

**AMATEUR RADIO EXAMINATION  
- QUESTION PAPER -**

INDEX NO.	AMR-11-2011-								
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DAY : SUNDAY  
DATE : 13<sup>th</sup> NOVEMBER 2011M / 17 ZULHIJAH 1432H  
TIME : 0930 - 1130 (2 HOURS)  
VENUE : MULTIPURPOSE HALL, UNIVERSITI BRUNEI DARUSSALAM

**TO ALL CANDIDATES  
PLEASE READ CAREFULLY THE INSTRUCTIONS BELOW  
BEFORE YOU START YOUR EXAMINATION PAPER**

1. This examination paper contains **60 multiple choice questions** and is separated into 2 sections. Section A contains **30 multiple choice questions**, and Section B also contains **30 multiple choice questions**, please answer all.
2. To answer, please **circle** the letters A, B, C or D that have been provided in the Answer Sheet.
3. Participants need to pass in both sections (Section A and B). Failure in either section will be counted as an automatic Fail.
4. Allowed writing material is **BLUE** or **BLACK** pens only. Pencils and other writing materials are prohibited.
5. **Strike** answers that are to be changed. The use of erasers, blanco or the likes is prohibited.
6. Mathematical work is allowed only on the question paper. Doing mathematical work on other paper is **prohibited**.
7. Examination Paper and Answer Sheet are to be returned to the invigilator, even if no questions are answered.
8. Participants are **prohibited** to speak, borrow writing materials or calculators or the likes during the whole duration of the exam.
9. Identification Card or passport is to be placed on the table for the whole duration of the examination. Participants are not allowed to leave their seats without permission from invigilators.
10. If it is found that participants are not following instructions, orders or warnings during the examination, their names will be recorded for further action or immediate disqualification.

## SECTION A

*This section contains 30 questions. Answer all.*

1. Section 68 of the Telecommunication Order 2001 states that any person who establishes, installs, maintains, provides or operates a telecommunication system or service within Brunei Darussalam without a license granted shall be guilty of an offence. Which of the following statement of conviction is CORRECT should a person do commit an offence?
  - A. Any person guilty of an offence under this section shall be liable on conviction to a fine not exceeding \$10,000, imprisonment for a term not exceeding 1 year or both.
  - B. Any person guilty of an offence under this Order or any regulations made thereunder for which no penalty is expressly provided shall, in addition to the forfeiture of any article seized, be liable on conviction to a fine not exceeding \$10,000, imprisonment for a term not exceeding 3 years of both.
  - C. Any person guilty of an offence under this section shall be liable on conviction to a fine not exceeding \$50,000, imprisonment for a term not exceeding 3 years or both.
  - D. No fine is liable at all.
  
2. In what Region and Zone is Brunei Darussalam located?
  - A. Region 3, Zone 28
  - B. Region 28, Zone 3
  - C. Region 38, Zone 2
  - D. Region 3, Zone 38
  
3. With regards to AITI rules and regulation, amateur radio equipment is only permitted to be operated
  - A. Within the frequency range stated in the license
  - B. Within the permitted range of frequency in the radio equipment
  - C. Using a radio transceiver
  - D. One time only
  
4. Before beginning a transmission, a good operator should
  - A. sharpen his/her pencil
  - B. measure transmitter input power
  - C. notify AITI
  - D. listen on transmitting frequency to be used
  
5. All operations regarding station usage need to be recorded in a log book. What details are required to be included in the log book for amateur radio operators everytime they are on air?
  - A. Date, station callsign which with you are communicating with, frequency band and emission.
  - B. Date, station which with you are communicating with, frequency band, emission and power output.
  - C. Date, frequency band and emission, station callsign which with you are communicating, start and end of conversation time, signal report, QSL
  - D. Date, frequency band and emission, power output, conversation time, signal report, statement.

