

# J & K BOARD OF TECHNICAL EDUCATION

ROLL No: \_\_\_\_\_

2MJ23

Class: - 2<sup>nd</sup> Semester (NEP)

Subject: - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time Allotted: - 3-Hrs

Max. Marks: - 100

Branch: - COMPUTER ENGG/IT

- Note: There are THREE sections in the paper A, B, and C.
- Answer all the 10 parts of the question in Section -A. Each part carries Two mark and all the 10 parts have objective type questions.
  - Answer any 4 questions out of 8 questions in Section -B. Each question carries 05 marks.
  - Answer any 4 questions out of 8 questions in Section -C. Each question carries 15 marks.
  - Solve all the question of a section consecutively together.

## Section A (10x2=20 marks)

### Q1. Multiple Choice Questions

Q1	Objective Type questions	Marks
I.	The ammeter is the instrument used to measure <input checked="" type="radio"/> (A) Current (B) Voltage (C) Power (D) Resistance	2
II.	In parallel connections, the _____ is the same at all resistances. <input checked="" type="radio"/> (A) Voltage (B) Current (C) Power	2
III.	Weber is the SI unit for <input checked="" type="radio"/> (A) Permiabilty (B) Permanance (C) Flux (D) Flux Density	2
IV.	Lenz's Law is used to find <input checked="" type="radio"/> (A) Direction of Induced EMF (B) Direction of Motion (C) Direction of Magnetic field (D) None	2
V.	In Lead Acid battery the Electrolyte is <input checked="" type="radio"/> (A) Sulphuric Acid (B) Nitric Acid (C) Hydrochloric Acid (D) Water	2
VI.	A group of cells is called <input checked="" type="radio"/> (A) Battery (B) Vent cap (C) Hydrometer (D) Inverter	2
VII.	A Zener diode is made to operate in <input checked="" type="radio"/> (A) Reverse bias (B) Forward Bias	2
VIII.	How many PN junctions a transistor have? <input checked="" type="radio"/> (A) 1 (B) 2 (C) 3 (D) 0	2
IX.	Penstock is a part of <input checked="" type="radio"/> (A) Turbine (B) Transformer (C) Alternator (D) Hydroelectric Power Plant	2
X.	The unit of frequency is <input checked="" type="radio"/> (A) Hz (B) Weber (C) Watt (D) Ampere	2

2MJ23

## J &amp; K BOARD OF TECHNICAL EDUCATION

ROLL No: \_\_\_\_\_

## SECTION B (Attempt any four) (4x5=20Marks)

Q1	What is OHM's Law? Write down its expression.	5
Q2	Compare magnetic & electric circuit.	5
Q3	Describe the features and application of solar cell	5
Q4	Differentiate between AC and DC	5
Q5	Describe the forward and reverse bias characteristics of diode. Draw and label these characteristics	5
Q6	Why is the common emitter configuration commonly used?	5
Q7	Differentiate between transistor and FET	5
Q8	Draw the circuit used to determine characteristics of NPN transistor in CE configuration. Also define various parameters in CE configuration.	5

## SECTION C (Attempt any four) (15x4=60 Marks)

Q1	State Kirchhoff's current and Voltage laws. Explain them with suitable circuits.	15
Q2	Explain the following terms: i) Magnetic flux ii) Flux Density iii) Relative permeability iv) MMF and v) Magnetic leakage	15
Q3	Explain the construction and working of Lead Acid battery. Give its applications	15
Q4	Explain the terms RMS value, Average value, Form factor and peak factor in AC	15
Q5	List various types of Power stations, Explain hydroelectric power station in detail,	15
Q6	Explain the difference between conductors, insulators and semiconductors with the help of Energy level diagrams.	07
Q7	a) Write short notes on Intrinsic and Extrinsic semiconductors. b) Compare CE, CB and CC configurations	08
Q8	Draw the schematic symbol of N channel JFET, Also draw and explain circuit used to determine characteristics of FET	15



2MJ23

## J &amp; K BOARD OF TECHNICAL EDUCATION

ROLL No: \_\_\_\_\_

Class: - 2<sup>nd</sup> Semester (NEP)

Branch: - ALL

Subject: APPLIED MATHEMATICS -II

Max. Marks: - 100

Time Allotted: - 3-Hrs

Note: There are THREE sections in the paper A, B, and C.

