- K-shell emission processes
- Radioactive decay
- Both a and b

No, the answer is incorrect.
Score: 0
Accepted Answers:
Both a and b

16. Which transform is used for reconstruction of images from CT scans data

- Radon inverse transform
- Fourier transform
- Both of the above
- None of the above
17) Pressure probe measurement interferes with gas/bubble flow behavior if
   - The diameter of probe is high
   - Purge flow is applied
   - Both of the above
   - None of the above

   **No, the answer is incorrect.**

   **Score:** 0

   **Accepted Answers:**
   - Both of the above

18) Filtered back projection method uses
   - Radon transform
   - Fourier slice transform
   - Both of the above
   - None of the above

   **No, the answer is incorrect.**

   **Score:** 0

   **Accepted Answers:**
   - Both of the above

19) Suitable projection for 2D Computed Tomography technique is
   - Parallel projection
   - Fan beam projection
   - Cone beam projection
   - Both b and c

   **No, the answer is incorrect.**

   **Score:** 0

   **Accepted Answers:**
   - Both b and c

20) Technique used for measurement of molecular-scale RTD
   - MRI
   - ECT
   - X ray Tomography
   - Impedance tomography

   **No, the answer is incorrect.**

   **Score:** 0

   **Accepted Answers:**
   - MRI

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I have completed this unit.

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