

**AMATEUR RADIO EXAMINATION  
- QUESTION PAPER -**

INDEX NO.	AMR-03-2015-								
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DAY : SUNDAY  
DATE : 29<sup>th</sup> MARCH 2015/ 8 JAMADILAKHIR 1436H  
TIME : 0930 – 1130 (2 HOURS)  
VENUE : B13, AITI BUILDING, KG. ANGGEREK DESA

**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 when a person commits 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. What is the definition of the Amateur Radio Service?
  - A. A radio communication service carried out by individual other than telecommunications service provider
  - B. A radio communication service carried out by non-professional people
  - C. A radio communication service carried out by technicians for the purpose of self-training of radio announcers
  - D. A radio communication service for the purpose of self-training, intercommunication and technical Investigations carried out by amateurs
  
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. One time only
  - D. Using a radio transceiver
  
4. Which of the following statement is correct:
  - A. An amateur radio station may only be used to communicate with another private network radio station
  - B. An amateur radio station may only be used to communicate with another broadcasting station
  - C. An amateur radio station may only be used to communicate with another amateur radio station
  - D. An amateur radio station may only be used to communicate with an illegal radio station
  
5. The content recorded on your station log book shall be preserved for a period of:
  - A. at least 6 months
  - B. at least 1 year
  - C. at least 2 years
  - D. forever

6. How much is the fee for the Amateur radio licence?
  - A. No fee is required
  - B. B\$25 for a year
  - C. B\$25 for a lifetime
  - D. B\$5 for a year
  
7. What are the two (2) types of amateur radio licence issued by AITI?
  - A. Written Class and Practical Class
  - B. Advanced Class and Standard Class
  - C. Advanced Class and General Class
  - D. Standard Class and Trial Class
  
8. 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 of the person you are communicating with, start and end of conversation time, signal report, QSL
  - D. Date, frequency band and emission, power output, conversation time, signal report, statement.
  
9. If an amateur radio licensee wants to terminate his/her licence, he or she must
  - A. inform AITI in written format and state reasons for termination while also informing the status of equipment, which must be signed by licensee prior to the licence expiry date
  - B. inform AITI in written format and states reasons for termination while also informing the status of equipment, which must be signed by licensee after licence has expired.
  - C. disconnect his/her amateur radio equipment.
  - D. inform his/her amateur radio association.
  
10. What is the primary requirement for a VHF (Standard) licence holder to upgrade to HF (Advance) licence?
  - A. Holding a standard licence for a minimum of six (6) months and to submit a logbook indicating active communication for the past six (6) months.
  - B. To sit and pass an HF licence written examination.
  - C. Holding a standard licence for a minimum of three (3) months and to submit a logbook indicating active communication for the past six (6) months.
  - D. To sit and pass an HF licence practical examination.
  
11. You installed a 144MHz transceiver for marine operation on your boat to operate as a mobile station. Under which of the following conditions for operating is 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

12. Which of the following are required by AITI during an inspection?
- Station Log Book, Station Licence and equipment.
  - Station Log Book, Driving Licence and equipment
  - Station Log Book, Station Licence and FM Radio
  - Station Log Book, Import Permit, and equipment
13. The word "LAND" should be spelt phonetically, using the phonetic alphabet
- Lima, Alpha, November, December
  - Lima, Alphabet, November, Delta
  - Lima, Alpha, November, Delta
  - Lord, Alpha, November, Delta
14. What are the requirements for a foreigner to obtain a temporary amateur radio license in Brunei Darussalam?
- A local guarantor, applicant must produce a valid foreign amateur radio licence and a copy of applicant valid passport.
  - Applicant has to sit for AITI amateur radio exam.
  - Foreigners are not allowed to hold a local amateur radio licence.
  - Foreign guarantor, applicant must produce a valid foreign amateur radio licence and a copy of applicant valid passport.
15. If you ask the exact time to the person you are communicating with, which "Q" code signal you would send?
- QTR
  - QRT
  - QRZ
  - QTH
16. Which of the statement below is CORRECT regarding installation of amateur radio equipment in a vehicle?
- Only one unit of licensed radio equipment is allowed for one vehicle unless stated otherwise in the license.
  - Radio equipment can be installed in any vehicle without any valid amateur radio license.
  - Installation of radio equipment and antenna is not required to meet the specifications and regulations of road and safety code.
  - One unit of licensed radio equipment can be transferred anytime from one to another vehicle.
17. If you purchase amateur radio equipment from outside the country, without an import permit, what is the right thing to do upon arrival at the custom's control post?
- Bring in the said equipment without notifying Royal Brunei Custom and Excise Officials and seek approval from AITI
  - Declare the equipment to the Royal Brunei Custom and Excise officials, seek approval from AITI and pay import duty for the equipment
  - Pay import tax for the equipment without seeking approval from AITI
  - Bring the equipment directly to AITI officials for approvals without having to pay for import tax.

