



**COLLEGE OF ENGINEERING, SCIENCE AND TECHNOLOGY
SCHOOL OF ELECTRICAL AND ELECTRONIC ENGINEERING**

CERTIFICATE4 IN ELECTRONIC ENGINEERING

EEE282 RADIO & TV SERVICING

FINAL EXAMINATION (PENSTER3, 2017)

DATE/TIME/ROOM – Refer to Exam Timetable

INSTRUCTIONS TO CANDIDATES

1. You are allowed 10 minutes extra time during which you are not to write.
2. Answer all questions in the Answer Booklet provided.
3. Begin each answer on a fresh new page and use both sides of each answer sheet.
4. Write your identification number on the top of each attached sheet.
5. Insert all written foolscaps, graph paper, drawing paper, etc in their correct sequence and secure with the string provided.
6. For all sheets of paper in which rough/draft work has been done, cross each one through and attach these to your answer script.
7. Write clearly the number(s) of the question(s) attempted on the top of each sheet.
8. Use of “GSM mobiles”, “Smartphones” and “Calculators with Digital Numbering Systems Conversions” are prohibited during this examination.
9. Attempt all questions from Question A to Question E. Total Marks of 100 Marks.
10. Questions F and G are Optional. Only attempt either one or both of these questions if you cannot answer either one or two of the questions in 9 above.

QUESTION-A**MATCHING****(20 Marks)**

Match Column A to Column B as best as you can, and place the alphabet representing the best answer in the Answer Booklet. Eg 1C, 2G etc.....

N ^{os}	COLUMN A		COLUMN B
1	One of the requirements of a good power supply is to keep its output voltage constant, which is produced by its stage called	A	Diode
2	The most important electronic component in a rectifier circuit is called	B	Regulator
3	The number of diode used in a Full Wave Rectifier that uses center-tapped transformer is	C	2
4	The number of diode used in a Half Wave Rectifier is	D	4
5	The number of diode used in a Bridged Rectifier is	E	Forward
6	When the positive side of the voltage source is connected to the anode of the zener diode, it is said to be _____ biased.	F	Reversed or negatively
7	In a diode when the positive terminal of the voltage source is connected to the cathode the diode is said to be _____ biased.	G	Up
8	The two terminals of the zener diode are the anode and the _____	H	1
9	If the number of turns of a power transformer is more in the primary than the secondary then the function is to step _____ the voltage.	I	Cathode
10	If the number of turns of a power transformer is less in the primary than the secondary then the function is to step _____ the voltage.	J	Down
11	The main sections or stages of a power supply are transformation, rectification, filtering and _____.	K	Regulation
12	The filter circuit of a power supply usually consists of components including inductance and _____	L	Capacitance
13	The type of transformer used to reduce shock hazard is called _____ the primary/secondary turns ration is usually one	M	C/Collector, & C/Base
14	The three basic transistor amplifiers are usually called common emitter, _____ and _____	N	Input Voltage
15	Gain of an amplifier = Ratio of Output voltage & _____	O	Isolation
16	Cut-off frequency is found in High Pass _____	P	Capacitive reactance
17	Low Pass Filter is a circuit that allow all frequencies below _____.	Q	Inductive reactance
18	An oscillator will _____ any repetitive or sinusoidal signal	R	Filter
19	Resistance to flow of AC current by capacitor is called _____	S	Cut Off Frequency
20	Resistance to flow of AC current by inductor is called _____	T	Generate

QUESTION-B**TRUE OR FALSE****(24 Marks)**

If the statement is true write the letter T in the Answer Booklet, F if the statement is false.
E.g. 1T, 2F etc.....

