

**AMATEUR RADIO EXAMINATION
- QUESTION PAPER -**

INDEX NO.	AMR-3-2013-								
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IC COLOUR

DAY : SUNDAY
DATE : 3rd MARCH 2013M / 20 RABIULAKHIR 1433H
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. What is Amateur Radio?
 - A. Amateur Radio is a service for broadcasting political and commercial news
 - B. Amateur Radio is a public telecommunication services that is provided by telecommunication operator
 - C. Amateur Radio is a service provided by AITI
 - D. Amateur Radio is a service for hobbyists that uses various type of radio equipment that allows communication with other amateur radio operator

2. 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 section shall be liable on conviction to a fine not exceeding \$50,000, imprisonment for a term not exceeding 3 years or both
 - C. 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
 - D. No fine is liable at all

3. What is the purpose of phonetic alphabetic?
 - A. To avoid misunderstanding and to overcome difficulty when a callsign is spoken
 - B. To have a form of abbreviation for question or response for suffixes to convey additional information
 - C. To have capable identification signals
 - D. To identify the operator holds a valid license

4. When can an Amateur Radio Service Station be allocated a callsign?
 - A. During the processing of Amateur Radio station license
 - B. During the amateur radio examination
 - C. No application is required
 - D. Only after three years after receiving an Amateur Radio station license

5. An amateur radio station license is used for:
 - A. The ownership and operation of radio-communication stations for the category described on the license
 - B. The user of the equipment whether the operator has not acquire any license
 - C. Providing only emergency communication in times of natural disaster
 - D. None of the above

6. In what Region and Zone is Brunei Darussalam located?
 - A. Region 28, Zone 3
 - B. Region 38, Zone 2
 - C. Region 3, Zone 38
 - D. Region 3, Zone 28

7. 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

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

9. The amateur radio license classes in Brunei are
 - A. Novice, Advances
 - B. Standard, Advanced
 - C. Class 1, Class 3
 - D. Novice, Technician

10. What is the correct way to make a contact on an Amateur Radio?
- A. Say, "Mayday, Mayday" then your callsign
 - B. Say your callsign and then the callsign station you want to contact three times
 - C. Say the callsign of the station you want to contact, then your callsign
 - D. Say the other operator's name, then your callsign three times
11. "QRL?" is the Q-code for
- A. Shall I reduce my transmitting power?
 - B. Who is calling me?
 - C. Have you a message for me?
 - D. Are you busy?
12. Station, Log book and license are required for random inspection done by
- A. A certified Radio Organization
 - B. Royal Brunei Police Force
 - C. Authority for Info-communications Technology Industry (AITI)
 - D. Registrar of Companies
13. The word "BSP" should be spelt phonetically, using the phonetic alphabet
- A. Brembo Sierra Papa
 - B. Bravo Sierra Papa
 - C. Brabo Sierra Papa
 - D. Bravo Sierra Pepe
14. If you trying to ask the callsign of the other operating station, which "Q" code signal you would send?
- A. QSL
 - B. QRM
 - C. QRZ
 - D. QTH
15. What type of operation which transmit and receive on a different frequency?
- A. Simplex Operation
 - B. Multiplex Operation
 - C. Duplex Operation
 - D. All of the above

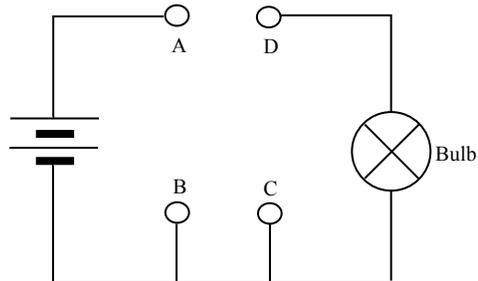
16. What type of interference may come from a multi-band antenna connected to a poorly tuned transmitter?
- A. Auroral distortion
 - B. Harmonic radiation
 - C. Parasitic excitation
 - D. Intermodulation noise
17. What is the correct callsign prefix for Standard and Advanced Class Amateur Radio Licence respectively?
- A. V85 and V89
 - B. V89 and V85
 - C. V8N and V8M
 - D. V8B and V8A
18. In International Morse code, what is **SOS** ?
- A. .- .-. -
 - B. --- ... ---
 - C. ... --- ...
 - D. .. - ..
19. If you are in contact with another station and you hear an emergency call for help 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
20. 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

