

**AMATEUR RADIO EXAMINATION
- QUESTION PAPER -**

INDEX NO.	AMR-2-2008-								
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IC COLOUR

DAY : SUNDAY
DATE : 17TH FEBRUARY 2008M / 10 SAFAR 1429H
MASA : 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. Candidates need to pass in both sections (Section A and B). Failure in either sections will be regarded as an automatic Fail.
4. Allowed writing material is BLUE or BLACK pens only. Pencils and other writing materials are not accepted.
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. Candidates are **prohibited** to speak, borrow writing materials or calculators or the likes during the whole duration of the examination.
9. Identification Card or passport is to be placed on the table for the whole duration of the examination. Candidates are not allowed to leave their seats without permission from invigilators
10. If it is found that candidates 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. 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 2, Zone 28

2. The Telecommunication Order 2001 under Section 33 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 \$100,000, imprisonment for a term not exceeding 3 years or both.
 - B. 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.
 - 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.

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, frequency band and emission, station callsign which with you are communicating, start and end of conversation time, signal report, QSL
 - C. Date, frequency band and emission, power output, conversation time, signal report, statement
 - D. Date, station which with you are communicating with, frequency band, emission and power output

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 INCORRECT regarding installation of amateur radio equipment in a vehicle?
 - A. Radio equipment can be installed in any vehicle according to remarks in a valid license
 - B. One unit of licensed radio equipment is only allowed for one vehicle unless stated otherwise in the licence
 - C. Every amateur licence holder is allowed to install in any vehicle that he/she owns
 - D. Installation of radio equipment and antenna is required to meet the specifications and regulations of road and safety code

7. If you are in contact with another station and you hear an emergency call for help 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. Every 15 minutes
 - C. Once after the first 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. A certified Radio Organisation
 - B. Authority for Info-communications Technology Industry
 - C. Royal Brunei Police Force
 - D. Registration of Organisations

10. 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

11. For 20 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
12. What is the 'Q' code for "Are you busy?" and "Who is calling me?"
- A. QSY and QTH
 - B. QRL and QRZ
 - C. QRQ and QSY
 - D. QRV and QTH
13. 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
14. What does the statement "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
15. 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
16. What is needed to take into account when installing an antenna on the surface of the earth?
- A. The antenna should be installed not 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

17. What does RST mean in a signal report?
- A. Recovery, signal strength, tempo
 - B. Recovery, signal speed, tone
 - C. Readability, signal speed, tempo
 - D. Readability, signal strength, tone
18. What is a good way to make 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, "Breaker, breaker" then your callsign
19. 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 tone patch
20. 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
 - D. Transmitting one-way frequency
21. 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
22. What is the validity period of an Amateur Radio Station Licence?
- A. 10 years
 - B. 1 year
 - C. 20 years
 - D. 5 years
23. Which of the following uses the International Phonetic Alphabet?
- A. Alpha, Norway, Delta
 - B. Alpha, Charlie, Tango
 - C. Denmark, Oscar, Gordon
 - D. Bravo, Uniform, Gordon

24. The Morse code format for the number '258' is:
- A. ..--- ---..
 - B. _ _ _...
 - C. ... _ _ _ _... -----
 - D. ... _ _ _ ---..
25. The Morse code format for 'SOS' is:
- A. ... --- ...
 - B. . _... _... ..
 - C. --- ... ---
 - D. . _ _ .
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. 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 "CQ"?
- A. Best regards
 - B. Distant station
 - C. Calling any station
 - D. Go ahead
29. What is the meaning of the term "GB"?
- A. Good bye
 - B. Best regards
 - C. Golf Brah voh
 - D. Good morning
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**.

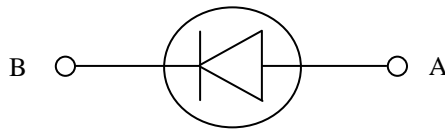
31. The relationships between 'Capacitance (C)', 'Voltage (V)' and 'Charge (Q)' is

- A. $V = CQ$
- B. $C = V/R$
- C. $Q = CV$
- D. $R = CIQ$

32. If 'c' is the velocity, 'f' the frequency and wavelength ' λ ', which listed below is the correct formula?

- A. $\lambda = f^2 \times c$
- B. $f = c \times \lambda$
- C. $\lambda = \sqrt{f \times c}$
- D. $\lambda = c \div f$

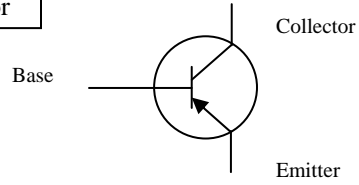
33. In the diagram below, indicate the current flow in the semi-conductor diode.



