

Results for sample extra2016 test paper

Your answers are marked like this:

✓ **A. You got this question right, this is your correct answer.**

✗ *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: E0A03

Which of the following would be a practical way to estimate whether the RF fields produced by an amateur radio station are within permissible MPE limits?

- A. Use a calibrated antenna analyzer
- B. Use a hand calculator plus Smith-chart equations to calculate the fields
- ✓ **C. Use an antenna modeling program to calculate field strength at accessible locations**
- D. All of the choices are correct

Subelement E1

2: E1A09

What is the first action you should take if your digital message forwarding station inadvertently forwards a communication that violates FCC rules?

- ✓ **A. Discontinue forwarding the communication as soon as you become aware of it**
- B. Notify the originating station that the communication does not comply with FCC rules
- C. Notify the nearest FCC Field Engineer's office
- D. Discontinue forwarding all messages

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: 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: E1D05

What class of licensee is authorized to be the control operator of a space station?

- A. All except Technician Class
- B. Only General, Advanced or Amateur Extra Class
- ☒ **C. Any class with appropriate operator privileges**
- D. Only Amateur Extra Class

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: E1F08

Which of the following types of amateur station communications are prohibited?

- ☒ **A. Communications transmitted for hire or material compensation, except as otherwise provided in the rules**
- B. Communications that have a political content, except as allowed by the Fairness Doctrine
- C. Communications that have a religious content
- D. Communications in a language other than English

Subelement E2

8: E2A07

Which of the following types of signals can be relayed through a linear transponder?

- A. FM and CW
- B. SSB and SSTV
- C. PSK and Packet
- ☒ **D. All of these choices are correct**

9: E2B16

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

- A. PAL
- B. DRM
- C. Scottie

☒ **D. NTSC**

10: E2C05

What is the function of a DX QSL Manager?

- A. To allocate frequencies for DXpeditions
- ☒ **B. To handle the receiving and sending of confirmation cards for a DX station**
- C. To run a net to allow many stations to contact a rare DX station
- D. To relay calls to and from a DX station

11: E2D11

Which of the following data are used by the APRS network to communicate your location?

- A. Polar coordinates
- B. Time and frequency
- C. Radio direction finding spectrum analysis
- ☒ **D. Latitude and longitude**

12: E2E13

Which of the following is a possible reason that attempts to initiate contact with a digital station on a clear frequency are unsuccessful?

- A. Your transmit frequency is incorrect
- B. The protocol version you are using is not the supported by the digital station
- C. Another station you are unable to hear is using the frequency
- ☒ **D. All of these choices are correct**

Subelement E3

13: E3A01

What is the approximate maximum separation measured along the surface of the Earth between two stations communicating by Moon bounce?

- A. 500 miles, if the Moon is at perigee
- B. 2000 miles, if the Moon is at apogee
- C. 5000 miles, if the Moon is at perigee
- ☒ **D. 12,000 miles, if the Moon is visible by both stations**

14: E3B02

What is the approximate maximum range for signals using transequatorial propagation?

- A. 1000 miles
- B. 2500 miles
- ☒ **C. 5000 miles**
- D. 7500 miles

15: E3C08

What does the space weather term G5 mean?

☒ **A. An extreme geomagnetic storm**

- B. Very low solar activity
- C. Moderate solar wind
- D. Waning sunspot numbers

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: 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: E4C07

What does the MDS of a receiver represent?

- A. The meter display sensitivity

☒ **B. The minimum discernible signal**

☒ **C. The multiplex distortion stability**

- D. The maximum detectable spectrum

19: E4D04

Which of the following may reduce or eliminate intermodulation interference in a repeater caused by another transmitter operating in close proximity?

- A. A band-pass filter in the feed line between the transmitter and receiver

☒ **B. A properly terminated circulator at the output of the transmitter**

- C. A Class C final amplifier
- D. A Class D final amplifier

20: E4E03

Which of the following signals might a receiver noise blanker be able to remove from desired signals?

- A. Signals which are constant at all IF levels

☒ **B. Signals which appear across a wide bandwidth**

- C. Signals which appear at one IF but not another
- D. Signals which have a sharply peaked frequency distribution

Subelement E5

21: E5A04

What is the magnitude of the impedance of a circuit with a resistor, an inductor and a capacitor all in parallel, at resonance?