6. Entries in the log book should *not* include.
  - A. Date
  - B. Time of commencement of operation
  - C. Signature of operator
  - D. Time of closing down of the station
  
7. The maximum power output for Very High Frequency and High Frequency
  - A. 400W
  - B. 10W
  - C. 150W
  - D. 50W
  
8. What is the correct way to make a contact on an Amateur Radio?
  - A. Say your callsign and then the callsign station you want to contact three times
  - B. Say the other operator's name, then your callsign three times
  - C. Say the callsign of the station you want to contact, then your callsign
  - D. Say, "Mayday, Mayday" then your callsign
  
9. You installed a 144MHz transceiver for marine operation on your boat to operate as a mobile station. Under which of the following conditions is operating permitted?
  - A. Not at all
  - B. Anywhere, provided the boat remains in Brunei Darussalam waters
  - C. On inland waterways and river but not in docks, estuaries or harbours
  - D. Only with special permission from the AITI
  
10. "QRP?" is the Q-code for
  - A. have you a power amplifier?
  - B. shall I reduce my transmitting power?
  - C. have you a message for me?
  - D. what time is it?
  
11. Station, Log book and license are required for random inspection done by
  - A. Authority for Info-communications Technology Industry (AITI)
  - B. A certified Radio Organization
  - C. Royal Brunei Police Force
  - D. Registrar of Companies
  
12. The word "MEDIC" should be spelt phonetically, using the phonetic alphabet
  - A. Mike Echo Delta India Chaplin
  - B. Mike Echo Denmark Indo Charlie
  - C. Mic Echo Denmark India Charlie
  - D. Mike Echo Delta India Charlie

13. If you heard somebody calling you but cannot exactly make out his callsign, which "Q" code signal you would send?
- A. QRS
  - B. QRZ
  - C. QRK
  - D. QRM
14. If you purchase amateur radio equipment from outside the country, what is the right thing to do upon arrival at the custom's control post?
- A. Bring in the said equipment without notifying Royal Brunei Custom and Excise official
  - B. Declare the equipment to the Royal Brunei Custom and Excise officials
  - C. Pay import tax for the equipment
  - D. Bring the equipment directly to AITI officials
15. What is the validity period of an Import Permit for an Amateur Radio equipment from the date of issue?
- A. 2 months
  - B. 3 weeks
  - C. 7 days
  - D. 14 days
16. A station 'Callsign' is sent for the purpose of identification at the start of transmission and end of transmission. It should be repeated for
- A. Within the first 30 minutes
  - B. Once after the first 15 minutes
  - C. Every 15 minutes
  - D. Once within 60 minutes
17. What is the frequency band used by an amateur radio for a "Very High Frequency" in Brunei Darussalam?
- A. 144.000 kHz – 148.000 kHz
  - B. 137.000 MHz – 156.000 MHz
  - C. 144.000 MHz – 148.000 MHz
  - D. 137.000 kHz – 148.000 kHz
18. What should be done when installing an antenna on the surface of the earth?
- A. The antenna should be installed not to expose people to radio frequency radiation from the antenna's transmission
  - B. The antenna should not be installed higher than you
  - C. The antenna can be installed on a wet surface
  - D. The antenna need to be painted to avoid human being and animals from colliding into the antenna

19. All amateur radio equipment in a station has to be maintained and used
- A. Not to interfere with other radio-communication services
  - B. With support from IEE
  - C. Approximately 20% of the approved maximum power
  - D. With complete discretion by AITI officials
20. Why is it necessary for a 'Directional High-Gain' antenna to be placed higher than the surrounding buildings?
- A. To prevent it from collapsing
  - B. To avoid the antenna from damaging nearby buildings with its RF power
  - C. For the antenna to receive greater universal wave and low wave
  - D. To avoid the antenna from directing its excess RF power to the people in nearby buildings
21. What type of operation which transmit and receive on a different frequency?
- A. Simplex Operation
  - B. Duplex Operation
  - C. Multiplex Operation
  - D. All of the above
22. Which of the statement below is CORRECT regarding installation of amateur radio equipment in a vehicle?
- A. One unit of licensed radio equipment is only allowed for one vehicle unless stated otherwise in the license.
  - B. Radio equipment can be installed in any vehicle without any valid amateur radio license.
  - C. Installation of radio equipment and antenna is not required to meet the specifications and regulations of road and safety code.
  - D. One unit of licensed radio equipment can be transferred anytime from one to another vehicle.
23. When using a repeater to communicate, which of the following do you need to know about the repeater?
- A. Its input frequency and offset
  - B. The owner of the repeater
  - C. Its power level and location
  - D. Whether or not it has a patch
24. What material is best for antenna conductor?
- A. Silicon
  - B. Steel
  - C. Aluminium
  - D. Copper

