Unit 3 - Week 2

Assignment 2

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

Due on 2019-03-13, 23:59 IST

1) A 10 MHz wave is travelling in iron with a conductivity is 0.58x107 S/m and relative permeability 500. The skin depth δ is ..... x 10^{-6} m.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 2.8,3.1

1 point

2) A 10 MHz wave is travelling in iron with a conductivity $\sigma = 0.58x10^7$ S/m and relative permeability 500. The phase velocity v is ..... m/s.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 185,187

1 point

3) A 10 MHz wave is travelling in iron with a conductivity $\sigma = 0.58x10^7$ S/m and relative permeability 500. The wavelength λ is ..... x 10^{-5} m.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.8,1.9

1 point

4) A 10 MHz wave is travelling in iron with a conductivity $\sigma = 0.58x10^7$ S/m and relative permeability 500. The intrinsic impedance oft he metal η is ..... ohm.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.08,0.09

1 point

5) A 10 MHz uniform plane wave is travelling in a lossless dielectric medium of relative permittivity 3.5. Assume relative permeability to be 1. The phase constant β is ..... x 10^2 rad/m

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.38,0.41

0 points

6) A 10 MHz uniform plane wave is travelling in a lossless dielectric medium of relative permittivity 3.5. Assume relative permeability to be 1. The intrinsic impedance of the medium η is ..... ohms.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 200,204

1 point

7) A 10 MHz uniform plane wave is travelling in a lossless dielectric medium of relative permittivity 3.5. Assume relative permeability to be 1. The phase velocity v is ..... x 10^8 . m/s.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.5,1.7

1 point

8) Identify all the true statements from among the following regarding wavelength of electromagnetic signal in a **metal**, with other parameters kept constant except the one changed

1 point

i) Wavelength increases when frequency is decreased
ii) Wavelength increases when magnetic permeability is increased
iii) Wavelength increases when conductivity is decreased
iv) Wavelength is unaffected by changes in magnetic permeability

- Statements (i, iii) and iv) are true
- Statements i), ii) and iii) are true
- Only statements i) and iii) are true
- Only statements i) and iv) are true

No, the answer is incorrect.
Score: 0
Accepted Answers:
Only statements i) and iii) are true

9) A very long coaxial cable with 50 ohms surge impedance is terminated in another very long coaxial cable of 75 ohms surge impedance. The free ends of the cables are terminated in its own surge impedance. A surge voltage of +100 V peak is travelling along the 50 ohm cable and incident on the 75 ohm cable. The peak of the reflected voltage wave into 50 ohm line from the junction is ..... V (**the correct polarity + or – should be indicated.**)

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) +20

1 point

10) A very long coaxial cable with 50 ohms surge impedance is terminated in another very long coaxial cable of 75 ohms surge impedance. The free ends of the cables are terminated in its own surge impedance. A surge voltage of +100 V peak is travelling along the 50 ohm cable and incident on the 75 ohm cable. The peak of the reflected current wave into 50 ohm line from the junction is ..... A (**the correct polarity + or – should be indicated.**)

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) -0.4

1 point

11) A very long coaxial cable with 50 ohms surge impedance is terminated in another very long coaxial cable of 75 ohms surge impedance. The free ends of the cables are terminated in its own surge impedance. A surge voltage of +100 V peak is travelling along the 50 ohm cable and incident on the 75 ohm cable. The peak reflected power into 50 ohm line from the junction is ..... W (**the correct polarity + or – should be indicated.**)

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) -8

1 point

12) A very long coaxial cable with 50 ohms surge impedance is terminated in another very long coaxial cable of 75 ohms surge impedance. The free ends of the cables are terminated in its own surge impedance. A surge voltage of +100 V peak is travelling along the 50 ohm cable and incident on the 75 ohm cable. The peak of the transmitted voltage wave into 75 ohm line from the junction is ..... V (**the correct polarity + or – should be indicated.**)

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) +120

1 point

13) A very long coaxial cable with 50 ohms surge impedance is terminated in another very long coaxial cable of 75 ohms surge impedance. The free ends of the cables are terminated in its own surge impedance. A surge voltage of +100 V peak is travelling along the 50 ohm cable and incident on the 75 ohm cable. The peak of the transmitted current wave into 75 ohm line from the junction is ..... A (**the correct polarity + or – should be indicated.**)

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) +1.6

1 point

14) A very long coaxial cable with 50 ohms surge impedance is terminated in another very long coaxial cable of 75 ohms surge impedance. The free ends of the cables are terminated in its own surge impedance. A surge voltage of +100 V peak is travelling along the 50 ohm cable and incident on the 75 ohm cable. The peak transmitted power into 75 ohm line from the junction is ..... W (**the correct polarity + or – should be indicated.**)

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) +192

1 point

15) For a frequency of 1.433 MHz, the wave impedance of fields from an electric dipole at a distance of 10 m is ..... Ω

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 3800,4200

1 point

16) For a frequency of 1.433 MHz, the wave impedance of fields from a magnetic loop (dipole) at a distance of 10 m is ..... Ω

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 110,130

1 point

17) Identify the true statement regarding wave impedance of fields from an electric dipole.

1 point

- In the near-field, approximately, proportional to the distance
- In the near-field, approximately proportional to the dielectric constant (permittivity of the medium)
- In the near-field, approximately proportional to the frequency
- In the far-field, approximately a constant value.

No, the answer is incorrect.
Score: 0
Accepted Answers:
In the far-field, approximately a constant value.

18) Identify the false statement regarding wave impedance of fields from a magnetic dipole

1 point

- In the near-field, approximately, inversely proportional to the distance
- In the near field, approximately proportional to the magnetic permeability of the medium
- In the near-field, approximately proportional to the frequency
- In the far-field, approximately a constant value.

No, the answer is incorrect.
Score: 0
Accepted Answers:
In the near-field, approximately, inversely proportional to the distance

19) Which of the following statements are true, regarding a transmission line that can support TEM waves. The circuit representation of the transmission line has series distributed parameters resistance (R) and inductance (L), and shunt distributed parameters conductance (G) and capacitance C. The medium between conductors are characterized by conductivity, permeability and permittivity (σ, μ, ε), respectively.

1 point

i) The presence of G make it not pure TEM (only qasi-TEM)
ii) The presence of R make it not pure TEM (only qasi-TEM)
iii) LC = με
iv) G/C = σ/ε

- Only iii) and iv) are true
- Only ii), iii) and iv) are true
- Only i) and ii) are true
- Only i), iii) and iv) are true

No, the answer is incorrect.
Score: 0
Accepted Answers:
Only ii), iii) and iv) are true

20) Which of the following statements are true, regarding a transmission line that can support TEM waves. The circuit representation of the transmission line has series distributed parameters resistance (R) and inductance (L), and shunt distributed parameters conductance (G) and capacitance C. The medium between conductors are characterized by conductivity, permeability and permittivity (σ, μ, ε), respectively. Assume a lossless transmission line, that is R=0, G=0.

1 point

i) The speed of the wave is given by $1/\sqrt{LC}$.
ii) The surge or characteristic impedance is given by $\sqrt{(L/C)}$
iii) The speed of the wave is given by $1/\sqrt{\mu\varepsilon}$.
iv) In general, the ratio of instantaneous voltage and current will be the same as the characteristic impedance.

- All statements are true
- Only i) and ii) are true.
- Only i), ii), and iii) are true
- Only i), ii) and iv) are true.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Only i), ii), and iii) are true

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