



GANDHI INSTITUTE FOR TECHNOLOGY (GIFT)
(An Autonomous Institution)

0+6
1/2/2021

Registration No:

2	3	0	1	2	9	8	5	8	8	
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Total Number of Pages: 02

2420

BTech
BTBS-T-BS-111

1st Semester End Semester Examination: 2023-24

Subject Name: Mathematics-I

BRANCH(CSE, CSE-AI, CE, ECE, EEE, Mech, Civil & AGE): BTech

Time: 3 Hour

Max Marks: 100

Q. Code: B24101

Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III
The figures in the right hand margin indicate marks.

Part - I		Marks		
01	Answer the following questions:	(02 x 10)	CO	BTL
a)	Under what condition the differential equations $(Ax - By)dx + (Cx - Dy)dy = 0$ is exact?	1	1	
b)	Find the order and degree of the following differential equation $\left[1 + \left(\frac{dy}{dx}\right)^2\right]^{\frac{5}{2}} = \frac{d^3y}{dx^3}$	1	2	
c)	Define Wronskian and find the Wronskian of $y_1 = \cos x, y_2 = \sec x$	2	1	
d)	Find the differential equations, if its two linearly independence solutions are $y = \sin \ln 2x$ and $y = \cos \ln 2x$	2	2	
e)	Verify the linear dependence or independence of the following set of vectors: (1,0,1), (1,1,-1), (-1,1,-3)	3	3	
f)	Check the matrix is singular or not $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 7 \\ 3 & 5 & 10 \end{bmatrix}$	3	5	
g)	Test whether vector $v=(x, y, -z)$ is irrotational and incompressible?	4	2	
h)	Find the unit vector perpendicular to both $\vec{a} = 3\hat{i} - 2\hat{j}$ and $\vec{b} = \hat{i} - 2\hat{j} + \hat{k}$?	4	4	
i)	A town has a population of 20,000. The population increases by 10% per year. What will be the population after 2 years?	5	1	
j)	The sum of the 12 numbers is 540. If first two numbers sum is 84, find the average remaining numbers.	6	1	

Part-II

02	Answer any 8 questions out of 12	(06 x 08)	Marks	
		CO	BTL	
a)	Find the solution of the ode $y' + xy = x^3, y(0) = 1$	1	2	
b)	Solve the differential equation $\frac{dy}{dx} - \frac{3}{x}y = x^3 e^{2x}$ with $y(1) = 1$.	1	2	
c)	Solve the differential equation $x^2 \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} + 2y = 0$ with $y(1) = 3, y(2) = 10$.	2	2	
d)	Find the integrating factor and solve the following differential equation $:2xy dx + 3x^2 dy = 0$.	2	2	
e)	If $A = \begin{bmatrix} 1 & 0 & 1 & 2 \\ 2 & 3 & 0 & 1 \\ 1 & 1 & 2 & 2 \end{bmatrix}$ and $B^T = \begin{bmatrix} 2 & 5 & 1 & 8 \\ 3 & 0 & 1 & 2 \\ 2 & 1 & 3 & 6 \end{bmatrix}$, verify that $(AB)^T = B^T A^T$	3	3	
f)	Determine the inverse of the following matrix by using Gauss-Jordan elimination method or otherwise. $A = \begin{bmatrix} -1 & 2 & 2 \\ 2 & -1 & 2 \\ 2 & 2 & -1 \end{bmatrix}$	3	5	
g)	If A is any square matrix, then shows that $\frac{A+A^T}{2}$ is a symmetric and $\frac{A-A^T}{2}$ is a	4	2	