18. The maximum power output for Very High Frequency and High Frequency
- A. 400W
  - B. 10W
  - C. 150W
  - D. 50W
19. 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
20. 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
21. What is the correct callsign prefix for Standard and Advanced Class Amateur Radio Licence respectively?
- A. V85 and V89
  - B. V89 and V85
  - C. V8N and V8M
  - D. V8B and V8A
22. For 6 meter band, which one of the following frequency band is correct?
- A. 21.550 – 21.650 MHz
  - B. 21.000 – 21.450 MHz
  - C. 50.000 – 54.000 MHz
  - D. 14.000 – 14.350 MHz
23. 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
24. Amateur radio services, as a secondary service, are permitted to use the frequency band if
- A. amateur radio user feels experienced enough
  - B. it only interferes with other primary services
  - C. it does not cause any interference to primary service
  - D. the primary service operates at a lower power and used at the same time

25. Which set of conversation in amateur radio should be avoided?
- A. Religion, Business, Politics, Racial and Ethnic Slurs.
  - B. Hobbies, Education, and Entertainment.
  - C. Sport, Personal details and Socializing.
  - D. Weather, Location and Q-Codes.
26. 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
27. 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
28. Amateur radio repeater frequencies in Brunei are assigned by
- A. Local amateur radio club
  - B. Authority for Info-communications Technology Industry of Brunei Darussalam
  - C. Ministry of Communication
  - D. International Amateur Radio Association
29. What does 'CQ' and 'DX' stands for?
- A. Calling all station and Wait
  - B. Calling all station and Distance foreign countries
  - C. Call quit/Closing down and Digital signal transmission
  - D. Station call interference and Distance foreign countries
30. 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

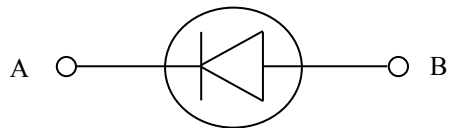
## SECTION B

This section contains 30 questions. Answer **all**.

31. If ' $f$ ' is frequency, ' $\lambda$ ' is wavelength and  $c=f\lambda$ , what does ' $c$ ' represent?

- A. wavelength
- B. time
- C. speed of light
- D. velocity

32. 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

33. What is the time period of an alternating current if the frequency is 10 kHz?

- A. 10 ms
- B. 0.1  $\mu$ s
- C. 0.1 ms
- D. 10  $\mu$ s

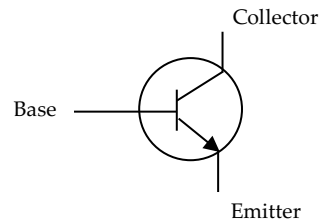
34. A transformer is used to balance a transmission line of  $4.0 \Omega$  with a ratio of 1 : 505. What is the resistance value used by the transformer?