25. In what circumstances can an amateur radio broadcast information to the public?
- A. When an amateur radio operator is paid
  - B. When broadcasting is less than one hour
  - C. When broadcasting is more than 15 minutes
  - D. It is entirely prohibited
26. What type of interference may come from a multi-band antenna connected to a poorly tuned transmitter?
- A. Harmonic radiation
  - B. Auroral distortion
  - C. Parasitic excitation
  - D. Intermodulation noise
27. For special event such as Jamboree On The Air, AITI allocate callsign in the following prefix
- A. V84S
  - B. V85S
  - C. V88S
  - D. V89S
28. An activity wherein participants use radio direction finding techniques to locate one or more radio transmitters hidden within a designated area, is called?
- A. Fox Hunting
  - B. Fox Dancing
  - C. DXing
  - D. Echolink
29. In International Morse code, what is **AITI** ?
- A. .- .. - ..
  - B. .. - .. -.
  - C. -- .. .- ..
  - D. .. .- .. --
30. The most common input/output frequency offset for repeaters in the 2-metre band is
- A. 1.6 MHz
  - B. 0.6 MHz
  - C. 5.0 MHz
  - D. 0.4 MHz

## SECTION B

This section contains 30 questions. Answer *all*.

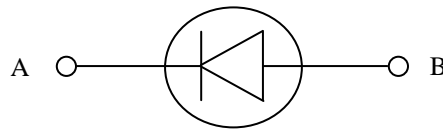
31. The relationships between 'Current (I)', 'Voltage (V)' and 'Resistance (R)' is

- A.  $V = IR$
- B.  $I = VR$
- C.  $V = I^2R$
- D.  $V = I+R$

32. If 'c' is speed of light, 'f' is frequency and  $c=f\lambda$ , what does  $\lambda$  represent?

- A. wavelength
- B. time
- C. amplitude
- D. velocity

33. In the diagram below, indicate the current flow in the semi-conductor diode.

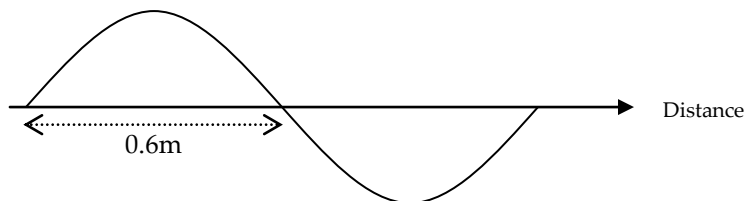


- A. From B to A
- B. From A to B
- C. From A to B and B to A
- D. None of the above

34. What is the time period of an alternating current if the frequency is 5 MHz?

- A. 0.2 ms
- B. 0.2  $\mu$ s
- C. 200 ms
- D. 20  $\mu$ s

35. What is the frequency of the signal shown below at speed  $3 \times 10^8$  m/s, if both half-cycle are of equal length?



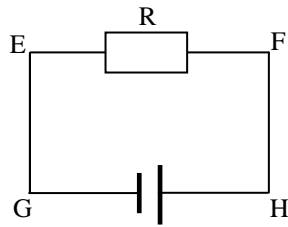
- A. 250 MHz
- B. 250 kHz
- C. 25 GHz
- D. 25 mHz

36. A transformer is used to balance a transmission line of 4.0 Ohm with a 2020 Ohm antenna. What is the ratio required for the transformer to do this?

