FRIENDLY CORRESPONDENCE COURSE
                              for the
        RADIO   AMATEUR   EXAMINATION


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6.1 and 6.2 see the RAE manual page 41 fig 3.29

6.3
This question should have been deleted as it is now not valid.
There are no longer any restrictions on RTTY being used on any of
the Class A and B amateur licences.
This used not to be the case. Until quite recently there were
several Amateur Bands that did not allow RTTY operation.
Perhaps I should have removed the question . However, I decided
to leave it (and others, later) in for the time being as it
encouraged detailed reading of the Frequency Schedule by the
students! Grumble, grumble, I hear you saying...

6.4
As an example, look at the circuit in question 7.
R4 is the thermal runaway resistor  and C2 is the by pass
capacitor. Removing the by pass capacitor would allow the AC
signal voltage to appear across the thermal runaway resistor.
This voltage, being 'out of phase', would reduce the wanted
signal. It would cause negative feedback and this would reduce
the gain or amplification of the amplifier stage.

6.5
The forward characteristic of a diode is a 'graph' showing the
current plotted against voltage, when the diode is conducting
current. IE when it is forward biased.

6.6
A typical varactor diode characteristic is shown in Fig3.25 in 16th edition of
the RAE Manual

6.7
    If R1 became open circuit then the
voltage on the base  of the transistor
would drop to zero. The transistor would no
longer be forward biased and would
therefore not conduct current. It would be
said to be in a cut off state.

If R2 became open circuit, the voltage on
the base of the transistor would rise
towards the positive supply voltage. This
would be more than enough to turn the
transistor fully on. The current then
flowing through the transistor (from
collector to emitter) could be enough to
actually destroy the transistor

6.8
RMS=Peak/1.414

RMS=250/1.414 = 176.8 volts


6.9
Beware of the two forms of each Q code. If there is no question mark, then it is the statement:
QRS = send more slowly.
But with a question mark, it is the question form of the Q code:
QRS? = shall I send more slowly?
Beware of these little differences in the actual C & G exam...
QRM? Means "am I being interfered with?"

6.10
F3E this is the representation of Frequency Modulated Telephony.
Telephony is the official way of saying "speech".

6.11
The recommended phonetic alphabet is shown in BR68 note (u)

6.12
The circuit of a high pass filter is shown in fig 3.17 (a) on page 40  of the RAE Manual (edition 16)

6.13
 Resonance is a "balance". It is when the inductive reactance  is
equal & opposite to capacitive reactance.
In other words XL  and XC will cancel out each other.

And the resonant frequency =     $\dfrac{1}{2\sqrt{(LxC)}}$

Tuned circuits are then able to use to 'select' one frequency and
not another.
There will nothing more complicated than these formulas, you will
be pleased to know. They cant ask too many questions on this sort
of thing so don't let you brain calls go into orbit over them!

6.14

The resonant frequency =     $\dfrac{1}{2\sqrt{(LxC)}}$


6.15
An actual circuit is not required for this question. Just sybols representing a
mike, amplifier headphones and a two way switch…

6.16

The main  advantage of a thermo couple meter is that it works
equally accurately on all frequencies. It relies on heating
effect of a current. Heat does not vary with frequency.

6.17
If the station is within 1 KM of an aerodrome the aerial or any mast or
supporting structure must not exceed 15 Metres above the ground.

6.18

Wavelength = $\dfrac{300 \times 10^6}{\text{Frequency}}$

1 MHz = $1 \times 10^6$ Hz

so the wavelength of 1MHz = $\dfrac{300 \times 10^6}{10^6}$

**= 300 Metres**

All best

Pete Pennington

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