# AMATEUR RADIO EXAMINATION - QUESTION PAPER -

INDEX NO.	AMR-10-2010-							IC COLOUR		
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DAY : SUNDAY

DATE : 17<sup>th</sup> OCTOBER 2010M / 9 ZULKAEDAH 1431H

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 <u>60 multiple choice questions</u> and is separated into 2 sections. Section A contains <u>30 multiple choice questions</u>, and Section B also contains <u>30 multiple choice questions</u>, please answer all.
- 2. To answer, please <u>circle</u> 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. <u>Strike</u> 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. According to the Telecommunication Order 2001, any person who establishes, installs, maintains, provides or operates a radio-communication service or any radio-communication equipment in any place or on board any vessel, aircraft or in any vehicle in Brunei Darussalam without a licence granted shall be guilty of an offence. Which of the statement below is CORRECT?
  - A. Any person guilty of an offence 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 offences shall 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 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 28, Zone 3
  - B. Region 3, Zone 28
  - C. Region 38, Zone 2
  - D. Region 2, Zone 38
- 3. 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 Officials and seek approval from AITI
  - B. Pay import tax for the equipment without seeking approval from AITI
  - C. Declare the equipment to the Royal Brunei Custom and Excise officials, seek approval from AITI and pay import tax for the equipment
  - D. Bring the equipment directly to AITI officials for approvals without having to pay for import tax.
- 4. What are the complete details inside the logbook for amateur radio operators everytime they are on air?
  - A. Duration of conversation time, station callsign which with you are communicating with, frequency band and emission.
  - B. Duration of conversation time, station which with you are communicating with, frequency band, emission and power output, signal report, QSL.
  - C. Date, frequency band and emission, power output, conversation time, signal report, statement.
  - D. Date, frequency band and emission, power output, station callsign which you are communicating with, start and end of conversation time, signal report, QSL.

- 5. Amateur Radio service is defined as
  - A. a radio station that is owned by a commercial entity. To be qualified as such, it must also be advertiser-supported and for-profit.
  - B. a radio-communications service in which a station is used for the purpose of self-training, intercommunication and technical investigations carried out by amateurs.
  - C. a conventional radio system uses a dedicated channel (frequency) for each individual group of users for public and commercial purposes.
  - D. a cellular service that can be used for voice and data.
- 6. What is the primary requirement for a VHF (Standard) licence holder to upgraded to a HF (Advance) licence?
  - A. To sit and pass an HF licence written examination.
  - B. 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.
  - 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.
- 7. Is an approved amateur radio equipment allowed to be modified?
  - A. With permission from the Royal Brunei Police Force and Royal Brunei Custom and Excise.
  - B. If the equipment is modified by a certified dealer.
  - C. Any approved equipment is not allowed to be modified, unless with written approval from AITI.
  - D. Once you have obtained a licence and type approval for your equipment, you can immediately modify.
- 8. If an amateur radio licensee changes to their address and/or vehicle registration, the licensee should notify
  - A. Registrar of Society
  - B. Amateur Radio Clubs/Association
  - C. Relevant Government Ministry
  - D. Authority for Info-communications Technology Industry of Brunei Darussalam
- 9. Which of the following message below should not be send?
  - A. A message to an overseas amateur of any country.
  - B. A message relating to WX.
  - C. A message relating to market a business.
  - D. A message to a large group of amateurs.
- 10. Which of the statement below is CORRECT regarding installation of amateur radio equipment in a premise?
  - A. One unit of licensed radio equipment is only allowed for one premise unless stated otherwise in the license.
  - B. Radio equipment can be installed in any premise without any valid amateur radio license.
  - C. Installation of radio equipment and antenna is not required to meet the specifications and regulations of building/residential code.
  - D. One unit of licensed radio equipment can be transferred anytime from one premise to another.

- 11. Zain and his son Zaini is having an amateur radio conversation. Which set of conversations below should they avoid:
  - 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.
- 12. For signal strength scale, what is the scale for 'fairly good signal' and 'extremely strong signal'?
  - A. 5 and 9
  - B. 1 and 9
  - C. 9 and 5
  - D. 1 and 5
- 13. A station 'Callsign' is sent for the purpose of identification at the start of transmission and end of transmission. It should...
  - A. Be mentioned once after the first 60 minutes
  - B. Be mentioned once after the first 15 minutes
  - C. Be repeated every 15 minutes
  - D. Be repeated every 60 minutes
- 14. What is required by AITI during random amateur radio inspections?
  - A. Station Log Book and a valid amateur radio licence
  - B. Station log book and a certificate from Radio Organisation
  - C. Station log book and a valid driving licence
  - D. A certificate from any Radio Organisation and a valid driving licence
- 15. An operator has the callsign, V8V2010. He/she is operating
  - A. Marine Radio
  - B. Amateur Radio
  - C. Aeronautical Radio
  - D. Satellite Radio
- 16. A visiting full licensed amateur radio user comes to Brunei Darussalam. His/Her callsign will be
  - A. prefixed by V85/ and suffixed by His/Her callsign
  - B. suffixed by V85/ and prefixed by His/Her callsign
  - C. prefixed by V89/ and suffixed by His/Her callsign
  - D. prefixed by V85/ and suffixed issued by AITI
- 17. For duplex, what is the frequency band used by an amateur radio for a "Very High Frequency" in Brunei Darussalam?
  - A. 144,0000 MHz 148,0000 MHz
  - B. 144.0125 MHz 148.0000 MHz
  - C. 146.0125 MHz 148.0000 MHz
  - D. 146.0000 MHz 148.0000 MHz