N ^{OS}	STATEMENT
1	A zener diode can be used both when it is forward biased or reversed biased
2	In radio the intelligence which is the modulating signal fall between the frequency range of 20Hz to 20KHz
3	The three input circuits of a differential amplifier are usually very different in nature
4	The input impedance of an ideal op-amp is zero
5	The output impedance of an ideal op-amp is zero
6	The current conduction angle of a Class C amplifier is less than 180 degrees
7	The current conduction angle of a Class A amplifier is less than 180 degrees
8	Class A amplifier is more efficient than Class B amplifier
9	Out of Class A, Class B and Class C amplifiers the most efficient is the Class C amplifier
10	In a half-wave rectifier circuits the centre-tapped transformer is used at the input
11	Negative feedback is a necessity for an oscillator circuit
12	In an oscillator a portion of the output is normally fed back to the input in order to oscillate
13	The resonant frequency of a tuned circuit can be calculated by the formula $f = 1/2LC$
14	A voltage divider is useful in calculating the bias voltage of a NPN transistor
15	The base emitter voltage of a PNP transistor determines the current flow through the emitter and collector
16	In a PNP transistor the current flows from the base
17	In a NPN transistor the current flows into the base
18	The distinguishing feature of the Hartley circuit is that the <u>feedback</u> needed for oscillation is taken from a tap on the coil, or the junction of two coils in series.
19	The distinguishing feature of the Colpitts circuit is that the <u>feedback</u> signal is taken from a voltage divider made by two capacitors in series.
20	The differential amplifier produces an output only when the two input signals are different
21	The radio system consists of two sub-systems in order to convey the intelligence through cable only
22	There are basically four transducers in a complete radio system namely, antenna, rectifier loudspeakers and microphone
23	Basically a television system consists of six transducers namely video camera, microphone, transmitting antenna, crt and loudspeakers
24	A LCD like a CRT are both display devices in a television system

1 Mark for each correct answer.

QUESTION-C**DESCRIPTION OF TERMS****(25 Marks)**

Briefly but clearly describe the function of each of the following Terms listed below.

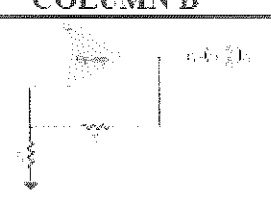
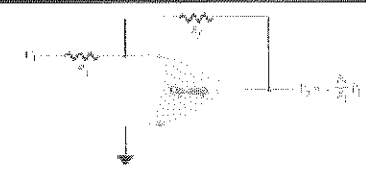
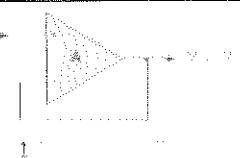
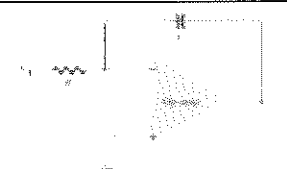
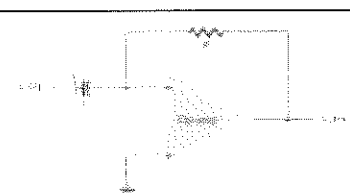
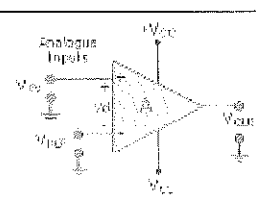
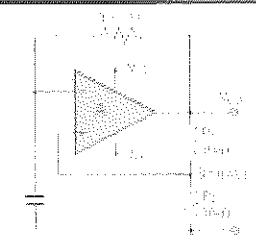
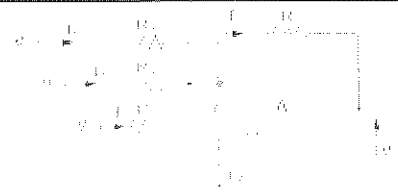
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|--|-----------|
| 1. Transducer | 2.5 Marks |
| 2. Microphone in a radio system | 2.5 Marks |
| 3. Video Camera in a television system | 2.5 Marks |
| 4. Transmitting Antenna in Radio System | 2.5 Marks |
| 5. Loudspeaker in a Radio System | 2.5 Marks |
| 6. CRT in a Television System | 2.5 Marks |
| 7. Transmitting Antenna in a Television System | 2.5 Marks |
| 8. Receiving Antenna in a Radio System | 2.5 Marks |
| 9. Demodulator or detector in a Radio Receiver | 2.5 Marks |
| 10. Modulator in a Radio System | 2.5 Marks |

QUESTION-D

OPERATIONAL AMPLIFIERS

(16 Marks)

Match Column A to Column B as best as you can, and place the alphabet representing the best answer in the Answer Booklet. Eg 1C, 2G etc.....

