

**AMATEUR RADIO EXAMINATION  
- QUESTION PAPER -**

INDEX NO.	AMR-5-2009-							
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DAY : SUNDAY  
DATE : 24th MAY 2009M / 29 JAMADILAWAL 1430H  
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 38
  - B. Region 1, Zone 25
  - C. Region 2, Zone 38
  - D. Region 3, Zone 28
  
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. Declare the equipment to the Royal Brunei Custom and Excise officials
  - B. Bringing in the said equipment without notifying Royal Brunei Custom and Excise officials
  - C. Paying import tax for the equipment
  - D. Bringing the equipment directly to AITI officials
  
4. 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.
  
5. With regards to AITI rules and regulation, amateur radio equipment is only permitted to be operated
  - A. Within the permitted range of frequency in the radio equipment
  - B. Using a radio transceiver
  - C. One time only
  - D. Within the frequency range stated in the license

6. Which of the statement below is CORRECT regarding installation of amateur radio equipment in a vehicle?
  - A. Radio equipment can be installed in any vehicle without any valid amateur radio license.
  - B. Installation of radio equipment and antenna is not required to meet the specifications and regulations of road and safety code.
  - C. Two units of licensed radio equipment is allowed for three vehicles.
  - D. One unit of licensed radio equipment is only allowed for one vehicle unless stated otherwise in the license.
  
7. If you are in contact with another station and you hear "MAYDAY MAYDAY" on your frequency, what should you do?
  - A. Stop your QSO immediately and take the emergency call
  - B. Tell the calling station that the frequency is in use
  - C. Call your local Fire and Rescue Department and inform them of the emergency
  - D. Direct the calling station to the nearest emergency net frequency
  
8. 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. Every 15 minutes
  - C. Once after the first 15 minutes
  - D. Once within 60 minutes
  
9. Station, Log book and license are required for random inspection done by
  - A. A certified Radio Organisation
  - B. Royal Brunei Police Force
  - C. Registration of Organisations
  - D. Authority for Info-communications Technology Industry (AITI)
  
10. What is the validity period of an Import Permit for an Amateur Radio equipment from the date of issue?
  - A. 2 months
  - B. 1 week
  - C. 2 weeks
  - D. 1 year
  
11. What is the frequency band used by an amateur radio for a "Very High Frequency"?
  - A. 144.000 MHz – 146.000 MHz
  - B. 144.000 MHz – 148.000 MHz
  - C. 137.000 MHz – 156.000 MHz
  - D. 146.000 MHz – 148.000 MHz
  
12. For 17 meter band, which one of the following frequency band is correct?
  - A. 18.068 – 18.168 MHz
  - B. 21.550 – 21.650 MHz
  - C. 14.000 – 14.350 MHz
  - D. 17.068 – 17.168 MHz

13. What is the 'Q' code for "Shall I increase transmitter power?" and "Are my signal fading?"
- A. QRO and QRS
  - B. QRZ and QRB
  - C. QRO and QRB
  - D. QRB and QRO
14. What is the 'Q' code for "When will you call me again?" and "Will you relay to .... ?"
- A. QRX and QSP
  - B. QSC and QSR
  - C. QRX and QRP
  - D. QTL and QRY
15. 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. With complete discretion by AITI officials
  - D. Not to interfere with other radio-communication services
16. What does the statement means: "Radio regulation defines amateur radio services as a secondary service whilst broadcasting services is the primary service" ?
- A. Each and every frequency band user has equal rights
  - B. Amateur radio services need to increase its transmission power to overcome any interference from broadcasting services
  - C. Amateur radio services are permitted to use the frequency band if it does not cause any interference to broadcasting services
  - D. None of the above
17. In Amateur Radio communications, what does '73' means?
- A. Hugs and Kisses
  - B. Attention to all radio amateur
  - C. Best regards
  - D. Hello
18. 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. To avoid the antenna from directing its excess RF power to the people in nearby buildings
  - D. For the antenna to receive greater universal wave and low wave
19. What should be done when installing an antenna on the surface of the earth?
- A. The antenna should not be installed higher than you
  - B. The antenna can be installed on a wet surface
  - C. The antenna need to be painted to avoid human being and animals from colliding into the antenna

