ABES Engineering College, Ghaziabad
B. Tech Odd Semester Sessional Test-2

Printed Pages: 01
Session: 2023-24

Semester: I
Course Code: BAS104
Course Name: Environment and Ecology
Maximum Marks: 30
Roll No.: 1182
Time: 1.15 Hrs.

Instructions:
1. **Attempt All sections.**
2. **If require any missing data, then choose suitably.**

Q. No.	Question	Marks	CO	KL	PI
	Section-A	**Total Marks : 20**			
1	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	What do you mean by solid waste? Describe the various methods of solid waste disposal.	**2+3**	**CO3**	K2	7.2.1
b)	Enumerate the causes, effects and control of soil pollution.	**1+2+2**	**CO3**	K2	8.1.1
2	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	What is noise pollution? Explain the different sources and effects of noise pollution.	**1+2+2**	**CO3**	K2	4.3.1
b)	Define thermal pollution. Write about its impacts and control measures.	**1+2+2**	**CO3**	K2	8.2.2
3	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Enumerate the causes and effects of water pollution. Describe the control measures of water pollution.	**2+3+5**	**CO3**	K2	8.2.2
b)	Write about the causes and effects of air pollution. Explain how it can be controlled?	**2+3+5**	**CO3**	K2	2.2.5
	Section-B	**Total Marks : 10**			
4	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	What is deforestation? Write the various factors which influence the deforestation and list the impacts of deforestation.	**1+2+2**	**CO2**	K2	12.3.2
b)	Define biodiversity. Explain the different types of biodiversity.	**2+3**	**CO2**	K2	12.3.2
5	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Draw the diagram of nitrogen cycle. Explain the process of nitrification and denitrification.	**3+1+1**	**CO2**	K2	6.1.1
b)	What do you understand by non-conventional energy resources? Explain in detail any two non-conventional energy resources.	**2+3**	**CO2**	K2	9.1.1

CO Course Outcomes mapped with respective question
KL Bloom's knowledge Level (K1, K2, K3, K4, K5, K6)
K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5:Evaluate, K6-Create

ABES Engineering College, Ghaziabad
B. Tech Odd Semester Sessional Test-II

Printed Pages: 1
Session: 2023-24

Semester: I
Course Code: BAS 101
Course Name: Engineering Physics
Maximum Marks: 30

Roll No.: 1182
Time: 1.15 Hrs.

Instructions:
1. **Attempt All sections.**
2. **If require any missing data, then choose suitably.**

Q. No.	Question	Marks	CO	KL	PI
	Section-A	**Total Marks : 20**			
1	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Calculate the skin depth for silver at 10^8 Hz frequency. Given- for silver $\mu_r=1$, $\mu_0 = 4\pi \times 10^{-7}$ N/A^2, $\sigma = 3 \times 10^7$ mho/m.	**5**	**CO2**	K3	2.4.1
b)	Calculate the amplitude of electric and magnetic fields at a distance of 5m from an oscillator which radiates energy 1000W.	**2.5+ 2.5**	**CO2**	K3	2.4.1
2	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Using Maxwell's equations, show that EM waves travel with speed 3×10^8m/sec in vacuum.	**2+3**	**CO2**	K2	2.2.3
b)	Explain the concept of displacement current.	**5**	**CO2**	K2	2.2.3
3	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	State and deduce Poynting theorem for the flow of energy for an electromagnetic field.	**2+8**	**CO2**	K2	4.1.1
b)	Write Maxwell's equation in free space. Prove that electromagnetic waves are transverse in nature.	**2+8**	**CO2**	K2	4.1.1
	Section-B	**Total Marks : 10**			
4	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Explain Sol-gel method for the synthesis of nanoparticles.	**5**	**CO5**	K2	4.1.1
b)	Discuss any two potential applications of nano materials.	**2.5+2.5**	**CO5**	K2	4.1.1
5	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Explain Top Down and Bottom Up approach for the fabrication of nanoparticles.	**2.5+2.5**	**CO5**	K2	4.1.1
b)	Describe the Chemical Vapor Deposition technique for the synthesis of nanoparticles.	**5**	**CO5**	K2	4.1.1

CO Course Outcomes mapped with respective question
KL Bloom's knowledge Level (K1, K2, K3, K4, K5, K6)
K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5:Evaluate, K6-Create

ABES Engineering College, Ghaziabad
B. Tech Odd Semester Sessional Test-2

Printed Pages:
Session: 2023-24

Semester: First
Course Code: BEE101
Course Name: Fundamentals of Electrical Engineering
Maximum Marks: 30

Roll No.: 1182
Time: 1.15 Hrs.