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## Section A (10x2=20 marks)

Qno1		Marks
I.	$\int e^x$ is equal to a) 1      b) 0 <del>c) <math>e^x</math></del> d) -1	2
II.	$\int \frac{1}{\sqrt{1-x^2}} dx$ a) $\sin^{-1} x$ b) $\cos^{-1} x$ c) $\frac{1}{\sqrt{\cos^{-1} x}}$ d) None of these	2
III.	$\int_1^2 \log x dx$ <del>a) <math>2 \log 2 - 1</math></del> b) $2 \log 2 + 1$ c) $2 \log 2 - 3$ d) none of these	2
IV.	Two lines are said to be perpendicular if the product of their slope is equal to: a) 1 <del>b) -1</del> c) 1/2      d) 0	2
V.	Two lines are said to be parallel if the difference of their slope is a) -1      b) 1 <del>c) 0</del> d) none of these	2
VI.	If A is a skew Symmetric matrix then $A^2$ is a) Null Matrix <del>b) Symmetric</del> c) Skew symmetric      d) none of these	2
VII.	The matrix which follows the conditions $m=n$ is called? a) Square matrix      b) Rectangular matrix      c) Scalar matrix      d) Diagonal matrix	2
VIII.	The trace of the matrix is defined as a) Sum of all the elements of the matrix <del>b) Sum of all the elements of leading diagonal of matrix</del> c) Sum of all non-zero elements of matrix      d) none of these	2
IX.	Mode refers to the value within a series that occurs _____ number of times. <del>a) a) Maximum</del> b) Minimum      c) Zero      d) Infinite	2

# J & K BOARD OF TECHNICAL EDUCATION

ROLL No: \_\_\_\_\_

2MJ23

X.	_____ is not a measure of central tendency	2
	a) Mode                      b) Mean                      c) Median                      d) Range	

## Section B (Attempt any four) (4x5=20 Marks)

Section B (Pattern)

1	Integrate $\int \sqrt{x}(1-x)^2$	5																
2	Integrate $\int x \sin x \, dx$	5																
3	If A(-2,1), B(2,3) and C(-2,-4) are the points, Find the angle between BA and BC.	5																
4	Determine the equation of the line through the point (-4, -3) and parallel to x-axis.	5																
5	If $A = \begin{bmatrix} 3 & 5 \\ 7 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & -4 \\ 2 & 3 \end{bmatrix}$ , Find $(4A - 3B)$ .	5																
6	If A and B are symmetric matrices of the same order then show that AB is symmetric if and only if $AB=BA$ .	5																
7	The Arithmetic mean of 7,9,5,2,4, 8, x is given to be 7. Find x.	5																
8	Find the mean from the data	5																
	<table><tr><td>Class interval</td><td>0-7</td><td>7-14</td><td>14-21</td><td>21-28</td><td>28-35</td><td>35-42</td><td>42-49</td></tr><tr><td>Frequency</td><td>19</td><td>25</td><td>36</td><td>72</td><td>51</td><td>43</td><td>28</td></tr></table>	Class interval	0-7	7-14	14-21	21-28	28-35	35-42	42-49	Frequency	19	25	36	72	51	43	28	
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Total: 45 (50 Marks)

## Section C (Attempt any four) (4x15=60 Marks)

Section C (Attempt any four) (4x15=60 Marks)

