

## Unit 12 - Week 11

## Course outline

## How to access the portal?

## Week 1

## Week 2

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## Week 11

- Microscopy
- Contrast in Microscopy, Fluorescence Microscopy
- Fluorescence Microscopy & Application
- Principle of NMR

 Quiz : Assignment 11

 Feedback Form

## Week 12

## Download Videos (mp4,flv,3gp,mp3)

## Lecture Slides

## Assignment 11

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

Due on 2019-10-16, 23:59 IST.

 1) For a nucleus with nuclear spin quantum number  $I = \frac{1}{2}$ , what are the values of  $m_I$ ?

1 point

- $+\frac{1}{2}, +1$   
  $+\frac{1}{2}, 0$   
  $+\frac{1}{2}, -\frac{1}{2}$   
  $0, +1$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $+\frac{1}{2}, -\frac{1}{2}$

2) Which of the nuclei set include only spin active nuclei?

1 point

- $^2\text{H}, ^{12}\text{C}, ^{19}\text{F}$   
  $^1\text{H}, ^{12}\text{C}, ^{19}\text{F}$   
  $^1\text{H}, ^2\text{H}, ^{12}\text{C}$   
  $^1\text{H}, ^{13}\text{C}, ^{19}\text{F}$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $^1\text{H}, ^{13}\text{C}, ^{19}\text{F}$

3) NMR is the study of the absorption of \_\_\_\_\_ by nuclei in a magnetic field.

1 point

- Radioactive radiation  
 IR radiation  
 Radio frequency radiation  
 Microwave radiation

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Radio frequency radiation

4) The amount of energy available in radio frequency radiation is sufficient for which of the following?

1 point

- Excite an atom  
 Affect the nuclear spin of an atom  
 Vibrate an atom  
 Vibrate a molecule

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Affect the nuclear spin of an atom

5) Nuclei having either the number of protons or neutrons as odd have \_\_\_\_\_ spin.

1 point

- Half integral spin  
 Integral spin  
 Zero spin  
 Positive spin

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Half integral spin

6) When placed in a magnetic field, all the random spins of the nuclei:

1 point

- Misalign  
 reverse direction  
 align with the magnetic field  
 rotate to  $90^\circ$  away from the induced field

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
align with the magnetic field

7) Resolving power of a microscope is a function of \_\_\_\_\_.

1 point

- Only Wavelength of light used  
 Only Numerical aperture of lens system  
 Refractive index  
 Wavelength of light used and numerical aperture of lens system

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Wavelength of light used and numerical aperture of lens system

8) Which statement is incorrect:

1 point

- Smaller the de Broglie wavelength, higher the resolution.  
 Resolving power is directly related to numerical aperture.  
 Larger the de Broglie wavelength, higher the resolution.  
 The higher the NA the greater the resolution.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Larger the de Broglie wavelength, higher the resolution.

9) Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?

1 point

- Eyepiece lens  
 Condenser lens  
 Objective lens  
 Magnifying lens

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Condenser lens

10) Choose the correct match:

1 point

- |                                      |                                |
|--------------------------------------|--------------------------------|
| 1. Lifetime measurement              | I. Photo bleaching             |
| 2. Acceptor emission depolarization  | II. FLIM                       |
| 3. Fluorescence quenching microscopy | III. Fluorescence polarization |

- 1(III), 2(II), 3(I)  
 1(II), 2(I), 3(III)  
 1(II), 2(III), 3(I)  
 1(III), 2(I), 3(II)

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
1(II), 2(III), 3(I)

11) The instrument that produces a bright image of the specimen against a dark background is called a(n) \_\_\_\_\_ microscope.

1 point

- phase-contrast  
 transmission electron  
 Bright-field  
 Dark-field

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Dark-field

12) If you were given a specimen of an active, motile microorganism, which of the following types of microscopy would be the most effective in visualizing the live microbe?

1 point

- bright-field microscopy  
 dark-field microscopy  
 fluorescence microscopy  
 phase-contrast microscopy

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
phase-contrast microscopy

13) What do phase-contrast and dark-field microscopes have in common?

1 point

- They increase contrast between the specimens and their surroundings without staining.  
 They make specimens appear bright on a dark background.  
 They make specimens appear dark on a bright background.  
 They make specimens fluoresce.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
They increase contrast between the specimens and their surroundings without staining.

14) In this experiment, fluorescent molecules are irreversibly photobleached in a small area of the cell by high intensity illumination with a focused laser beam. Subsequently, diffusion of the surrounding non-bleached fluorescent molecules into the bleached area leads to recovery of fluorescence with a particular velocity. The experiment is known as

1 point

- FLIP  
 FRAP  
 FLIM  
 FRET

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
FRAP

15) FLIM is based on

1 point

- the measurement of intensity.  
 the measurement of polarization.  
 the measurement of life time.  
 the quenching of fluorescence on photobleaching.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
the measurement of life time.