N ^{OS}	COLUMN A		COLUMN B	
1	The Inverting Amplifier	A		2 Marks
2	The Non-Inverting Amplifier	B		2 Marks
3	The Voltage Follower	C		2 Marks
4	The Summing Amplifier	D		2 Marks
5	The Intergrator	E		2 Marks
6	The Differentiator	F		2 Marks
7	The Comparator	G		2 Marks
8	The Multivibrator	H		2 Marks

QUESTION-E

TELEVISION

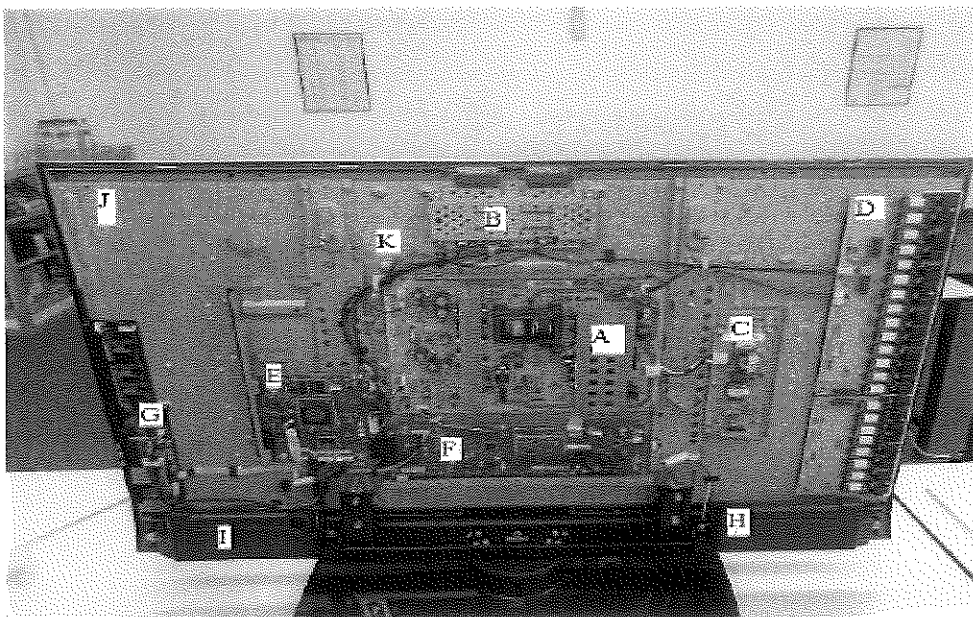
(15 Marks)

