Electronics & Communication

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°
B) 0°
C) 90°
D) - 180°
Answer : (A)

2 In an abrupt p-n junction, the doping concentrations on the p-side and n-side are NA = 9x 1016/cm3 and ND = 1 x 1016/cm3 respectively. The p-n junction is reverse biased and the total depletion width is 3 m m. 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 l0-4 m2 and plate separation of 10-3 m. It is connected to a 0.5 V, 3.6 GHz source. The magnitude of the displacement current is (e0 = 1/36p x 10-9 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 TE10 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 N0W/Hz is passed through a filter H (w) = 2 exp(-jwtd) followed by an ideal low pass filter of bandwidth BHz. 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) = x2(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) = s5 + s4 + 2s3 + 2s2 + 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 b of a bipolar transistor reduces if the base width is increased.
S2: The b 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)