Results for sample extra2016 test paper

Your answers are marked like this:

✔ **A. You got this question right, this is your correct answer.**

x *A. You got this question wrong, this is your incorrect answer.*

✔ *A. You got this question wrong, this is the correct answer.*

✔ **A. You didnt answer this question but this would be the correct answer.**

Subelement E0

1: E0A06
Why are there separate electric (E) and magnetic (H) field MPE limits?
A. The body reacts to electromagnetic radiation from both the E and H fields
B. Ground reflections and scattering make the field impedance vary with location
C. E field and H field radiation intensity peaks can occur at different locations
✔ **D. All of these choices are correct**

Subelement E1

2: E1A04
With your transceiver displaying the carrier frequency of phone signals, you hear a DX station calling CQ on 3.601 MHz LSB. Is it legal to return the call using lower sideband on the same frequency?
A. Yes, because the DX station initiated the contact
B. Yes, because the displayed frequency is within the 75 meter phone band segment
✔ **C. No, the sideband will extend beyond the edge of the phone band segment**
D. No, U.S. stations are not permitted to use phone emissions below 3.610 MHz

3: E1B08
What limitations may the FCC place on an amateur station if its signal causes interference to domestic broadcast reception, assuming that the receivers involved are of good engineering design?
A. The amateur station must cease operation
B. The amateur station must cease operation on all frequencies below 30 MHz
C. The amateur station must cease operation on all frequencies above 30 MHz
✔ **D. The amateur station must avoid transmitting during certain hours on**

frequencies that cause the interference

4: E1C10

What types of amateur stations may automatically retransmit the radio signals of other amateur stations?

A. Only beacon, repeater or space stations

✔ **B. Only auxiliary, repeater or space stations**

C. Only earth stations, repeater stations or model craft

D. Only auxiliary, beacon or space stations

5: E1D03

What is a telecommand station in the amateur satellite service?

A. An amateur station located on the Earth's surface for communication with other Earth stations by means of Earth satellites

✔ **B. An amateur station that transmits communications to initiate, modify or terminate functions of a space station**

C. An amateur station located more than 50 km above the Earth's surface

D. An amateur station that transmits telemetry consisting of measurements of upper atmosphere

6: E1E03

What is a Volunteer Examiner Coordinator?

A. A person who has volunteered to administer amateur operator license examinations

B. A person who has volunteered to prepare amateur operator license examinations

✔ **C. An organization that has entered into an agreement with the FCC to coordinate amateur operator license examinations**

D. The person who has entered into an agreement with the FCC to be the VE session manager

7: E1F10

What is the maximum permitted transmitter peak envelope power for an amateur station transmitting spread spectrum communications?

A. 1 W

B. 1.5 W

✔ **C. 10 W**

D. 1.5 kW

Subelement E2

8: E2A05

What do the letters in a satellite's mode designator specify?

A. Power limits for uplink and downlink transmissions

B. The location of the ground control station

C. The polarization of uplink and downlink signals

✔ **D. The uplink and downlink frequency ranges**

9: E2B11

What is the function of the Vertical Interval Signaling (VIS) code sent as part of an SSTV transmission?

xA. To lock the color burst oscillator in color SSTV images

✔ **B. To identify the SSTV mode being used**

C. To provide vertical synchronization

D. To identify the call sign of the station transmitting

10: E2C08

Which of the following contacts may be confirmed through the U.S. QSL bureau system?

A. Special event contacts between stations in the U.S.

✔ **B. Contacts between a U.S. station and a non-U.S. station**

C. Repeater contacts between U.S. club members

D. Contacts using tactical call signs

11: E2D10

How can an APRS station be used to help support a public service communications activity?

A. An APRS station with an emergency medical technician can automatically transmit medical data to the nearest hospital

B. APRS stations with General Personnel Scanners can automatically relay the participant numbers and time as they pass the check points

✔ **C. An APRS station with a GPS unit can automatically transmit information to show a mobile station's position during the event**

D. All of these choices are correct

12: E2E09

Which of the following HF digital modes uses variable-length coding for bandwidth efficiency?

