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: E0A11
Which of the following injuries can result from using high-power UHF or microwave transmitters?
A. Hearing loss caused by high voltage corona discharge
B. Blood clotting from the intense magnetic field
✔ **C. Localized heating of the body from RF exposure in excess of the MPE limits**
D. Ingestion of ozone gas from the cooling system

Subelement E1

2: E1A14
What is the maximum bandwidth for a data emission on 60 meters?
A. 60 Hz
B. 170 Hz
C. 1.5 kHz
✔ **D. 2.8 kHz**

3: E1B04
What must be done before placing an amateur station within an officially designated wilderness area or wildlife preserve, or an area listed in the National Register of Historical Places?
A. A proposal must be submitted to the National Park Service
B. A letter of intent must be filed with the National Audubon Society
✔ **C. An Environmental Assessment must be submitted to the FCC**
D. A form FSD-15 must be submitted to the Department of the Interior

4: E1C06

Which of the following statements concerning remotely controlled amateur stations is true?

A. Only Extra Class operators may be the control operator of a remote station

xB. A control operator need not be present at the control point

✔ **C. A control operator must be present at the control point**

D. Repeater and auxiliary stations may not be remotely controlled

5: E1D11

Which amateur stations are eligible to operate as Earth stations?

A. Any amateur station whose licensee has filed a pre-space notification with the FCC's International Bureau

B. Only those of General, Advanced or Amateur Extra Class operators

C. Only those of Amateur Extra Class operators

✔ **D. Any amateur station, subject to the privileges of the class of operator license held by the control operator**

6: E1E07

What should a VE do if a candidate fails to comply with the examiner's instructions during an amateur operator license examination?

A. Warn the candidate that continued failure to comply will result in termination of the examination

✔ **B. Immediately terminate the candidate's examination**

C. Allow the candidate to complete the examination, but invalidate the results

D. Immediately terminate everyone's examination and close the session

7: E1F02

What privileges are authorized in the U.S. to persons holding an amateur service license granted by the Government of Canada?

A. None, they must obtain a U.S. license

B. All privileges of the Extra Class license

✔ **C. The operating terms and conditions of the Canadian amateur service license, not to exceed U.S. Extra Class privileges**

D. Full privileges, up to and including those of the Extra Class License, on the 80, 40, 20, 15, and 10 meter bands

Subelement E2

8: E2A01

What is the direction of an ascending pass for an amateur satellite?

A. From west to east

B. From east to west

✔ **C. From south to north**

D. From north to south

9: E2B16

Which is a video standard used by North American Fast Scan ATV stations?

A. PAL
B. DRM
C. Scottie
✔ **D. NTSC**

10: E2C11

How should you generally identify your station when attempting to contact a DX station during a contest or in a pileup?

✔ **A. Send your full call sign once or twice**
B. Send only the last two letters of your call sign until you make contact
C. Send your full call sign and grid square
D. Send the call sign of the DX station three times, the words "this is", then your call sign three times

11: E2D13

What type of modulation is used for JT65 contacts?

✔ **A. Multi-tone AFSK**
B. PSK
C. RTTY
D. IEEE 802.11

12: E2E11

What is the difference between direct FSK and audio FSK?

✔ **A. Direct FSK applies the data signal to the transmitter VFO**
B. Audio FSK has a superior frequency response
C. Direct FSK uses a DC-coupled data connection
D. Audio FSK can be performed anywhere in the transmit chain

Subelement E3

13: E3A08

When a meteor strikes the Earth's atmosphere, a cylindrical region of free electrons is formed at what layer of the ionosphere?

✔ **A. The E layer**
B. The F1 layer
C. The F2 layer
D. The D layer

14: E3B04

What is meant by the terms extraordinary and ordinary waves?

