

**RLA ACADEMY**

**ELECTRICAL | ELECTRONICS**

ENGINEERING

Useful for

**TNPSC & TNMAWS**

Assistant Engineer

**MULTIPLE CHOICE  
QUESTIONS BANK**



with

**4000+**

**MCQ'S**

Unit wise PDF material  
7 units covered

**BASED ON  
AE EXAM  
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❖ Includes Unit wise  
Technical Subjects

USEFUL FOR

**AE | SSC JE | RRB JE**



unit 7 Analog & Digital Electronics\_w...

Modified Dec 4, 2023



unit 4 Control System & Communica...

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UNIT 9 DIGITAL PROCESSORS & CO...

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unit 8 Power Electronics\_watermark...

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unit 3 Measurements and instrumen...

Modified Dec 4, 2023



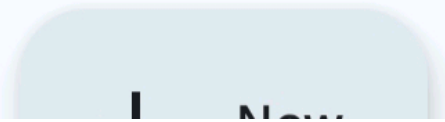
unit 2 Electronic Magnetic fields\_wa...

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unit 1 Electronic circuits\_watermark....

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## 1. ELECTRICAL CIRCUITS

### PRACTICE SECTION-01

1. At room temperature the current in an intrinsic semiconductor is due to

- (A) holes
- (B) electrons
- (C) ions
- (D) holes and electrons

Answer: Option (D)

Explanation:

Intrinsic material has equal number of holes and electrons.

2. Work function is the maximum energy required by the fastest electron at 0 K to escape from the metal surface.

- (A) True
- (B) False

Answer: Option (B)

Explanation:

Work function is the minimum energy required by the fastest electron at 0 K to escape from the metal surface.

3. The most commonly used semiconductor material is

- (A) silicon
- (B) germanium
- (C) mixture of silicon and germanium
- (D) none of the above

Answer: Option (A)

Explanation:

Germanium is rarely used.



## 1.ELECTRO & MAGNETIC FIELDS

### PRACTICE SECTION-01

1.  $Z_L = 200 \Omega$  and it is desired that  $Z_i = 50 \Omega$  The quarter wave transformer should have a characteristic impedance of

- (A)  $100 \Omega$
- (B)  $40 \Omega$
- (C)  $10000 \Omega$
- (D)  $4 \Omega$

Answer: Option (A)

Explanation:

$$Z_0 = \sqrt{Z_i \cdot Z_L}$$

2. A broadside array consisting of 200 cm wavelength with 10 half-wave dipole spacing 10 cm. And if each array element feeding with 1 amp. current and operating at same frequency then find the half power beamwidth

- (A)  $4^\circ$
- (B)  $2^\circ$
- (C)  $10^\circ$
- (D)  $15^\circ$

Answer: Option (B)

Explanation:

$$\text{HPBW} = \frac{\text{BWFN}}{2} \Rightarrow \frac{2\lambda}{nd \cdot 2} \Rightarrow \frac{\lambda}{nd}$$

$$\Rightarrow d = \frac{\lambda}{20} \Rightarrow \text{HPBW} = \frac{20}{10} \Rightarrow 2^\circ.$$

3. Refractive index of glass is 1.5. Find the wavelength of a beam of light with a frequency of  $10^{14}$  Hz in glass. Assume velocity of light is  $3 \times 10^8$  m/sec in vacuum.

- (A)  $4 \mu\text{m}$
- (B)  $3 \mu\text{m}$
- (C)  $2 \mu\text{m}$

## 1. MEASUREMENTS & INSTRUMENTATION

### PRACTICE SECTION-01

1. To increase Q factor of a coil, the wire should be

- Ⓐ long
- Ⓑ thin
- Ⓒ thick
- Ⓓ long and thin

**Answer:** Option Ⓒ

**Explanation:**

Q is high if resistance is low. Therefore, wire should be thick.