- D. The antenna should be installed not to expose people to radio frequency radiation from the antenna's transmission
20. What is the correct way to make a contact on a Amateur Radio?
- A. Say the callsign of the station you want to contact three times
  - B. Say the call sign of the station you want to contact, then your callsign
  - C. Say the other operator's name, then your callsign three times
  - D. Say, "Mayday, Mayday" then your callsign
21. When using a repeater to communicate, which of the following do you need to know about the repeater?
- A. The operator callsign
  - B. Its power level and location
  - C. Whether or not it has a mo patch
  - D. Its input frequency and offset
22. What type of operation which transmit and receive on the same frequency?
- A. Simplex Operation
  - B. Duplex Operation
  - C. Multiplex Operation
  - D. All of the above
23. When should you use simplex operation instead of a repeater?
- A. When a contact is possible without using a repeater
  - B. When the most reliable communications are needed
  - C. When an emergency telephone call is needed
  - D. When you are traveling and need some local information
24. Which of the following uses the International Phonetic Alphabet?
- A. India, Alpha, November, Dub, Romeo
  - B. November, India, Zulu, Alpha, Mike
  - C. Bravo, Charlie, Robin, Tango, Uniform
  - D. Bravo, Uniform, Radio, Tango, Mike
25. What material is best for antenna conductor?
- A. Plastic
  - B. Glass
  - C. Copper
  - D. Aluminium
26. The type of communication for an amateur radio operator to test a transmission into a repeater without giving information on the station callsign is called a
- A. Invalid and unlicensed voice transmission
  - B. Unknown transmission which is invalid
  - C. Transmission without communication, without voice being transmitted
  - D. A transmission test without a callsign information given

27. 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. It is entirely prohibited
  - D. When broadcasting is more than 15 minutes
28. What is meant by the term "CQ"?
- A. Best regards
  - B. Distant station
  - C. Calling all stations
  - D. Call Queue
29. What is the meaning of the term "Harmonic"?
- A. Very Clear
  - B. Children
  - C. Radio Broadcasting
  - D. Wife
30. What type of interference may come from a multi-band antenna connected to a poorly tuned transmitter?
- A. Auroral distortion
  - B. Parasitic excitation
  - C. Intermodulation noise
  - D. Harmonic radiation

## SECTION B

This section contains 30 questions. Answer *all*.

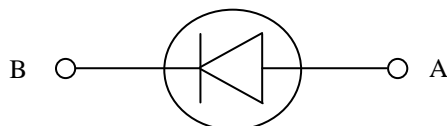
31. The relationships between 'Current (I)', 'Voltage (V)' and 'Resistance (R)' is

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

32. If ' $\lambda$ ' is wavelength, ' $c$ ' is speed of light and ' $f$ ' is frequency, which listed below is the correct formula?

- A.  $\lambda = fc$
- B.  $f = \lambda/c$
- C.  $c = f\lambda$
- D.  $c = f^2\lambda$

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 2.5 MHz?

- A.  $0.4 \mu\text{s}$
- B.  $0.4 \text{ms}$
- C.  $400 \text{ms}$
- D.  $40 \mu\text{s}$

35. What is the frequency of a signal with wavelength of 0.6m and speed at  $3 \times 10^8 \text{m/s}$ ?

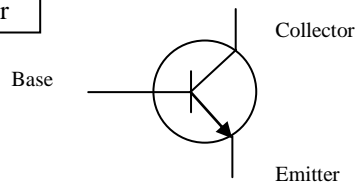
- A. 500 kHz
- B. 5 GHz
- C. 50 mHz
- D. 500 MHz

36. A transformer is used to balance a transmission line of 9.0 Ohm with a 5400 Ohm antenna. What is the ratio required for the transformer to do this?

