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: E0A07
How may dangerous levels of carbon monoxide from an emergency generator be detected?
A. By the odor
✔ **B. Only with a carbon monoxide detector**
C. Any ordinary smoke detector can be used
D. By the yellowish appearance of the gas

Subelement E1

2: E1A02
When using a transceiver that displays the carrier frequency of phone signals, which of the following displayed frequencies represents the lowest frequency at which a properly adjusted LSB emission will be totally within the band?
A. The exact lower band edge
B. 300 Hz above the lower band edge
C. 1 kHz above the lower band edge
✔ **D. 3 kHz above the lower band edge**

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: E1C08

What is the maximum permissible duration of a remotely controlled station's transmissions if its control link malfunctions?

A. 30 seconds

✔ **B. 3 minutes**

C. 5 minutes

D. 10 minutes

5: E1D07

Which amateur service HF bands have frequencies authorized for space stations?

✔ **A. Only the 40 m, 20 m, 17 m, 15 m, 12 m and 10 m bands**

B. Only the 40 m, 20 m, 17 m, 15 m and 10 m bands

C. Only the 40 m, 30 m, 20 m, 15 m, 12 m and 10 m bands

D. All HF bands

6: E1E09

What may be the penalty for a VE who fraudulently administers or certifies an examination?

✔ **A. Revocation of the VE's amateur station license grant and the suspension of the VE's amateur operator license grant**

B. A fine of up to $1000 per occurrence

C. A sentence of up to one year in prison

D. All of these choices are correct

7: E1F05

Amateur stations may not transmit in which of the following frequency segments if they are located in the contiguous 48 states and north of Line A?

A. 440 MHz - 450 MHz

B. 53 MHz - 54 MHz

x C. 222 MHz - 223 MHz

✔ **D. 420 MHz - 430 MHz**

Subelement E2

8: E2A12

What is one way to predict the location of a satellite at a given time?

A. By means of the Doppler data for the specified satellite

B. By subtracting the mean anomaly from the orbital inclination

C. By adding the mean anomaly to the orbital inclination

✔ **D. By calculations using the Keplerian elements for the specified satellite**

9: E2B14

What aspect of an amateur slow-scan television signal encodes the brightness of the picture?

✔ **A. Tone frequency**

xB. Tone amplitude

C. Sync amplitude

D. Sync frequency

10: E2C03

From which of the following bands is amateur radio contesting generally excluded?

✔ **A. 30 m**

B. 6 m

C. 2 m

D. 33 cm

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: 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: E3A07

Atmospheric ducts capable of propagating microwave signals often form over what geographic feature?

A. Mountain ranges

B. Forests

✔ **C. Bodies of water**

D. Urban areas

14: E3B11

At what time of day is Sporadic-E propagation most likely to occur?

A. Around sunset

B. Around sunrise

C. Early evening

✔ **D. Any time**

15: E3C01

What does the term ray tracing describe in regard to radio communications?

A. The process in which an electronic display presents a pattern

✔ **B. Modeling a radio wave's path through the ionosphere**

C. Determining the radiation pattern from an array of antennas

D. Evaluating high voltage sources for X-Rays

Subelement E4

16: E4A10

Which of the following displays multiple digital signal states simultaneously?

A. Network analyzer

B. Bit error rate tester

C. Modulation monitor

✔ **D. Logic analyzer**

17: E4B03

If a frequency counter with a specified accuracy of +/- 1.0 ppm reads 146,520,000 Hz, what is the most the actual frequency being measured could differ from the reading?

A. 165.2 Hz

B. 14.652 kHz

✔ **C. 146.52 Hz**

D. 1.4652 MHz

18: E4C16

Which of the following is caused by missing codes in an SDR receiver's analog-to-digital converter?

✔ **A. Distortion**

B. Overload

C. Loss of sensitivity

xD. Excess output level

19: E4D06

What is the term for unwanted signals generated by the mixing of two or more signals?

A. Amplifier desensitization

B. Neutralization

xC. Adjacent channel interference

✔ **D. Intermodulation interference**

20: E4E13

What might be the cause of a loud roaring or buzzing AC line interference that comes and goes at intervals?

A. Arcing contacts in a thermostatically controlled device
B. A defective doorbell or doorbell transformer inside a nearby residence
C. A malfunctioning illuminated advertising display
✔ **D. All of these choices are correct**

Subelement E5

21: E5A01
What can cause the voltage across reactances in series to be larger than the voltage applied to them?
✔ **A. Resonance**
xB. Capacitance
C. Conductance
D. Resistance

22: E5B08
What is the phase angle between the voltage across and the current through a series RLC circuit if XC is 100 ohms, R is 100 ohms, and XL is 75 ohms?
✔ **A. 14 degrees with the voltage lagging the current**
B. 14 degrees with the voltage leading the current
C. 76 degrees with the voltage leading the current
D. 76 degrees with the voltage lagging the current

23: E5C06
What does the impedance 50â€“j25 represent?
A. 50 ohms resistance in series with 25 ohms inductive reactance
✔ **B. 50 ohms resistance in series with 25 ohms capacitive reactance**
C. 25 ohms resistance in series with 50 ohms inductive reactance
D. 25 ohms resistance in series with 50 ohms capacitive reactance

24: E5D15
What is the power factor of an R-L circuit having a 45 degree phase angle between the voltage and the current?
A. 0.866
B. 1.0
C. 0.5
✔ **D. 0.707**

Subelement E6

25: E6A15
Which semiconductor material contains excess holes in the outer shell of electrons?
A. N-type

✔ **B. P-type**

C. Superconductor-type

D. Bipolar-type

26: E6B07

What is the failure mechanism when a junction diode fails due to excessive current?

