CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examinations

ELECTRICAL POWER SYSTEMS

ELECTRICAL AND ELECTRONIC CIRCUITS 1

5240

JUNE XXXX **INTERMEDIATE LEVEL**

Centre No. & Name	
Candidate No.	
Candidate Name	

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

5240 ELECTRICAL AND ELECTRONIC CIRCUITS 1: MULTIPLE CHOICE QUESTION PAPER

1 HOUR 30 MINUTES

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 – 5240 Electrical And Electronic Circuits**
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.**

1. Identify the component which is not a semiconductor.

A	Thyristor
B	Diode
C	Capacitor
D	Transistor

2. Resonance will occur in the RLC circuit of fig 1 when:

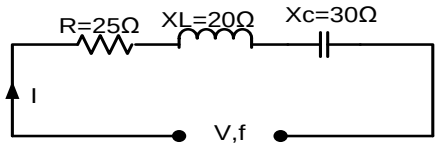

Fig 1

A	When $X_L=X_C=30\Omega$
B	When $X_L=X_C=20\Omega$
C	When $X_L=X_C=25\Omega$
D	When $Z=25\Omega$

3. The symbol which represents exclusive NOR gate is:

A	
B	
C	
D	

4. The voltage across the 1μF capacitor of fig 2 is:

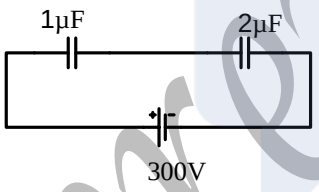

Fig 2

A	200V
B	20V
C	220V
D	100V

5. Two resistors are said to be connected in parallel if

A	both carry the same value of current
B	total current equals the sum of branch currents
C	sum of voltage drops equals the applied emf
D	same current passes in turn through both

6. A primary cell is not rechargeable because the chemical action inside the cell is

A	reversible
B	interchangeable
C	irreversible
D	too expensive

7. An ac current given by $i=14.14\sin(\omega t+\pi/6)$ has an rms value of

A	10A
B	14.14A
C	1.96A
D	7.07A

8. The phase voltage of a star connected circuit whose line voltage equals 440V is:

A	Vp = 2.54KV
B	Vp = 254V
C	Vp = 25.4V
D	Vp = 2.54V

9. The decimal equivalence of the binary number 11110 is:

A	300
B	30
C	3
D	33

10. A two input NAND gate is connected through a NOT gate gives:

A	a NOR gate
B	an AND gate
C	an OR gate
D	an exclusive OR gate

11. The equivalence of two identical capacitors of 2μF connected in series is:

A	4μF
B	3μF
C	2μF
D	1μF

12. Three basic electrical quantities are:

A	Resistance, capacitance, inductance
B	Power, voltage, conductance
C	Current, reluctance, inductance
D	Voltage, current, resistance

13. In figure 3, the value of the resistance between points A and B is:

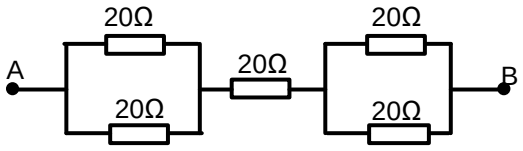

Fig 3

A	$R_{AB}=100\Omega$
B	$R_{AB}=20\Omega$
C	$R_{AB}=40\Omega$
D	$R_{AB}=10\Omega$

14. If a resistor is connected across a voltage source and the frequency of the voltage and the current waveforms is 50Hz, then the frequency of the circuit power will be