A. RTTY

B. PACTOR

C. MT63

✔ **D. PSK31**

Subelement E3

13: E3A16

Which of the following best describes electromagnetic waves traveling in free space?

A. Electric and magnetic fields become aligned as they travel

B. The energy propagates through a medium with a high refractive index

C. The waves are reflected by the ionosphere and return to their source

✔ **D. Changing electric and magnetic fields propagate the energy**

14: E3B12

What is the primary characteristic of chordal hop propagation?

A. Propagation away from the great circle bearing between stations

✔ **B. Successive ionospheric reflections without an intermediate reflection from the ground**

C. Propagation across the geomagnetic equator

D. Signals reflected back toward the transmitting station

15: E3C03

Which of the following signal paths is most likely to experience high levels of absorption when the A index or K index is elevated?

A. Transequatorial propagation

✔ **B. Polar paths**

C. Sporadic-E

D. NVIS

Subelement E4

16: E4A06

What is the effect of aliasing in a digital or computer-based oscilloscope?

✔ **A. False signals are displayed**

B. All signals will have a DC offset

C. Calibration of the vertical scale is no longer valid

D. False triggering occurs

17: E4B07

What do the subscripts of S parameters represent?

✔ **A. The port or ports at which measurements are made**

B. The relative time between measurements

C. Relative quality of the data

D. Frequency order of the measurements

18: E4C13

How does a narrow-band roofing filter affect receiver performance?

A. It improves sensitivity by reducing front end noise

B. It improves intelligibility by using low Q circuitry to reduce ringing

✔ **C. It improves dynamic range by attenuating strong signals near the receive frequency**

D. All of these choices are correct

19: E4D09

What is the purpose of the preselector in a communications receiver?

x A. To store often-used frequencies

B. To provide a range of AGC time constants

✔ **C. To increase rejection of unwanted signals**

D. To allow selection of the optimum RF amplifier device

20: E4E01

Which of the following types of receiver noise can often be reduced by use of a receiver noise blanker?

✔ **A. Ignition noise**

B. Broadband white noise

C. Heterodyne interference

D. All of these choices are correct

Subelement E5

21: E5A10

How is the Q of an RLC series resonant circuit calculated?

✔ **A. Reactance of either the inductance or capacitance divided by the resistance**

B. Reactance of either the inductance or capacitance times the resistance

C. Resistance divided by the reactance of either the inductance or capacitance

D. Reactance of the inductance times the reactance of the capacitance

22: E5B06

What is susceptance?

A. The magnetic impedance of a circuit

B. The ratio of magnetic field to electric field

✔ **C. The inverse of reactance**

D. A measure of the efficiency of a transformer

23: E5C07

What is a vector?

A. The value of a quantity that changes over time

✔ **B. A quantity with both magnitude and an angular component**

C. The inverse of the tangent function

D. The inverse of the sine function

24: E5D04

Why are short connections necessary at microwave frequencies?

A. To increase neutralizing resistance

✔ **B. To reduce phase shift along the connection**

C. Because of ground reflections

xD. To reduce noise figure

Subelement E6

25: E6A08

What term indicates the frequency at which the grounded-base current gain of a transistor has decreased to 0.7 of the gain obtainable at 1 kHz?

A. Corner frequency
B. Alpha rejection frequency
C. Beta cutoff frequency
✔ **D. Alpha cutoff frequency**

26: E6B05

What characteristic of a PIN diode makes it useful as an RF switch or attenuator?

A. Extremely high reverse breakdown voltage
B. Ability to dissipate large amounts of power
xC. Reverse bias controls its forward voltage drop
✔ **D. A large region of intrinsic material**

27: E6C12

What is BiCMOS logic?

A. A logic device with two CMOS circuits per package
B. A FET logic family based on bimetallic semiconductors
C. A logic family based on bismuth CMOS devices
✔ **D. An integrated circuit logic family using both bipolar and CMOS transistors**

28: E6D01

How many turns will be required to produce a 5-microhenry inductor using a powdered-iron toroidal core that has an inductance index (A L) value of 40 microhenrys/100 turns?

