



COLLEGE OF ENGINEERING SCIENCE & TECHNOLOGY

SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

FINAL EXAMINATION-PENSTER 1-2014

CERTIFICATE IV IN E ELECTRONIC ENGINEERING STAGE 5

EEE422 TELEVISION SYSTEMS

DAY/TIME : To be determined. TIME : To be determined

INSTRUCTIONS TO STUDENTS

1. You are allowed 10 minutes EXTRA time during which you are not to write.
2. Write your candidate number on the top of each sheet of the answer booklet.
3. Write all your answers in the ANSWER BOOKLET provided.
4. For all sheet of papers on which rough/draft work has been done, cross it through and attach these to your answer script.
5. There are 8 questions worth a total of 125 MARKS.
6. Attempt all questions

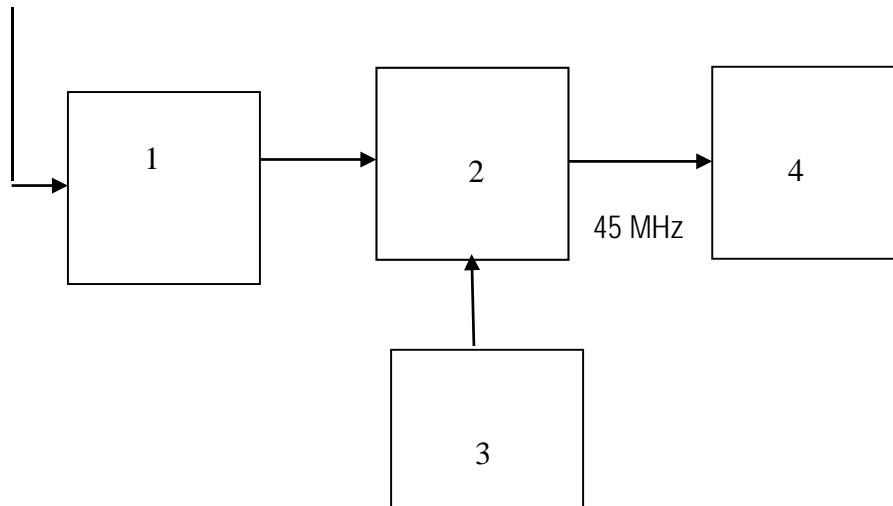
Section A – Analyse the table below of each television channel and fill each empty space with the correct frequency to complete ?

[Note : Copy the table in your answer sheet and complete by filling required frequency and bandwidth]
0.5 mark per blank

	TV Channel	Maximum frequency	Minimum Frequency	Picture Carrier	Sound Carrier	Bandwidth
1	2		54 MHz			6 MHz
2	3	66 MHz				
3	13		210 MHz			
4	10		192 MHz			
5	83	890 MHz				

10 marks

Section B – Refer to the block diagram below and answer the questions that follow ?



1	What is the combined name of these blocks of a television receiver?	2m
2	State the name of the block numbered 1 ?	1m
3	State the name of the block numbered 2 ?	1m
4	State the name of the block numbered 3 ?	1m
5	State the name of the block numbered 4 ?	1m
6	How is the frequency in block 3 related to the frequency in block 1 ?	2m
7	State the function of block 2 ?	2m
10 marks <small>20</small>		

Section C

From the list of terms in the last row select the particular one that matches a statement [1-20]. Place the selected term on the ANSWER column. Clearly write the question number in your answer sheet and the answer beside it? [0.5 mark each]