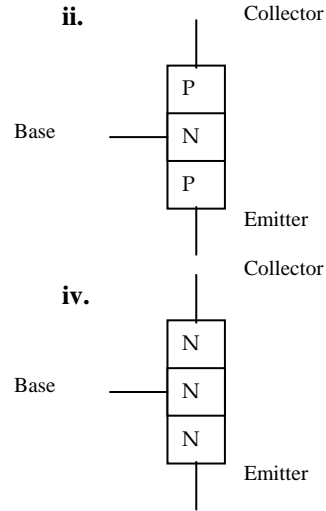
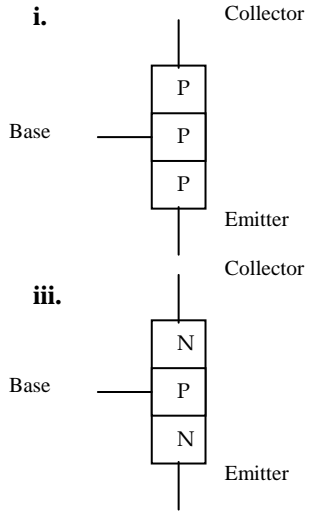
- A. From B to A
- B. From A to B
- C. From A to B and B to A
- D. None of the above

34.

Symbol transistor



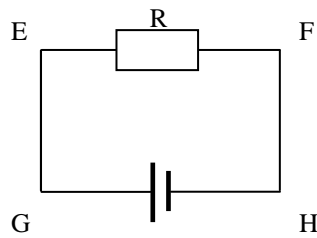
With reference to the transistor symbol above, which one is the correct answer?



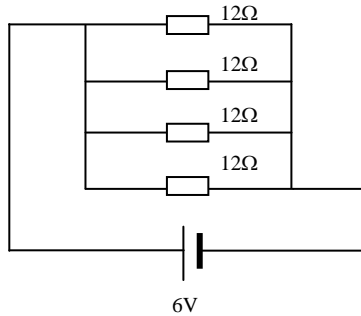
- A. i
- B. ii
- C. iii
- D. iv

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

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



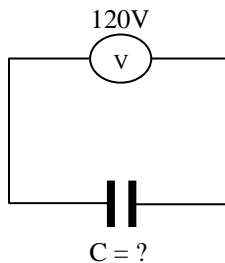
36. What is the total resistance of four 12 Ohms resistors arranged as shown below?
- A. 48 Ohms
 - B. 3 Ohms
 - C. 18 Ohms
 - D. 24 Ohms



37. A transformer is used to balance a transmission line of 2.0 Ohm with a 240 Ohm antenna. What is the ratio required for the transformer to do this?
- A. 1 : 1
 - B. 1 : 120
 - C. 1 : 6
 - D. 1 : 36

38. If a capacitor (C) is connected to a 120V supply with a total charge (Q) of 240 micro coulombs, what is the total capacitor (C) as shown in the diagram below?

- A. $0.02 \mu\text{F}$
- B. 20.0 F
- C. $2.0 \mu\text{F}$
- D. 0.2 F



39. What is the frequency of an alternating current if the time period is $0.5 \mu\text{s}$?
- A. 2.0 kHz
 - B. 2.0 MHz
 - C. 50 Hz
 - D. 50 kHz
40. What is the wavelength of a 430 MHz wave with (c) speed of light at $3 \times 10^8 \text{ m/s}$?
- A. 0.143 m
 - B. 698 mm
 - C. 698 mm/sec
 - D. $6.98 \mu\text{m}$

41. Two resistors with a 20 Ohms and 20 Ohms connected in series with a 40 Ohms resistor connected in parallel. What is the total resistance of the three resistors and the voltage if a 5A current flows through the circuit?
- A. 80 Ohms and 800 V
 - B. 40 Ohms and 200 V
 - C. 20 Ohms and 100 V
 - D. 20 Ohms and 4 V
42. Define the function of Low-pass filter and High-pass filter?
- 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"?
- 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. For a frequency of a 15 meter band, which one of the frequency band below is correct for amateur radio?
- A. 12.36 – 12.53 MHz
 - B. 24.89 – 24.99 MHz
 - C. 50.00 – 54.00 MHz
 - D. 21.00 – 21.45 MHz
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 main factor for a repeater to be used in a (VHF) amateur radio is
- A. Increase long distance
 - B. Improve receiving and transmitting signal
 - C. Decrease transmitter power
 - D. Improve repeater image
50. What is the velocity of an electro-magnetic wave?
- A. 3×10^6 metres/sec
 - B. 3×10^8 metres/sec
 - C. 3×10^{-8} metres/sec
 - D. 3×10^{10} metres/sec
51. The relationship of 'Resistance' is
- A. $R = VI$
 - B. $R = V/I$
 - C. $R = I^2V$
 - D. $R = V^2I$
52. What is the SI Unit for 'VOLTAGE' and 'RESISTANCE'?
- A. Volt and Resistor
 - B. Ampere and Ohm
 - C. Volt and Ohm
 - D. Henry and Ohm
53. The relationship of 'Power' is
- A. $P = V/R$
 - B. $P = V^2R$
 - C. $P = I/V$
 - D. $P = I^2R$
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. What is the number of identical lamps if each draws a current (I) of 1500 mA, from a 15A supply:
- A. 10
 - B. 15
 - C. 30
 - D. 23
59. Eight 10,000 ohm resistors are connected in series across a 90 Volt supply. The voltage drop across one of the resistors is:
- A. 22.5 Volt
 - B. 11.25 Volt
 - C. 90 Volt
 - D. 0.009 Volt
60. 2 resistors are connected in parallel and are connected across a 240 volt battery. If each resistor is 5000 ohms, the total battery current is:
- A. 96 ampere
 - B. 9.6 milliampere
 - C. 9.6 ampere
 - D. 96 miliampere