✔ **A. 35 turns**
B. 13 turns
C. 79 turns
D. 141 turns

29: E6E01

Which of the following is true of a charge-coupled device (CCD)?

A. Its phase shift changes rapidly with frequency
B. It is a CMOS analog-to-digital converter
✔ **C. It samples an analog signal and passes it in stages from the input to the output**
D. It is used in a battery charger circuit

30: E6F07

What is a solid state relay?

A. A relay using transistors to drive the relay coil
✔ **B. A device that uses semiconductors to implement the functions of an electromechanical relay**
C. A mechanical relay that latches in the on or off state each time it is pulsed
D. A passive delay line

Subelement E7

31: E7A10

What is a truth table?

A. A table of logic symbols that indicate the high logic states of an op-amp
B. A diagram showing logic states when the digital device output is true
✔ **C. A list of inputs and corresponding outputs for a digital device**
D. A table of logic symbols that indicate the logic states of an op-amp

32: E7B08

How can an RF power amplifier be neutralized?

A. By increasing the driving power
B. By reducing the driving power
✔ **C. By feeding a 180-degree out-of-phase portion of the output back to the input**
D. By feeding an in-phase component of the output back to the input

33: E7C07

What kind of filter would you use to attenuate an interfering carrier signal while receiving an SSB transmission?

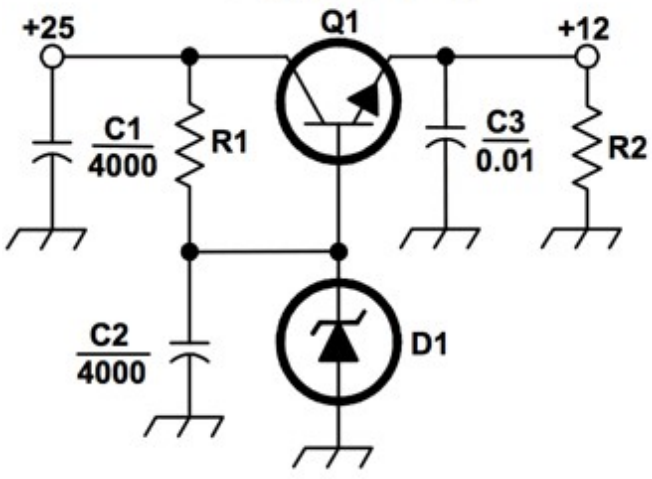
A. A band-pass filter
✔ **B. A notch filter**
C. A Pi-network filter
D. An all-pass filter

34: E7D06

What is the purpose of Q1 in the circuit shown in Figure E7-3?

A. It provides negative feedback to improve regulation
B. It provides a constant load for the voltage source
✔ **C. It increases the current-handling capability of the regulator**
D. It provides D1 with current

Figure E7- 3



35: E7E02

What is the function of a reactance modulator?

A. To produce PM signals by using an electrically variable resistance
B. To produce AM signals by using an electrically variable inductance or capacitance
C. To produce AM signals by using an electrically variable resistance
✔ **D. To produce PM signals by using an electrically variable inductance or capacitance**

36: E7F12
What digital process is applied to I and Q signals in order to recover the baseband modulation information?
✔ **A. Fast Fourier Transform**
B. Decimation
C. Signal conditioning
D. Quadrature mixing

37: E7G03
What is the typical input impedance of an integrated circuit op-amp?
A. 100 ohms
B. 1000 ohms
C. Very low
✔ **D. Very high**

38: E7H03
How is positive feedback supplied in a Hartley oscillator?
✔ **A. Through a tapped coil**
B. Through a capacitive divider
C. Through link coupling
D. Through a neutralizing capacitor

Subelement E8

39: E8A04
What is "dither" with respect to analog to digital converters?
A. An abnormal condition where the converter cannot settle on a value to represent the signal
✔ **B. A small amount of noise added to the input signal to allow more precise representation of a signal over time**
C. An error caused by irregular quantization step size
D. A method of decimation by randomly skipping samples

40: E8B10
What describes frequency division multiplexing?
A. The transmitted signal jumps from band to band at a predetermined rate
✔ **B. Two or more information streams are merged into a baseband, which then modulates the transmitter**
C. The transmitted signal is divided into packets of information
D. Two or more information streams are merged into a digital combiner, which then pulse

position modulates the transmitter

41: E8C06

What is the necessary bandwidth of a 170-hertz shift, 300-baud ASCII transmission?

