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ADC MID-TERM TEST

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Multiple Choice Questions
Total Time : 45 minutes

* Required

NAME: *

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Q1. The ratio between the modulating signal voltage and the carrier voltage is called? * 1 point

- Amplitude modulation
- Modulation frequency
- Modulation index
- Ratio of modulation

Q2. What is the percentage of modulation if the modulating signal is of 75V and carrier is of 5V? * 1 point

- 100
- 50
- 60.00
- 0

Q3. What is the modulation index value if V max= 5.5Vs and V min= 1.2v ? * 1 point

- 0.5
- 0.462
- 0.425
- 0.14

Q4. An AM signal is detected using an envelope detector. The carrier frequency and modulation signal frequency are 1MHz and 2 kHz respectively. An appropriate value for the time constant of the envelope detector is ? 1 point

- 500 μsec
- 0.25 μsec
- 20 μsec
- 1 μsec

Q5. * 2 points

A 250-W signal is generated using the noise source x(t) and AM modulating input s(t). The average 250-W SBDSC signal is

$x(t)$

- Option 1

$[x(t)]$

- Option 2

$x(t)\cos\omega_c t$

- Option 3

$x(t)\cos t$

- Option 4

Q6. * 2 points

A combined signal is given by
$x(t) = 5\cos(2\pi 10t) + 10\cos(2\pi 20t)$
Where 10 and 20 are the frequencies of 10kHz and 20kHz respectively. The bandwidth of the combined signal is kHz is

- 10
- 15
- 20
- 30

Q7. A 1MHz unsuscide carrier is amplitude modulated by a symmetrical square wave of period 100 μsec. Which of the following frequencies will not be present in the modulated signal? * 1 point

- 990 kHz
- 1010 kHz
- 1020 kHz
- 1030 kHz

Q8. * 1 point

The Hilbert transform of $\cos\omega_c t + \sin\omega_c t$ is

$\sin\omega_c t - \cos\omega_c t$

- Option 1

$\sin\omega_c t + \cos\omega_c t$

- Option 2

$\cos\omega_c t - \sin\omega_c t$

- Option 3

$\sin\omega_c t + \sin\omega_c t$

- Option 4

Q9. The Nyquist sampling rate for the signal $g(t) = 10\cos(50\pi t)\cos(200\pi t)$, where t is in seconds is * 2 points

- 150 samples per second
- 200 samples per second
- 300 samples per second
- 350 samples per second

Q10. The quantization will be finer when * 1 point

- Smaller the number of discrete amplitudes
- Larger the number of discrete amplitudes
- Does not depend on amplitudes
- None of the mentioned

Q11. Which one of the following statements about differential pulse code modulation (DPCM) is true? 2 points

- The sum of message signal sample with its predictions quantized
- The message signal samples directly quantized, and its prediction is not used
- The difference of message signal sample and its past samples is quantized
- The difference of message signal with its predictions quantized

Q12. The amplitude of a sinusoidal signal is "uniformly distributed" between -4V and +4V. If the number of quantization levels sets required to uniformly quantizing the signal is 43.5dB, the step size of the quantization is approximately * 2 points

- 0.0625 V
- 0.25 V
- 0.0667 V
- 0.125 V

Q13. The signal to quantization noise ratio (SQNR) in an n-bit PCM system * 2 points

- depends upon the sampling frequency employed
- is independent of the value of 'n'
- increasing with increasing value of 'n'
- decreases with the increasing value of 'n'

Q14. Find the Nyquist rate and Nyquist interval for the signal $f(t) = 1 + \sin 4\pi 2t$ * 2 points

- 200 Hz, 0.1msec
- 200 Hz, 5.5 msec
- 20 Hz, 0.1msec
- 5 Hz, 5msec

Q15. * 2 points

A sinusoidal signal $x(t) = 2\sin(2\pi 2000t)$ is used to quantize a given signal uniformly in 8 levels. Which $x_q(t)$ is the QT signal? Assume the step size is 0.5 V and the signal is sampled at the Nyquist rate. The normalized power in the quantization error is

- 1/3
- 1/4
- 1/2
- 1/6

Q16. Companding in PCM system leads to gives improved value of SQNR. This improvement is for * 1 point

- Lower frequency components
- Higher frequency components
- Lower amplitudes only
- Higher amplitudes only

Q17. A CDMA signal has frequency band of 861-894 MHz. The minimum possible rate at which the signal is to be sampled is * 1 point

- 66 MHz
- 51.00 MHz
- 1738 MHz
- 1788 MHz

Q18. Increase(s)aular width in the flat top sampling leads to * 1 point

- attenuation of high frequencies in reproduction
- attenuation of low frequencies in reproduction
- Greater aliasing error in reproduction
- No harmful effects in reproduction

Q19. In a PCM system if the number of bits used are increased from n to 5, then the SQNR improves by the factor * 1 point

- 3/5
- 12
- 16
- 6

Q20. A signal with amplitude between -3 V to +5 V and bandwidth 4 kHz is sampled at the Nyquist rate. The sample is quantized and represented by 8 bits. The number of quantization levels required to reduce the quantization noise by a factor of 8 would be * 2 points

- 1024
- 512
- 256
- 64

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