Electronic Circuits 1
5255

GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examination

JUNE 2025 KAWLO **INTERMEDIATE LEVEL**

Specialty Name and Acronym	**ELECTRONICS – ELN**
Centre No. and Name	
Candidate No.	
Candidate Name	

Mobile phones are **NOT** allowed in the examination room.

5255 ELECTRONIC CIRCUITS 1: MULTIPLE CHOICE QUESTION PAPER

Duration: One and a Half Hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed "**Intermediate Level – 5255** ELECTRONIC CIRCUITS 1.
4. Insert the information required in the spaces above.
5. Insert the information required in the spaces provided on the answer sheet using your HB pencil:

   Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.

   Take care that you do not erase or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination:

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.

   For example, if **C** is your correct answer, mark **C** as shown below:

   [A] [B] [~~C~~] [D]

8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. **You must not take this booklet and the answer sheet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination.**
12. **Non programmable calculators are allowed.**

1. The Thevenin's equivalent voltage is
   A The same as the load voltage
   B Equal to the source voltage
   C Equal to the input voltage
   D The open circuit voltage

2. If in a linear load the resistance increases while the supply voltage remains constant, we shall register a(n)
   A increase in power
   B decrease in current
   C constant current
   D increases in current

3. The Norton's equivalent current is the
   A short circuit current
   B current through the load
   C open-current from the source
   D Open load current

4. Which of the following is the current labeled 'I' in figure 1?

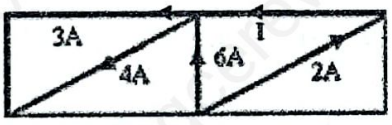

Figure 1

   A 2A
   B 1A
   C 13A
   D -2A

5. How many branches are in the circuit of figure 1?
   A 9
   B 5
   C 7
   D 11

6. Maximum power is transferred to the load when the
   A internal resistance of the voltage source is equal to the load resistance
   B circuit current is very high
   C load resistance is equal to zero
   D internal resistance is very high

7. What is the equivalent resistance of the circuit in figure 2?

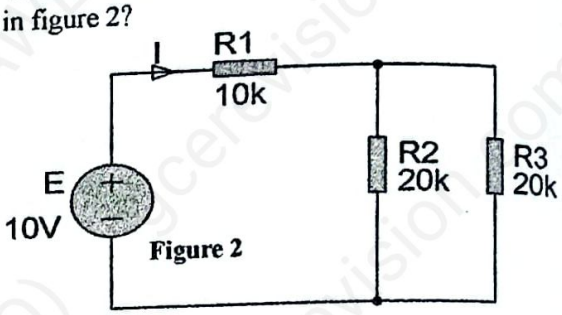

Figure 2

   A 15kΩ
   B 10KΩ
   C 20KΩ
   D 25KΩ

8. Which of the following is the value of the current labeled I in the circuit of figure 2
   A 4mA
   B 1mA
   C 2mA
   D 0.5mA

9. If the reactance of a capacitor is 10KΩ when an ac source of frequency 400Hz is applied across it, what is the capacitance of the capacitor?
   A 39.8μF
   B 39.8nF
   C 3.98nF
   D 3.98μF

10. Two capacitors, C1 and C2, are connected in series and each have capacitance 10μF and 47μF respectively. If the charge in C1 is 10mC, what is the charge in C2?
   A 47mC
   B 57mC
   C 37mC
   D 10mC

