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: E0A01
What is the primary function of an external earth connection or ground rod?
A. Reduce received noise
✔ **B. Lightning protection**
C. Reduce RF current flow between pieces of equipment
D. Reduce RFI to telephones and home entertainment systems

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: E1B05
What is the National Radio Quiet Zone?
A. An area in Puerto Rico surrounding the Arecibo Radio Telescope
B. An area in New Mexico surrounding the White Sands Test Area
✔ **C. An area surrounding the National Radio Astronomy Observatory**
D. An area in Florida surrounding Cape Canaveral

4: E1C12

What types of communications may be transmitted to amateur stations in foreign countries?

A. Business-related messages for non-profit organizations
B. Messages intended for connection to users of the maritime satellite service
✔ **C. Communications incidental to the purpose of the amateur service and remarks of a personal nature**
D. All of these choices are correct

5: E1D01

What is the definition of the term telemetry?

✔ **A. One-way transmission of measurements at a distance from the measuring instrument**
B. Two-way radiotelephone transmissions in excess of 1000 feet
C. Two-way single channel transmissions of data
D. One-way transmission that initiates, modifies, or terminates the functions of a device at a distance

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: E1F03

Under what circumstances may a dealer sell an external RF power amplifier capable of operation below 144 MHz if it has not been granted FCC certification?

✔ **A. It was purchased in used condition from an amateur operator and is sold to another amateur operator for use at that operator's station**
B. The equipment dealer assembled it from a kit
C. It was imported from a manufacturer in a country that does not require certification of RF power amplifiers
D. It was imported from a manufacturer in another country and was certificated by that country's government

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: E2B05

Which of the following is an advantage of using vestigial sideband for standard fast-scan TV transmissions?

A. The vestigial sideband carries the audio information

B. The vestigial sideband contains chroma information

✔ **C. Vestigial sideband reduces bandwidth while allowing for simple video detector circuitry**

xD. Vestigial sideband provides high frequency emphasis to sharpen the picture

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: E2D09

Which of these digital modes has the fastest data throughput under clear communication conditions?

A. AMTOR

B. 170 Hz shift, 45 baud RTTY

xC. PSK31

✔ **D. 300 baud packet**

12: E2E04

What is indicated when one of the ellipses in an FSK crossed-ellipse display suddenly disappears?

✔ **A. Selective fading has occurred**

B. One of the signal filters is saturated

C. The receiver has drifted 5 kHz from the desired receive frequency

D. The mark and space signal have been inverted

Subelement E3

13: E3A13

Which emission mode is best for aurora propagation?

✔ **A. CW**

B. SSB

C. FM

D. RTTY

14: E3B14

What happens to linearly polarized radio waves that split into ordinary and extraordinary waves in the ionosphere?

xA. They are bent toward the magnetic poles

B. Their polarization is randomly modified

✔ **C. They become elliptically polarized**

D. They become phase-locked

15: E3C14

Why does the radio-path horizon distance exceed the geometric horizon?

A. E-region skip

B. D-region skip

C. Downward bending due to aurora refraction

✔ **D. Downward bending due to density variations in the atmosphere**

Subelement E4

16: E4A05

What might be an advantage of a digital vs an analog oscilloscope?

A. Automatic amplitude and frequency numerical readout

B. Storage of traces for future reference

C. Manipulation of time base after trace capture

✔ **D. All of these choices are correct**

17: E4B12

What is the significance of voltmeter sensitivity expressed in ohms per volt?

✔ **A. The full scale reading of the voltmeter multiplied by its ohms per volt rating will indicate the input impedance of the voltmeter**

B. When used as a galvanometer, the reading in volts multiplied by the ohms per volt rating will determine the power drawn by the device under test

C. When used as an ohmmeter, the reading in ohms divided by the ohms per volt rating will determine the voltage applied to the circuit

D. When used as an ammeter, the full scale reading in amps divided by ohms per volt rating will determine the size of shunt needed

18: E4C15

What is usually the primary source of noise that is heard from an HF receiver with an antenna connected?