Instructions:
1. Attempt All sections.
2. If require any missing data, then choose suitably.

Q. No.	Question	Marks	CO	KL	PI
	Section-A	**Total Marks : 20**			
1	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Explain the construction and working of MCB with relevant diagrams.	5	CO5	K2	3.1.4 3.1.5
b)	. Explain the construction and working of ELCB with relevant diagrams	5	CO5	K2	3.1.4 3.1.5
2	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Explain any two types of lightning protection system with schematic diagrams	5	CO5	K2	3.1.4 6.2.1
b)	With the help of relevant diagrams discuss the need and advantages of earthing	5	CO5	K2	3.1.4 3.1.5
3	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	An alkaline cell is discharged at a steady current of 1.2 A for 12 hours, the average terminal voltage being 1.44 V. To restore it to original state of voltage, a steady current of 3.2 A for 5 hours is required, the average terminal voltage being 1.66 V. Calculate the ampere-hour and watt-hour efficiency in this case	10	CO5	K3	2.1.2, 2.1.3
b)	Calculate the electricity bill amount for a year, if the following devices are used as specified. (i) 2 Bulbs of 40W for 9 hours per day (ii) 8 Tube lights of 50W for 4 hours per day Given the rate of electricity is Rs. 5 per unit.	10	CO5	K3	2.1.2 2.1.3
	Section-B	**Total Marks : 10**			
4	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Derive the resonance frequency expression of a parallel resonating circuit.	5	CO2	K1	1.1.1 1.2.1
b)	Derive the relation between line and phase parameters of 3-φ, Star connected load	5	CO2	K1	1.1.1 1.2.1
5	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			

a)	Two impedances of value 8+6j Ω and 6-8j Ω are connected in parallel across a 100 Volts, 50 Hz AC supply. Calculate the value of branch currents and supply current. Also find the power factor of the circuit.	5	CO2	K3	2.1.2 2.1.3
b)	A3-Ø, Star connected load operates at 415V,50Hz supply. If the resistance and inductive reactance of load are 12 Ω and 9 Ω per phase respectively then find the value of line current and power consumed and power factor of the load.	5	CO2	K3	2.1.2 2.1.3

CO Course Outcomes mapped with respective question
KL Bloom's knowledge Level (K1, K2, K3, K4, K5, K6)
K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5:Evaluate, K6-Create

ABES Engineering College, Ghaziabad
B. Tech Odd Semester Sessional Test-2

Printed Pages:
Session: 2023-24

Semester: I
Course Code: BCS 101
Course Name: PROGRAMMING FOR PROBLEM SOLVING
Maximum Marks: 30
Roll No.: 1282
Time: 1.15 Hrs.

Instructions:
1. Attempt All sections.
2. If require any missing data, then choose suitably.

Q. No.	Question	Marks	CO	KL	PI
	Section-A	**Total Marks : 20**			
1	**Attempt ANY ONE part from the following**				
a)	Differentiate between break and continue and write the use of Break statement in switch case	4+1	CO3	K2	1.4.1
b)	Differentiate between entry controlled and exit controlled loop with example	2.5 + 2.5	CO3	K2	1.4.1
2	**Attempt ANY ONE part from the following**				
a)	Write a program in C to print the following patterns. 12345 1234 123 12 1	5	CO3	K3	2.1.2
b)	Write a program in C to print the Fibonacci series up to N^{th} term.	5	CO3	K3	2.1.2
3	**Attempt ANY ONE part from the following**				
a)	Write the advantages of array and write a program in C to input two 3*3 matrixes from the user and print the multiplication as a result in the matrix form.	2+8	CO3	K3	2.1.3
b)	Write the disadvantages of array and write a program to find out the odd place and even place numbers from the array elements and print the sum of these numbers respectively	2+8	CO3	K3	2.1.3
	Section-B	**Total Marks : 10**			
4	**Attempt ANY ONE part from the following**				
a)	Write a program in C to check whether a triangle is equilateral, isosceles or scalene.	5	CO2	K3	2.1.3
b)	Write a program in C that accepts marks of five subjects and finds percentage and prints grades according to the following criteria: i) Between 90-100%-----Print 'A' ii) 80-90%----------Print 'B iii) 60-80%----------Print 'C' iv)Below 60%----------Print 'D'	5	CO2	K3	2.1.3