21. 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
 - D. Harmonic radiation
22. 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 should be installed not to expose people to radio frequency radiation from the antenna's transmission
 - 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
23. What material is best for antenna conductor?
- A. Copper
 - B. Plastic
 - C. Glass
 - D. Aluminium
24. How many types of amateur radio licence does AITI issue?
- A. Temporary, Class and Exclusive
 - B. Trial, Standard and Advance
 - C. Station, Standard and Premium
 - D. Temporary, Standard and Advance
25. For 15 meter band, which one of the following frequency band is correct?
- A. 144.000 – 148.000 MHz
 - B. 14.000 – 14.350 MHz
 - C. 18.068 – 18.168 MHz
 - D. 21.000 – 21.450 MHz

26. What is the validity period of an Import Permit for an Amateur Radio equipment from the date of issue?
- A. 2 months
 - B. 3 weeks
 - C. 14 days
 - D. 7 days
27. 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
28. Which antenna can be installed for a VHF station?
- A. Horn antenna
 - B. Helix antenna
 - C. Satellite Dish
 - D. Yagi antenna
29. Which antenna is not to be installed for an HF station?
- A. Dipole
 - B. Three element Quad
 - C. Three element Yagi
 - D. Satellite Dish
30. An activity wherein participants use radio direction finding techniques to locate one or more radio transmitters hidden within a designated area, is called?
- A. Fox Dancing
 - B. Fox Hunting
 - C. DXing
 - D. Echolink

SECTION B

31. To allow the bulb in the diagram to light correctly, a wire should be connected between points

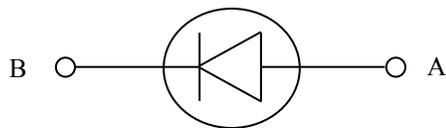


- A. A and D
- B. A and B
- C. A and C
- D. D and C

32. If ' λ ' 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. $c = f\lambda$
- D. $c = f^2\lambda$

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

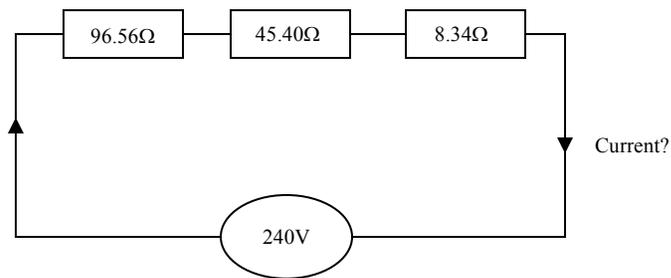


- A. From A to B
- B. From B to A
- C. From A to B and B to A
- D. None of the above

34. For AC measurement, the value of Voltage-Root-Mean-Square (V_{rms}) is

- 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})

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



- A. 1.596 mA and 42.82 Ohms
- B. 1.596 A and 150.3 Ohms
- C. 1.596 A and 42.82 Ohms
- D. 0.626 A and 150.3 Ohms

36. A standing wave meter (SWR) is used to check the

- A. Height of the tower
- B. Matching of the transmitter to the aerial system
- C. Efficiency of a transmitter
- D. Resonant frequency of an aerial

37. What is the Unit(s) for each of the components (Capacitor, Current, Resistor, Inductor) respectively?

- A. Coulombs, Meter, Ohm, Henry
- B. Coulombs, Ampere, Ohm, Farad
- C. Farad, Ampere, Ohm, Henry
- D. Farad, Ampere, Resistance, Henry

38. What is the unit prefixes for Giga, Kilo, Mega respectively?

- A. 10^9 , 10^6 , 10^3
- B. 10^9 , 10^3 , 10^6
- C. 10^6 , 10^3 , 10^9
- D. 10^{-9} , 10^3 , 10^6

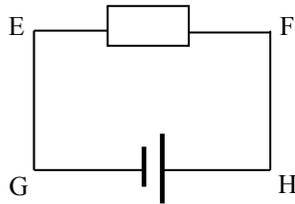
39. A power amplifier has a gain of 3dB. If you input 35W, the output would be?

