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: E0A10
What toxic material may be present in some electronic components such as high voltage capacitors and transformers?

✔ **A. Polychlorinated Biphenyls**
B. Polyethylene
C. Polytetrafluroethylene
D. Polymorphic silicon

Subelement E1

2: E1A03
With your transceiver displaying the carrier frequency of phone signals, you hear a station calling CQ on 14.349 MHz USB. Is it legal to return the call using upper sideband on the same frequency?
A. Yes, because you were not the station calling CQ
B. Yes, because the displayed frequency is within the 20 meter band
✔ **C. No, the sideband will extend beyond the band edge**
D. No, U.S. stations are not permitted to use phone emissions above 14.340 MHz

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

B. 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: 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: E1E04

Which of the following best describes the Volunteer Examiner accreditation process?

A. Each General, Advanced and Amateur Extra Class operator is automatically accredited as a VE when the license is granted

xB. The amateur operator applying must pass a VE examination administered by the FCC Enforcement Bureau

C. The prospective VE obtains accreditation from the FCC

✔ **D. The procedure by which a VEC confirms that the VE applicant meets FCC requirements to serve as an examiner**

7: E1F06

Under what circumstances might the FCC issue a Special Temporary Authority (STA) to an amateur station?

✔ **A. To provide for experimental amateur communications**

B. To allow regular operation on Land Mobile channels

C. To provide additional spectrum for personal use

D. To provide temporary operation while awaiting normal licensing

Subelement E2

8: E2A08

Why should effective radiated power to a satellite which uses a linear transponder be limited?

A. To prevent creating errors in the satellite telemetry

✔ **B. To avoid reducing the downlink power to all other users**

C. To prevent the satellite from emitting out-of-band signals

D. To avoid interfering with terrestrial QSOs

9: E2B13

How many lines are commonly used in each frame of an amateur slow-scan color television picture?

A. 30 or 60
B. 60 or 100
✔ **C. 128 or 256**
D. 180 or 360

10: E2C06

During a VHF/UHF contest, in which band segment would you expect to find the highest level of activity?

A. At the top of each band, usually in a segment reserved for contests
B. In the middle of each band, usually on the national calling frequency
✔ **C. In the weak signal segment of the band, with most of the activity near the calling frequency**
D. In the middle of the band, usually 25 kHz above the national calling frequency

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
C. PSK31
✔ **D. 300 baud packet**

12: E2E05

Which type of digital mode does not support keyboard-to-keyboard operation?

✔ **A. Winlink**
B. RTTY
C. PSK31
D. MFSK

Subelement E3

13: E3A17

What is meant by circularly polarized electromagnetic waves?

x A. Waves with an electric field bent into a circular shape
✔ **B. Waves with a rotating electric field**
C. Waves that circle the Earth
D. Waves produced by a loop antenna

14: E3B05

Which amateur bands typically support long-path propagation?

A. 160 meters to 40 meters

B. 30 meters to 10 meters

✔ **C. 160 meters to 10 meters**

D. 6 meters to 2 meters

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: 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: E4C09

Which of the following choices is a good reason for selecting a high frequency for the design of the IF in a conventional HF or VHF communications receiver?

A. Fewer components in the receiver

B. Reduced drift

✔ **C. Easier for front-end circuitry to eliminate image responses**

D. Improved receiver noise figure

19: E4D03

How can intermodulation interference between two repeaters occur?

A. When the repeaters are in close proximity and the signals cause feedback in the final amplifier of one or both transmitters

✔ **B. When the repeaters are in close proximity and the signals mix in the final amplifier of one or both transmitters**

C. When the signals from the transmitters are reflected out of phase from airplanes passing overhead

D. When the signals from the transmitters are reflected in phase from airplanes passing overhead

20: E4E12

What is one disadvantage of using some types of automatic DSP notch-filters when attempting to copy CW signals?

✔ **A. A DSP filter can remove the desired signal at the same time as it removes interfering signals**

B. Any nearby signal passing through the DSP system will overwhelm the desired signal

C. Received CW signals will appear to be modulated at the DSP clock frequency

D. Ringing in the DSP filter will completely remove the spaces between the CW characters

Subelement E5

21: E5A01

What can cause the voltage across reactances in series to be larger than the voltage applied to them?