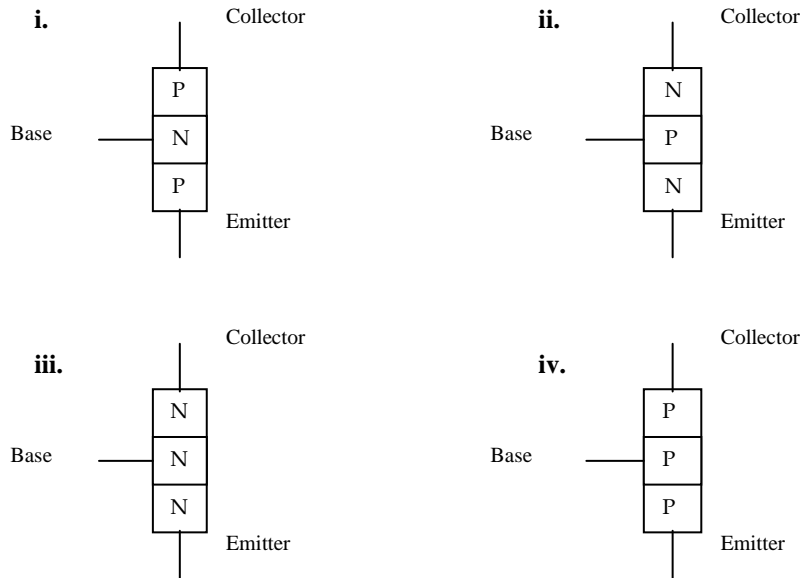
- A. 1 : 600
- B. 1 : 6
- C. 1 : 1200
- D. 1 : 30

37.

Symbol transistor



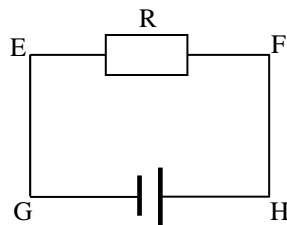
With reference to the transistor symbol above, which one is the correct answer?



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

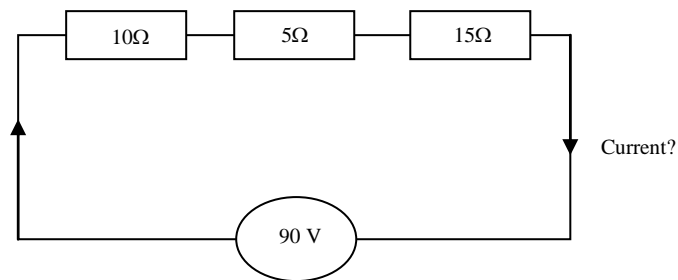
38. Which direction is the current flowing in the diagram below?

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

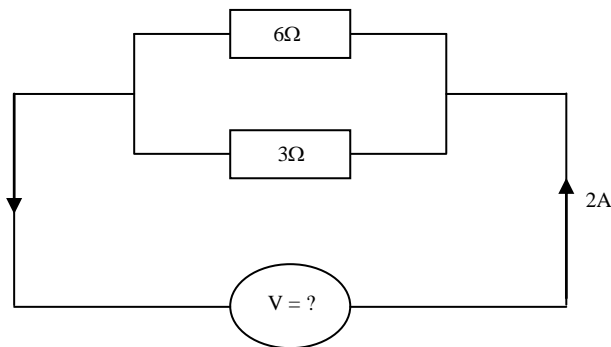




39. What is the Current and the total Resistance of three resistors connected in series as shown below?



- A. 450 A and 300 Ohms  
 B. 450 A and 30 Ohms  
 C. 3 A and 30 Ohms  
 D. 3 A and 1.67 Ohms
40. The main advantage of the yagi aerial as compared with dipole is
- A. Increased forward gain  
 B. Smaller physical dimensions  
 C. A wider beam width  
 D. A better match for the feeder
41. What is the Voltage (V) and the total Resistance of 6 Ohms and 3 Ohms resistors connected in parallel as shown below, if a 2A current flows through the circuit?



- A. 2 V and 9 Ohms  
 B. 4 V and 2 Ohms  
 C. 2 V and 8 Ohms  
 D. 4 V and 9 Ohms
42. Define the function of a Band-Pass filter?
- A. Restrict high frequency and restrict low frequency  
 B. Restrict low frequency only  
 C. Channeling high frequency and channeling low frequency  
 D. None of the above

