

**AMATEUR RADIO EXAMINATION
- QUESTION PAPER -**

INDEX NO.	AMR-1-2009-								
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DAY : SUNDAY
DATE : 18th JANUARI 2009M / 21 MUHARRAM 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 33 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 licence 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 section shall be liable on conviction to a fine not exceeding \$100,000, imprisonment for a term not exceeding 3 years or 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 3, Zone 25
 - C. Region 1, Zone 25
 - D. Region 1, 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. Bringing in the said equipment without notifying Royal Brunei Custom and Excise officials
 - B. Declare the equipment to the 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, power output, conversation time, signal report, statement.
 - D. Date, frequency band and emission, station callsign which with you are communicating, start and end of conversation time, signal report, QSL.

5. With regards to AITI rules and regulation, amateur radio equipment is only permitted to be operated
 - A. Within the frequency range stated in the licence
 - B. Within the permitted range of frequency in the radio equipment
 - C. Using a radio transceiver
 - D. One time only

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.
 - B. One unit of licensed radio equipment is only allowed for one vehicle unless stated otherwise in the licence.
 - C. Radio equipment can be installed in any vehicle without any valid amateur radio licence.
 - D. Installation of radio equipment and antenna is not required to meet the specifications and regulations of road and safety code.

7. If you are in contact with another station and you hear "MAYDAY MAYDAY" on your frequency, what should you do?
 - A. Tell the calling station that the frequency is in use
 - B. Stop your QSO immediately and take the emergency call
 - 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. Once after the first 15 minutes
 - C. Every 15 minutes
 - D. Once within 30 minutes

9. Station and Log book as well as a licence are required for random inspection done by
 - A. Authority for Info-communications Technology Industry (AITI)
 - B. A certified Radio Organisation
 - C. Royal Brunei Police Force
 - D. Registration of Organisations

10. What is the validity period of an Amateur Radio Station Licence?
 - A. 10 years
 - B. 5 years
 - C. 20 years
 - 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. 137.000 MHz – 156.000 MHz
 - C. 144.000 MHz – 148.000 MHz
 - D. 146.000 MHz – 148.000 MHz

12. For 15 meter band, which one of the following frequency band is correct?
 - A. 21.550 – 21.650 MHz
 - B. 21.000 – 21.450 MHz
 - C. 14.000 – 14.350 MHz
 - D. 14.450 – 14.600 MHz

13. What is the 'Q' code for "What is the correct time?" and "Who is calling me?"
- A. QTR and QRS
 - B. QRZ and QTR
 - C. QTH and QRZ
 - D. QTR and QRZ
14. What is the 'Q' code for "What is your location?" and "Are you busy?"
- A. QSV and QRS
 - B. QTH and QRL
 - C. QTH and QRZ
 - D. QRL and QRL
15. 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
16. What does the statement mean: "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 is permitted to use the frequency band in case of emergency
 - C. Amateur radio services need to increase its transmission power to overcome any interference from broadcasting services
 - D. Amateur radio services are permitted to use the frequency band if it does not cause any interference to broadcasting services
17. In Amateur Radio communications, what does '88' mean?
- A. Hugs and Kisses
 - B. Attention to all radio amateur
 - C. Hello
 - D. Best regards
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. 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
19. 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

20. What is the correct way to make a contact on a repeater?
- A. Say the callsign of the station you want to contact three times
 - B. Say the other operator's name, then your callsign three times
 - C. Say the call sign of the station you want to contact, then your callsign
 - 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. Its input frequency and offset
 - B. Its callsign
 - C. Its power level
 - D. Whether or not it has a mo patch
22. What is simplex operation?
- A. Transmitting and receiving on the same frequency
 - B. Transmitting and receiving over a wide area
 - C. Transmitting on one frequency and receiving on another frequency
 - D. Transmitting one-way frequency
23. When should you use simplex operation instead of a repeater?
- A. When the most reliable communications are needed
 - B. When a contact is possible without using a repeater
 - 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. Alpha, Norway, Delta, Romeo
 - B. Brave, Charlie, Tango, Uniform
 - C. Alpha, Romeo, India, Foxtrot
 - D. Bravo, Uniform, Gordon, Tango
25. What material is best for antenna insulator?
- A. Brass
 - B. Glass
 - C. Gold
 - D. Plastic
26. What is the type of communication to test a transmission into a repeater without giving information on the station callsign?
- A. Invalid and unlicensed voice transmission
 - B. Transmission without communication, without voice being transmitted
 - C. Unknown transmission which is invalid
 - 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. When broadcasting is more than 15 minutes
 - D. It is entirely prohibited
28. What is meant by the term "DX"?
- A. Best regards
 - B. Distant station
 - C. Calling any station
 - D. Calling all stations
29. What is the meaning of the term "YL"?
- A. Young Lady
 - B. Best regards
 - C. X-Ray Yankee Lima
 - D. Wife
30. 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

SECTION B

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

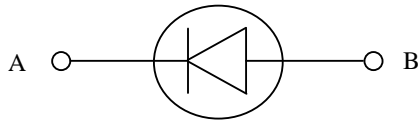
31. The relationships between 'Current (I)', 'Voltage (V)' and 'Resistance (R)' is

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

32. If 'T' is the Time and 'f' is the frequency, which listed below is the correct formula?

- A. $T = f$
- B. $T = 1/f$
- C. $1 = f^2 T$
- D. $1 = f/T$

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 frequency of an alternating current if the time period is $0.2 \mu\text{s}$?