✔ **A. Resonance**

B. Capacitance

C. Conductance

D. Resistance

22: E5B04

What is the time constant of a circuit having two 220 microfarad capacitors and two 1 megohm resistors, all in parallel?

A. 55 seconds

B. 110 seconds

C. 440 seconds

✔ **D. 220 seconds**

23: E5C13

What coordinate system is often used to display the resistive, inductive, and/or capacitive reactance components of impedance?

A. Maidenhead grid

B. Faraday grid

C. Elliptical coordinates

✔ **D. Rectangular coordinates**

24: E5D03

What is microstrip?

A. Lightweight transmission line made of common zip cord

B. Miniature coax used for low power applications
C. Short lengths of coax mounted on printed circuit boards to minimize time delay between microwave circuits
✔ **D. Precision printed circuit conductors above a ground plane that provide constant impedance interconnects at microwave frequencies**

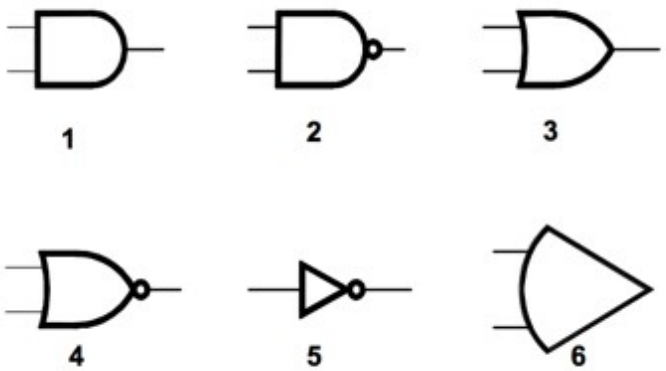
Subelement E6

25: E6A03
Why does a PN-junction diode not conduct current when reverse biased?
A. Only P-type semiconductor material can conduct current
B. Only N-type semiconductor material can conduct current
✔ **C. Holes in P-type material and electrons in the N-type material are separated by the applied voltage, widening the depletion region**
D. Excess holes in P-type material combine with the electrons in N-type material, converting the entire diode into an insulator

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: E6C11
In Figure E6-5, what is the schematic symbol for the NOT operation (inverter)?
A. 2
B. 4
✔ **C. 5**
D. 6

Figure E6-5



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: E6E11

What is a characteristic of DIP packaging used for integrated circuits?

A. Package mounts in a direct inverted position
B. Low leakage doubly insulated package
C. Two chips in each package (Dual In Package)

✔ **D. A total of two rows of connecting pins placed on opposite sides of the package (Dual In-line Package)**

30: E6F14

Which of the following is true of LCD displays?

A. They are hard to view in high ambient light conditions

✔ **B. They may be hard view through polarized lenses**

C. They only display alphanumeric symbols
D. All of these choices are correct

Subelement E7

31: E7A03

Which of the following can divide the frequency of a pulse train by 2?

A. An XOR gate

✔ **B. A flip-flop**

C. An OR gate
D. A multiplexer

32: E7B12

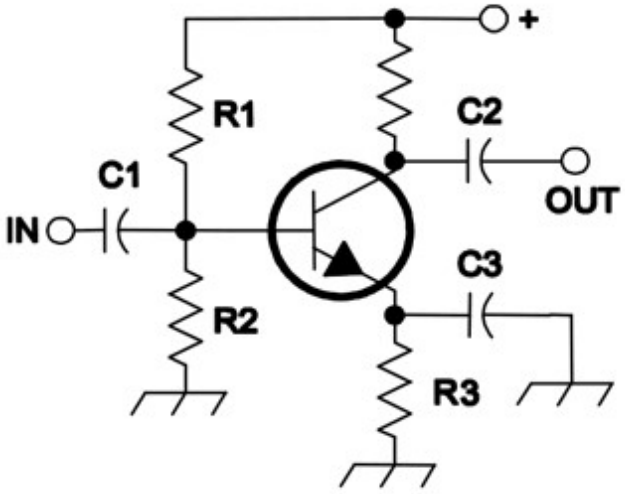
What type of amplifier circuit is shown in Figure E7-1?

A. Common base
B. Common collector

✔ **C. Common emitter**

D. Emitter follower

Figure E7-1



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: E7D08

What type of circuit is shown in Figure E7-3?

