

083

RADIO AND TELEVISION SERVICING (For Both School and Private Candidates)

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TIME: 3 Hours

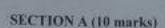
Friday 24th October 2008 p.m.

Instructions

- This paper consists of sections A. B and C.
- Answer all questions in sections A and H, and three (3) questions from section C
- Colfular phones are not allowed in the examination room.
 - Electronic calculators are not allowed in the examination reom.
 - Write your Examination Number on every page of your answer bookleus)

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This paper consists of 5 printed pages.



Answer all questions in this section.

- For each of the items (i)-(x), choose the correct answer among the given alternatives and write its letter beside the item number.
 - In electronics the term "LED" stands for
 - Linear electronic devices
 - Long equipment devices B
 - C Light encoding devices
 - D Light emitting diode
 - Light electrons display.
 - Which of the following is the formula in which power, voltage and current gains are (ii) related?
 - Ay = Aix Ap A
 - B Ap - Av x Ai
 - $Ai = Av \times Ap$ Ap = Av + AiC
 - D
 - Av Ai + Ap E
 - (iii) Sky wave is returned to the earth by the
 - receiving aerial A
 - B earth surface
 - C molecules
 - D high frequency
 - E ionphere.
 - In the oscillator tuned circuits, the impedance in series resonance is always
 - A maximum
 - B minimum
 - C equal to its capacitance.
 - D parallel with the inductor
 - less than its resistance.
 - The band width of the tuned amplifier is given by (v)
 - $f_1 f_2$
 - B 2 fr
 - ft Bw
 - D 2π√LC



- (vi) The mixer stage of the superhet radio receiver is sometimes known as
 - A mixer amplifier
 - B detector stage
 - C AF amplifier
 - D oscillator
 - E frequency changer.
- (vii) What is meant by NTSC as used in television?
 - A National television society corporation
 - B National assembly in television colour
 - C National transmission system of communication
 - D National television society cooperation of Japan
 - E National Television systems committee of America.
- (viii) If a radio receiver produces no sound, what would be the possible cause?
 - A Poor selectivity
 - B Image frequency
 - C Defective loud speaker
 - D Signal to noise ratio
 - E Fading
- (ix) The voltage at which the electrons start to flow from the cathode to the anode through a diode is called
 - A break down voltage
 - B peak inverse voltage
 - C peak voltage
 - D pinch off voltage
 - E cut off voltage.
- (x) The type of radio receiver where the incoming radio frequency signal is changed to another frequency is known as a
 - A tuned radio frequency receiver
 - B super heterodyne receiver
 - C continuous wave receiver
 - D frequency modulated receiver
 - E super-regenerative receiver.

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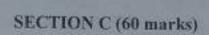


SECTION B (30 marks)

Answer all questions in this section.

- 2. What is a d.c loadline?
- Mention three (3) main parts of oscillator.
- Write a formula for the impedance of a speaker coil having both inductive reactance and resistance.
- When a carrier wave (fc) is amplitude modulated by another signal (fm), three (3) separate frequencies are produced. Mention the frequencies.
- 6. How can the overall gain of a radio receiver be varied automatically with the changing strength of the received signal?
- 7. (a) When the base emitter bias is about +0.2 V, electron cross the junction into the base. What material is this transistor made of?
 - (b) If the transistor is operating with Vcc = 9V, and it is properly biased, calculate the value of V_{CE}.
- 8. In radio receiver a tuner stage is formed by three (3) combined stages. Mention them.
- (a) One of the qualities of the tuned circuit of a radio receiver is its ability to extract the desired signal and reject all the other unwanted signals. Give the name of that quality.
 - (b) State three (3) ways in which radio waves travel.
- Define the following terms as used in amplitude modulation.
 - (a) Modulation index
 - (b) Modulation depth
- If your superhet radio receiver produces twice the IF away from the wanted signal, predict the possible problem at the output.

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Answer three (3) questions from this section.

- 12. (a) What is the function of the following stages of the superhet radio receiver?
 - (i) Local oscillator
 - (ii) IF amplifier
 - (iii) Mixer stage
 - (iv) Detector stage
 - (v) A.F amplifier
 - (b) What purpose does AGC line serve in a superhet radio receiver?
- (a) Name three (3) passive components used in electronic circuits.
 - (b) (i) A pure inductor L (i.e one possessing negligible resistance) is connected to 230V, 50 Hz domestic supply. A current of 2A flows. Determine the value of the inductance?
 - (ii) If the inductor L in 13(b)(i) above has 100 turns of wire and another coil X is wound with 150 turns but having identical dimensions as that of inductor L, calculate the current that will pass if it is connected to the same supply?
- 14. (a) What is the general function of antennas in electronic systems?
 - (b) Mention four (4) types of radio receiving antennas.
 - (c) If the frequency of the transmitted signal is 1 kHz, what will be the value of its wavelength?
 - (d) Draw a neat sketch of a Yagi antenna and show its three (3) important elements.
- 15. (a) Mention two (2) types of video tape recorders and state one (1) use of each type.
 - (b) Make a neat and well labelled sketch of a video tape construction.
 - (c) Draw a block diagram of a video cassette recorder (VCR) and label all of its parts.
- 16. (a) If the emitter terminal of the NPN transistor is blown, what two (2) effects will be noted?
 - (b) What do you expect if a junction diode at the detector stage of the superhet radio receiver is dead?
 - (c) What could be the problem in the superhet radio receiver if the output signal strength is varying either higher or low.
 - (d) What will happen if the 3.58 MHz section of a TV receiver is defective?
 - (e) State two (2) possible causes for a TV to produce a very clear picture with no sound.