- A. 11.67 W
- B. 105 W
- C. 38 W
- D. 70 W

40. The unit Watt (W) is a measure for
- RF electric field strength
 - RF energy
 - RF power
 - RF voltage
41. A three-element Yagi antenna of rods of unequal length, please arrange the elements in descending order
- Driven element, reflector, director
 - Reflector, driven element, director
 - Director, driven element, reflector
 - Reflector, director, driven element

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

- From E → F
- From H → G
- From H → F → E → G
- From G → E → F → H



43. Define the function of High-pass filter respectively?
- Restrict high frequency
 - Restrict high frequency and Restrict low frequency
 - Restrict low frequency
 - None of the above
44. A transformer is used to balance a transmission line of 4.0 Ohm with a 20 Ohm antenna. What is the ratio required for the transformer to do this?
- 1 : 5
 - 1 : 80
 - 1 : 505
 - 1 : 0.2
45. Current is define 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

46. What is the symbol for resistor

- A. 
- B. 
- C. 
- D. 

47. What is the ideal vertical antenna for $\frac{1}{4}$ wavelength for operating frequency of 146MHz?

- A. 5 m
- B. 0.5 m
- C. 50 m
- D. 30 m

48. Groundwave is define as

- A. radio waves that reflect off the ionosphere
- B. radio waves traveling along the Earth's surface
- C. radio waves that is absorb by the ground
- D. none of the above

49. What is used to convert sounds from our voice into radio signals?

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

50. $V = IR$ is derived from

- A. Cole's Law
- B. Tesla's Law
- C. Ohm's Law
- D. Tesco's Law

51. A 50 hertz current in a wire means that

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

52. What is the frequency of an alternating current if the time period is $1.5 \mu\text{s}$?

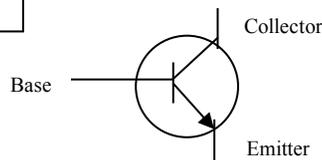
- A. 0.6 kHz
- B. 60 Hz
- C. 0.6 MHz
- D. 60 kHz

53. The process of modulation allows

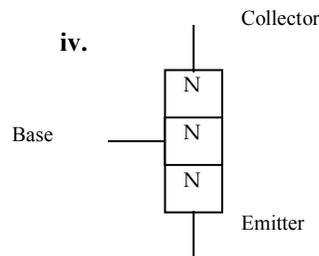
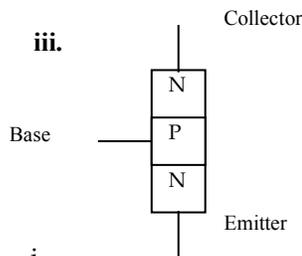
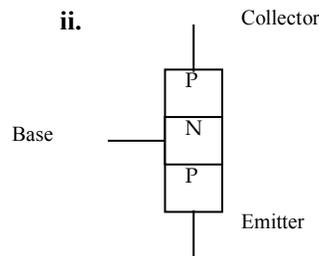
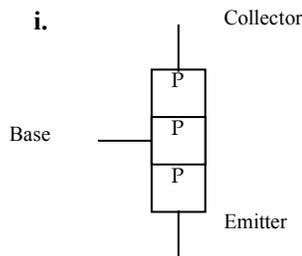
- A. information to be removed from a carrier
- B. information to be impressed on to a carrier
- C. voice and Morse code to be combined
- D. None of the above

54.

Symbol transistor



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



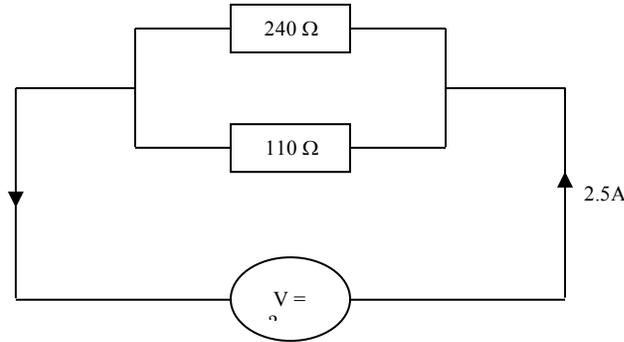
- A. i
- B. ii
- C. iii
- D. iv

55. Radio Horizon is define as

- A. The line of sight between two transmissions
- B. The communications done in coastal areas

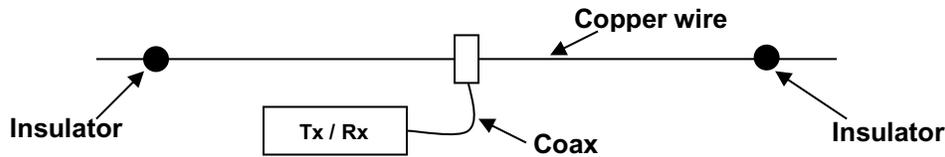
- C. The point where radio signals between two points are blocked by the curvature of the Earth
- D. The communications to the space-station during ideal weather condition

56. What is the Voltage (V) and the total Resistance of 240 Ohms and 110 Ohms resistors connected in parallel as shown below, if a 2.5A current flows through the circuit?



