

SIR ARTHUR LEWIS COMMUNITY COLLEGE

FACULTY OF ENGINEERING

ACADEMIC YEAR (2024/2025) - SEMESTER TWO

END OF SEMESTER EXAMINATION

LECTURER(S)	:	Mr Lindsley Philbert
PROGRAMME TITLE	:	Electrical Engineering
COURSE TITLE	:	Electronics I
COURSE CODE	:	ELE103
LEVEL	:	Associate Degree/Year Ones
PAPER	:	One
DATE	:	Tuesday, 29th April 2025
COMMENCEMENT TIME	:	1:00 p.m.
DURATION	:	2 Hours
INVIGILATOR(S)	:	A. Larcihere-Pascal, S. Leon & T. Tobierre
ROOM(S)	:	OTW-1R-08

GENERAL INFORMATION AND INSTRUCTIONS

- This paper consists of Two (2) Sections. All questions must be attempted on the foolscap provided.
- **Section A** contains Forty (40) Multiple Choice Questions. You are required to answer all questions. One mark is awarded for each correct answer.
- **Section B** contains Two (2) Short Answer Questions. You are required to answer all questions. Marks are awarded accordingly.
- Students must sign **IN** and **OUT** on the examination class list.
- Students must **not** write their names on their answer sheets, only their ID number.
- Students are reminded to read **all** questions and instructions in each section very carefully.
- Please number your responses accordingly.
- **Calculators are needed.**

**DO NOT TURN THIS COVER SHEET UNTIL
YOU ARE TOLD TO DO SO!!!**

SECTION A: Multiple Choice Questions

Answer all questions. (One mark will be awarded for each correct answer)

- 1). The input frequency applied to low pass filter is ____?
 - a) High
 - b) Low
 - c) mid
 - d) wideband

- 2). The output frequency obtained from low pass filter is ____?
 - a) High
 - b) Low
 - c) Zero
 - d) Constant

- 3). A device that separates disturbances from a signal is ____?
 - a) Filter
 - b) Diode
 - c) Switch
 - d) All the above

- 4). Which of the following are the applications of filters?
 - a) Radar
 - b) TV
 - c) Control systems
 - d) All the above

- 5). Which of the following are the types of filters?
 - a) Linear and non-linear
 - b) Active, passive
 - c) Analog, digital
 - d) All the above

- 6). Filters are classified into multiple types namely linear, nonlinear; analog, digital; time variant, invariant; active, passive; discrete and continuous; IIR and FIR. A LPF is also called ____?
 - a) High cut filter
 - b) Treble-cut filter
 - c) Low-cut filter
 - d) Both a and b

- 7). Which of the following is the low frequency value?
 - a) 100 KHz
 - b) <100KHz
 - c) >100KHz
 - d) =1000KHz

- 8). Which of the following is the high frequency value?
 - a) 100 KHz
 - b) <100KHz
 - c) >100KHz
 - d) =1000KHz

- 9). Which of the following is the output wave shape obtained from ideal low pass filter?
- Sine
 - Rectangle
 - Triangle
 - Peak
- 10). Which of the following are the components of low frequency type a passive filters?
- Resistors
 - Capacitors
 - Inductors
 - Both a and b
- 11). Which of the following are the components of high frequency type passive filters?
- Resistors
 - Capacitors
 - Inductors
 - All the above
- 12). A circuit design with resistor, capacitor and inductor component is called _____ circuit?
- RLC
 - RC
 - LC
 - RL
- 13). A first order LPF filter is called _____ circuit?
- Integrator
 - Differentiator
 - Multiplier
 - Adder
- 14). The components of LPF are connected in _____ configuration?
- Series
 - Parallel
 - Concurrent
 - Both b and c
- 15). Increase in frequency of LPF _____ the gain value?
- Increases
 - Decreases
 - Zero
 - Constant
- 16). The BW of LPF is _____?
- High
 - Low
 - Zero
 - Limited
- 17). At which of the following component of LPF input is applied?
- Resistor
 - Capacitor
 - Inductor
 - Load

- 18). At which of the following component of LPF output is obtained?
- Resistor
 - Capacitor
 - Inductor
 - Load
- 19). Increase in input frequency of LPF inductive type circuit ____ the value of inductors impedance?
- Increases
 - Decreases
 - Zero
 - Constant
- 20). Which of the following is the advantage of Inductive based LPF?
- Blocks high frequency
 - Allows low frequency
 - Generates constant frequency
 - Both a and b
- 21). Increases in input signal ____ the impedance of capacitor?
- Increases
 - Decreases
 - Zero
 - Infinity
- 22). Which of the following are the components of second order LPF?
- Resistor
 - Capacitor
 - Inductor
 - All the above
- 23). The output from second order LPF is taken from ____ component?
- Resistor
 - Capacitor
 - Inductor
 - All the above
- 24). Which of the following are passive components in second order LPF responsible for blocking high frequency?
- Resistor
 - Capacitor
 - Inductor
 - Both b and c
- 25). How many RC filters are cascaded in second order LPF?
- 1
 - 2
 - 3
 - 4
- 26). The band gain of second order LPF is ____ times the first order LPF?
- 2
 - 3
 - 4
 - 5