	STATEMENT	ANSWER
1	The television system used in Fiji	
2	The television system used in North America	
3	The bandwidth of the television system use in Fiji	
4	Usually located on the neck of the CRT	
5	Movement of electron beam from left to right of the screen	
6	Movement of the electron beam from the end of the 625 th line to the starting point	
7	A type of electron gun used in a CRT of a television receiver	
8	A component to control the flow of current in a ADG	
9	A circuit that that operates only on the moment of switching the power on in a television receiver	
10	The part that when heated up produces electrons	
11	The impedance of the rf input of the television receiver	
12	Transformer that matches the antenna impedance to the coaxial cable	
13	Causes the beam to deflect horizontally	
14	Frequency difference between the maximum and minimum frequency of a television channel	
15	Causes the electron beam to accelerate to the phosphor dots	
16	Commonly known as luminance signal which causes brightness	
17	Commonly called colour signal for colour information or chroma	
18	Make invisible the retraces required in scanning	
19	Scanning in the camera and that of the CRT to move in step of each other	
20	Each group of odd or even scan lines	
T E R M S	ADG, Balun, Blanking pulses, C signal, Cathode, Delta, Deflection Yoke, Deflection coil, Field, High voltage, NTSC, Posistor, PAL, Sync pulses, Trace, Vertical retrace, 6 MHz, Y signal, 6 MHz, 75 ohm,	
	10 marks ₃₀	

Section D - Fill each blank with the correct word or number to complete the statement ? Clearly write the question number in your answer sheet and the answer beside it ? DO IT RIGHT THE FIRST TIME? [1 mark per blank]

1	In a television system there are two carriers in one channel. One carrier is for the _____ and the other one is for _____
2	A television system could be identified by the number of lines scanned in a frame of picture; and for NTSC system there are _____ lines and for the PAL system there are _____ lines.
3	Intercarrier Frequency is the difference between the _____ carrier frequency and the _____ carrier frequency.
4	A simple television system usually consists of two sub-systems namely the _____ and the _____
5	A transducer is an electronic device that _____ a form of energy from one form to another form.
6	In a television transmitter system there are three transducers used; namely _____, _____, and _____
7	In a television receiver system the transducers used are the _____, the _____, and the _____
8	The input into the television receiver is the _____ and the input device is the _____.
9	One output of the television receiver is the picture and its output device is the _____
10	One output of the television receiver is the sound and its output device is the _____
11	The function of the television transmitting antenna is to convert _____ energy into _____ energy.
12	The function of the television receiving antenna is to convert _____ energy into _____ energy.
13	The two types of modulation used in a television transmission are _____ and _____
14	The front end of a television receiver usually consists of _____, _____, and _____
15	The function of the mixer is to _____ the signal received to _____
30 marks₆₀	

Section E – Briefly explain the answer to each of the following questions ?Clearly write the question number in your answer sheet and the answer beside it ?

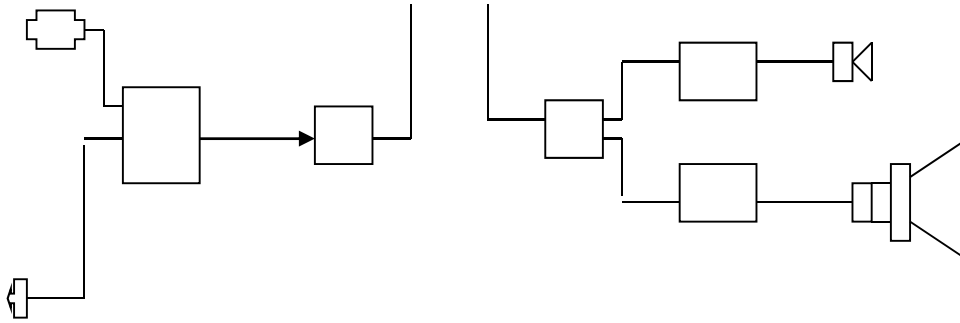
1	Differentiate between a colour and monochrome television ?	1.5 marks
2	Describe how the colour is obtained in television receiver?	1.5marks
3	Describe how the CYAN color is produced in a television receiver ?	0.5 mark
4	Describe how the YELLOW color is produced in a television receiver ?	0.5mark
5	Describe how the MAGENTA color is produced in a television receiver ?	0.5mark
6	Describe how WHITE is produced in a television receiver ?	0.5mark
7	Describe the formula which is used to calculate the length of an efficient antenna ?	0.5 marks
8	Calculate the length of a dipole to receive the TV signal sent by Fiji One channel, the frequency of which is 200 MHz ?	2.5marks
9	Briefly explain the term "bidirectional" in relation to antenna ?	0.5mark
10	Briefly explain the term "omnidirectional" in relation to antenna ?	0.5mark
11	Explain the term aspect ratio in television ?	0.5mark
12	State the aspect ratio of the PAL system ?	0.5mark
13	Describe the cause of ghost image in television reception ?	1 mark
14	What is " Line Of Sight" in television transmission ?	1 mark
15	Why is it required to place a balun between the RF input to a TV receiver and the coaxial cable that runs to the antenna ?	1 mark
16	Briefly explain horizontal polarization ?	1 mark
17	Briefly explain circular polarization ?	1 mark
	15 marks	75