11. The barrier potential of the diode in figure 3 is 0.6V. The current flowing through R2 is

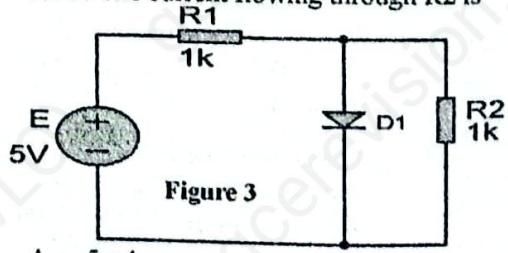

Figure 3

   A 5mA
   B 4.4mA
   C 0.6mA
   D 2.2mA

12. The current flowing through R1 in the circuit of figure 3 is
A 2.2mA
B 4.4mA
C 0.6mA
D 5mA

13. Which of the following is the current flowing through the diode D1 in figure 3?
A 4.4mA
B 1.6mA
C 3.8mA
D 0A

14. One application of pn junction diode is in
A rectification
B filtering
C amplification
D Voltage regulation

15. If the input voltage to a half wave rectifier circuit is 12Vmax, what is the average load voltage? Assume that the diode is ideal.
A 7.63V
B 3.81V
C 4.23V
D 4.32V

16. The current flowing through R2 in the circuit of figure 4 is

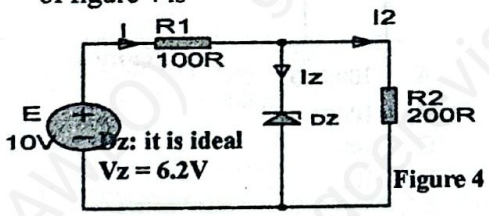

Figure 4

A 31mA
B 40mA
C 80mA
D 20mA

17. The current flowing through R1 in the circuit of figure 4 is
A 40mA
B 38mA
C 60mA
D 10mA

18. The current flowing through the zener diode in the circuit of figure 4 is
A 7mA
B 0A
C 10mA
D 20mA

19. The power dissipated by the zener diode in the circuit of figure 4 is
A 24.65mW
B 47.5mW
C 43.4mW
D 14.72mW

20. Which of the following is a device that allow current to flow only in one direction?
A capcitor
B inductor
C Resistor
D diode

21. Which one of the following is a biasing technique for a bipolar junction transistor?
A Self-bias
B Gate base
C Base bias
D Drain feedback bias

22. In a common emitter configuration, the output voltage is
A 180^0 out of phase the input voltage
B 90^0 out of phase the input voltage
C In phase the input voltage
D 270^0 out of phase the input voltage

23. A transistor operating in the active region has a base current I_B, of 20μA. if the current gain is 100, what is the value of the collector current Ic?
A 0.05mA
B 0.2mA
C 2A
D 2mA

24. If in a voltage divider bias of an npn bipolar junction transistor circuit the resistor connected to Vcc is open,
A the transistor goes into cutoff
B the transistor goes into saturation
C the transistor burns out
D the supply voltage is too high

25. The channel of a JFET is between the
A gate and drain
B drain and source
C gate and source
D input and output

26. A common collector amplifier produces a voltage gain that is
A zero
B unity
C infinite
D large

27. The parameters of the circuit in figure 5 are V_{BE} = 0.6V, $\beta = 100$, $I_B = 10\mu A$ and $V_{CE} = 3V$. What is the collector current in this circuit?

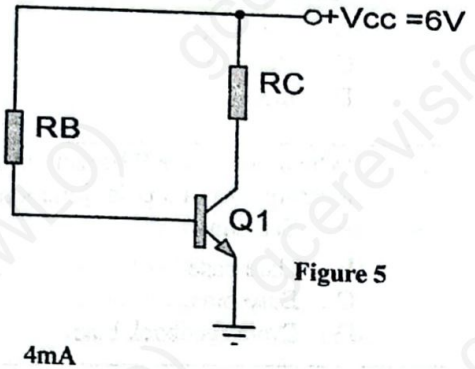

Figure 5

A 4mA
B 2mA
C 1mA
D 6mA

28. The value of the base resistor R_B in the circuit of figure 5 is
A 300KΩ
B 600KΩ
C 540KΩ
D 600Ω

29. Which of the following is the value of the collector resistor Rc in the circuit of figure 5?
A 3KΩ
B 6KΩ
C 8KΩ
D 2KΩ

30. The power dissipated by the transistor in figure 5 is
A 2mW
B 6mW
C 3mW
D 4mW

31. One method of biasing a junction field transistor is
A Collector feedback bias
B Self-bias
C Base bias
D Emitter bias