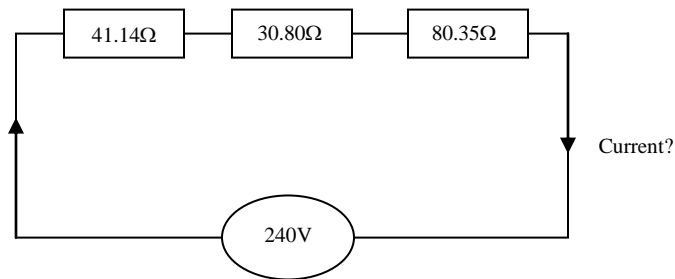
- A. 1 : 8080
- B. 1 : 505
- C. 1 : 1010
- D. 1 : 2020

37. Which direction is the electron flowing in the diagram below?

- A. From F to E
- B. From G to H
- C. From H -> F -> E -> G
- D. From G -> E -> F -> H



38. What is the Current and the total Resistance of three resistors connected in series as shown below?



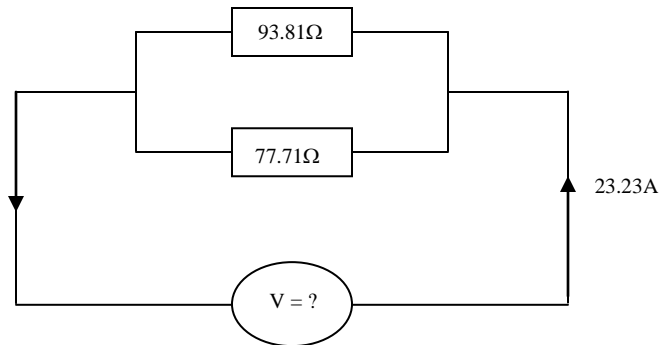
- A. 0.64 A and 50.76 Ohms
- B. 0.64 A and 152.29 Ohms
- C. 1.58 A and 50.76 Ohms
- D. 1.58 A and 152.29 Ohms

39. The main advantage of the yagi aerial as compared with dipole is

- A. Smaller physical dimensions
- B. Increased forward gain
- C. A wider beam width
- D. A better match for the feeder



40. What is the Voltage (V) and the total Resistance of 93.81 Ohms and 77.71 Ohms resistors connected in parallel as shown below, if a 23.23 A current flows through the circuit?



- A. 240 V and 7289.98 Ohms  
B. 3984.41 V and 171.52 Ohms  
C. 169346.24 V and 7289.98 Ohms  
D. 240 V and 171.52 Ohms
41. Define the function of a Low-Pass filter?
- A. Restrict high frequency and restrict low frequency  
B. Restrict low frequency only  
C. Channeling high frequency and channeling low frequency  
D. Restrict high frequency only
42. What is the modulation used in "Very High Frequency" and "High Frequency" respectively?
- A. Single band and multiple band  
B. Amplitude modulation and frequency modulation  
C. Frequency modulation and amplitude modulation  
D. Quadrature amplitude modulation and phase modulation
43. Which one of the following is the correct application of the frequency 7040 kHz in amateur radio?
- A. Short distance communication ie. Borneo Island  
B. Long distance communication ie. Hawaii  
C. Repeaters  
D. None of the above
44. What is the frequency band for a 'High Frequency'?
- A. 30 MHz – 300 MHz  
B. 3000 kHz – 30000 kHz  
C. 3 Hz – 30 kHz  
D. 3 kHz – 30 kHz

