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: E0A02
When evaluating RF exposure levels from your station at a neighbor's home, what must you do?
A. Make sure signals from your station are less than the controlled MPE limits
✔ **B. Make sure signals from your station are less than the uncontrolled MPE limits**
C. You need only evaluate exposure levels on your own property
D. Advise your neighbors of the results of your tests

Subelement E1

2: E1A10
If an amateur station is installed aboard a ship or aircraft, what condition must be met before the station is operated?
✔ **A. Its operation must be approved by the master of the ship or the pilot in command of the aircraft**
B. The amateur station operator must agree not to transmit when the main radio of the ship or aircraft is in use
C. The amateur station must have a power supply that is completely independent of the main ship or aircraft power supply
D. The amateur operator must have an FCC Marine or Aircraft endorsement on his or her amateur license

3: E1B09
Which amateur stations may be operated under RACES rules?
A. Only those club stations licensed to Amateur Extra class operators
B. Any FCC-licensed amateur station except a Technician class
✔ **C. Any FCC-licensed amateur station certified by the responsible civil defense organization for the area served**

D. Any FCC-licensed amateur station participating in the Military Auxiliary Radio System (MARS)

4: E1C02
What is meant by automatic control of a station?
✔ **A. The use of devices and procedures for control so that the control operator does not have to be present at a control point**
B. A station operating with its output power controlled automatically
C. Remotely controlling a station's antenna pattern through a directional control link
D. The use of a control link between a control point and a locally controlled station

5: E1D02
What is the amateur satellite service?
A. A radio navigation service using satellites for the purpose of self training, intercommunication and technical studies carried out by amateurs
B. A spacecraft launching service for amateur-built satellites
✔ **C. A radio communications service using amateur radio stations on satellites**
D. A radio communications service using stations on Earth satellites for public service broadcast

6: E1E10
What must the administering VEs do after the administration of a successful examination for an amateur operator license?
A. They must collect and send the documents to the NCVEC for grading
B. They must collect and submit the documents to the coordinating VEC for grading
✔ **C. They must submit the application document to the coordinating VEC according to the coordinating VEC instructions**
D. They must collect and send the documents to the FCC according to instructions

7: E1F01
On what frequencies are spread spectrum transmissions permitted?
A. Only on amateur frequencies above 50 MHz
✔ **B. Only on amateur frequencies above 222 MHz**
xC. Only on amateur frequencies above 420 MHz
D. Only on amateur frequencies above 144 MHz

Subelement E2

8: E2A03
What is the orbital period of an Earth satellite?
A. The point of maximum height of a satellite's orbit
B. The point of minimum height of a satellite's orbit
✔ **C. The time it takes for a satellite to complete one revolution around the Earth**
D. The time it takes for a satellite to travel from perigee to apogee

9: E2B07
What is the name of the signal component that carries color information in NTSC

video?

A. Luminance

✔ **B. Chroma**

C. Hue

D. Spectral Intensity

10: E2C02

Which of the following best describes the term self-spotting in regards to HF contest operating?

✔ **A. The generally prohibited practice of posting one's own call sign and frequency on a spotting network**

B. The acceptable practice of manually posting the call signs of stations on a spotting network

C. A manual technique for rapidly zero beating or tuning to a station's frequency before calling that station

D. An automatic method for rapidly zero beating or tuning to a station's frequency before calling that station

11: E2D11

Which of the following data are used by the APRS network to communicate your location?

A. Polar coordinates

B. Time and frequency

C. Radio direction finding spectrum analysis

✔ **D. Latitude and longitude**

12: E2E06

What is the most common data rate used for HF packet?

A. 48 baud

B. 110 baud

✔ **C. 300 baud**

D. 1200 baud

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

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

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

14: E3B01

What is transequatorial propagation?