- A. 2020 m $\Omega$
- B. 2020  $\Omega$
- C. 126.25  $\Omega$
- D. 8 m $\Omega$

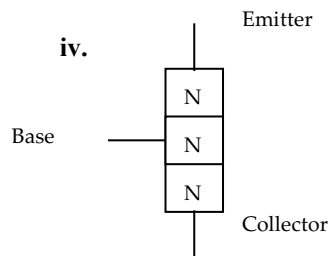
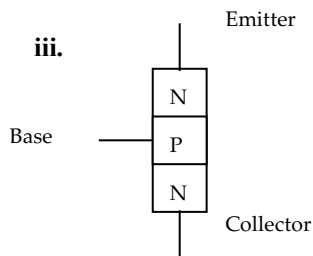
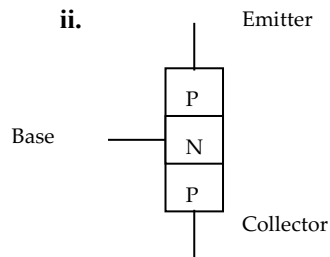
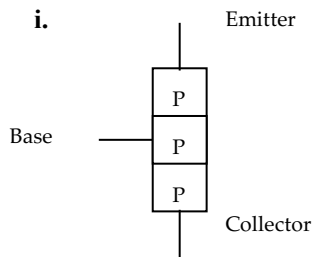
35. Which is the correct units for the following components:

- Capacitor
  - Resistor
  - Inductor
- A. Coulombs, Meter, Ohm
  - B. Coulombs, Ampere, Farad
  - C. Farad, Ampere, Henry
  - D. Farad, Ohm, Henry

36.



With reference to the transistor symbol above, which one is the correct answer?



- A. i
- B. ii
- C. iii
- D. iv

37. Which of the following is the correct function of a Low-Pass filter?

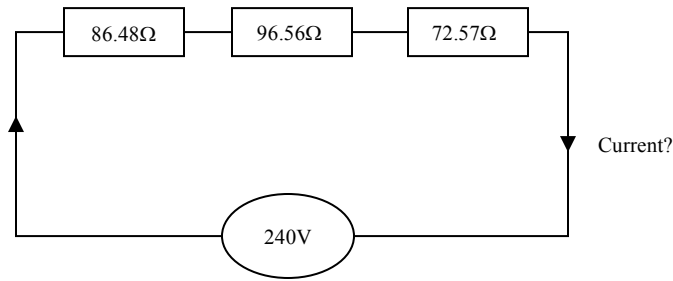
- A. Restrict high frequency and restrict low frequency
- B. Restrict low frequency only
- C. Channeling high frequency and channeling low frequency
- D. Restrict high frequency only

38. Which of the following are the correct modulations used for "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

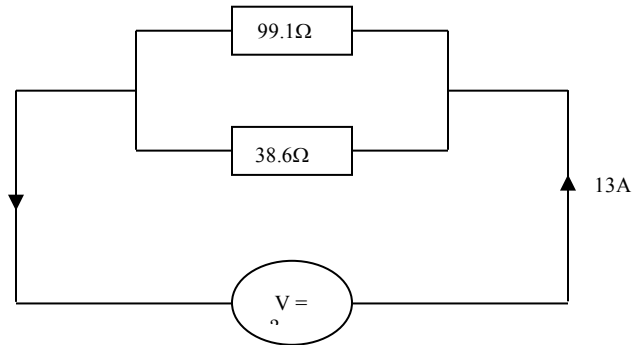


39. What is the Current and the total Resistance of three resistors connected in series as shown below?



- A. 0.94 A and  $255.61\Omega$
- B. 0.94 mA and  $255.61\text{ k}\Omega$
- C. 1.07 A and  $85.20\Omega$
- D. 0.3 A and  $766.83\Omega$

40. What is the Voltage (V) and the total Resistance of  $99.1\Omega$  and  $38.6\Omega$  resistors connected in parallel as shown below, if a 13 A current flows through the circuit?