45. Define which antenna comprises of a center-fed driven element for transmitting or receiving radio frequency energy?
- A. Omni-directional Antenna
  - B. Half wavelength dipole
  - C. Yagi Antenna
  - D. Straight wire antenna
46. What is the velocity of an electro-magnetic wave?
- A.  $200 \times 10^6$  metres/sec
  - B.  $3 \times 10^8$  metres/sec
  - C.  $0.3 \times 10^8$  metres/sec
  - D.  $3 \times 10^{-8}$  metres/sec
47. A standing wave meter (SWR) is used to check the
- A. Height of the tower
  - B. Efficiency of a transmitter
  - C. Resonant frequency of an aerial
  - D. Matching of the transmitter to the aerial system
48. What is the Unit(s) for each of the components (Capacitor, Current, Resistor, Inductor) respectively?
- A. Farad, Ampere, Ohm, Henry
  - B. Coulombs, Meter, Ohm, Henry
  - C. Coulombs, Ampere, Ohm, Farad
  - D. Farad, Ampere, Resistance, Henry
49. The relationship of 'Charge' is
- A.  $Q = V/R$
  - B.  $Q = CV$
  - C.  $Q = C/V$
  - D.  $Q = C^2V$
50. Which of the following principles is used when working with almost any electronic circuit?
- A. Ohm's Law
  - B. Coulomb's Law
  - C. Cole's Law
  - D. Tesla's Law
51. What is the unit prefixes for Giga, Kilo, Mega respectively?
- A.  $10^9, 10^3, 10^6$
  - B.  $10^9, 10^6, 10^3$
  - C.  $10^6, 10^3, 10^9$
  - D.  $10^{-9}, 10^3, 10^6$

52. An increase in power from 13 Watts to 26 Watts is equal to a gain of:

- A. 3 dB
- B. -3 dB
- C. -13 dB
- D. 13 dB

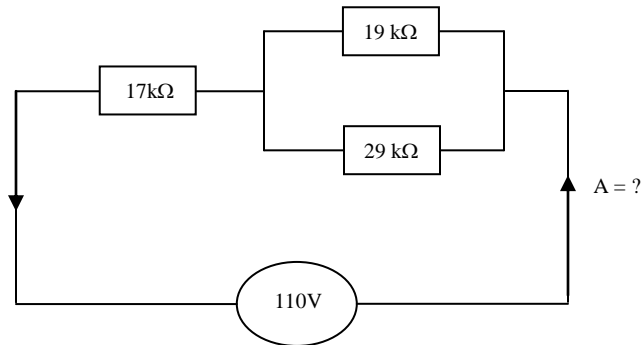
53. The unit Watt (W) is a measure for:

- A. RF power
- B. RF electric field strength
- C. RF energy
- D. RF voltage

54. What is the meter band for the frequency 3.50-3.90MHz?

- A. 80 meters
- B. 80 cm
- C. 30 meters
- D. 30 cm

55. What is the total current in the circuit shown below?



- A. 0.00386 ampere
- B. 0.00065 ampere
- C. 1.69231 ampere
- D. 464.750 ampere

56. Compared with an ordinary amplitude modulated signal a single-sideband signal

- A. occupies a wider bandwidth
- B. occupies half the bandwidth
- C. is distorted
- D. is easier to tune in

57. The frequency of a Variable Frequency Oscillator (VFO) is determined by
- A. the supply voltage
  - B. the inductance and capacitance of the tuned circuit
  - C. the type of transistor used
  - D. the particular circuit used
58. What is the advantage of a quarter-wave vertical ground-plane antenna for DX working on 21MHz?
- A. Small size
  - B. All-round radiation
  - C. Good matching to the feeder
  - D. Low radiation angle
59. What is the advantage of using a trap dipole antenna over a usual dipole?
- A. It has more gain
  - B. It operates on several bands
  - C. It is omni-directional
  - D. It is a broadband antenna
60. A three-element Yagi antenna of rods of unequal length, please arrange the elements in descending order
- A. Reflector, driven element, director
  - B. Driven element, reflector, director
  - C. Director, driven element, reflector
  - D. Reflector director, driven element