A. Extraordinary waves describe rare long skip propagation compared to ordinary waves which travel shorter distances
✔ **B. Independent waves created in the ionosphere that are elliptically polarized**
C. Long path and short path waves
D. Refracted rays and reflected waves

15: E3C09
How does the intensity of an X3 flare compare to that of an X2 flare?
A. 10 percent greater
B. 50 percent greater
✔ **C. Twice as great**
D. Four times as great

Subelement E4

16: E4A01
Which of the following parameter determines the bandwidth of a digital or computer-based oscilloscope?
A. Input capacitance
B. Input impedance
✔ **C. Sampling rate**
D. Sample resolution

17: E4B10
Which of the following describes a method to measure intermodulation distortion in an SSB transmitter?
A. Modulate the transmitter with two non-harmonically related radio frequencies and observe the RF output with a spectrum analyzer
✔ **B. Modulate the transmitter with two non-harmonically related audio frequencies and observe the RF output with a spectrum analyzer**
C. Modulate the transmitter with two harmonically related audio frequencies and observe the RF output with a peak reading wattmeter
D. Modulate the transmitter with two harmonically related audio frequencies and observe the RF output with a logic analyzer

18: E4C04
How is the noise figure of a receiver defined?
A. The ratio of atmospheric noise to phase noise
B. The ratio of the noise bandwidth in Hertz to the theoretical bandwidth of a resistive network
C. The ratio of thermal noise to atmospheric noise
✔ **D. The ratio in dB of the noise generated by the receiver to the theoretical minimum noise**

19: E4D01
What is meant by the blocking dynamic range of a receiver?
✔ **A. The difference in dB between the noise floor and the level of an incoming signal which will cause 1 dB of gain compression**
B. The minimum difference in dB between the levels of two FM signals which will cause one signal to block the other
C. The difference in dB between the noise floor and the third order intercept point

D. The minimum difference in dB between two signals which produce third order intermodulation products greater than the noise floor

20: E4E09

What undesirable effect can occur when using an IF noise blanker?

A. Received audio in the speech range might have an echo effect

xB. The audio frequency bandwidth of the received signal might be compressed

✔ **C. Nearby signals may appear to be excessively wide even if they meet emission standards**

D. FM signals can no longer be demodulated

Subelement E5

21: E5A05

What is the magnitude of the current at the input of a series RLC circuit as the frequency goes through resonance?

A. Minimum

✔ **B. Maximum**

C. R/L

D. L/R

22: E5B07

What is the phase angle between the voltage across and the current through a series RLC circuit if XC is 500 ohms, R is 1 kilohm, and XL is 250 ohms?

A. 68.2 degrees with the voltage leading the current

B. 14.0 degrees with the voltage leading the current

✔ **C. 14.0 degrees with the voltage lagging the current**

D. 68.2 degrees with the voltage lagging the current

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?

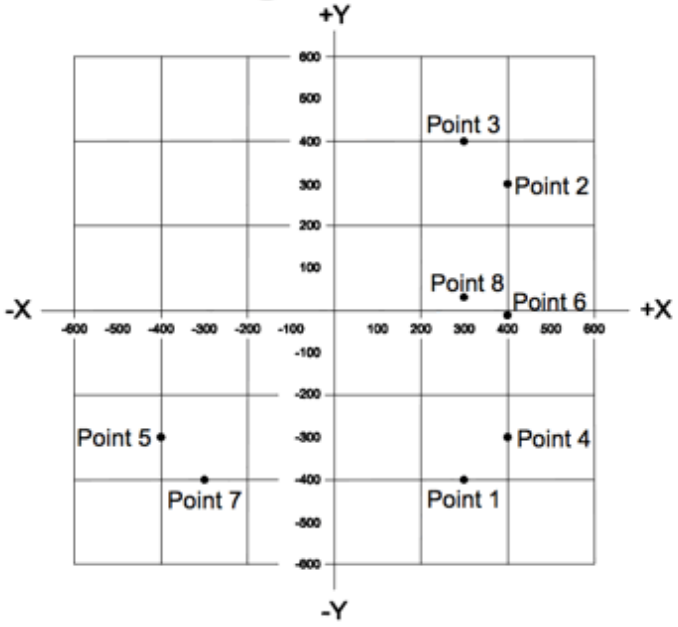
A. Point 1

B. Point 3

C. Point 5

✔ **D. Point 8**

Figure E5-2



24: E5D01

What is the result of skin effect?