A. Excessive inverse voltage

✔ **B. Excessive junction temperature**

C. Insufficient forward voltage

D. Charge carrier depletion

27: E6C13

Which of the following is an advantage of BiCMOS logic?

A. Its simplicity results in much less expensive devices than standard CMOS

B. It is totally immune to electrostatic damage

✔ **C. It has the high input impedance of CMOS and the low output impedance of bipolar transistors**

D. All of these choices are correct

28: E6D04

Which materials are commonly used as a slug core in a variable inductor?

A. Polystyrene and polyethylene

✔ **B. Ferrite and brass**

C. Teflon and Delrin

D. Cobalt and aluminum

29: E6E04

Which is the most common input and output impedance of circuits that use MMICs?

✔ **A. 50 ohms**

B. 300 ohms

C. 450 ohms

D. 10 ohms

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: E7B04

Where on the load line of a Class A common emitter amplifier would bias normally be set?

✔ **A. Approximately half-way between saturation and cutoff**
B. Where the load line intersects the voltage axis
C. At a point where the bias resistor equals the load resistor
D. At a point where the load line intersects the zero bias current curve

33: E7C09

What is a Jones filter as used as part of an HF receiver IF stage?

A. An automatic notch filter
✔ **B. A variable bandwidth crystal lattice filter**
C. A special filter that emphasizes image responses
D. A filter that removes impulse noise

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: E7E06

Why is de-emphasis commonly used in FM communications receivers?

✔ **A. For compatibility with transmitters using phase modulation**
B. To reduce impulse noise reception
C. For higher efficiency
D. To remove third-order distortion products

36: E7F14

Which of the following would allow a digital signal processing filter to create a sharper filter response?

A. Higher data rate
✔ **B. More taps**
C. Complex phasor representations
D. Double-precision math routines

37: E7G04

What is meant by the term op-amp input offset voltage?

A. The output voltage of the op-amp minus its input voltage

xB. The difference between the output voltage of the op-amp and the input voltage required in the immediately following stage

✔ **C. The differential input voltage needed to bring the open loop output voltage to zero**

D. The potential between the amplifier input terminals of the op-amp in an open loop condition

38: E7H13

Which of the following is a technique for providing highly accurate and stable oscillators needed for microwave transmission and reception?

xA. Use a GPS signal reference

B. Use a rubidium stabilized reference oscillator

C. Use a temperature-controlled high Q dielectric resonator

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

Subelement E8

39: E8A03

What type of wave does a Fourier analysis show to be made up of sine waves of a given fundamental frequency plus all of its harmonics?

✔ **A. A sawtooth wave**

xB. A square wave

C. A sine wave

D. A cosine wave

40: E8B06

What is the deviation ratio of an FM-phone signal having a maximum frequency swing of plus or minus 7.5 kHz when the maximum modulation frequency is 3.5 kHz?

✔ **A. 2.14**

B. 0.214

C. 0.47

D. 47

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: E8D05

What is the most common method of reducing key clicks?

✔ **A. Increase keying waveform rise and fall times**

B. Low-pass filters at the transmitter output

C. Reduce keying waveform rise and fall times

D. High-pass filters at the transmitter output

Subelement E9

43: E9A06

How does the beamwidth of an antenna vary as the gain is increased?

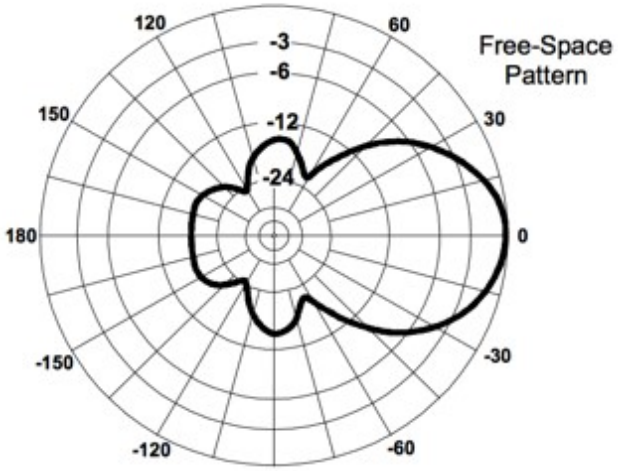
A. It increases geometrically
B. It increases arithmetically
C. It is essentially unaffected
✔ **D. It decreases**

44: E9B03

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

A. 12 dB
✔ **B. 14 dB**
C. 18 dB
D. 24 dB

Figure E9-1



45: E9C09

What is a G5RV antenna?

✔ **A. A multi-band dipole antenna fed with coax and a balun through a selected length of open wire transmission line**
B. A multi-band trap antenna
C. A phased array antenna consisting of multiple loops
D. A wide band dipole using shorted coaxial cable for the radiating elements and fed with a 4:1 balun

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: 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: E9G04

What are the two families of circles and arcs that make up a Smith chart?

A. Resistance and voltage

B. Reactance and voltage

✔ **C. Resistance and reactance**

D. Voltage and impedance

50: E9H04

What is an advantage of using a shielded loop antenna for direction finding?

A. It automatically cancels ignition noise in mobile installations

✔ **B. It is electro statically balanced against ground, giving better nulls**

C. It eliminates tracking errors caused by strong out-of-band signals

D. It allows stations to communicate without giving away their position

Results:

You scored 42 correct answers and 8 incorrect answers from a total of 50.

You would have passed the exam! Congratulations!

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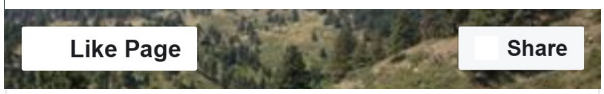

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