1	Evaluate $\int \log(1+x^2)dx$	15																
2	Evaluate $\int \frac{dx}{x(x+1)}$ by partial fraction method.	15																
3	Find the equation of the parabola whose focus is the point (0,0) and whose directrix is the straight line $3x-4y+2=0$	15																
4	Find the centre and radius of the circle $x^2+y^2-4x+6y=12$ .	15																
5	Using properties of determinants, prove that $\begin{vmatrix} y+z & z & y \\ z & z+x & x \\ y & x & x+y \end{vmatrix} = 4xyz$	15																
6	Find the inverse of the matrix $A = \begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$	15																
7	Find out the standard deviation for the following data 5, 8,7,11,9,10,8,2,4,6,7.	15																
8	Find Mean, Median and Mode from the data	15																
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**J & K BOARD OF TECHNICAL EDUCATION****2MJ23****ROLL No: \_\_\_\_\_****Class: - 2<sup>nd</sup> Semester (NEP)****Branch: - COMPUTER ENGINEERING / IT****Subject: - PROGRAMMING IN C****Max. Marks: - 100****Time Allotted: - 3-Hrs****Note: There are THREE sections in the paper A, B, and C.**

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**Section A (10x2=20 marks)**

Q1	Objective Type questions	Marks
I.	Which of the following is not a logical operator? a) &&    b) !    c)       d)	2
II.	Which of the following is true for variable names in C? a) They can contain alphanumeric characters as well as special characters b) It is not an error to declare a variable to be one of the keywords (like goto, static) c) Variable names cannot start with a digit d) Variable can be of any length	2
III.	Which is valid C expression? a) int my_num = 100,000;    b) int my_num = 100000; c) int my num = 1000;    d) int \$my_num = 10000;	2
IV.	What is an example of iteration in C? a) for    b) while    c) do-while    d) all of the mentioned	2
V.	What is #include <stdio.h>? a) Preprocessor directive    b) Inclusion directive c) File inclusion directive    d) None of the mentioned	2
VI.	What will be the final value of x in the following C code?  #include <stdio.h> void main() { int x = 5 * 9 / 3 + 9; } a) 3.75    b) Depends on compiler    c) 24    d) 3	2
VII.	The C-preprocessors are specified with _____ symbol. a) #    b) \$    c) ""    d) &	2
VIII.	Find output of the following program ? #include <stdio.h> int main() { char str[] = "Smaller";	2

# J & K BOARD OF TECHNICAL EDUCATION

2MJ23

ROLL No: \_\_\_\_\_

	<pre>int a = 100; printf(a &gt; 10 ? "Greater" : "%s", str); return 0; }</pre> <p>a) compile error    b) Smaller    <input checked="" type="checkbox"/> c) Greater    d) 100</p>	
IX.	Which of the following is not an example of looping statement? a) While    b) do-while    c) for    d) Switch	2
X.	Which of the following is an exit control loop? a) While <input checked="" type="checkbox"/> b) do-while    c) for    d) Switch	2

## SECTION B (Attempt any four) (4x5=20Marks)

Q1	What are different types of languages in computers?	5
Q2	Explain structure of a C Program.	5
Q3	Write a program to illustrate the concept of Switch Case.	5
Q4	What is a function? What is function definition and function declaration?	5
Q5	What is pointer arithmetic? Illustrate the concept with the help of an example	5
Q6	What is a structure? How is a structure declared and initialized?	5
Q7	Discuss while loop and Do While loop? Draw flowchart for both the loops.	5
Q8	Discuss fundamental data types in C.	5

## SECTION C (Attempt any four) (15x4=60 Marks)

Q1	What is an algorithm? Write an algorithm for greatest of four numbers. Draw its flowchart.	15
Q2	Write a program to illustrate the concept of call by value and call by reference.	15
Q3	Discuss operators in C	15
Q4	Discuss else-if statement in C. Write a Program to find grades of a student based on percentage obtained using else-if statement.	15
Q5	What is a 1-d array? Discuss run time declaration and initialization of 1-d arrays. Write a program to sort an array in ascending order.	15
Q6	Discuss forloop in C. Write a program to draw the following pattern using for loop. <pre>1 12 123 1234 12345</pre>	15
Q7	What is a pointer? How is a pointer declared and initialized? Write a program to illustrate the concept of pointers.	15
Q8	What is a 2-d array? Discuss run time declaration and initialization of 2-d arrays. Write a program to perform addition of 2 3x3 arrays.	15