- A. 240 V and 350 Ohms
- B. 110 V and 75.4 Ohms
- C. 188 V and 75.4 Ohms
- D. 188 V and 350 Ohms

57. 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 21400 kHz?

- A. 10 ft 9 inch
 - B. 14 ft 26 inch
 - C. 3 ft 21 inch
 - D. 15 ft 21 inch
58. 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
59. What is the function of a fuse?
- A. Burns open at higher currents than fuse rating

- B. Produce a voltage across its terminal that is proportional to electric current
- C. Ground electrical equipment
- D. Decrease the frequency of the power voltage

60. Ionization in D layer as shown in figure .1, below has the following properties:

- A. Recombines quickly after sunset
- B. Can stay ionized long after sunset
- C. No properties change after sunset
- D. Disperse quickly after sunset

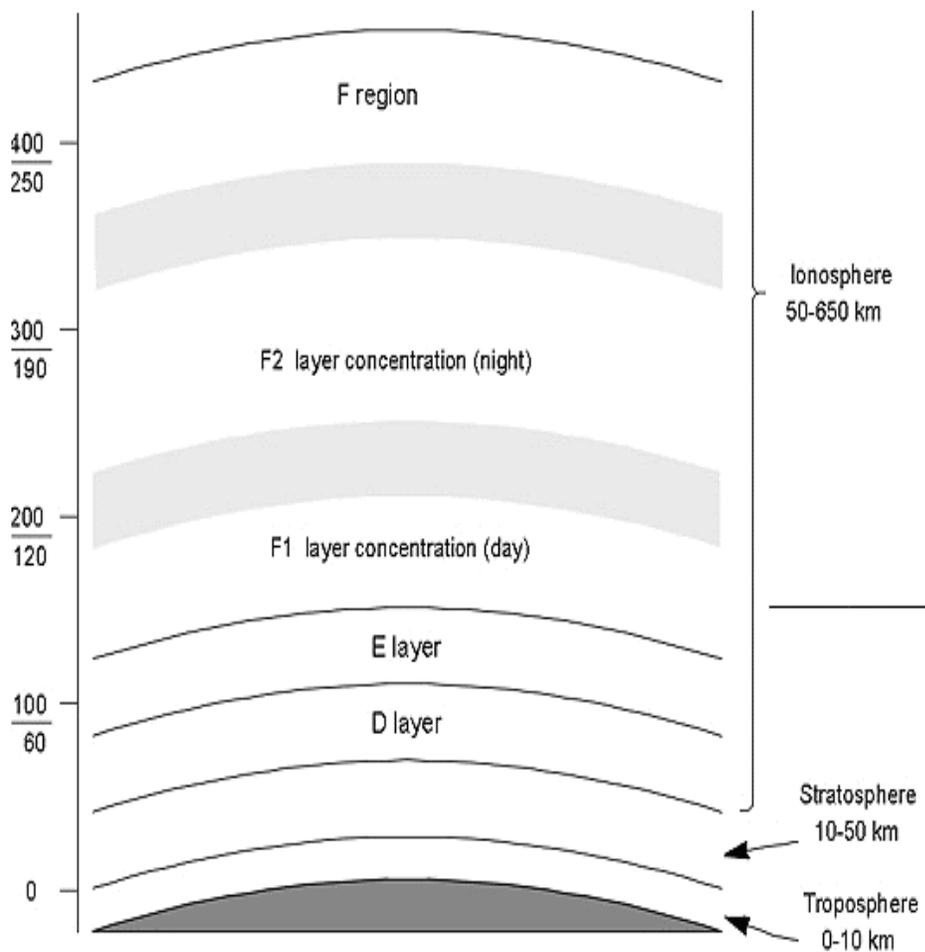


Figure .1