Section F – Match the probable cause of the symptom of the following machine failures ? Write the number against the letter ?

	SYMPTOMS	ANS	CAUSES	
1	Vertical line on the screen		Vertical deflection oscillator above 60 Hz	A
2	Picture rolls upward		Voltages become too low	B
3	Horizontal line on across the screen		Low voltage on G2	C
4	Picture rolls downward		No horizontal output	D
5	Low resolution		Cathode to grid short	E
6	High resolution		Faulty picture tube /low or no anode voltage/no screen voltage	F
7	No picture but sound is present		Faulty power capacitors	G
8	A gassy picture tube		Tab at the back of tape missing	H
9	No picture, no raster, no sound		Open horizontal winding	I
10	Inability to control brightness		Vertical sweep circuit failed	J
11	Main failure in the flat screen TV		High voltage on G2	K
12	Cannot record in a VCR tape		Slipping belt	L
13	Squeaking sound in VCR		Absence of filament voltage	M
14	No glow in the filament		CRT board to be checked	N
15	No red colour present in the screen		Vertical deflection oscillator below 60 Hz	O
		15m	90	

Section G

1. Copy the block diagram below in your answer sheet and give its name ? (1 marks)
2. Clearly label each block in the diagram ? 0.5 m each (5 marks)
3. Select 8 blocks and write down the function of each of them ? 0.5 m each (4 marks)



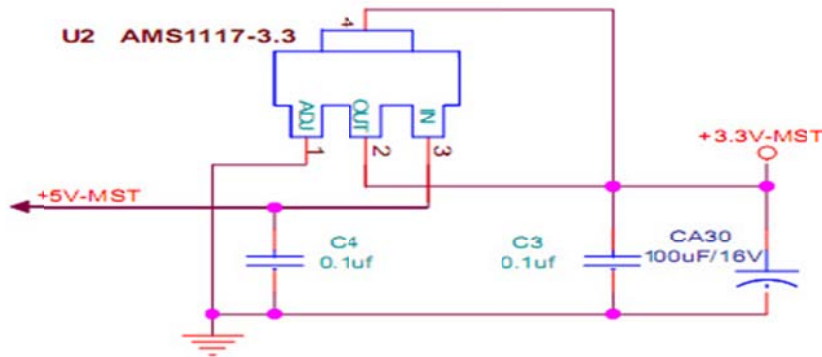
[10 marks]₁₀₀

Section H

1. Below is part of a circuit in a LCD television. A fault occurring was that, *the TV channel automatically changing*. During fault finding 3.7 volts was measured where 3.3 volts is marked on the circuit to be present. .

Comment on this case to clearly demonstrate symptom and cause of fault or problem ?

(5 marks)



2. (i) List advantages of the circuit below with respect to the common type ?