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		skew symmetric.				
	h)	Solve the following system of equations by using Gauss Elimination method: $x + 2y + 3z = 20, 7x + 3y + z = 13, x + 6y + 2z = 0.$		4	3	
	i)	Find the arc length of the curve $\vec{R} = (2t, 2 \sin t, 2 \cos t)$ from $t = 0$ to $\frac{\pi}{2}$. $\int_0^{\frac{\pi}{2}} \sqrt{37} dt = 13$		5	2	
	j)	Find div \vec{F} and curl \vec{F} at the point $p(1,2,3)$ if $\vec{F} = x^2yz\hat{i} + xy^2z\hat{j} + xyz^2\hat{k}$ 16		5	3	
	k)	Two numbers are respectively 20% and 50% more than a third number. What is the ratio of those two numbers?		6	4	
	l)	The average weight of a group of seven boys is 56 kg. The individual weight (in kg) of six of them are 52, 57, 60, 55, 59 and 55. Find the weight of the seventh boy.		6	2	
			Marks			
		Answer any Two questions from the Q-3 to Q-6	(16 x 2)	CO		
03	a)	Find the solution of the ode $(y \ln x - 1)y dx - x dy = 0, y(1) = 1$	8	1	2	
	b)	Reduce the order of the equations and solve the following differential equation $(1 - x^2)y'' - 2xy' + 2y = 0$ given that $y_1 = x$ is a solution.	8	2	3	
04	a)	Solve the differential equation $x^2 \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} + 2y = 0$ with $y(1) = 3, y(2) = 10.$ 18	8	1	4	
	b)	Solve the differential equation $\frac{dy}{dx} = x^3y^2 + xy.$ 18	8	2	4	
05	a)	Evaluate the determinant of the matrix $A = \begin{bmatrix} 1 & 0 & 3 & 7 \\ 4 & 2 & 0 & 1 \\ 7 & 7 & 3 & 0 \\ 5 & 0 & 6 & 8 \end{bmatrix}$ without expansion. 18	8	3	4	
	b)	Find the Eigen values of the matrix $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$ and its corresponding Eigen vectors. 2	8	4	2	
06	a)	Find the directional derivative of the function $f(x, y, z) = x^2 + 3y^2 + 4z^2$ at the point $(1, 0, 1)$ in the direction $\hat{i} + 2\hat{j} + \hat{k}$	8	5	4	
	b)	The mean of 25 numbers is 36. If the mean of the first 13 numbers is 32 and that of the last 13 numbers is 39, find the 13th number.	8	6	3	

$$x_1 + y_1 + x_2 y_2 + x_3 y_3 = 0$$

** BTL: Bloom's Taxonomy Level

** CO: Course Outcomes

$$x^3y^2 - xy = 0$$

$$-27 + \frac{819}{48} - \frac{1296 + 819}{48} - \frac{-477}{48}$$

$$7x^2y - 12x^3y - 12x^2y + 12x^3y$$



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Total Number of Pages: 02

BTech
BTBS-T-BC-103

1stSemester End Semester Examination: 2023-24

Subject Name: Applied Chemistry

BRANCH(S): BTech

Time: 3 Hour

Max Marks: 100

Q. Code: 24B105

*Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III
The figures in the right hand margin indicate marks.*

Part - I		Marks		
01	Answer the following questions:	(02 x 10)	CO	BTL
a)	Define Zero Point Energy (ZPE).	1	1	
b)	State the significance of Eigen values and Eigen Function.	1	2	
c)	Fusion Curve of Ice has a Negative slope. Why? <i>-ve curve</i> (2)	1	3	
d)	Write the chemical reaction for Lead acid storage cell in its discharging mode.	2	2	
e)	Find the Mass and Volume of air required for complete combustion of 2 Kg of Carbon?	3	3	
f)	What is Differential aeration Corrosion?	3	2	
g)	What are the monomers of Nylon -6?	3	2	
h)	What is Dulong's formula to find the Calorific Value?	3	4	
i)	Define a 1D nanomaterial , with example.	4	1	
j)	What do you mean by Degree of polymerisation?	3	3	
02	Answer any 8 questions out of 12	(06 x 08)	CO	BTL
a)	Explain Phase, Component and Degree of Freedom with suitable examples (at least two) for each. (3)	1	2	
b)	Draw the qualitative Phase Diagram of a bi component system and explain it. (3)	1	2	
c)	Assuming an electron to be confined in a one dimensional box 2.0 nm in length, find the lowest three energy levels for the electron. Also find the wavelength of the radiation emitted during de-excitation of electron from the first excited state to ground state.	1	3	
d)	Explain mechanism of Electro Chemical Corrosion with a suitable example?	2	2	
e)	Explain the mechanism and uses of Hydrogen – Oxygen Fuel cell?	2	3	
f)	Explain factors influencing corrosion and how to prevent corrosion. (4)	2	3	
g)	Differentiate between thermo plastic and thermo settings polymers (5)	3	2	



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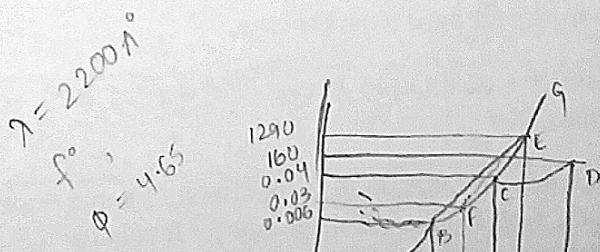
b)	Write short notes on Cracking of heavy oil fractions	12	3	3
i)	Enlist different types of Gaseous fuels and their uses.		3	2
j)	Describe some important applications of Nanomaterials in Medicine and research sector?		4	3
k)	Explain the stages of synthesis of Nanomaterials in Bottom up approach.	13	4	4
l)	Write short notes on Rubber, why vulcanisation is necessary?	12	3	2

