

# Unit 2 - Week 1

**Register for Certification exam**

**Course outline**

**How to access the portal**

**Week 1**

- Introduction to EMC - Definitions
- Introduction to EMC - Sources, units etc
- Introduction to EMC
- Electromagnetic principles - Faraday's and Ampere's equations
- Electromagnetic principles - Gauss's equation, boundary conditions
- Quiz : Assignment 1
- Week 1 Lecture material
- Week - 1 Feedback Form

**Week 2**

**Week 3**

**Week 4**

**Week 5**

**Week 6**

**Week 7**

**Week 8**

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## Assignment 1

The due date for submitting this assignment has passed. **Due on 2019-03-13, 23:59 IST**  
As per our records you have not submitted this assignment.

- 1) The typical impulse waveshape of an Electrostatic Discharge between Human body and metal has a rise-time of the order of
- 10 nanoseconds
  - 10 micro-seconds
  - 10 milli-seconds
  - 100 micro-seconds
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*10 nanoseconds*
- 2) Express 20 mV in dB $\mu$ V
- 26 dB $\mu$ V
  - 78 dB $\mu$ V
  - 39 dB $\mu$ V
  - 86 dB $\mu$ V
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*86 dB $\mu$ V*
- 3) Express 50 $\mu$ A in dBmA
- 26 dBmA
  - +26 dBmA
  - 94 dBmA
  - 13 dBmA
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*-26 dBmA*
- 4) Express 250 mW in dB $\mu$ W
- 24 dB $\mu$ W
  - 108 dB $\mu$ W
  - 54 dB $\mu$ W
  - 6 dB $\mu$ W
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*54 dB $\mu$ W*
- 5) Express 56 dBmA in A
- 631 A
  - 0.631 A
  - 63.1 A
  - 398 A
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*0.631 A*
- 6) Express 108 dB $\mu$ V/m in V/m
- 251.2 V/m
  - 63096 V/m
  - 251200 V/m
  - 0.2512 V/m
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*0.2512 V/m*
- 7) Express -23 dBW in mW
- 5000 mW
  - 71 mW
  - 5 mW
  - 0.071 mW
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*5 mW*
- 8) Express the wave length of 2 GHz computer clock fundamental frequency in glass epoxy with relative permittivity of 4.7
- 6.92 m
  - 0.0692 m
  - 0.0319 m
  - 3.19 m
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*0.0692 m*
- 9) A coaxial cable connecting a source with a receiver is 0.8 meters long. There is a noise with dominant frequency of 900 MHz superimposed on the desired signal. The relative permittivity of cable insulation is 2.3 and relative magnetic permeability is 1. Which statement below is correct?
- The cable is 'electrically short' for the noise signal.
  - The cable is 'electrically long' for the noise signal.
  - The cable is neither 'electrically short' nor 'electrically long' for the noise signal.
  - Insufficient data to answer the question.
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*The cable is 'electrically long' for the noise signal.*
- 10) Which of the following statements regarding 'common-mode current' and 'differential mode currents' in an overhead distribution line are true.
- Normal power supply (between phase and neutral) is in 'common mode'
  - When subjected to distant lightning electromagnetic fields, overvoltages are induced in all the lines and these create primarily 'common-mode currents' in the line.
  - In general, 'common-mode' and 'differential mode' currents can be present at the same time.
  - In general, common-mode currents are larger than differential-mode currents.
- All statements i), ii), iii), and iv) are true
  - Only i) and iv) are true
  - Only ii), iii, and iv) are true
  - Only ii) and iii) are true
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*Only ii) and iii) are true*
- 11) What is the SI unit for Magnetic flux density, B
- A/m
  - V/m
  - $Wb/m^2$
  - Wb/m
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
 *$Wb/m^2$*
- 12) What is the SI unit for Electric flux density, D
- V/m
  - $C/m^2$
  - C/m
  - $C/m^3$
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
 *$C/m^2$*
- 13) What is the SI unit for Magnetic field intensity, H
- A/m
  - V/m
  - $Wb/m^2$
  - Wb/m
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*A/m*
- 14) What is the SI unit for Electric field intensity, E
- V/m
  - $C/m^2$
  - C/m
  - $C/m^3$
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*V/m*
- 15) If an imaginary surface is closing to on itself with an opening (shape of a bag with an opening) situated in a vector field, what can you say about the closed line integral of the vector field along the opening.
- Cannot say anything from the information given.
  - Equal to the net flux of the curl of the vector field coming out of the surface.
  - Equal to the net flux of the vector field coming out of the surface.
  - Equal to the sum of all divergence of the vector field in the volume bounded by the surface
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*Equal to the net flux of the curl of the vector field coming out of the surface.*
- 16) Which of the following statements are true.
- In general, the integral of electric field intensity E between two points are path independent
  - The total magnetic field flux coming out of a closed surface is zero
  - The total electric field flux coming out of a closed surface need not be zero
  - The amount of electric current leaving a closed surface is equal in magnitude to the rate of change of total charge enclosed by the surface.
- All statements are true
  - Only i), ii) and iv) are true
  - Only ii), iii), iv) are true
  - Only i), iii) and iv) are true
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*Only ii), iii), iv) are true*
- 17) Compute the divergence of the vector field  $\vec{E} = yz\hat{x} + zy\hat{y} + xz\hat{z}$
- x + y
  - x + z
  - y + z
  - x + y + z
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*x + z*
- 18) Compute the curl of the vector field  $\vec{E} = xy\hat{x} + 2zy\hat{y} - \hat{z}$
- $-2y\hat{x} - x\hat{z}$
  - $+2y\hat{x} + x\hat{z}$
  - $-2y\hat{y} - x\hat{z}$
  - $+2y\hat{x} + x\hat{y}$
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
 *$-2y\hat{x} - x\hat{z}$*
- 19) Which of the following statements are true.
- The external magnetic field interaction with a circuit can be modelled primarily as a voltage source in series with that circuit
  - The external electric field interaction with a circuit can be modelled primarily as a voltage source in series with that circuit
  - The external magnetic field interaction with a circuit can be modelled primarily as a current source in series with that circuit
  - The external electric field interaction with a circuit can be modelled primarily as a current source in parallel with that circuit
- Only i) and iii) are true
  - Only ii) and iii) are true
  - Only iii) and iv) are true
  - Only i) and iv) are true
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*Only i) and iv) are true*
- 20) Which of the following statements are true regarding boundary condition between two dielectric media.
- The tangential components of the electric field intensity vector  $\vec{E}$  are the same at the boundary in both media
  - The tangential components of the magnetic field intensity vector  $\vec{H}$  are the same at the boundary in both media
  - The tangential components of the electric flux density vector  $\vec{D}$  are the same at the boundary in both media
  - The tangential components of the magnetic flux density vector  $\vec{B}$  are the same at the boundary in both media
- Only iii) and iv) are true
  - Only ii) and iii) are true
  - Only i) and iv) are true
  - Only i) and ii) are true
- No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
*Only i) and ii) are true*

Previous Page

End