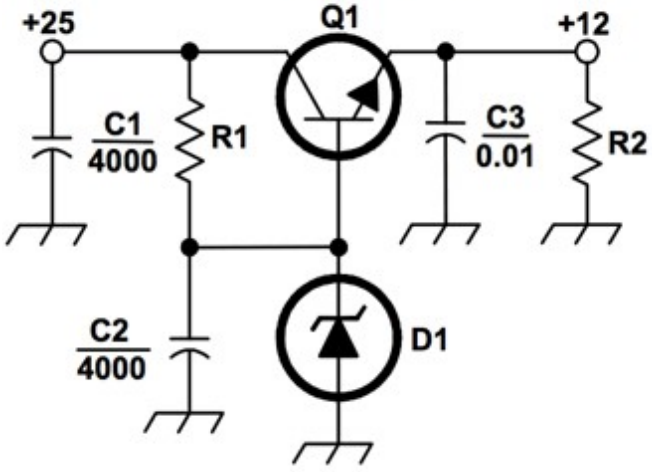
A. Switching voltage regulator

B. Grounded emitter amplifier

✔ **C. Linear voltage regulator**

D. Emitter follower

Figure E7- 3



35: E7E10

How does a diode detector function?

✔ **A. By rectification and filtering of RF signals**

B. By breakdown of the Zener voltage

C. By mixing signals with noise in the transition region of the diode

D. By sensing the change of reactance in the diode with respect to frequency

36: E7F01

What is meant by direct digital conversion as applied to software defined radios?

A. Software is converted from source code to object code during operation of the receiver

B. Incoming RF is converted to a control voltage for a voltage controlled oscillator

✔ **C. Incoming RF is digitized by an analog-to-digital converter without being mixed with a local oscillator signal**

D. A switching mixer is used to generate I and Q signals directly from the RF input

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: E7H12

Which of the following must be done to insure that a crystal oscillator provides the frequency specified by the crystal manufacturer?

A. Provide the crystal with a specified parallel inductance

✔ **B. Provide the crystal with a specified parallel capacitance**

C. Bias the crystal at a specified voltage

D. Bias the crystal at a specified current

Subelement E8

39: E8A08

Why would a direct or flash conversion analog-to-digital converter be useful for a software defined radio?

A. Very low power consumption decreases frequency drift

B. Immunity to out of sequence coding reduces spurious responses

✔ **C. Very high speed allows digitizing high frequencies**

xD. All of these choices are correct

40: E8B07

Orthogonal Frequency Division Multiplexing is a technique used for which type of amateur communication?

✔ **A. High speed digital modes**

B. Extremely low-power contacts

C. EME

D. OFDM signals are not allowed on amateur bands

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: E8D02
What spread spectrum communications technique uses a high speed binary bit stream to shift the phase of an RF carrier?
A. Frequency hopping
✔ **B. Direct sequence**
C. Binary phase-shift keying
D. Phase compandored spread spectrum

Subelement E9

43: E9A01
What describes an isotropic antenna?
A. A grounded antenna used to measure earth conductivity
B. A horizontally polarized antenna used to compare Yagi antennas
✔ **C. A theoretical antenna used as a reference for antenna gain**
D. A spacecraft antenna used to direct signals toward the earth

44: E9B14
What type of information can be obtained by submitting the details of a proposed new antenna to a modeling program?
A. SWR vs frequency charts
✘ B. Polar plots of the far field elevation and azimuth patterns
C. Antenna gain
✔ **D. All of these choices are correct**

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: 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: E9F05

What is the approximate physical length of a solid polyethylene dielectric coaxial transmission line that is electrically one-quarter wavelength long at 14.1 MHz?

A. 20 meters

B. 2.3 meters

✔ **C. 3.5 meters**

D. 0.2 meters

49: E9G11

How are the wavelength scales on a Smith chart calibrated?

A. In fractions of transmission line electrical frequency

✔ **B. In fractions of transmission line electrical wavelength**

C. In fractions of antenna electrical wavelength

D. In fractions of antenna electrical frequency

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 46 correct answers and 4 incorrect answers from a total of 50.

You would have passed the exam! Congratulations!

e)

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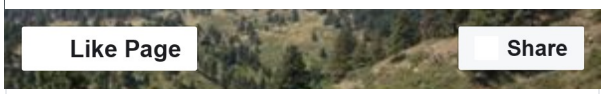

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