A. Detector noise

B. Induction motor noise

C. Receiver front-end noise

✔ **D. Atmospheric noise**

19: E4D11

Why are third-order intermodulation products created within a receiver of particular

interest compared to other products?

✔ **A. The third-order product of two signals which are in the band of interest is also likely to be within the band**

B. The third-order intercept is much higher than other orders

C. Third-order products are an indication of poor image rejection

D. Third-order intermodulation produces three products for every input signal within the band of interest

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: E5A11

What is the half-power bandwidth of a parallel resonant circuit that has a resonant frequency of 7.1 MHz and a Q of 150?

A. 157.8 Hz

B. 315.6 Hz

✔ **C. 47.3 kHz**

D. 23.67 kHz

22: E5B13

What letter is commonly used to represent susceptance?

A. G

B. X

C. Y

✔ **D. B**

23: E5C14

Which point on Figure E5-2 best represents the impedance of a series circuit consisting of a 400 ohm resistor and a 38 picofarad capacitor at 14 MHz?

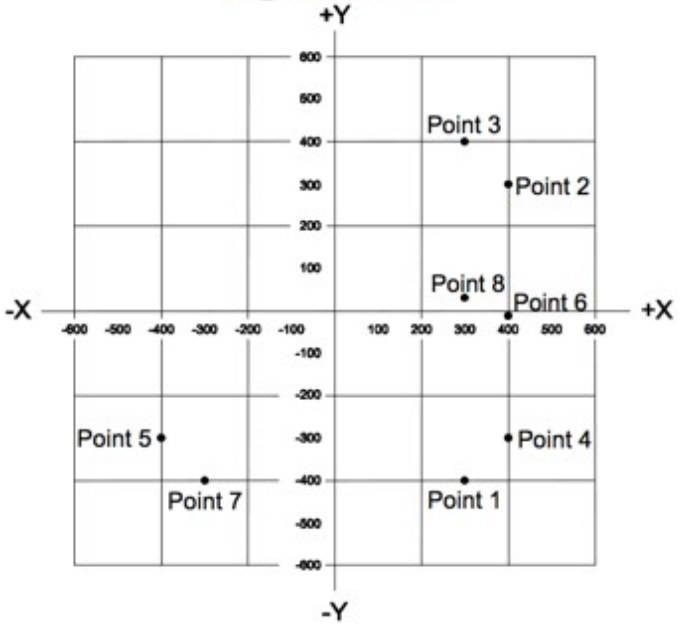
A. Point 2

✔ **B. Point 4**

C. Point 5

D. Point 6

Figure E5-2



24: E5D05

Which parasitic characteristic increases with conductor length?

✔ **A. Inductance**

B. Permeability

C. Permittivity

D. Malleability

Subelement E6

25: E6A05

What is the alpha of a bipolar junction transistor?

A. The change of collector current with respect to base current

B. The change of base current with respect to collector current

✔ **C. The change of collector current with respect to emitter current**

D. The change of collector current with respect to gate current

26: E6B04

What type of semiconductor device is designed for use as a voltage-controlled capacitor?

✔ **A. Varactor diode**

B. Tunnel diode

C. Silicon-controlled rectifier

D. Zener diode

27: E6C03

What is tri-state logic?

✔ **A. Logic devices with 0, 1, and high impedance output states**

B. Logic devices that utilize ternary math

C. Low power logic devices designed to operate at 3 volts

D. Proprietary logic devices manufactured by Tri-State Devices

28: E6D09

What devices are commonly used as VHF and UHF parasitic suppressors at the input and output terminals of a transistor HF amplifier?

A. Electrolytic capacitors
B. Butterworth filters
✔ **C. Ferrite beads**
D. Steel-core toroids

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: E6F10

What is the most common type of photovoltaic cell used for electrical power generation?

A. Selenium
✔ **B. Silicon**
C. Cadmium Sulfide
D. Copper oxide

Subelement E7

31: E7A07

What logical operation does a NAND gate perform?