- A. 240 kV and  $137.7\text{ k}\Omega$
- B. 361.127 V and  $27.779\Omega$
- C. 361.127 kV and  $27.779\text{ k}\Omega$
- D. 240 V and  $137.7\Omega$

41. Which of the following equipment that is used to convert sounds from our voice into radio signals

- A. Transmitter
- B. Receiver
- C. Speaker
- D. Antenna

42. What is the velocity of an electro-magnetic wave?

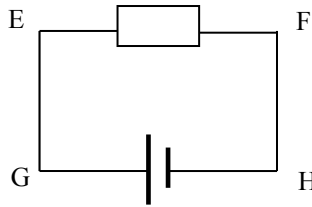
- A.  $200 \times 10^6$  metres/sec
- B.  $3 \times 10^8$  metres/sec
- C.  $0.3 \times 10^8$  metres/sec
- D.  $3 \times 10^{-8}$  metres/sec

43. Which of the following is true about Capacitor?
- A. It is an electrical device that resists the flow of current (Resistor)
  - B. A device that only allows a current to flow in one direction in a circuit (Diode)
  - C. Stores energy and produces a mechanical force between the conductors (Capacitor)
  - D. Used for filtering and smoothing of signals and are the major components in transformers (Inductor)
44. The wavelength of a signal in free space with a frequency of 146.08MHz is
- A. 0.487 meter
  - B. 0.0205 km
  - C. 2.05 meter
  - D. 0.487 km
45. 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
46. The correct formula for 'Charge' is:
- A.  $Q = V/R$
  - B.  $Q = CV$
  - C.  $Q = C/V$
  - D.  $Q = C^2V$
47. A power amplifier has a gain of 3dB. If you input 60W, the output would be?
- A. 20 W
  - B. 120 W
  - C. 120 kW
  - D. 20 kW
48. Which of the following is the correct value of Voltage-Root-Mean-Square ( $V_{rms}$ ) for measuring AC?
- A. 0.5 peak voltage ( $V_{pk}$ )
  - B. 0.707 peak voltage ( $V_{pk}$ )
  - C. 1.0 peak voltage ( $V_{pk}$ )
  - D. 0.333 peak voltage ( $V_{pk}$ )
49. What is the meter band for the frequency 3.50-3.90MHz?
- A. 80 meters
  - B. 80 cm
  - C. 30 meters
  - D. 30 cm

50. Which of the following is the correct arrangement for the three-element Yagi antenna of rods of unequal length in descending order?
- Reflector, driven element, director
  - Driven element, reflector, director
  - Director, driven element, reflector
  - Reflector director, driven element

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

- From E to F
- From H to G
- From H -> F -> E -> G
- From G -> E -> F -> H



52. Which of the following is the correct function of an antenna tuner?
- To improve power efficiency between transceiver and antenna by matching the impedance
  - To tune the frequency
  - To maintain power transmission at a safe level
  - To provide excellent grounding to the equipment during lightning
53. A 'line of sight' transmission between two stations uses mainly the:
- Ionosphere
  - Ground wave
  - Troposphere
  - Sky wave
54. Current is defined as
- a measure of electromotive (EMF) force between two points
  - material property that opposes the flow of electrons
  - a measure of the flow of electrons through a conductor
  - the amount of energy per unit time expended by a system
55. What does Single-sideband modulation (SSB) means?
- It is a refinement of the technique of frequency modulation
  - It is a refinement of the technique of amplitude modulation
  - It is a form of digital modulation
  - It is a spread spectrum modulation technique
56. Which of following is the correct component that can amplify a small signal using low voltages?
- PNP transistor
  - Transformer
  - Mega Cell Battery
  - Resistor

57. Which of the following of the components is used to make RF filters?
- A. Diode and Resistor
  - B. Zener Diode and Zeti Diode
  - C. Capacitor and LEDs
  - D. Inductors and Capacitors
58. Which of the following is the correct definition of Groundwave?
- A. Groundwave are radio waves that reflect off the ionosphere
  - B. Groundwave are radio waves traveling along the Earth's surface
  - C. Groundwave are radio waves that is absorb by the ground
  - D. none of the above
59. What does Modulation process allow?
- A. information to be compressed on to a carrier
  - B. information to be removed from a carrier
  - C. voice and Morse code to be combined
  - D. None of the above
60. What is the difference between an ordinary amplitude modulated signal and a single-sideband signal?
- A. single-sideband signal occupies a wider bandwidth
  - B. single-sideband signal is distorted
  - C. single-sideband signal occupies half the bandwidth
  - D. single-sideband signal is easier to tune in