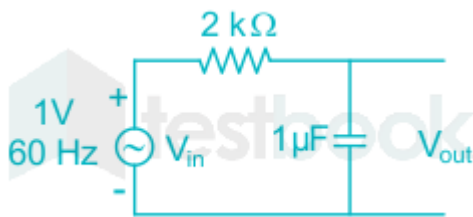
- 27). Gain is expressed in terms of ___ units?
- dB
 - Hertz
 - Baud rate
 - Both b and c
- 28). A device that increases the amplitude of a signal is called ___?
- Amplifier
 - Rectifier
 - Tuner
 - Oscillator
- 29). Which of the following parameter of LPF characteristics is plotted on X-axis?
- Gain
 - Angular frequency
 - Voltage
 - Current
- 30). Which of the following parameter of LPF characteristics is plotted on Y-axis?
- Gain
 - Angular frequency
 - Voltage
 - Current
- 31). A cut-off frequency is also called ____?
- Corner frequency
 - Break frequency
 - Highest frequency
 - Both a and b
- 32). A bandwidth consists of which of the following frequencies?
- Higher frequency
 - Lower frequency
 - Mid frequency
 - All the above
- 33). ___ type of filter can be used as audio and feedback systems?
- Analog
 - Digital
 - Both a and b
 - None of the above
- 34). What does the figure below represent?



- First order high pass filter
- First order low pass filter
- Second order high pass filter
- Second order low pass filter

- 35). What is the main difference between first order LPF and second order LPF?
- High cutoff frequency
 - Low cutoff frequency
 - Lower voltage gain
 - Higher voltage gain
- 36). Find the cut-off frequency for an RC low pass filter of $R = 8.2 \Omega$ and $C = 0.0033 \mu\text{F}$.
- 6 kHz
 - 5.88 MHz
 - 4.26 kHz
 - 170 MHz
- 37). A simple low pass RC filter having a cut-off frequency of 1 kHz is connected to a constant ac source of 10 V. Calculate C if $R = 10 \text{ k}\Omega$.
- 15.9 nF
 - 15.9 F
 - 1 nF
 - 1 F

- 38). What circuit is shown below?



- high-pass filter
 - differentiator
 - band pass filter
 - low pass filter
- 39). What does the below figure represent?



- First order high pass filter
 - First order low pass filter
 - Second order high pass filter
 - Second order low pass filter
- 40). For attenuation of high frequencies we should use
- shunt capacitance
 - series capacitance
 - inductance
 - resistance

Total 40 Marks

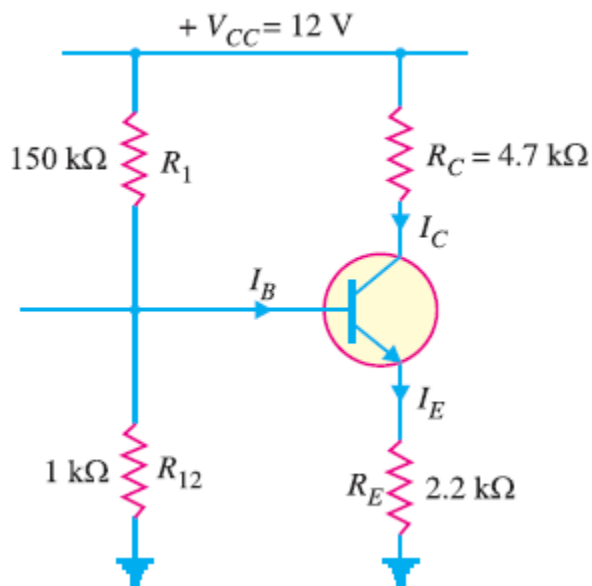
SECTION B: Short Answer Questions.

Answer all questions. (Marks are awarded accordingly)

- 1) Find all the currents and voltages for the voltage divider bias circuit below.

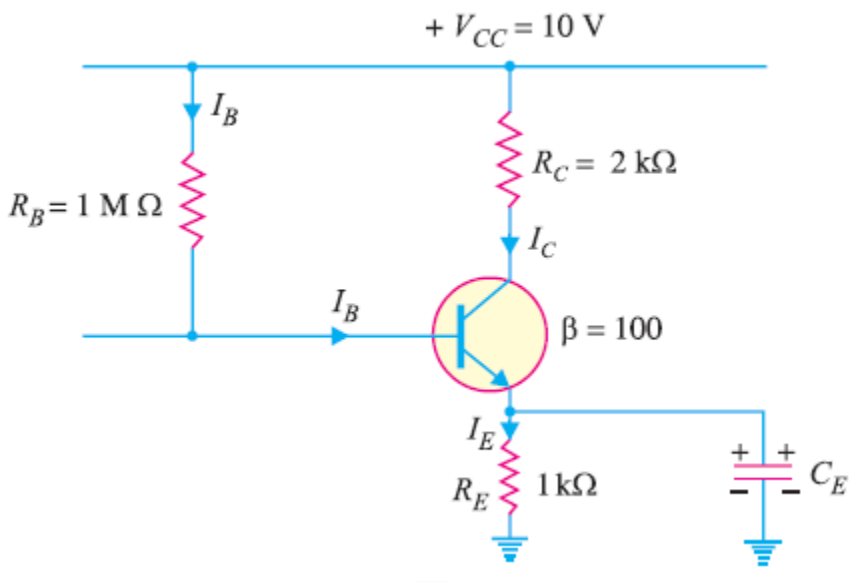
Use a Beta of 50 to answer the question.

(12 marks)



- 2) Find all voltages and currents for the circuit below.

(12 marks)



Total [24 Marks]

END OF EXAMINATION!!!