Marks

		Answer any Two questions from the Q-3 to Q-6	(16 x 2)	CO
03	a)	Describe in detail about the steps involved in synthesis of Nano materials by Top-Down and Bottom-up approach.	8	4 2
	b)	Define Fuel. Explain the fractional distillation of crude oil?	8	3 3
04	a)	Write in brief about the gaseous fuels. And their industrial uses	8	3 2
	b)	Explain with proper diagram and the reaction mechanism of a Secondary Storage cell.	8	2 3
05	a)	Write a short note on Caustic embrittlement and its prevention.	8	2 4
	b)	Derive the Expression for Zero point Energy for particle in One dimensional Box.	8	1 2
06	a)	When light of wavelength 2200\AA falls on Cu, photo electrons are emitted from it. Find (i) the threshold frequency and (ii) the stopping potential. Given: the work function for Cu is $\phi_0 = 4.65 \text{ eV}$.	8	1 4
	b)	Explain the Phase diagram of One component system with two different solid phases?	8	1 3

** BTL: Bloom's Taxonomy Level

** CO: Course Outcomes





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Total Number of Pages: 02

BTech
BTBS-T-ES-103

1st Semester End Semester Examination: 2023-24

Subject Name: Basic Programming Skills

BRANCH(All): BTech

Time: 3 Hour

Max Marks: 100

Q. Code: B24104

*Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III
The figures in the right hand margin indicate marks.*

		Part – I	Marks		
01	Answer the following questions:	(02 x 10)	CO	BTL	
a)	What do you know by a token? Write the rules of identifier.	1	1		
b)	Why do we need type conversion. Explain type casting.	1	2		
c)	Rewrite the following using switch-case if(code=='M' code =='R') printf("Manager"); else if(code=='A' code=='a') printf("Accountant"); else printf("Accountant");	2	1		
d)	Find output of the following code snippet. int x; For(x=5;x>10;x++) printf(x+5); printf(x+10); printf(x+15);	2	2		
e)	Find output of the following code snippet. int p=200; while(1) { If(p<100) break; P = 20; } printf("%d",p);	3	1		
f)	Write the difference between formal and actual parameters.	3	5		
g)	Explain strcmp() function with suitable example.	4	2		
h)	Find output. int A[7]={ 12,8,-6,17,20,10,7}; printf("%d\n", A[2]); printf("%d\n", A[1]+A[4]); printf("%d\n", A[A[0]+A[2]]);	4	4		
i)	Discuss different FILE modes?	5	1		
j)	Discuss all storage class specifiers used in C?	6	3		
		Marks			
02		(06 x 08)	CO	BTL	
a)	Write a C program to find area of a valid triangle by entering the length of 3 sides of triangle.	1	2		



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b)	Explain the difference between entry controlled and exit controlled loop using suitable example.	1	2
c)	Write a program in C to accept value of two variables. Swap them without using a third variable	2	2
d)	Write a program to accept three sides of a triangle and print whether it is an "EQUILATERAL" or "ISOSCELES" or "SCALENE" triangle.	2	2
e)	Write a C program to calculate the length of a string using pointer.	3	3
f)	Write the difference between pass by value and pass by reference.	3	5
g)	What do you know by recursive function? Write a C program to print factorial of a number using recursive function.	4	2
h)	Write a C program to transpose a square matrix in the same matrix.	4	3
i)	Explain difference between structure and Union with suitable example.	5	2
j)	Write difference between static and dynamic memory allocation. Also differentiate between malloc() and calloc().	5	3
k)	Write a program to copy contents of one file to another.	6	4
l)	Write a program to accept value of 10 integers into an array and print the highest number along with its index in the array.	5	2

Marks

Answer any Two questions from the Q-3 to Q-6			(16 x 2)	CO
03	a)	Write a program to input a number and print its norm. Norm of a number is the square root of the sum of the squares of its digits. Example : Norm of number 68 is square root of 6^2+8^2	8	1 2
	b)	Write a C program to find all prime numbers between two given numbers 'm' and 'n' where m, n>0.	8	2 3
04	a)	Write a program print all 3 digit palindrome numbers. A number is said to be palindrome if it is same as its reverse.	8	1 2
	b)	Write a program using nested for loop to print the following pattern. 1 2 2 3 3 3 4 4 4 4 5 5 5 5 5	8	2 3
05	a)	Write an algorithm and C program for Bubble Sort.	8	3 4
	b)	What is a pointer variable? Discuss pointer arithmetic and pointer as function parameter with suitable examples.	8	4 5
06	a)	Write program to input elements into two 4X4 matrices and print them whether they are equal matrices. Two matrices are said to be equal if their corresponding elements are equal.	8	5 4
	b)	Define a structure named circle to represent a circle with a radius. Write a C program to calculate the area and perimeter of two circles and display the result.	8	6 5



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Total Number of Pages: 02

BTech
BTBS-T-HS-111

1st Semester End Semester Examination: 2023-24
Subject Name: ENGLISH FOR ENGINEERS-I
BRANCH (ALL): BTech

Time: 3 Hour

Max Marks: 100

Q. Code: B24105

Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III
The figures in the right hand margin indicate marks.