✔ **A. Propagation between two mid-latitude points at approximately the same distance north and south of the magnetic equator**

B. Propagation between any two points located on the magnetic equator
C. Propagation between two continents by way of ducts along the magnetic equator
D. Propagation between two stations at the same latitude

15: E3C04
What does the value of Bz (B sub Z) represent?
A. Geomagnetic field stability
B. Critical frequency for vertical transmissions
✔ **C. Direction and strength of the interplanetary magnetic field**
x D. Duration of long-delayed echoes

Subelement E4

16: E4A09
When using a computer's soundcard input to digitize signals, what is the highest frequency signal that can be digitized without aliasing?
A. The same as the sample rate
✔ **B. One-half the sample rate**
C. One-tenth the sample rate
D. It depends on how the data is stored internally

17: E4B17
What three test loads are used to calibrate a standard RF vector network analyzer?
A. 50 ohms, 75 ohms, and 90 ohms
✔ **B. Short circuit, open circuit, and 50 ohms**
C. Short circuit, open circuit, and resonant circuit
D. 50 ohms through 1/8 wavelength, 1/4 wavelength, and 1/2 wavelength of coaxial cable

18: E4C05
What does a value of -174 dBm/Hz represent with regard to the noise floor of a receiver?
A. The minimum detectable signal as a function of receive frequency
✔ **B. The theoretical noise at the input of a perfect receiver at room temperature**
C. The noise figure of a 1 Hz bandwidth receiver
D. The galactic noise contribution to minimum detectable signal

19: E4D13
Which of the following can cause receiver desensitization?
A. Audio gain adjusted too low
✔ **B. Strong adjacent channel signals**
C. Audio bias adjusted too high
D. Squelch gain misadjusted

20: E4E02
Which of the following types of receiver noise can often be reduced with a DSP noise filter?

A. Broadband white noise
B. Ignition noise
C. Power line noise
✔ **D. All of these choices are correct**

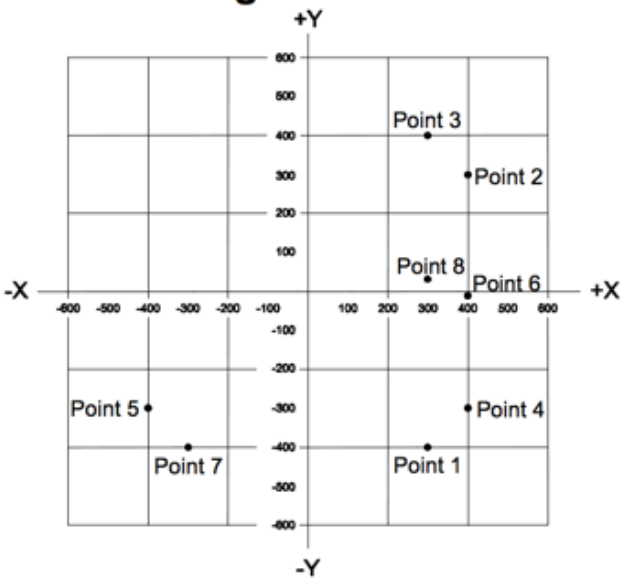
Subelement E5

21: E5A12
What is the half-power bandwidth of a parallel resonant circuit that has a resonant frequency of 3.7 MHz and a Q of 118?
A. 436.6 kHz
B. 218.3 kHz
✔ **C. 31.4 kHz**
D. 15.7 kHz

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: E5C17
Which point on Figure E5-2 best represents the impedance of a series circuit consisting of a 300 ohm resistor, a 0.64-microhenry inductor and an 85-picofarad capacitor at 24.900 MHz?
A. Point 1
B. Point 3
C. Point 5
✔ **D. Point 8**

Figure E5-2



24: E5D14

What is reactive power?