1. List the main reasons why the CRT TV is different from the LCD TV? 3Marks

2. State the reason why in the CRT TV the high voltages more than 10,000 volts ? 3Marks

3. Give the main difference between LCD and LED TV? 3Marks

4. Name the board of the TV set below represented by the letter A, B, C, D, E & F 6Marks

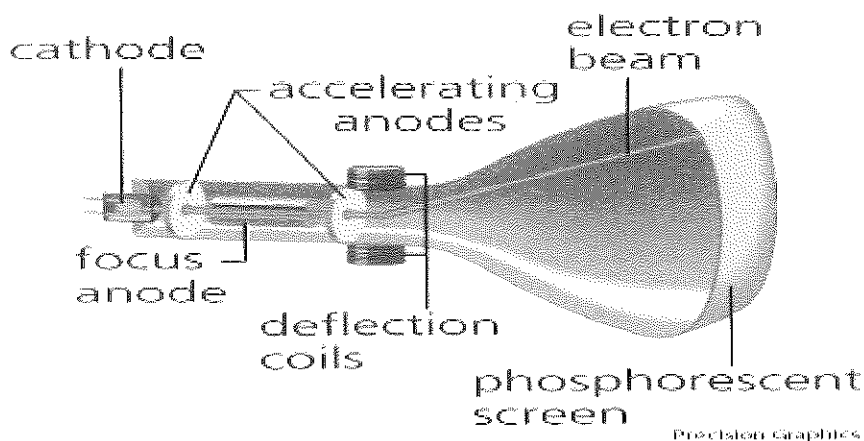


QUESTION-F

TELEVISION-(OPTIONAL)

(10 Marks)

1. Name the device shown on the diagram below and comment on its use ? (1 mark each)
2. Write down the name of each part of the device on your answer sheet and explain its function? (1.5 marks each)



QUESTION-G

OSCILLATORS-(OPTIONAL)

(15 Marks)

Refer to Figure 1 and Figure 2 and answer the following questions

1. Name the circuit in Figure 1 and Figure 2 ? (2 Marks)
2. State the formula for the frequency of oscillation in Fig 1.? (1 Marks)
3. Name the two un-labeled capacitors of Figure 1? (2 Marks)
4. State the two functions of the two un-labeled capacitor of Figure 2? (2 Marks)
5. Explain the functions of the tank circuit of Figure 1? (2 Marks)
6. Explain the functions of the tune circuit of Figure 2? (2 Marks)
7. If in Figure 1 $C_1=2000\text{ pF}, C_2=2000\text{ pF}, L=10\text{mH}$, determine the resonant frequency ? (4 Marks)

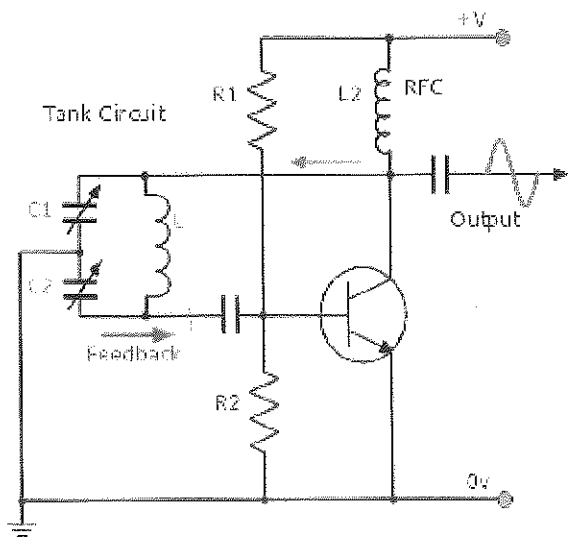


Figure 1

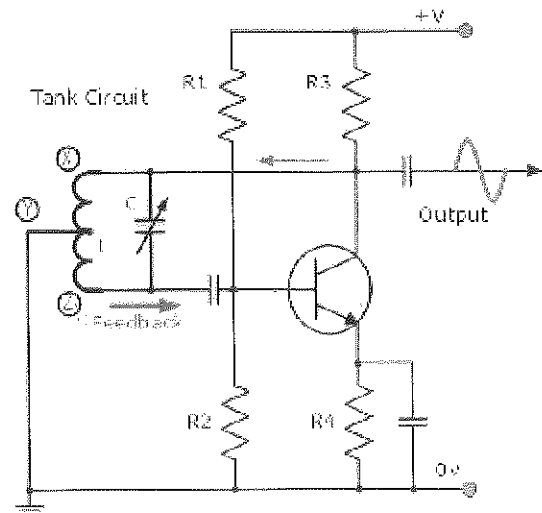


Figure 2