5	**Attempt ANY ONE part from the following**				
a)	Write a program in C to sort n number of elements in an array using bubble sort.	**5**	**CO4**	K3	2.1.3
b)	Write a C program to implement binary search in an array to check whether an element exists or not.	**5**	**CO4**	K3	2.1.3

CO Course Outcomes mapped with respective question
KL Bloom's knowledge Level (K1, K2, K3, K4, K5, K6)
K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5:Evaluate, K6-Create

ABES Engineering College, Ghaziabad
B. Tech Odd Semester Sessional Test-2

Printed Pages:2
Session: 2023-24

Semester: I
Course Code: BAS103
Course Name: Engineering Mathematics -I
Maximum Marks: 30

Roll No.: 1182
Time: 1.15 Hrs.

Instructions:
1. Attempt All sections.
2. If require any missing data, then choose suitably.

Q. No.	Question	Marks	CO	KL	PI
	Section-A	**Total Marks : 20**			
1	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	If $u = \sin^{-1}\left(\frac{x^{\frac{1}{4}} + y^{\frac{1}{4}}}{x^{\frac{1}{6}} + y^{\frac{1}{6}}}\right)$, then evaluate $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2}$.	**5**	**CO2**	K3	2.1.3
b)	Trace the curve $y^2(2a - x) = x^3$	**5**	**CO2**	K3	2.4.1, 5.1.1
2	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	If $u = f(r,s,t)$ and $r = \frac{x}{y}$, $s = \frac{y}{z}$, $t = \frac{z}{x}$, prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z} = 0$	**5**	**CO2**	K3	2.2.3, 2.4.1
b)	If $u = ylog(xy)$, where $x^3 + y^3 + 3xy = 1$, find $\frac{du}{dx}$	**5**	**CO2**	K3	2.1.3
3	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	If u, v, w are the roots of the cubic equation $(\lambda - x)^3 + (\lambda - y)^3 + (\lambda - z)^3 = 0$ in λ, then find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$	**10**	**CO3**	K3	2.1.3
b)	Find the shortest and longest distances from the point $(1, 2, -1)$ to the sphere $x^2 + y^2 + z^2 = 24$	**10**	**CO3**	K3	2.2.5

Section-B		Total Marks : 10			
4	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Prove that the functions $y_1 = (x_1 - x_2)(x_2 + x_3)$, $y_2 = (x_1 + x_2)(x_2 - x_3)$, $y_3 = x_2(x_1 - x_3)$ are not independent. Find the relation between them.	**2+3**	**CO3**	K3	2.4.2, 2.1.3
b)	Compute an approximate value of $[(3.82)^2 + 2(2.1)^3]^{1/5}$.	**5**	**CO3**	K3	2.1.3
5	**Attempt ANY ONE part from the following**	***Same K Levels Questions***			
a)	Examine for extreme values of function $x^3y^2(1 - x - y)$	**5**	**CO3**	K3	2.1.3
b)	Expand $sin\ xy$ in powers of $(x - 1)$ and $(y - \frac{\pi}{2})$ up to second degree terms.	**5**	**CO3**	K3	2.1.3

CO Course Outcomes mapped with respective question
KL Bloom's knowledge Level (K1, K2, K3, K4, K5, K6)
K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5:Evaluate, K6-Create

$f(x,y) = \sin xy = 1$

$f_x = y\cos xy = 0$

$f_y = x\cos xy = 0$

$f_{xx} = -y^2 \sin xy$

$f_{xy} = \cos xy - x\sin xy \cdot y$

$= -\pi/2$

$f_{yy} = -x^2 \sin xy = -1$