- A. 5.0 kHz
- B. 5.0 MHz
- C. 500 Hz
- D. 50 kHz

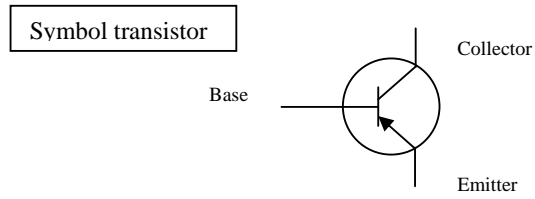
35. What is the wavelength of a 30MHz wave with speed at $3 \times 10^8 \text{ m/s}$?

- A. 0.1m
- B. 1 m
- C. 10000 mm/sec
- D. $1.00 \mu\text{m}$

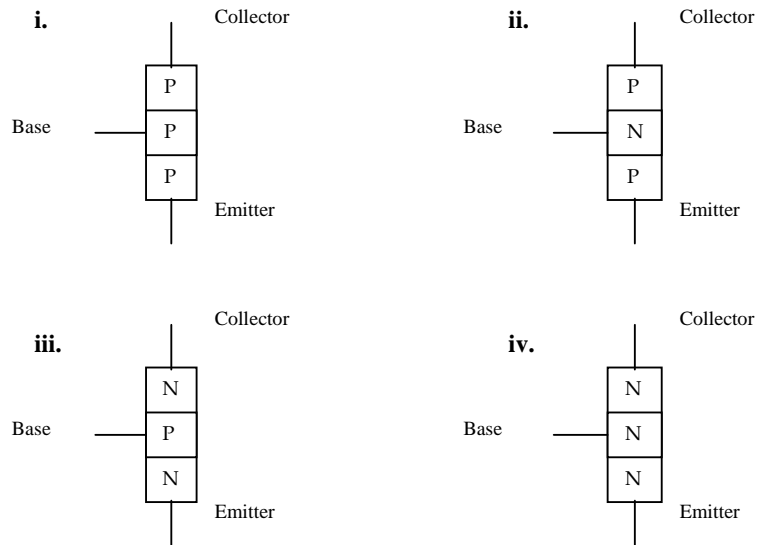
36. A transformer is used to balance a transmission line of 2.0 Ohm with a 600 Ohm antenna. What is the ratio required for the transformer to do this?

- A. 1 : 1
- B. 1 : 300
- C. 1 : 1200
- D. 1 : 30

37.



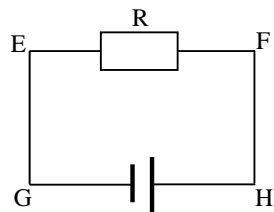
With reference to the transistor symbol above, which one is the correct answer?



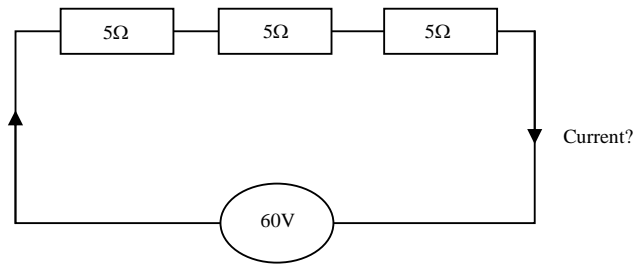
- A. i
- B. ii
- C. iii
- D. iv

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

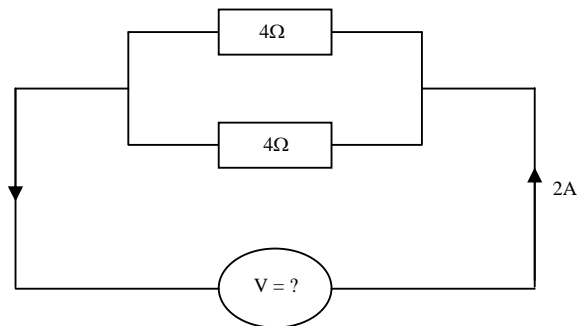
- A. From F to E
- B. From G to H
- C. From G → E → F → H
- D. From H → F → E → G



39. What is the Current and the total Resistance of three 5 Ohms resistors connected in series as shown below?



- A. 450 A and 1.67 Ohms
 B. 450 A and 15 Ohms
 C. 4 A and 1.67 Ohms
 D. 4 A and 15 Ohms
40. 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
41. What is the Voltage (V) and the total Resistance of two 4 Ohms resistors connected in parallel as shown below, if a 2A current flows through the circuit?