✔ **A. Wattless, nonproductive power**
B. Power consumed in wire resistance in an inductor
C. Power lost because of capacitor leakage
D. Power consumed in circuit Q

Subelement E6

25: E6A06
What is the beta of a bipolar junction transistor?
A. The frequency at which the current gain is reduced to 1
✔ **B. The change in collector current with respect to base current**
C. The breakdown voltage of the base to collector junction
D. The switching speed of the transistor

26: E6B06
Which of the following is a common use of a hot-carrier diode?
A. As balanced mixers in FM generation
B. As a variable capacitance in an automatic frequency control circuit
C. As a constant voltage reference in a power supply
✔ **D. As a VHF/UHF mixer or detector**

27: E6C06
Why do CMOS digital integrated circuits have high immunity to noise on the input signal or power supply?
A. Larger bypass capacitors are used in CMOS circuit design
B. The input switching threshold is about two times the power supply voltage
✔ **C. The input switching threshold is about one-half the power supply voltage**
D. Input signals are stronger

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: E6E05
Which of the following noise figure values is typical of a low-noise UHF preamplifier?
✔ **A. 2 dB**
B. -10 dB
C. 44 dBm
D. -20 dBm

30: E6F08

Why are optoisolators often used in conjunction with solid state circuits when switching 120VAC?

A. Optoisolators provide a low impedance link between a control circuit and a power circuit

B. Optoisolators provide impedance matching between the control circuit and power circuit

✔ **C. Optoisolators provide a very high degree of electrical isolation between a control circuit and the circuit being switched**

D. Optoisolators eliminate the effects of reflected light in the control circuit

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: E7C10

Which of the following filters would be the best choice for use in a 2 meter repeater duplexer?

A. A crystal filter

✔ **B. A cavity filter**

C. A DSP filter

D. An L-C filter

34: E7D07

What is the purpose of C2 in the circuit shown in Figure E7-3?

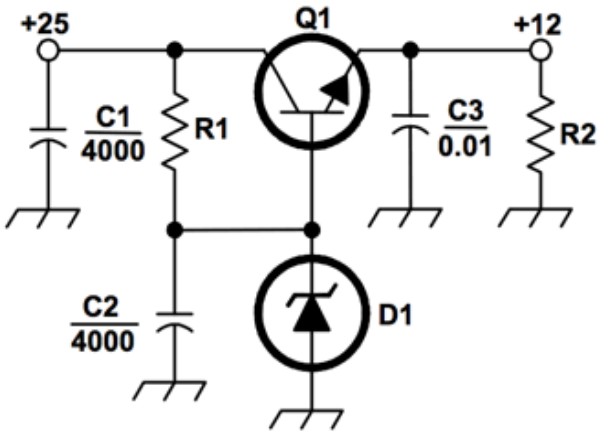
✔ **A. It bypasses hum around D1**

B. It is a brute force filter for the output

C. To self-resonate at the hum frequency

D. To provide fixed DC bias for Q1

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: E7F16

How might the sampling rate of an existing digital signal be adjusted by a factor of 3/4?

A. Change the gain by a factor of 3/4
B. Multiply each sample value by a factor of 3/4
C. Add 3 to each input value and subtract 4 from each output value

✔ **D. Interpolate by a factor of three, then decimate by a factor of four**

37: E7G06

Which of the following is the most appropriate use of an op-amp active filter?

A. As a high-pass filter used to block RFI at the input to receivers
B. As a low-pass filter used between a transmitter and a transmission line
C. For smoothing power supply output

✔ **D. As an audio filter in a receiver**

38: E7H14

What is a phase-locked loop circuit?

A. An electronic servo loop consisting of a ratio detector, reactance modulator, and voltage-controlled oscillator
B. An electronic circuit also known as a monostable multivibrator

✔ **C. An electronic servo loop consisting of a phase detector, a low-pass filter, a voltage-controlled oscillator, and a stable reference oscillator**

D. An electronic circuit consisting of a precision push-pull amplifier with a differential input

Subelement E8

39: E8A13
Which of these methods is commonly used to convert analog signals to digital signals?
✔ **A. Sequential sampling**
B. Harmonic regeneration
C. Level shifting
D. Phase reversal

40: E8B08
What describes Orthogonal Frequency Division Multiplexing?
A. A frequency modulation technique which uses non-harmonically related frequencies
B. A bandwidth compression technique using Fourier transforms
xC. A digital mode for narrow band, slow speed transmissions
✔ **D. A digital modulation technique using subcarriers at frequencies chosen to avoid intersymbol interference**

