 Province of the

EASTERN CAPE

EDUCATION

**DIRECTORATE SENIOR CURRICULUM MANAGEMENT (SEN-FET)**

**HOME SCHOOLING SELF-STUDY WORKSHEET**

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| **SUBJECT** | **ELECTRONICS** | **GRADE** | 12 | **DATE** | MAY 2020 |
| **TOPIC** | **SWITCHING CIRCUITS** | **TERM 1****REVISION** | () | **TERM 2 CONTENT** | (√) |
| **TIME ALLOCATION** | 2 hrs. | **TIPS TO KEEP HEALTHY**1. **WASH YOUR HANDS** thoroughly with soap and water for at least 20 seconds. Alternatively, use hand sanitizer with an alcohol content of at least 60%.2. **PRACTICE SOCIAL DISTANCING** – keep a distance of 1m away from other people.3. **PRACTISE GOOD RESPIRATORY HYGIENE**: cough or sneeze into your elbow or tissue and dispose of the tissue immediately after use.4. **TRY NOT TO TOUCH YOUR FACE.** The virus can be transferred from your hands to your nose, mouth and eyes. It can then enter your body and make you sick. 5. **STAY AT HOME.**  |
| **INSTRUCTIONS** |  |

QUESTION 1

* 1. List THREE types of multivibrators.
	2. Refer to FIGURE 1.1 BELOW and answer the questions which follow.

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 Figure 1.1

1.2.1 Identify the circuit diagram above.

1.2.2 Describe the operation of the circuit.

1.3 State two applications of a monostable multivibrator.

1.4 Design a circuit diagram of a Schmitt trigger.

1.5 Determine four applications of a Schmitt trigger

1.6 draw a fully labelled diagram of a monostable multivibrator

1.7 Sketch a fully labelled circuit diagram for a 555 IC Astable multivibrator circuit showing input and output waveforms.

1.8 Figure 1.2 below represents the summing amplifier. Calculate circuit output voltage.

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 Figure 1.2

1.9 Refer to Figure 1.3 below and answer question that follows.

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 Figure 1. 3

1.9.1 Draw TWO full cycles of the input and output waveforms for this circuit if a sinusoidal waveform was added to its supply.

1.10 FIGURE 1.4 represents a passive RC differentiator. Answer the question that follows.

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 Figure 1.4

1.10.1 Sketch the output wave form.

1.11 Explain the operation of an integrator.

1.12 Design a circuit diagram of an op-amp integrator.

1.13 A 555 astable multivibrator circuit has the following components:

 Given: R1 = 47 kΩ

 C = 1$ μF$

 R2 = 5 kΩ

 Calculate the following:

1.13.1 Charging time

1.13.2 Discharging time

1.13.3 Time to complete one cycle

1.13.4 Frequency of oscillation