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: E0A06
Why are there separate electric (E) and magnetic (H) field MPE limits?

xA. The body reacts to electromagnetic radiation from both the E and H fields
B. Ground reflections and scattering make the field impedance vary with location
C. E field and H field radiation intensity peaks can occur at different locations
✔ **D. All of these choices are correct**

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: E1B03
Within what distance must an amateur station protect an FCC monitoring facility from harmful interference?

✔ **A. 1 mile**
B. 3 miles
C. 10 miles
D. 30 miles

4: E1C13

Which of the following is required in order to operate in accordance with CEPT rules in foreign countries where permitted?

A. You must identify in the official language of the country in which you are operating
B. The U.S. embassy must approve of your operation
✔ **C. You must bring a copy of FCC Public Notice DA 11-221**
D. You must append "/CEPT" to your call sign

5: E1D09

Which UHF amateur service bands have frequencies available for a space station?

A. 70 cm only
✔ **B. 70 cm and 13 cm**
C. 70 cm and 33 cm
D. 33 cm and 13 cm

6: E1E05

What is the minimum passing score on amateur operator license examinations?

A. Minimum passing score of 70%
✔ **B. Minimum passing score of 74%**
C. Minimum passing score of 80%
D. Minimum passing score of 77%

7: E1F09

Which of the following conditions apply when transmitting spread spectrum emission?

A. A station transmitting SS emission must not cause harmful interference to other stations employing other authorized emissions
B. The transmitting station must be in an area regulated by the FCC or in a country that permits SS emissions
C. The transmission must not be used to obscure the meaning of any communication
✔ **D. All of these choices are correct**

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: E2B09

What hardware, other than a receiver with SSB capability and a suitable computer, is needed to decode SSTV using Digital Radio Mondiale (DRM)?

A. A special IF converter
B. A special front end limiter
C. A special notch filter to remove synchronization pulses
✔ **D. No other hardware is needed**

10: E2C08
Which of the following contacts may be confirmed through the U.S. QSL bureau system?
A. Special event contacts between stations in the U.S.
✔ **B. Contacts between a U.S. station and a non-U.S. station**
C. Repeater contacts between U.S. club members
D. Contacts using tactical call signs

11: E2D05
Which of the following techniques is normally used by low Earth orbiting digital satellites to relay messages around the world?
A. Digipeating
✔ **B. Store-and-forward**
C. Multi-satellite relaying
D. Node hopping

12: E2E08
Which of the following HF digital modes can be used to transfer binary files?
A. Hellschreiber
✔ **B. PACTOR**
C. RTTY
D. AMTOR

Subelement E3

13: E3A15
What is an electromagnetic wave?
A. A wave of alternating current, in the core of an electromagnet
B. A wave consisting of two electric fields at parallel right angles to each other
✔ **C. A wave consisting of an electric field and a magnetic field oscillating at right angles to each other**
D. A wave consisting of two magnetic fields at right angles to each other

14: E3B03
What is the best time of day for transequatorial propagation?
A. Morning
B. Noon
✔ **C. Afternoon or early evening**
D. Late at night

15: E3C06
By how much does the VHF/UHF radio horizon distance exceed the geometric horizon?
✔ **A. By approximately 15 percent of the distance**
B. By approximately twice the distance
C. By approximately 50 percent of the distance
D. By approximately four times the distance

Subelement E4

16: E4A06

What is the effect of aliasing in a digital or computer-based oscilloscope?

✔ **A. False signals are displayed**

B. All signals will have a DC offset

C. Calibration of the vertical scale is no longer valid

D. False triggering occurs

17: E4B01

Which of the following factors most affects the accuracy of a frequency counter?

A. Input attenuator accuracy

✔ **B. Time base accuracy**

C. Decade divider accuracy

D. Temperature coefficient of the logic

18: E4C01

What is an effect of excessive phase noise in the local oscillator section of a receiver?

A. It limits the receiver's ability to receive strong signals

xB. It reduces receiver sensitivity

C. It decreases receiver third-order intermodulation distortion dynamic range

✔ **D. It can cause strong signals on nearby frequencies to interfere with reception of weak signals**

19: E4D02

Which of the following describes two problems caused by poor dynamic range in a communications receiver?

✔ **A. Cross-modulation of the desired signal and desensitization from strong adjacent signals**

B. Oscillator instability requiring frequent retuning and loss of ability to recover the opposite sideband

C. Cross-modulation of the desired signal and insufficient audio power to operate the speaker

D. Oscillator instability and severe audio distortion of all but the strongest received signals

20: E4E14

What is one type of electrical interference that might be caused by the operation of a nearby personal computer?

