

# Electronics & Communication <http://isbigdeal.blogspot.com>

**1 A system has poles at 0.01 Hz, 1 Hz and 80 Hz; zeros at 5 Hz, 100 Hz and 200 Hz. The approximate phase of the system-response at 20 Hz is**

- A)  $-90^\circ$
- B)  $0^\circ$
- C)  $90^\circ$
- D)  $-180^\circ$

**Answer : (A)**

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**2 In an abrupt p-n junction, the doping concentrations on the p-side and n-side are  $N_A = 9 \times 10^{16}/\text{cm}^3$  and  $N_D = 1 \times 10^{16}/\text{cm}^3$  respectively. The p-n junction is reverse biased and the total depletion width is 3 mm. The depletion width on the p-side is**

- A) 2.7 mm
- B) 0.3 mm.
- C) 2.25 mm
- D) 0.75 mm

**Answer : (B)**

**3 A master-slave flip-flop has the characteristic that**

- A) change in the input immediately reflected in the output
- B) change in the output occurs when the state of the master is affected
- C) change in the output occurs when the state of the slave is affected
- D) both the master and the slave states are affected at the same time

**Answer : (C)**

**4 A parallel plate air-filled capacitor has plate area of  $10^{-4} \text{ m}^2$  and plate separation of  $10^{-3} \text{ m}$ . It is connected to a 0.5 V, 3.6 GHz source. The magnitude of the displacement current is ( $\epsilon_0 = 1/36\pi \times 10^{-9} \text{ F/m}$ )**

- A) 10 mA
- B) 100 mA
- C) 10 A
- D) 1.59 mA

**Answer : (A)**

**5 The phase velocity of an electromagnetic wave propagating in a hollow metallic rectangular waveguide in the TE<sub>10</sub> mode is**

- A) equal to its group velocity
- B) less than the velocity of light in free space
- C) equal to the velocity of light in free space
- D) greater than the velocity of light in free space

**Answer : (D)**

**6 Noise with uniform power spectral density of  $N_0 \text{ W/Hz}$  is passed through a filter  $H(\omega) = 2 \exp(-j\omega t_d)$  followed by an ideal low pass filter of bandwidth  $B \text{ Hz}$ . The output noise power in Watts is**

- A)  $2N_0B$

- B)  $4N_0B$   
C)  $eN_0B$   
D)  $16 N_0B$

**Answer : (B)**

**7 The cascade amplifier is a multistage configuration of**

- A) CC-CB  
B) CE-CB  
C) CB-CC  
D) CE-CC

**Answer : (B)**

**8 Consider a lossless antenna with a directive gain of +6dB. If 1 mW of power is fed to it the total power radiated by the antenna will be**

- A) 4 mW  
B) 1 mW  
C) 7 mW  
D) 1/4 mW

**Answer : (A)**

**9 The bandgap of Silicon at room temperature is**

- A) 1.3 eV  
B) 0.7 eV  
C) 1.1 eV  
D) 1.4 eV

**Answer : (C)**

**10 In a PCM system, if the code word length is increased from 6 to 8 bits, the signal to quantization noise ratio improves by the factor**

- A) 8/6  
B) 12  
C) 16  
D) 8

**Answer : (C)**

**11 A device with input  $x(t)$  and output  $y(t)$  is characterized by:  $y(t) = x^2(t)$ . An FM signal with frequency deviation of 90 kHz and modulating signal bandwidth of 5 kHz is applied to this device. The bandwidth of the output signal is**

- A) 370 kHz  
B) 190 kHz  
C) 380kHz  
D) 95kHz

**Answer : (C)**

**12 For the polynomial  $P(s) = s^5 + s^4 + 2s^3 + 2s^2 + 3s + 15$ , the number of roots which lie in the right half of the s-plane is**

- A) 4
- B) 2
- C) 3
- D) 1

**Answer : (B)**

**13 An AM signal is detected using an envelope detector. The carrier frequency and modulating signal frequency are 1 MHz and 2 kHz respectively. An appropriate value for the time constant of the envelope detector is**

- A) 500 msec
- B) 20 msec
- C) 0.2 msec
- D) 1 msec

**Answer : (B)**

**14 In a PCM system, if the code word length is increased from 6 to 8 bits, the signal to quantization noise ratio improves by the factor**

- A) 8/6
- B) 12
- C) 16
- D) 8

**Answer : (C)**

**15 Consider the following statements S1 and S2.**

**S1: The  $\beta$  of a bipolar transistor reduces if the base width is increased.**

**S2: The  $\beta$  of a bipolar transistor increases if the doping concentration in the base is increased. Which one of the following is correct?**

- A) S1 is FALSE and S2 is TRUE
- B) Both S1 and S2 are TRUE
- C) Both S1 and S2 are FALSE
- D) S1 is TRUE and S2 is FALSE

**Answer : (D)**