- ☒ **A. Approximately equal to circuit resistance**
- ☐ B. Approximately equal to inductive reactance
- ☐ C. Low, as compared to the circuit resistance
- ☐ D. Approximately equal to capacitive reactance

22: E5B03

What happens to the phase angle of a reactance when it is converted to a susceptance?

- ☐ A. It is unchanged
- ☒ **B. The sign is reversed**
- ☐ C. It is shifted by 90 degrees
- ☐ D. The susceptance phase angle is the inverse of the reactance phase angle

23: E5C05

What is the name of the diagram used to show the phase relationship between impedances at a given frequency?

- ☐ A. Venn diagram
- ☐ B. Near field diagram
- ☒ **C. Phasor diagram**
- ☐ D. Far field diagram

24: E5D06

In what direction is the magnetic field oriented about a conductor in relation to the direction of electron flow?

- ☒ **xA. In the same direction as the current**
- ☐ B. In a direction opposite to the current
- ☐ C. In all directions; omni-directional
- ☒ **D. In a direction determined by the left-hand rule**

Subelement E6

25: E6A02

Which of the following semiconductor materials contains excess free electrons?

- ☒ **A. N-type**
- ☐ B. P-type
- ☐ C. Bipolar
- ☐ D. Insulated gate

26: E6B13

What type of bias is required for an LED to emit light?

- A. Reverse bias
- ✓ B. Forward bias
- C. Zero bias
- D. Inductive bias

27: E6C14

What is the primary advantage of using a Programmable Gate Array (PGA) in a logic circuit?

- A. Many similar gates are less expensive than a mixture of gate types
- ✓ B. Complex logic functions can be created in a single integrated circuit
- C. A PGA contains its own internal power supply
- D. All of these choices are correct

28: E6D17

Why should core saturation of a conventional impedance matching transformer be avoided?

- ✓ A. Harmonics and distortion could result
- B. Magnetic flux would increase with frequency
- C. RF susceptance would increase
- D. Temporary changes of the core permeability could result

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: E6F13

What is a liquid crystal display (LCD)?

- A. A modern replacement for a quartz crystal oscillator which displays its fundamental frequency
- ✓ B. A display utilizing a crystalline liquid and polarizing filters which becomes opaque when voltage is applied
- C. A frequency-determining unit for a transmitter or receiver
- D. A display that uses a glowing liquid to remain brightly lit in dim light

Subelement E7

31: E7A04

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

- A. 1
- ✓ B. 2

C. 4

xD. 8

32: E7B18

What is a characteristic of a grounded-grid amplifier?

- A. High power gain
- B. High filament voltage

✓ C. Low input impedance

- D. Low bandwidth

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: E7D11

What circuit element is controlled by a series analog voltage regulator to maintain a constant output voltage?

- A. Reference voltage
- B. Switching inductance
- C. Error amplifier

✓ D. Pass transistor

35: E7E02

What is the function of a reactance modulator?

- A. To produce PM signals by using an electrically variable resistance
- B. To produce AM signals by using an electrically variable inductance or capacitance
- C. To produce AM signals by using an electrically variable resistance

✓ D. To produce PM signals by using an electrically variable inductance or capacitance

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

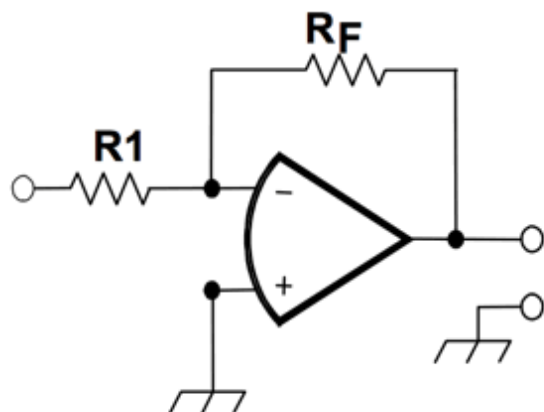
37: E7G07

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: E7H04

How is positive feedback supplied in a Colpitts oscillator?

- A. Through a tapped coil
- B. Through link coupling
- ☒ **C. Through a capacitive divider**
- D. Through a neutralizing capacitor

Subelement E8

39: E8A01

What is the name of the process that shows that a square wave is made up of a sine wave plus all of its odd harmonics?