A	0Hz
B	150Hz
C	50Hz
D	100Hz

15. Conductance is the reciprocal of

A	resistance
B	inductance
C	reluctance
D	capacitance

16. Electric pressure is also called

A	resistance
B	power
C	energy
D	voltage

17. The capacity of a cell is measured in

A	Watt-hour
B	Ampere-hours
C	Watts
D	Amperes

18. The symbol of fig 4 is that of an NPN transistor. Which of the current equation the is correct?

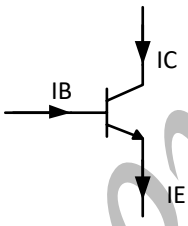

Fig 4

A	IC+IB-IE=0
B	IC-IB-IE=0
C	IC+IB+IE=0
D	IB+IE-IC=0

19. The current drawn by a 75W incandescent lamp on a 220V, 50Hz supply is:

A	0.34A
B	16500A
C	2.9A
D	0.426A

20. Four identical capacitors of capacitance 40μF each are connected in series. What will be the equivalent capacitance?

A	160μF
B	40μF
C	10μF
D	0.1μF

21. How many possible combinations are required to construct the truth table of the circuit of fig 5?

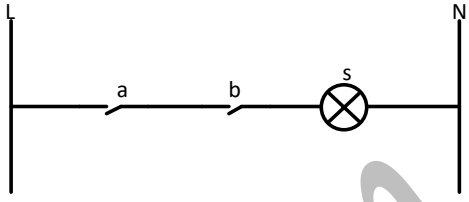

Fig 5

A	2
B	4
C	8
D	16

22. Calculate the period of the signal whose frequency is 60Hz

A	20ms
B	60ms
C	166.67ms
D	16.67

23. A closed switch has a resistance of

A	Zero
B	About 50Ω
C	About 500Ω
D	Infinity

24. An open resistor when checked with an ohmmeter reads:

A	Zero
B	Infinity
C	High but within tolerance
D	Low but not zero

25. The power factor of a capacitive circuit is always

A	Leading
B	Lagging
C	Zero
D	unity

26. Series RLC resonance occurs when

A	XL=R
B	Z=XC
C	XL=XC
D	R=0

27. The loop which does not contain any other inner loop is known as

A	A node
B	A mesh
C	A branch
D	A super mesh

28. Two resistors each of 4Ω and 12Ω are connected in parallel and the parallel combination is connected in series with a 2Ω resistor. What is the equivalent resistance

A	50Ω
B	5Ω
C	20Ω
D	2Ω

29. Four cells of 1.5V each are connected in parallel. The output voltage is;

A	1V
B	6V
C	4V
D	1.5V

30. Identify the passive element among the following

A	Voltage source
B	Current source
C	Inductor
D	transistor

31. Maximum power is transferred when the load resistance is equal to

A	Source resistance
B	Half the source resistance
C	Zero
D	The highest value as compare to others

32. In a certain RL circuit, V_R=2V and V_L=3V. What is the magnitude of the total voltage

A	2V
B	3V
C	5V
D	3.61V

33. The charge in the capacitor is stored at the

A	Plates
B	Terminals
C	Dielectric
D	Air

34. When simplified using Boolean algebra, the expression (X+Y)(X+Z) becomes:

A	X
B	X+X(Y+Z)
C	X(1+YZ)
D	X+YZ

35. How many AND gates are required to realised Y=CD+EF+G

A	4
B	2
C	3
D	5

36. The term micro is equal to

A	10^{-3}
B	10^{3}
C	10^{-6}
D	10^{-9}

37. When a diode is reverse biased, it is equivalent to

A	An OFF switch
B	An ON switch
C	A high inductance
D	A low inductance

38. An electron has

A	Positive charge
B	Negative charge
C	Neutral
D	0 charge

39. In a half wave rectifier, the load current flows for

A	A complete cycle of the input signal
B	Less than half cycle of the input signal
C	More than half cycle but less than complete cycle of the input signal
D	Only for the positive half cycle of the input signal

40. A load of 10KVA and *KW has a reactive power of:

A	4KVAr
B	6KVAr
C	8KVAr
D	10KVAr

41. With gate signal open, the minimum anode current at which a thyristor is turned OFF is called:

A	Rated current
B	Saturation current
C	Holding current
D	Latching current

42. The binary addition 1+1+1 gives

A	111
B	10
C	110
D	11

43. When an input electrical signal A=10100 is applied to a NOT gate, its output signal is:

A	01011
B	10101
C	10100
D	00101

44. The output of a 2- input OR gate is zero only when:

A	ON
B	Positive
C	High
D	OFF

45. Ohms law is not applicable to

A	Dc circuits
B	Semiconductors
C	Ac circuits
D	Small resistors

46. In an ac circuit, the product of voltage and current is known as

A	Apparent power
B	True power
C	Reactive power
D	Power factor

47. The power factor at resonance in RLC circuit is

A	Zero
B	Unity
C	0.8 lagging
D	0.8 leading

48. A battery is a source of

A	DC voltage
B	Ac and dc voltage
C	High frequency supply
D	Both single phase and three phase ac

49. An intrinsic semiconductor at absolute zero temperature

A	Has a large number of holes
B	Behalves like an insulator
C	Behalves like a metallic conductor
D	Has few holes and same number of electrons

50. The equation S=$\bar{a}bcd + cd + dcd + k$ has ;

A	4 variables
B	3 variables
C	5 variables
D	6 variables