2. An ammeter of 0-25 A range has a guaranteed accuracy of 1% of full scale reading. The current measured is 5 A. The limiting error is

- Ⓐ 2%
- Ⓑ 2.5%
- Ⓒ 4%
- Ⓓ 5%

**Answer:** Option Ⓓ

**Explanation:**

$$\text{Error} = \frac{25 \times 1}{100} = 0.25 \text{ A,}$$

$$\% \text{error} = \frac{0.25}{5} \times 100 = 5\% .$$

3. The coil of a moving iron instrument has a resistance of 500 Ω and an inductance of 1 H. It reads 250 V when a 250 V dc is applied. If series resistance is 2000 Ω, its reading when fed by 250 V, 50 Hz ac will be

- Ⓐ 260 V
- Ⓑ 252 V
- Ⓒ 250 V
- Ⓓ 248 V

**Answer:** Option Ⓓ

**Explanation:**

$$\text{Meter current for d.c} = \frac{250}{2000 + 500} = 0.1 \text{ A}$$

$$\text{Meter current for a.c} = \frac{250}{2500 + j314.16} = 0.09922 \text{ A}$$

$$\text{Reading} = \frac{0.09922}{0.1} \times 250 = 248 \text{ V}$$

4. In 3 phase power measurement by two wattmeter method, the reading of one wattmeter is zero. The power factor of load is

- Ⓐ 1
- Ⓑ 0.5
- Ⓒ 0
- Ⓓ 0.8

**Answer:** Option Ⓑ

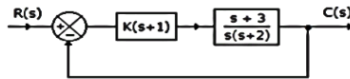
**Explanation:**

When p.f. = 0.5,  $\theta = 60^\circ$  and one of the wattmeters reads zero.

## 1.CONTROL SYSTEMS

### PRACTICE SECTION-01

1. For the system in the given figure the characteristic equation is



- Ⓐ  $1 + \frac{K(s+1)(s+3)}{s(s+2)} = 0$
- Ⓑ  $1 + \frac{K(s-1)(s-3)}{s(s-2)} = 0$
- Ⓒ  $K(s+1)(s+3) = 0$
- Ⓓ  $s(s+2) = 0$

Answer: Option Ⓐ

Explanation:

$$\text{Transfer function} = \frac{K(s+1) \cdot \frac{(s+3)}{s(s+2)}}{1 + \frac{K(s+1)(s+3)}{s(s+2)}}$$

Hence characteristic equation is  $1 + \frac{K(s+1)(s+3)}{s(s+2)} = 0$ .

2. Mechanical impedance is the ratio of

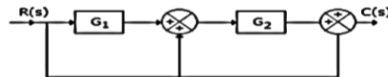
- Ⓐ rms force to rms velocity
- Ⓑ rms force to rms displacement
- Ⓒ rms velocity to rms displacement
- Ⓓ none of the above

Answer: Option Ⓐ

Explanation:

In force voltage analogy force is analogous to voltage and velocity to current. Just as  $\frac{V}{I} = Z$ , force/velocity = mechanical impedance.

3. For the system in the given figure. The transfer function  $C(s)/R(s)$  is



- Ⓐ  $G_1 + G_2 + 1$
- Ⓑ  $G_1 G_2 + 1$
- Ⓒ  $G_1 G_2 + G_2 + 1$
- Ⓓ  $G_1 G_2 + G_1 + 1$

Answer: Option Ⓒ

Explanation:

Transfer function =  $(G_1 + 1) G_2 + 1 = G_1 G_2 + G_2 + 1$ .

4. Whether a linear system is stable or unstable that it

- Ⓐ is a property of the system only
- Ⓑ depends on the input function only
- Ⓒ both (a) and (b)
- Ⓓ either (a) or (b)

Answer: Option Ⓐ

Explanation:

Stability is a property of the system only.

5. For the system of the given figure the transfer function  $\frac{E_o(s)}{E_i(s)} =$



## 1. ANALOG & DIGITAL ELECTRONICS

### PRACTICE SECTION-01

1. To prevent a DC return between source and load, it is necessary to use

- Ⓐ resistor between source and load
- Ⓑ inductor between source and load
- Ⓒ capacitor between source and load
- Ⓓ either (a) or (b)

Answer: Option Ⓒ

Explanation:

Capacitor offers infinite impedance to DC.