✔ **A. As frequency increases, RF current flows in a thinner layer of the conductor, closer to the surface**

B. As frequency decreases, RF current flows in a thinner layer of the conductor, closer to the surface

C. Thermal effects on the surface of the conductor increase the impedance

D. Thermal effects on the surface of the conductor decrease the impedance

Subelement E6

25: E6A04

What is the name given to an impurity atom that adds holes to a semiconductor crystal structure?

A. Insulator impurity

B. N-type impurity

✔ **C. Acceptor impurity**

D. Donor impurity

26: E6B10

In Figure E6-3, what is the schematic symbol for a light-emitting diode?

A. 1

✔ **B. 5**

C. 6

D. 7

Figure E6-3

27: E6C09

What is a Programmable Logic Device (PLD)?

A. A device to control industrial equipment

✔ **B. A programmable collection of logic gates and circuits in a single integrated circuit**

C. Programmable equipment used for testing digital logic integrated circuits

D. An algorithm for simulating logic functions during circuit design

28: E6D12

What is the definition of saturation in a ferrite core inductor?

A. The inductor windings are over coupled

B. The inductor's voltage rating is exceeded causing a flashover

✔ **C. The ability of the inductor's core to store magnetic energy has been exceeded**

D. Adjacent inductors become over-coupled

29: E6E03

Which of the following materials is likely to provide the highest frequency of operation when used in MMICs?

A. Silicon

B. Silicon nitride

C. Silicon dioxide

✔ **D. Gallium nitride**

30: E6F12

What absorbs the energy from light falling on a photovoltaic cell?

A. Protons

B. Photons

✔ **C. Electrons**

D. Holes

Subelement E7

31: E7A04

How many flip-flops are required to divide a signal frequency by 4?

A. 1

✔ **B. 2**

C. 4

D. 8

32: E7B17

Why are odd-order rather than even-order intermodulation distortion products of concern in linear power amplifiers?

✔ **A. Because they are relatively close in frequency to the desired signal**

B. Because they are relatively far in frequency from the desired signal

C. Because they invert the sidebands causing distortion

D. Because they maintain the sidebands, thus causing multiple duplicate signals

33: E7C13

What is one advantage of a Pi-matching network over an L-matching network consisting of a single inductor and a single capacitor?

✔ **A. The Q of Pi-networks can be varied depending on the component values chosen**

B. L-networks cannot perform impedance transformation

C. Pi-networks have fewer components

D. Pi-networks are designed for balanced input and output

34: E7D10

What is the primary reason that a high-frequency switching type high voltage power supply can be both less expensive and lighter in weight than a conventional power supply?

A. The inverter design does not require any output filtering

B. It uses a diode bridge rectifier for increased output

✔ **C. The high frequency inverter design uses much smaller transformers and filter components for an equivalent power output**

D. It uses a large power factor compensation capacitor to create free power from the unused portion of the AC cycle

35: E7E08

What are the principal frequencies that appear at the output of a mixer circuit?

A. Two and four times the original frequency

B. The sum, difference and square root of the input frequencies

✔ **C. The two input frequencies along with their sum and difference frequencies**

D. 1.414 and 0.707 times the input frequency

36: E7F02

What kind of digital signal processing audio filter is used to remove unwanted noise from a received SSB signal?

✔ **A. An adaptive filter**

B. A crystal-lattice filter

C. A Hilbert-transform filter

D. A phase-inverting filter

37: E7G12

What is an integrated circuit operational amplifier?

✔ **A. A high-gain, direct-coupled differential amplifier with very high input impedance and very low output impedance**

B. A digital audio amplifier whose characteristics are determined by components external to the amplifier

C. An amplifier used to increase the average output of frequency modulated amateur signals to the legal limit

D. A RF amplifier used in the UHF and microwave regions

38: E7H09

What type of frequency synthesizer circuit uses a phase accumulator, lookup table, digital to analog converter, and a low-pass anti-alias filter?