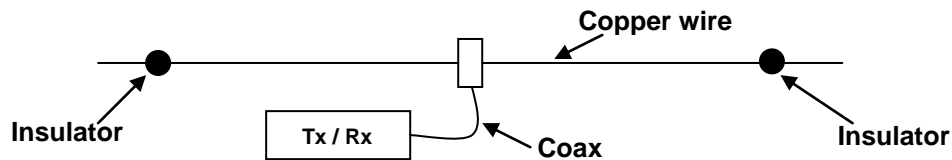
43. What is the modulation used in “High Frequency” and “Very High Frequency” respectively?
- A. Single band and multiple band
  - B. Amplitude modulation and frequency modulation
  - C. Frequency modulation and amplitude modulation
  - D. None of the above
44. The transmission power for transmitting amateur radio must not exceed
- A. 100 Watts
  - B. 75 Watts
  - C. 200 Watts
  - D. 150 Watts
45. Which one of the following frequency would be the best for short distance communication in amateur radio ie. Borneo Island.
- A. 14320kHz
  - B. 18072kHz
  - C. 28500kHz
  - D. 7040kHz
46. What is the frequency band for a ‘Very High Frequency’?
- A. 3000 kHz – 30000 kHz
  - B. 300 Hz – 3 kHz
  - C. 3 kHz – 300 kHz
  - D. 30000 kHz – 300000 kHz
47. Define which antenna comprises of a center-fed driven element for transmitting or receiving radio frequency energy ?
- A. Half wavelength dipole
  - B. Omni-directional Antenna
  - C. Yagi Antenna
  - D. Straight wire antenna
48. Which antenna is not to be installed for an HF station?
- A. Dipole
  - B. Three element Quad
  - C. Satellite Dish
  - D. Three element Yagi
49. The purpose of a 2 meter repeater is to
- A. Provide amateur operation without the use of call signs
  - B. Make possible VHF contacts over longer distance
  - C. Provide communication for emergency purposes
  - D. Experiment with frequency shift techniques

50. What is the velocity of an electro-magnetic wave?
- A.  $300 \times 10^6$  metres/sec
  - B.  $200 \times 10^6$  metres/sec
  - C.  $0.3 \times 10^8$  metres/sec
  - D.  $3 \times 10^{-8}$  metres/sec
51. A standing wave meter (SWR) is used to check the
- A. Height of the tower
  - B. Efficiency of a transmitter
  - C. Matching of the transmitter to the aerial system
  - D. Resonant frequency of an aerial
52. What does Henry and Farad unit stands for?
- A. Inductance and Charge
  - B. Inductance and Capacitance
  - C. Conductivity and Charge
  - D. Resistance and Capacitance
53. The relationship of 'Charge' is
- A.  $Q = CV$
  - B.  $Q = V/R$
  - C.  $Q = C/V$
  - D.  $Q = C^2V$
54. Which of the following principles is used when working with almost any electronic circuit?
- A. Coulomb's Law
  - B. Ampere's Law
  - C. Tesla's Law
  - D. Ohm's Law
55. What is the basic unit of current?
- A. The ohm
  - B. The watt
  - C. The ampere
  - D. The volt
56. A decrease in power from 40 Watts to 20 Watts is equal to an attenuation of:
- A. -3 dB
  - B. 3 dB
  - C. -20 dB
  - D. 20 dB

57. The unit volt per meter (V/m) is a measure for:

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

58. Below is a diagram of a Half wavelength for a dipole antenna.



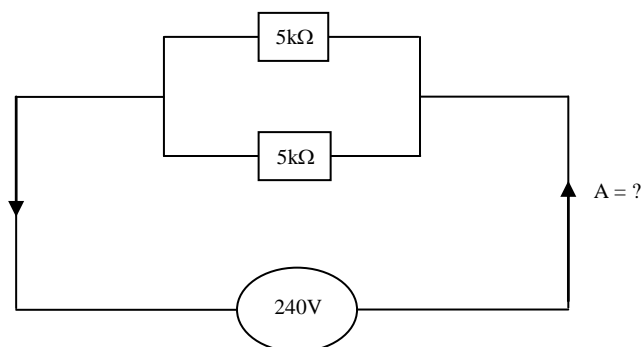
What is the length of the copper wire required for Half Wavelength dipole antenna for 15 meter on frequency 21400kHz?

- A. 14 ft 26 inch
- B. 3 ft 21 inch
- C. 15 ft 21 inch
- D. 10 ft 9 inch

59. What is the length copper wire required for the frequency of 28.071MHz on 10 meter?

- A. 9 ft 3 inch
- B. 12 ft 1 inch
- C. 13 ft 1 inch
- D. 8 ft 3 inch

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



- A. 96 ampere
- B. 9.6 milliampere
- C. 96 miliampere
- D. 9.6 ampere