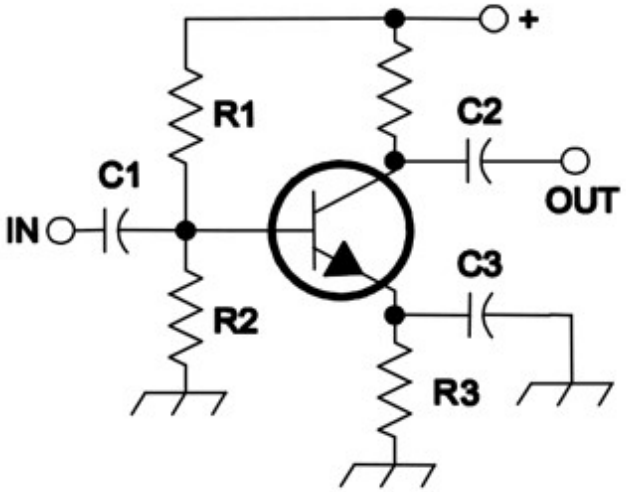
A. It produces logic "0" at its output only when all inputs are logic "0"
B. It produces logic "1" at its output only when all inputs are logic "1"
C. It produces logic "0" at its output if some but not all inputs are logic "1"
✔ **D. It produces logic "0" at its output only when all inputs are logic "1"**

32: E7B10

In Figure E7-1, what is the purpose of R1 and R2?

A. Load resistors
✔ **B. Fixed bias**
C. Self bias
D. Feedback

Figure E7-1



33: E7C15

What is a crystal lattice filter?

A. A power supply filter made with interlaced quartz crystals
B. An audio filter made with four quartz crystals that resonate at 1kHz intervals
C. A filter with wide bandwidth and shallow skirts made using quartz crystals
✔ **D. A filter with narrow bandwidth and steep skirts made using quartz crystals**

34: E7D04

Which of the following types of linear voltage regulator usually make the most efficient use of the primary power source?

A. A series current source
✔ **B. A series regulator**
C. A shunt regulator
D. A shunt current source

35: E7E12

What is a frequency discriminator stage in a FM receiver?

A. An FM generator circuit
B. A circuit for filtering two closely adjacent signals
C. An automatic band-switching circuit
✔ **D. A circuit for detecting FM signals**

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: E7G07

What magnitude of voltage gain can be expected from the circuit in Figure E7-4 when R1 is 10 ohms and RF is 470 ohms?

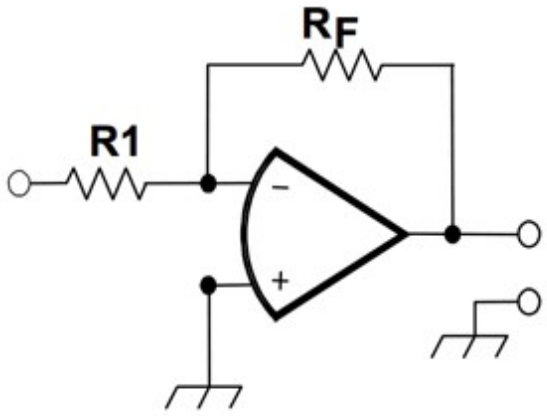
A. 0.21

B. 94

✔ **C. 47**

D. 24

Figure E7-4



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: E8A10

What is the purpose of a low pass filter used in conjunction with a digital-to-analog converter?

xA. Lower the input bandwidth to increase the effective resolution

B. Improve accuracy by removing out of sequence codes from the input

✔ **C. Remove harmonics from the output caused by the discrete analog levels generated**

D. All of these choices are correct

40: E8B01

What is the term for the ratio between the frequency deviation of an RF carrier wave and the modulating frequency of its corresponding FM-phone signal?

A. FM compressibility

B. Quieting index

C. Percentage of modulation

✔ **D. Modulation index**

41: E8C07

What is the necessary bandwidth of a 4800-Hz frequency shift, 9600-baud ASCII FM

transmission?

✔ **A. 15.36 kHz**

B. 9.6 kHz
C. 4.8 kHz
D. 5.76 kHz

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: E9A17

What is the effective radiated power of a repeater station with 200 watts transmitter power output, 2 dB feed line loss, 2.8 dB duplexer loss, 1.2 dB circulator loss, and 7 dBi antenna gain?