- 18. For 160 meter band, which one of the following frequency band is correct?
  - A. 16.000 16.999 MHz
  - B. 5.650-5.925 MHz
  - C. 1.800 2.000 MHz
  - D. 144.000 148.000 MHz
- 19. What is the 'Q' code for "Will you tell my frequency?" and "Are you busy?"
  - A. QSL and QRB
  - B. QSU and QSO
  - C. QRM and QRB
  - D. QRG and QRL
- 20. What does 'CQ' and 'WX' stands for?
  - A. Calling all station and Distance foreign countries
  - B. Call quit/Closing down and Weather
  - C. Calling all station and Weather
  - D. Station call interference and Distance foreign countries
- 21. All amateur radio equipment in a station has to be maintained and used
  - A. With support from IEE
  - B. Approximately 20% of the approved maximum power
  - C. Not to interfere with other radio-communication services
  - D. With complete discretion by AITI officials
- 22. 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
- 23. Amateur radio repeater frequencies in Brunei are coordinated by:
  - A. Royal Brunei Police Force (Signalling Division)
  - B. Amateur Radio Society
  - C. Repeater committee
  - D. Authority for Info-communications Technology Industry of Brunei Darussalam (AITI)
- 24. The maximum output power permitted for an amateur radio station is
  - A. 150 Watts
  - B. 100 Watts
  - C. 50 Watts
  - D. 25 Watts
- 25. The amateur radio license classes in Brunei are:
  - A. Novice, Advances
  - B. Standard, Advanced
  - C. Novice, Technician
  - D. Class 1, Class 3

- 26. What kind of amateur station simultaneously retransmits the signal of other stations on another frequency?
  - A. Repeater Station
  - B. Beacon Station
  - C. Telex Station
  - D. Relay Station
- 27. An amateur radio licensee should renew their licence every?
  - A. No renewal required
  - B. 3 months
  - C. 12 months
  - D. 24 months
- 28. Where does a Brunei Darussalam Amateur Radio licence allow you to operate?
  - A. From anywhere in the world
  - B. From wherever the Amateur Radio Service is regulated as stated in the licence issued
  - C. From a country that shares a third party agreement with Brunei Darussalam
  - D. Only from the mailing address printed on your license
- 29. What are the requirements for applying an Amateur Radio licence upgrade (ie. V89 V85)?
  - A. The licence holder must fill up the Amateur Radio Callsign Application form and submit a minimum six (6) month logbook.
  - B. Licence holder must hold a valid Amateur Radio licence for at least three (3) years
  - C. To purchase an amateur HF radio equipment before applying.
  - D. No further process required upon passing your amateur radio examination.
- 30. A 'line of sight' transmission between two stations uses mainly the
  - A. ionosphere
  - B. troposphere
  - C. sky wave
  - D. ground wave

## **SECTION B**

This section contains 30 questions. Answer all.

31.	Radio wave	polarization	ı is defined l	by the	orientation	of the radiated:

- A. magnetic field
- B. electric field
- C. inductive field
- D. capacitive field

# 32. The relationships between, 'Voltage (V)', 'Resistor (R)' and 'Current (I)' is

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

#### 33. The unit for resistance is

- A. Farad
- B. Ohm
- C. Watt
- D. Ampere

# 34. Which instrument would you use to measure an electric current?

- A. Ammeter
- B. Thermometer
- C. Voltmeter
- D. Ohmmeter

# 35. What is the symbol for capacitor

- A. ---
- В.
- C. —————
- D. ----

## 36. A 50 hertz current in a wire means that:

- A. A potential difference of 50 volts exists across the wire
- B. The current flowing in the wire is 50 amperes
- C. The power dissipated in the wire is 50 watts
- D. A cycle is completed 50 times in each second

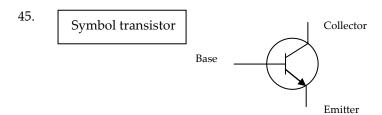
# 37. The voltage through a $125k\Omega$ resistor is 100 V. What is the current across this resistor?

