FIJI NATIONAL UNIVERSITY

COLLEGE OF ENGINEERING SCIENCE & TECHNOLOGY

SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

FINAL EXAMINATION-PENSTER 3-2017

RADIO ELECTRONICS & TELEVISION SERVICING CERTIFICATE

EEE332 COLOUR TV & VCR

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 6 questions (A,B,C,D,E, F) worth a total of 130 MARKS.
6. Attempt all questions

SECTION A-Complete the statement by filling each blank with the correct word or number ? Clearly write the answer in your answer sheet beside the question number ? 1m per blank

1	[a] A television receiver usually reproduces two carrier signals sent from a television transmitter radiated through space or cable by the processes called _____ and _____ modulations [b] In the CRT television receiver, the main difference between the monochrome and colour is that there are _____beams for colour and _____ for monochrome
2	The colour of the picture displayed on the television screen is the result of having three phosphor dots in each triad . So each triad has a _____ dot, a_____ dot and _____ dot , but there are thousands of triads.
3	[a] In a complete television system , the function of the transmitting antenna is to convert electrical energy to _____ whereas the receiving antenna is to convert _____ to electrical energy. [b] It must be noted that the signal radiated by the antenna travels through space at the speed of _____
4	[a] The CRT television power supply is in the range of extra-high-tension ,and for large CRT it is as high as _____ volts, its purpose is to cause the electron beam to accelerate from cathode to anode at a very _____ speed. [b] The thickest cable that is present in a CRT television PCB runs from the _____ to the _____ of the screen.
5	[a] In a television receiver its front end consists of the RF TUNER which consists of a _____, an _____ and a mixer. [b] The purpose of the RF amplifier is to _____ and_____ the wanted carrier . [c] The purpose of the mixer is to convert the incoming carrier to _____ which then after amplification is demodulated to extract the _____ signal
6	[a] VCR is an electromechanical machine that can receive, _____ and _____ video signals. [b] The playback process of the signal recorded on the VCR tape is possible only if the tape _____ across the head-gap of the VCR player. [c] For recording the _____ frequency signal on the head , the writing speed must be high hence the head-drum is made to rotate at 1800 rpm.
7	It must be noted that a VCR records video signals by changing the magnetic alignment of iron oxide molecules deposited on the flexible plastic (usually mylar) tape. This change in magnetic alignment is known as _____ or _____ magnetism
8	[a] The two types of servo control systems used in VCR are _____and_____ [b] The scanner drum speed is varied while tape speed is constant in _____ [c] A _____ servo system controls the rotational speed of the capstan to change the tape speed.

30 marks

SECTION B – Match each term on the RHS column to its meaning on the LHS column ? Clearly write your answer beside the question number on your answer sheet.

	LHS	RHS
1	[a] The primary colours of the colour television [b] The composite colours of a television receiver [c] Result of mixing green and blue. [d]Result of mixing red and yellow. [e]Result of mixing red and blue.	Magenta Cyan Yellow Red, green, blue Yellow, yellow,cyan,magenta, white
2	[a]An input of a television receiver. [b]An output of a television receiver. [c]The tuner output is usually connected to input of [d]What usually connected to the output of luminance amp [e]What adds several inputs in calculated proportions to form new output voltage combination	IF CRT socket Matrix circuit Carrier , electromagnetic wave picture
3	[a] A formula used for determining the length of an antenna [b] A common type of antenna used for TV reception [c] The velocity of the television signal leaving the antenna [d] The TV antenna polarisation [e] The higher television band	UHF 300×10^6 m/sec V=f x wavelength Horizontally or vertically YAGI
4	[a] The highest voltage in the CRT television [b] A significant component in generating the Main HT voltage in CRT [c] Movement of beam across from left to right of screen [d] Movement of beam from right to left of screen [e] Movement of beam from end of last line to start of 1^{st} line	24 KV Trace Vertical retrace Retrace Flyback Transformer
	20 marks$_{50}$	

SECTION C - **Question in reference to vertical and horizontal section of CRT TV.**

1. State the usual location of the deflection yoke ? 1 m
2. What is the deflection yoke ? 2m
3. Describe its purpose ? 2m
4. Can the deflection yoke be mounted on the PCB? 2m
5. Give the typical value of the resistances of its two coils? 2m

10marks$_{60}$

SECTION D – 1. Draw the diagram which represents the spectrum of a broadcast TV signal ? **5 m**

2. The television channel 2 has the minimum frequency of 82 MHz. Using the above diagram, determine ;

(i) the channel bandwidth ? **2m**

(ii) the picture carrier frequency ? **2m**

(iii) the sound carrier frequency ? **2m**

(iv) the intercarrier frequency ? **2m**

(v) the maximum frequency ? **2m**

15 marks$_{75}$

SECTION E - **Briefly give answers to these questions , each of which worth 2 marks**

1	What is a plasma flat screen TV ?	2m
2	What is an LCD TV ?	2m
3	What do you mean by LED TV?	2m
4	How does a LED TV screen work?	2m
5	What is a plasma TV screen?	2m
6	What is a back-lit LED TV ?	2m
7	When was the first plasma screen TV invented ?	2m
8	How long do LCD TVs usually last	2m
9	When did the plasma TV first sold?	2m
10	What is a full array LED TV?	2m

20 marks$_{95}$

SECTION F : 1- List 5 tips that can cause increased life-span for LED TV? 5 marks

2- Match each symptom of faulty television on the LHS to its cause on the RHS? Write the letter representing the cause beside the question number on your answer sheet ?

2 marks each

	SYMPTOM OF FAULTY TV		CAUSE OF FAULT
1	LG:Picture divided into several parts	A	Faulty capacitor in PSU
2	Philips: No sound	B	LVDS cable not properly inserted or dirty contact pins
3	SONY: No start-up. Red LED flashes 3 times	C	Faulty circuit protector fuse on T-CON board
4	Small dark spot on the TV screen	D	Loss of voltage to the CCF lamp supply line
5	Skyworth LED : At every day first power on, it is hard to start-up	E	Antenna mismatch or orientation not right
6	Samsung LCD : Display is completely green colour only	F	Defective sound output IC7732(ANS7522)
7	LED TV: No backlight or display dim	G	Power IC is defective in PSU board
8	Snowy picture with crackling sound	H	T-CON V_{CC} voltage 4.7 volts instead of 5 volt
9	Samsung: Half screen is purple	I	Dead pixel
10	Only raster on the screen	J	The PSU 12V output is giving only 6-7 volts
11	No backlight glowing in LCD TV	K	T-CON board faulty
12	Samsung LED: No power	L	LED inverter/drive board voltage is low 24v
13	Samsung LCD: Brightness & contrast automatically change to 100%	M	Antenna not connected
14	Changhong LCD: Display white screen, but sound ok	N	The eeprom IC (AT24C256C) to be replaced
15	Westinghouse: Blue screen No sound, no picture and no OSD	O	LCD panel controller board is defective

30 $marks_{130}$

TOTAL MARKS OF 130

IN TOTAL OF 5 PAGES

END OF EXAMINATION PAPER