A. 159 watts

✔ **B. 252 watts**

C. 632 watts
D. 63.2 watts

44: E9B01

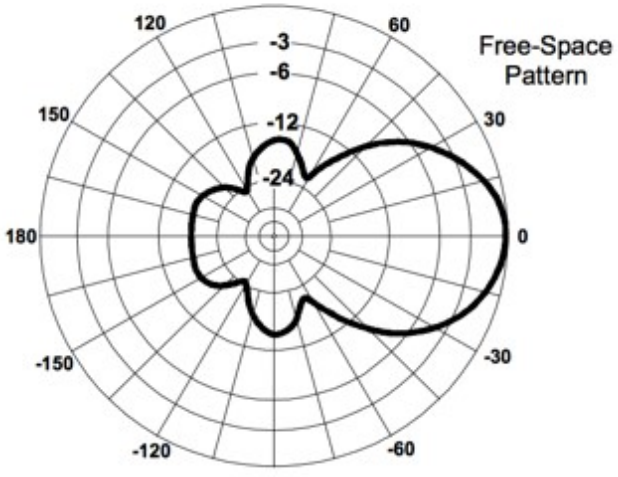
In the antenna radiation pattern shown in Figure E9-1, what is the 3 dB beam-width?

A. 75 degrees

✔ **B. 50 degrees**

C. 25 degrees
D. 30 degrees

Figure E9-1



45: E9C15

How does the radiation pattern of a horizontally polarized 3-element beam antenna vary with its height above ground?

A. The main lobe takeoff angle increases with increasing height

✔ **B. The main lobe takeoff angle decreases with increasing height**

C. The horizontal beam width increases with height

D. The horizontal beam width decreases with height

46: E9D01

How does the gain of an ideal parabolic dish antenna change when the operating frequency is doubled?

A. Gain does not change

B. Gain is multiplied by 0.707

✔ **C. Gain increases by 6 dB**

D. Gain increases by 3 dB

47: E9E12

What is the primary purpose of a phasing line when used with an antenna having multiple driven elements?

✔ **A. It ensures that each driven element operates in concert with the others to create the desired antenna pattern**

B. It prevents reflected power from traveling back down the feed line and causing harmonic radiation from the transmitter

C. It allows single-band antennas to operate on other bands

D. It makes sure the antenna has a low-angle radiation pattern

48: E9F14

What impedance does a 1/2 wavelength transmission line present to a generator when the line is shorted at the far end?

A. Very high impedance

✔ **B. Very low impedance**

C. The same as the characteristic impedance of the line

D. The same as the output impedance of the generator

49: E9G07

On the Smith chart shown in Figure E9-3, what is the only straight line shown?

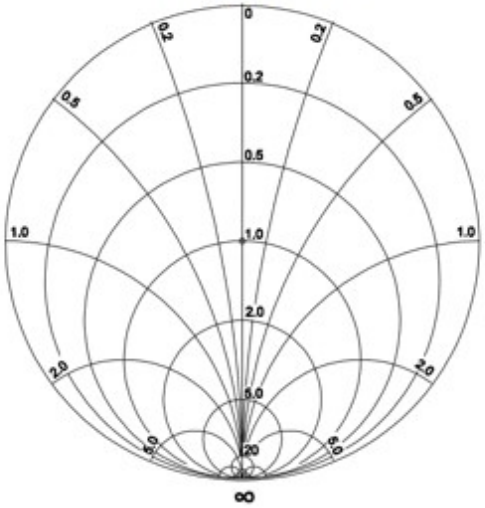
A. The reactance axis

B. The current axis

C. The voltage axis

✔ **D. The resistance axis**

Figure E9-3



50: E9H09

Which of the following describes the construction of a receiving loop antenna?

A. A large circularly polarized antenna

B. A small coil of wire tightly wound around a toroidal ferrite core

✔ **C. One or more turns of wire wound in the shape of a large open coil**

D. A vertical antenna coupled to a feed line through an inductive loop of wire

Results:

You scored 45 correct answers and 5 incorrect answers from a total of 50.

You would have passed the exam! Congratulations!

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