A. 0.1 Hz
B. 0.3 kHz
✔ **C. 0.5 kHz**
D. 1.0 kHz

42: E8D02

What spread spectrum communications technique uses a high speed binary bit stream to shift the phase of an RF carrier?

xA. Frequency hopping
✔ **B. Direct sequence**
C. Binary phase-shift keying
D. Phase compandored spread spectrum

Subelement E9

43: E9A18

What term describes station output, taking into account all gains and losses?

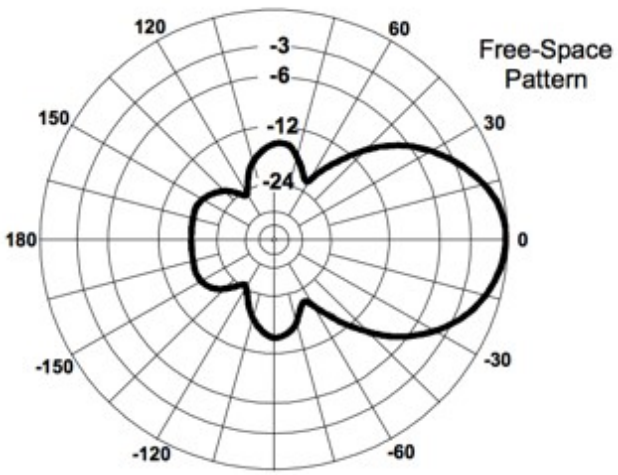
xA. Power factor
B. Half-power bandwidth
✔ **C. Effective radiated power**
D. Apparent power

44: E9B02

In the antenna radiation pattern shown in Figure E9-1, what is the front-to-back ratio?

A. 36 dB
✔ **B. 18 dB**
C. 24 dB
D. 14 dB

Figure E9-1



45: E9C12

Which of the following describes an extended double Zepp antenna?

A. A wideband vertical antenna constructed from precisely tapered aluminum tubing
B. A portable antenna erected using two push support poles
✔ **C. A center fed 1.25 wavelength antenna (two 5/8 wave elements in phase)**
D. An end fed folded dipole antenna

46: E9D06

What happens to the bandwidth of an antenna as it is shortened through the use of loading coils?

A. It is increased
✔ **B. It is decreased**
C. No change occurs
D. It becomes flat

47: E9E04

What is the purpose of the series capacitor in a gamma-type antenna matching network?

A. To provide DC isolation between the feed line and the antenna
✔ **B. To cancel the inductive reactance of the matching network**
C. To provide a rejection notch that prevents the radiation of harmonics
D. To transform the antenna impedance to a higher value

48: E9F03

Why is the physical length of a coaxial cable transmission line shorter than its electrical length?

A. Skin effect is less pronounced in the coaxial cable
B. The characteristic impedance is higher in a parallel feed line
C. The surge impedance is higher in a parallel feed line
✔ **D. Electrical signals move more slowly in a coaxial cable than in air**

49: E9G02

What type of coordinate system is used in a Smith chart?

A. Voltage circles and current arcs
✔ **B. Resistance circles and reactance arcs**
C. Voltage lines and current chords
D. Resistance lines and reactance chords

50: E9H08

What is the function of a sense antenna?

✔ **A. It modifies the pattern of a DF antenna array to provide a null in one direction**
B. It increases the sensitivity of a DF antenna array
C. It allows DF antennas to receive signals at different vertical angles
D. It provides diversity reception that cancels multipath signals

Results:

You scored 44 correct answers and 6 incorrect answers from a total of 50.

You would have passed the exam! Congratulations!

e)

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