- A. 125 milliamps
- B. 8 amps
- C. 0.8 milliamps
- D. 1.25 amps

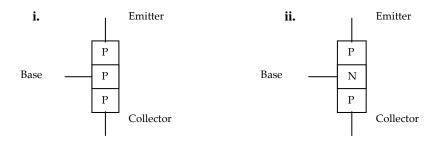
38.	The	energy supplied to a secondary cell is stored as
	A.	a charge of electricity
	B.	electrical energy
	C.	chemical energy

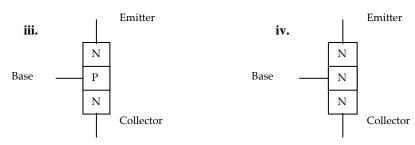
D. joules with a potential difference.

- 39. The wavelength of a signal in free space with a frequency of 100MHz is
  - A. 3 meter
  - B. 30 meter
  - C. 3 millimeter
  - D. 3 cm
- 40. If ' $\lambda$ ' is wavelength, 'c' is speed of light and 'f' is frequency, which formula listed below is correct?
  - A.  $\lambda = fc$
  - B.  $f = \lambda/c$
  - C.  $c = f^2 \lambda$
  - D.  $c = f\lambda$
- 41. 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
- 42. What are three good electrical conductors
  - A. Copper, gold, mica
  - B. Gold, silver, wood
  - C. gold, silver, aluminium
  - D. copper, aluminium, paper
- 43. What is the Phonetic Code for 'V89YKB'?
  - A. Victor, Eight, Nine, Yankee, Kilo, Bravo
  - B. Victoria, Eight, Nine, Yankee, Kilo, Bravo
  - C. Victoria, Eight, Nine, Yahoo, Kilo, Bravo
  - D. Victor, Eight, Nine, Yahoo, Kathy, Bravo
- 44. 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

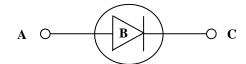


With reference to the transistor symbol above, which one is the correct answer?

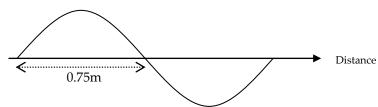




- A. i
- B. ii
- C. iii
- D. iv
- 46. In the diagram below, indicate the current flow in the semi-conductor diode.



- A. From A to B
- B. From A to C
- C. From A to B and B to A
- D. From C to A
- 47. 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. 100 MHz
- B. 200 MHz
- C. 450 MHz
- D. 900 MHz

- 48. What is the function of an antenna tuner?
  - A. To improve power efficiency between transceiver and antenna by matching the impedance
  - B. To tune the frequency
  - C. To maintain power transmission at a safe level
  - D. To provide excellent grounding to the equipment during lighting
- 49. A low pass filter will
  - A. suppress sub-harmonics
  - B. reduce harmonics
  - C. always eliminate interference
  - D. improve harmonic radiation
- 50. For long distance propagation, the radiation angle of RF energy from antenna should be
  - A. Less than 30 degrees
  - B. More than 30 degrees but less than 45 degrees
  - C. More than 45 degrees but less than 90 degrees
  - D. 90 degrees
- 51. What is the modulation used in "Very High Frequency" and "High Frequency" respectively?
  - A. Single band and multiple band
  - B. Frequency modulation and amplitude modulation
  - C. Amplitude modulation and frequency modulation
  - D. Quadrature amplitude modulation and phase modulation
- 52. Process of modulation allows
  - A. Voice and Morse code to be combined
  - B. Information to be conveyed over a carrier wave
  - C. Information to be removed from a carrier wave
  - D. None of the above
- 53. A power amplifier has a gain of 5. If you input 2W, the output would be?
  - A. 0.2W
  - B. 10W
  - C. 0.4W
  - D. 5W
- 54. Harmonic frequencies are
  - A. Always lower in the frequency than the fundamental frequency
  - B. At multiples of the fundamental frequency
  - C. Any unwanted frequency above the fundamental frequency
  - D. Any frequency causing TVI
- 55. What is used to convert sounds from our voice into radio signals?
  - A. Transmitter
  - B. Receiver
  - C. Speaker
  - D. Antenna

- 56. Radio Horizon is define as
  - A. The line of sight between two transmissions
  - B. The communications done in coastal areas
  - C. The point where radio signals between two points are blocked by the curvature of the Earth
  - D. The communications to the space-station during ideal weather condition
- 57. The frequency band '3 MHz 30 MHz ' is categorised under?
  - A. Very high frequency
  - B. High frequency
  - C. Ultra high frequency
  - D. Low frequency
- 58. 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
- 59. The purpose of a 2 meter repeater is to
  - A. Provide amateur operation without the use of callsigns
  - B. Provide communication for emergency purposes
  - C. Make possible VHF contacts over longer distance
  - D. Experiment with frequency shift techniques
- 60. 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