32. Which of the following is a characteristics of an ideal operational amplifier?
A Zero bandwidth
B Unity differential mode gain
C Zero input impedance
D Zero output impedance

33. Another name for a unity gain amplifier is
A Voltage follower
B Differential amplifier
C Comparator
D Differentiator

34. If zero volts is applied on both inputs of an ideal OPAM, what is the output voltage?
A +Vcc
B -Vcc
C 0V
D CMMR

35. What is the voltage gain of the circuit in figure 6?

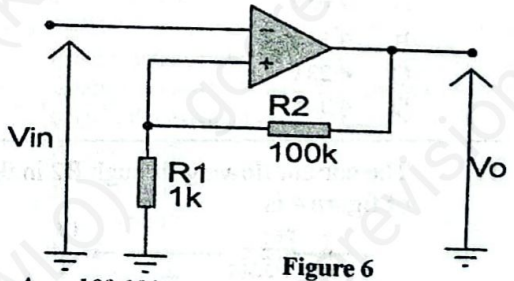

Figure 6

A 100,000
B 1000
C 100
D 101

36. If Vin = 2mV, what is the output voltage
A 200mV
B 202mV
C 2000mV
D 200000mV

37. The 1's complement of the binary number 01010011 is
A 10101101
B 11001101
C 10101100
D 01001101

Go on to the next page

38. The decimal number +100 express as an 8 bits number in the 1's complement form is
A 11010001
B 10011011
C 10001100
D 10010011

39. The simplified expression of the Boolean function $F = b\bar{c}d + ab\bar{c} + \bar{a}b\bar{c}$ is
A $F = bd + b\bar{c} + a\bar{c}$
B $F = b\bar{c}d + b\bar{c}$
C $F = b\bar{c}$
D $F = \bar{c}d + ab + b\bar{c}$

40. What logic function is implemented when the output of a half adder is summed?
A XOR
B XNOR
C AND
D NAND

41. Which of the following represents the logic function of the circuit in figure 7?

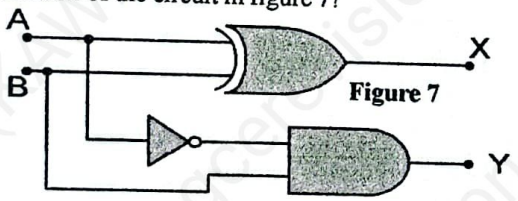

Figure 7

A Half Adder
B Half subtractor
C Half Comparator
D Half decoder

42. The binary equivalent of the gray code 10001001_{Gray} is
A $(11001101)_2$
B $(10101010)_2$
C $(11110001)_2$
D $(11110011)_2$

43. Which logic gate is represented in the circuit of figure 8?

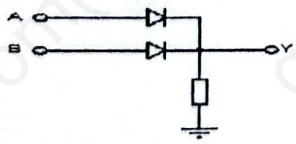

Figure 8

A NAND
B AND
C NOR
D OR

44. A device which serve as a data selector is called a(n)
A multiplexer
B demultiplexer
C decoder
D transcoder

45. The result of the binary subtraction 100101 – 10111is
A 001110
B 101110
C 011110
D 100011

46. How many flip flops are required to build a counter that counts from zero to 11?
A 3
B 5
C 2
D 4

47. What is the frequency at the output put of a MOD 10 counter if the frequency of the clock signal is 100KHz?
A 1000KHz
B 100KHz
C 10KHz
D 5KHz

48. If an asynchronous counter has four flip flops, what is its MOD number?
A 32
B 16
C 8
D 4

49. In a JK flip-flop, when J=K=1,the flip-flop is operating in the
A reset mode
B toggle mode
C set mode
D counting mode

50. A flip-flop is capable of storing
A one bit
B eight bits
C four bits
D sixteen bits

STOP

GO BACK AND CHECK YOUR WORK