A. A loud AC hum in the audio output of your station receiver

B. A clicking noise at intervals of a few seconds

✔ **C. The appearance of unstable modulated or unmodulated signals at specific frequencies**

D. A whining type noise that continually pulses off and on

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: E5B12
What is admittance?
✔ **A. The inverse of impedance**
B. The term for the gain of a field effect transistor
C. The turns ratio of a transformer
D. The unit used for Q factor

23: E5C11
What do the two numbers that are used to define a point on a graph using rectangular coordinates represent?
xA. The magnitude and phase of the point
B. The sine and cosine values
✔ **C. The coordinate values along the horizontal and vertical axes**
D. The tangent and cotangent values

24: E5D16
What is the power factor of an R-L circuit having a 30 degree phase angle between the voltage and the current?
A. 1.73
B. 0.5
✔ **C. 0.866**
D. 0.577

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: E6B08
Which of the following describes a type of semiconductor diode?
✔ **A. Metal-semiconductor junction**

B. Electrolytic rectifier
C. CMOS-field effect
D. Thermionic emission diode

27: E6C02
What happens when the level of a comparator's input signal crosses the threshold?
A. The IC input can be damaged
✔ **B. The comparator changes its output state**
C. The comparator enters latch-up
D. The feedback loop becomes unstable

28: E6D11
How many turns will be required to produce a 1-mH inductor using a core that has an inductance index (A L) value of 523 millihenrys/1000 turns?
A. 2 turns
B. 4 turns
✔ **C. 43 turns**
D. 229 turns

29: E6E06
What characteristics of the MMIC make it a popular choice for VHF through microwave circuits?
A. The ability to retrieve information from a single signal even in the presence of other strong signals
B. Plate current that is controlled by a control grid
C. Nearly infinite gain, very high input impedance, and very low output impedance
✔ **D. Controlled gain, low noise figure, and constant input and output impedance over the specified frequency range**

30: E6F07
What is a solid state relay?
A. A relay using transistors to drive the relay coil
✔ **B. A device that uses semiconductors to implement the functions of an electromechanical relay**
C. A mechanical relay that latches in the on or off state each time it is pulsed
D. A passive delay line

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: E7B01

For what portion of a signal cycle does a Class AB amplifier operate?

✔ **A. More than 180 degrees but less than 360 degrees**

B. Exactly 180 degrees

C. The entire cycle

D. Less than 180 degrees

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: E7D15

What is the purpose of a "step-start" circuit in a high voltage power supply?

A. To provide a dual-voltage output for reduced power applications

B. To compensate for variations of the incoming line voltage

C. To allow for remote control of the power supply

✔ **D. To allow the filter capacitors to charge gradually**

35: E7E10

How does a diode detector function?

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

B. By breakdown of the Zener voltage

xC. 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: E7G01

What is the typical output impedance of an integrated circuit op-amp?

✔ **A. Very low**

B. Very high

C. 100 ohms

D. 1000 ohms

38: E7H07

How can an oscillator's microphonic responses be reduced?

A. Use of NP0 capacitors

B. Eliminating noise on the oscillator's power supply

C. Using the oscillator only for CW and digital signals
D. Mechanically isolating the oscillator circuitry from its enclosure

Subelement E8

39: E8A06
What is the approximate ratio of PEP-to-average power in a typical single-sideband phone signal?
✔ **A. 2.5 to 1**
B. 25 to 1
C. 1 to 1
D. 100 to 1

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: 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: E8D03
How does the spread spectrum technique of frequency hopping work?
A. If interference is detected by the receiver it will signal the transmitter to change frequencies
B. If interference is detected by the receiver it will signal the transmitter to wait until the frequency is clear
xC. A pseudo-random binary bit stream is used to shift the phase of an RF carrier very rapidly in a particular sequence
✔ **D. The frequency of the transmitted signal is changed very rapidly according to a particular sequence also used by the receiving station**

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**
xD. Take-off angle

44: E9B04
What may occur when a directional antenna is operated at different frequencies within the band for which it was designed?
A. Feed point impedance may become negative
B. The E-field and H-field patterns may reverse
C. Element spacing limits could be exceeded
✔ **D. The gain may change depending on frequency**

45: E9C12
Which of the following describes an extended double Zepp antenna?
A. A wideband vertical antenna constructed from precisely tapered aluminum tubing
B. A portable antenna erected using two push support poles
✔ **C. A center fed 1.25 wavelength antenna (two 5/8 wave elements in phase)**
D. An end fed folded dipole antenna

46: E9D09
What is the function of a loading coil used as part of an HF mobile antenna?
A. To increase the SWR bandwidth
B. To lower the losses
C. To lower the Q
✔ **D. To cancel capacitive reactance**

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: E9F10
What impedance does a 1/8 wavelength transmission line present to a generator when the line is shorted at the far end?
xA. A capacitive reactance
B. The same as the characteristic impedance of the line
✔ **C. An inductive reactance**
D. The same as the input impedance to the final generator stage

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

You would have passed the exam! Congratulations!

e:

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