- ☒ **A. Fourier analysis**
- B. Vector analysis
- C. Numerical analysis
- D. Differential analysis

40: E8B04

What is the modulation index of an FM-phone signal having a maximum carrier deviation of plus or minus 6 kHz when modulated with a 2 kHz modulating frequency?

- A. 6000
- ☒ **B. 3**
- C. 2000
- D. 1/3

41: E8C11

What is the relationship between symbol rate and baud?

- ☒ **A. They are the same**
- B. Baud is twice the symbol rate
- C. Symbol rate is only used for packet-based modes

D. Baud is only used for RTTY

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: E9A13

How much gain does an antenna have compared to a 1/2-wavelength dipole when it has 12 dB gain over an isotropic antenna?

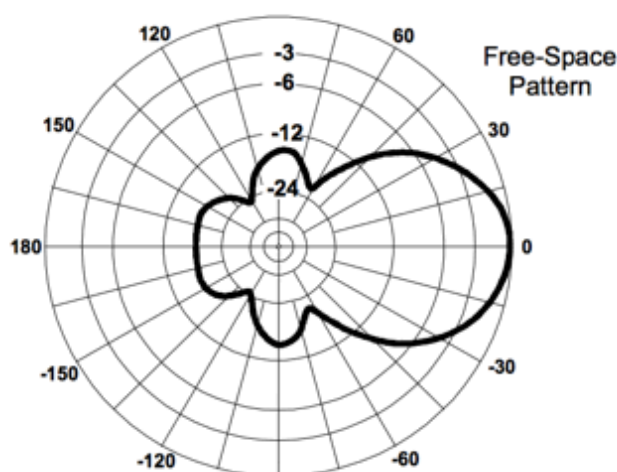
- A. 6.17 dB
- ✓ B. 9.85 dB
- C. 12.5 dB
- D. 14.15 dB

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: E9C03

What is the radiation pattern of two 1/4 wavelength vertical antennas spaced a 1/2 wavelength apart and fed in phase?

- A. Omni-directional
- B. Cardioid
- ✓ C. A Figure-8 broadside to the axis of the array

D. A Figure-8 end-fire along the axis of the array

46: E9D08

What happens as the Q of an antenna increases?

- A. SWR bandwidth increases
- ✓ B. SWR bandwidth decreases
- C. Gain is reduced
- D. More common-mode current is present on the feed line

47: E9E03

What is the name of the matching system that uses a section of transmission line connected in parallel with the feed line at or near the feed point?

- A. The gamma match
- B. The delta match
- C. The omega match
- ✓ D. The stub match

48: E9F13

What impedance does a 1/4 wavelength transmission line present to a generator when the line is shorted at the far end?

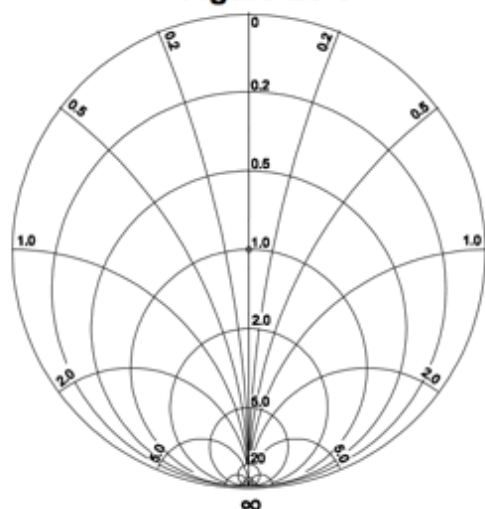
- ✓ A. Very high impedance
- B. Very low impedance
- C. The same as the characteristic impedance of the transmission line
- D. The same as the generator output impedance

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: E9H06

What is the triangulation method of direction finding?

- A. The geometric angles of sky waves from the source are used to determine its position

B. A fixed receiving station plots three headings to the signal source

✓ C. Antenna headings from several different receiving locations are used to locate the signal source

D. A fixed receiving station uses three different antennas to plot the location of the signal source

Results:

You scored 47 correct answers and 3 incorrect answers from a total of 50.

You would have passed the exam! Congratulations!

e)

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