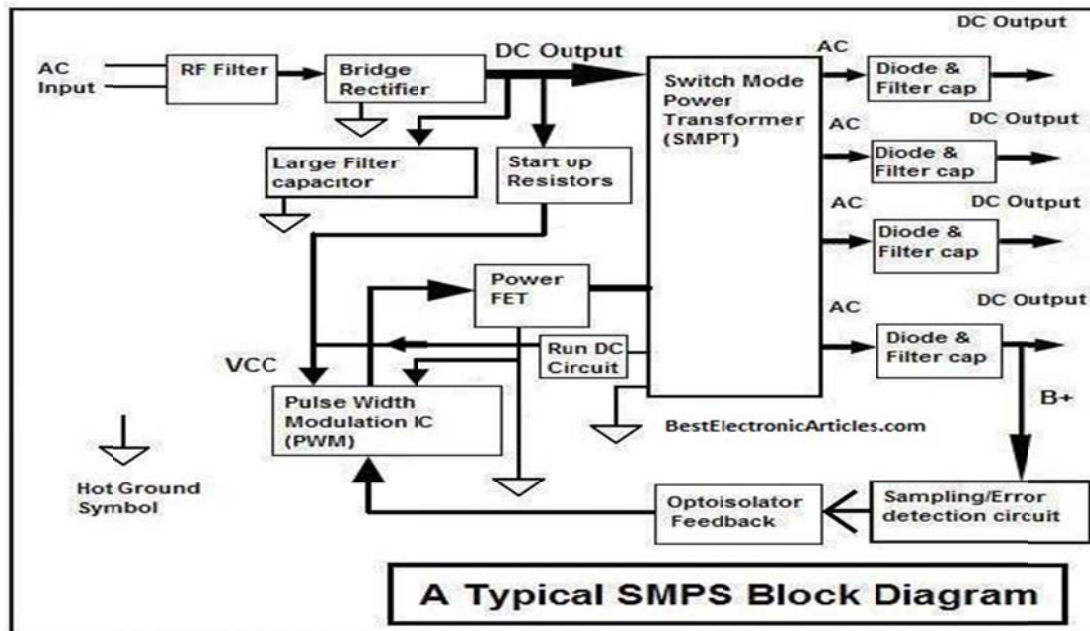
(ii) RF Filter?

(iii) Bridge Rectifier?

(iv) Large Filter Capacitor?

(v) Start up Resistor?

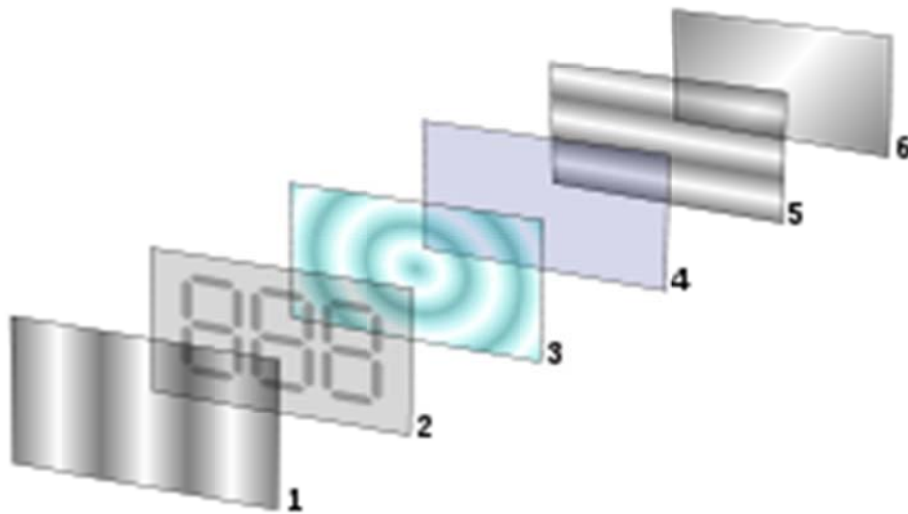
(10 marks)



4. The diagram below shows a basic structure of LCD display .

(i) Name and briefly explain each layer (1-6) and ? (7 marks)

(ii) Comment on advantages and disadvantages of LCD over CRT ? (3 marks)



[25 marks]₁₂₅