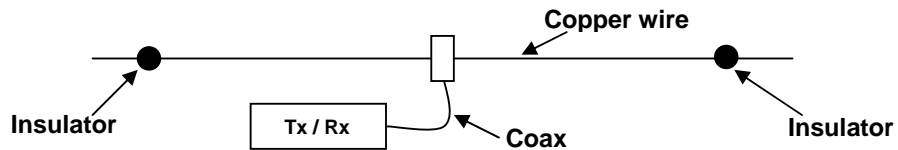
- A. 2 V and 2 Ohms
 B. 2 V and 8 Ohms
 C. 4 V and 2 Ohms
 D. 4 V and 8 Ohms
42. Define the function of Low-pass filter and High-pass filter respectively?
- A. Restrict high frequency and restrict low frequency
 B. Restrict low frequency and restrict high frequency
 C. Channeling high frequency and channeling 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. 150 Watts
 - B. 100 Watts
 - C. 50 Watts
 - D. 25 Watts
45. Which one of the following frequency would be the best for short distance communication in amateur radio ie. Borneo Island.
- A. 7040kHz
 - B. 14320kHz
 - C. 18072kHz
 - D. 28500kHz
46. What is the frequency band for a 'High Frequency'?
- A. 30000 kHz – 300000 kHz
 - B. 3000 kHz – 30000 kHz
 - C. 300 Hz – 3 kHz
 - D. 3 kHz – 300 kHz
47. Define which antenna comprises of 'Driven Element' as well as 'Reflector Element'?
- A. Omni-directional Antenna
 - B. Half wavelength dipole
 - C. Yagi Antenna
 - D. Straight wire antenna
48. Which antenna is the best option to be installed for a portable HF station in case of emergency?
- A. Dipole
 - B. Three element Quad
 - C. Three element Yagi
 - D. Satellite Dish
49. 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

50. What is the velocity of an electro-magnetic wave?
- A. 2×10^6 metres/sec
 - B. 3×10^8 metres/sec
 - C. 2×10^8 metres/sec
 - D. 3×10^6 metres/sec
51. A standing wave meter (SWR) is used to check the
- A. Stability of the oscillator
 - B. Efficiency of a transmitter
 - C. Resonant frequency of an aerial
 - D. Matching of the transmitter to the aerial system
52. What is the SI Unit for 'INDUCTANCE' and 'CAPACITANCE'?
- A. Henry and Watt
 - B. Coulomb and Ohm
 - C. Henry and Farad
 - D. Coulomb and Farad
53. The relationship of 'Power' is
- A. $P = V/R$
 - B. $P = V^2/R$
 - C. $P = I/V$
 - D. $P = I^2V$
54. Which of the following principles is used when working with almost any electronic circuit?
- A. Ohm's Law
 - B. Coulomb's Law
 - C. Ampere's Law
 - D. Tesla's Law
55. What is the basic unit of electric power?
- A. The ohm
 - B. The watt
 - C. The volt
 - D. The ampere
56. An increase in power from 20 Watts to 40 Watts is equal to a gain of:
- A. 2.5 dB
 - B. 3 dB
 - C. 4 dB
 - D. 10 dB

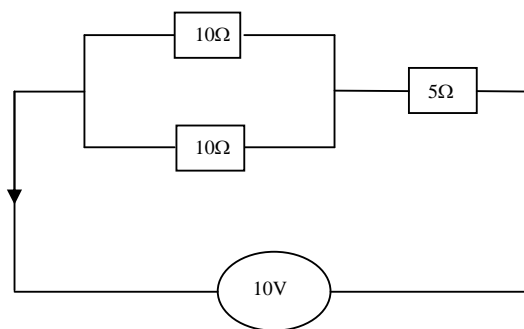
57. What unit of measurement specifies RF electric field strength?
- A. Coulombs (C) at one wavelength from the antenna
 - B. Volts per meter (V/m)
 - C. Microfarads (μF) at the transmitter output
 - D. Microhenrys (μH) per square centimeter

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 20 meter on frequency 14250kHz?

- A. 16 ft 4 inch
 - B. 17 ft 4 inch
 - C. 21 ft 6 inch
 - D. 15 ft 8 inch
59. What is the length copper wire required for the frequency of 28.071MHz on 10 meter?
- A. 8 ft 3 inch
 - B. 9 ft 3 inch
 - C. 12 ft 1 inch
 - D. 13 ft 1 inch
60. What is the total current in the circuit shown below?



- A. 0.4 ampere
- B. 10 milliampere
- C. 1.0 ampere
- D. 0.67 ampere