2. For a base current of  $10 \mu\text{A}$ , what is the value of collector current in common emitter if  $\beta_{dc} = 100$

- Ⓐ  $10 \mu\text{A}$
- Ⓑ  $100 \mu\text{A}$
- Ⓒ  $1 \text{ mA}$
- Ⓓ  $10 \text{ mA}$

Answer: Option Ⓒ

Explanation:

$$I_c = 10 \times 100 \mu\text{A} = 1 \text{ mA.}$$

3. Which of the following oscillators is suitable for frequencies in the range of mega hertz?

- Ⓐ RC phase shift
- Ⓑ Wien bridge
- Ⓒ Hartley
- Ⓓ Both (a) and (c)

Answer: Option Ⓒ

Explanation:

Only LC oscillators are suitable for MHz range.

4. If the input to the ideal comparator shown in the figure is a sinusoidal signal of  $8 \text{ V}$  (peak to peak) without any DC component, then the output of the comparator has a duty cycle of

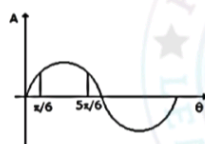


- Ⓐ  $1/2$
- Ⓑ  $1/3$
- Ⓒ  $1/6$
- Ⓓ  $1/12$

Answer: Option Ⓑ

Explanation:

$$\text{Duty cycle} = \frac{T_{\text{ON}}}{T} \Rightarrow \frac{\pi - \frac{\pi}{6} - \frac{\pi}{6}}{2\pi} = \frac{1}{3}$$



## 1. POWER ELECTRONICS

### PRACTICE SECTION-1

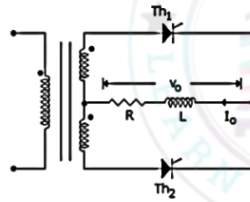
1. A cycloconverter can be
- A step down
  - B step up
  - C step down or step up
  - D none of the above

Answer: Option C

Explanation:

The output frequency can be more or less than input frequency.

2. In the below figure the average load current is 15 A. The rms value of transformer secondary current is



- A 15 A
- B 10.61 A
- C 7.5 A
- D 14.14 A

Answer: Option B

Explanation:

$$\text{RMS secondary current} = \frac{15}{\sqrt{2}} = 15/1.414 = 10.608 \text{ A.}$$

3. In a 3 phase fully controlled converter the firing frequency is

- A 3 times the line frequency
- B 6 times the line frequency
- C 9 times the line frequency
- D 12 times the line frequency

Answer: Option B

Explanation:

It is a 6 pulse converter.

4. Two thyristor of same rating and same specifications
- A will have equal turn on and turn off periods
  - B will have equal turn on but unequal turn off periods
  - C may have equal or unequal turn on and turn off periods
  - D will have unequal turn on and turn off periods

Answer: Option C

Explanation:

Turn on and turn off times of similar SCRs may not be same.



## 1.DIGITAL PROCESSORS & COMMUNICATION

### PRACTICE SECTION-01

1. Which of the following can be accessed only sequentially?

- Ⓐ Floppy disk
- Ⓑ Hard disk
- Ⓒ Magnetic tape
- Ⓓ ROM

**Answer:** Option Ⓒ

**Explanation:**

Magnetic tape can be accessed only sequentially.

2. MICR stands for

- Ⓐ Magnetic Ink Chart Receipt
- Ⓑ Magnetic Ink Character Recognition
- Ⓒ Magnetic Ink Chart Recognition
- Ⓓ Magnetic Ink Character Receipt

**Answer:** Option Ⓑ

**Explanation:**

Magnetic ink character recognition is used in banking.

3. 8085 has 6 sign flags.

- Ⓐ True
- Ⓑ False

**Answer:** Option Ⓑ

**Explanation:**

It has one sign flag S.

4. JCOKE = 3

JCOKE = JCOKE + 1

GO TO (5, 8, 9, 11, 15, 16 18, 20) JCOKE.