41: E8C08
How does ARQ accomplish error correction?
A. Special binary codes provide automatic correction
B. Special polynomial codes provide automatic correction
C. If errors are detected, redundant data is substituted
✔ **D. If errors are detected, a retransmission is requested**

42: E8D06
Which of the following indicates likely overmodulation of an AFSK signal such as PSK or MFSK?
A. High reflected power
✔ **B. Strong ALC action**
C. Harmonics on higher bands
D. Rapid signal fading

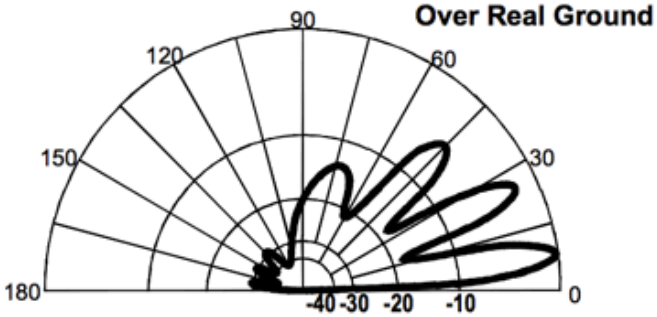
Subelement E9

43: E9A11
Which of the following factors determines ground losses for a ground-mounted vertical antenna operating in the 3 MHz to 30 MHz range?
A. The standing wave ratio
B. Distance from the transmitter
✔ **C. Soil conductivity**
D. Take-off angle

44: E9B16
How many elevation lobes appear in the forward direction of the antenna radiation pattern shown in Figure E9-2?
✔ **A. 4**
B. 3
C. 1

D. 7

Figure E9-2



45: E9C13

What is the main effect of placing a vertical antenna over an imperfect ground?

A. It causes increased SWR

B. It changes the impedance angle of the matching network

✔ **C. It reduces low-angle radiation**

D. It reduces losses in the radiating portion of the antenna

46: E9D02

How can linearly polarized Yagi antennas be used to produce circular polarization?

A. Stack two Yagis fed 90 degrees out of phase to form an array with the respective elements in parallel planes

B. Stack two Yagis fed in phase to form an array with the respective elements in parallel planes

✔ **C. Arrange two Yagis perpendicular to each other with the driven elements at the same point on the boom fed 90 degrees out of phase**

D. Arrange two Yagis collinear to each other with the driven elements fed 180 degrees out of phase

47: E9E02

What is the name of an antenna matching system that matches an unbalanced feed line to an antenna by feeding the driven element both at the center of the element and at a fraction of a wavelength to one side of center?

✔ **A. The gamma match**

B. The delta match

C. The epsilon match

D. The stub match

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**

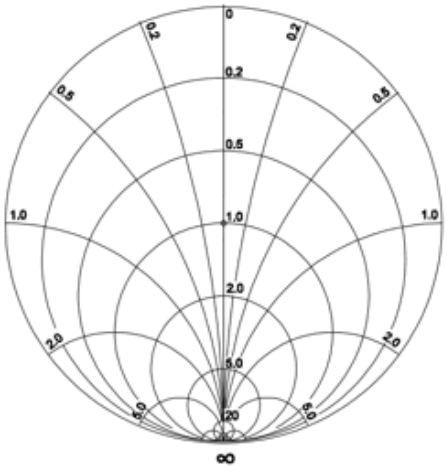
49: E9G05

What type of chart is shown in Figure E9-3?

✔ **A. Smith chart**

B. Free space radiation directivity chart
C. Elevation angle radiation pattern chart
D. Azimuth angle radiation pattern chart

Figure E9-3



50: E9H05

What is the main drawback of a wire-loop antenna for direction finding?

✔ **A. It has a bidirectional pattern**
B. It is non-rotatable
C. It receives equally well in all directions
D. It is practical for use only on VHF bands

Results:
You scored 46 correct answers and 4 incorrect answers from a total of 50.

You would have passed the exam! Congratulations!

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