✔ **A. A direct digital synthesizer**

B. A hybrid synthesizer

C. A phase locked loop synthesizer
D. A diode-switching matrix synthesizer

Subelement E8

39: E8A11
What type of information can be conveyed using digital waveforms?
A. Human speech
B. Video signals
xC. Data
✔ **D. All of these choices are correct**

40: E8B09
What is meant by deviation ratio?
A. The ratio of the audio modulating frequency to the center carrier frequency
✔ **B. The ratio of the maximum carrier frequency deviation to the highest audio modulating frequency**
C. The ratio of the carrier center frequency to the audio modulating frequency
D. The ratio of the highest audio modulating frequency to the average audio modulating frequency

41: E8C09
Which is the name of a digital code where each preceding or following character changes by only one bit?
xA. Binary Coded Decimal Code
B. Extended Binary Coded Decimal Interchange Code
C. Excess 3 code
✔ **D. Gray code**

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: E9A07
What is meant by antenna gain?
✔ **A. The ratio of the radiated signal strength of an antenna in the direction of maximum radiation to that of a reference antenna**

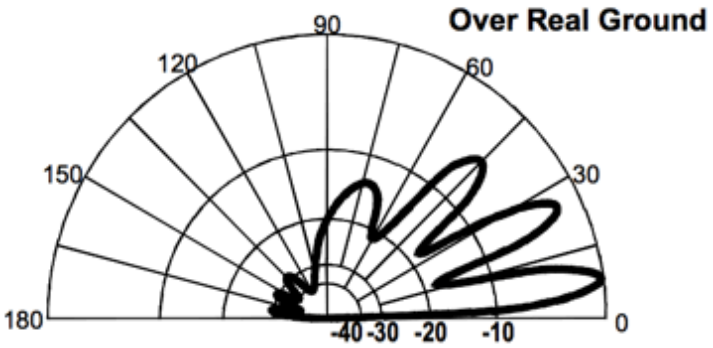
B. The ratio of the signal in the forward direction to that in the opposite direction
C. The ratio of the amount of power radiated by an antenna compared to the transmitter output power
D. The final amplifier gain minus the transmission line losses

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: E9C01

What is the radiation pattern of two 1/4-wavelength vertical antennas spaced 1/2-wavelength apart and fed 180 degrees out of phase?

A. Cardioid
B. Omni-directional
C. A figure-8 broadside to the axis of the array
✔ **D. A figure-8 oriented along the axis of the array**

46: E9D11

Which of the following types of conductors would be best for minimizing losses in a station's RF ground system?

A. A resistive wire, such as spark plug wire
✔ **B. A wide flat copper strap**
C. A cable with six or seven 18 gauge conductors in parallel
D. A single 12 gauge or 10 gauge stainless steel wire

47: E9E07

What term best describes the interactions at the load end of a mismatched transmission line?

A. Characteristic impedance
✔ **B. Reflection coefficient**
C. Velocity factor
D. Dielectric constant

48: E9F06

What is the approximate physical length of an air-insulated, parallel conductor transmission line that is electrically one-half wavelength long at 14.10 MHz?

A. 15 meters
B. 20 meters
✔ **C. 10 meters**
D. 71 meters

49: E9G09

What third family of circles is often added to a Smith chart during the process of solving problems?

✔ **A. Standing wave ratio circles**
B. Antenna-length circles
C. Coaxial-length circles
D. Radiation-pattern circles

50: E9H10

How can the output voltage of a multiple turn receiving loop antenna be increased?

A. By reducing the permeability of the loop shield
xB. By increasing the number of wire turns in the loop and reducing the area of the loop structure
C. By winding adjacent turns in opposing directions
✔ **D. By increasing either the number of wire turns in the loop or the area of the loop structure or both**

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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