		Part - I		Marks		
01	Answer the following questions:			(02 x 10)	CO	BTL
a)	What is communication? From which word is it derived?	2	1	1		
b)	What is MEMO? How does it work?	2	1	2		
c)	Write a short note on context.	2	2	1		
d)	What is the limited word limit of a notice?	2	2	2		
e)	What helps the speaker in the poem "Life Doesn't Fear Me" to get over the fear?	2	3	1		
f)	What is haptics? Give two examples.	2	3	5		
g)	Define Proxemics.	2	4	2		
h)	What are the claims of Shaw that no native speaker speaks "correct" English?	2	4	4		
i)	What is the significance of communication?	2	5	1		
j)	What are the two types of communication?	2	6	3		
02				Marks		
				(06 x 08)	CO	BTL
a)	Write the difference between oral and written communication.	6	1	2		
b)	Explain Shaw's view that broken English is quite sufficient for intelligible speech? Support your answer with an example from the Essay.	6	1	2		
c)	Imagine you are the cultural secretary of your institution. Draft a notice regarding a blood donation camp which will take place	6	2	2		
d)	What is Paralanguage?	6	2	2		
e)	Explain the different forms of verbal communication with advantages and disadvantages.	6	3	3		
f)	Describe Abdul Kalam's father in a few sentences.	6	3	5		
g)	What was Jainulabdeen's daily routine?	6	4	2		
h)	You are the General secretary of your institute. Your institute is going to organise a three days' workshop on "Enhancing soft skill and personality". Draft a notice giving all details.	6	4	3		
i)	What is an E-Mail? Explain the etiquettes.	6	5	2		
j)	You are the CEO of a company. Draft a circular to inform employees about the revised working hours of the company	6	5	3		
k)	How did Jallaluddin influence Kalam?	6	6	4		
l)	Write an application to the librarian of your institute to exempt a fine imposed on you.	6	6	2		
		Marks				



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	Answer any Two questions from the Q-3 to Q-6			(16 x 2)	CO	
03	a) <input checked="" type="checkbox"/>	How did Jalaluddin and Samsuddin shape the life of Kalam?	8	1	2	
	b) <input checked="" type="checkbox"/>	How did Jalaluddin and Samsuddin shape the life of Kalam?	8	2	3	
04	a) <input checked="" type="checkbox"/>	Write the history of communication.	8	1	2	
	b) <input checked="" type="checkbox"/>	You are Sara/Sam, the class representative of your section. The air conditioner in your classroom is malfunctioning. Report this to the Principal in an email.	8	2	3	
05	a) <input checked="" type="checkbox"/>	What is the filter? How is it different from barriers? Explain the different types of filters with examples.	8	3	4	
	b) <input checked="" type="checkbox"/>	Communication is a dynamic Process. Explain with the help of a suitable diagram.	8	4	3	
06	a) <input checked="" type="checkbox"/>	Write a summary of the prose "On Superstition" by AG Gardiner.	8	5	4	
	b) <input checked="" type="checkbox"/>	Write a letter to a local bookseller enquiring if copies of the books prescribed in your syllabus are available with him/her. Find out the mode of purchase available. (120-130words)	8	6	3	

** BTL: Bloom's Taxonomy Level

** CO: Course Outcomes



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BTech
BTBS-T-ES-112

1st Semester End Semester Examination: 2023-24

Subject Name: Basic Electronics

BRANCH (All): B.Tech.

Time: 3 Hour

Max Marks: 100

Q. Code: B24107

Answer Question No. 1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III
The figures in the right-hand margin indicate marks.

Part – I

Marks

01	Answer the following questions:	(02 x 10)	CO	BTL
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- | | | | |
|----|---|---|---|
| a) | Why BJT is called as a current controlled device? | 2 | 1 |
| b) | Semiconductor diode is a unipolar or bipolar. Explain how? | 1 | 1 |
| c) | Draw a properly biased NPN transistor and Find the base current I_B , if, $I_C = 10mA$ and $I_E = 12mA$. | 2 | 2 |
| d) | What is the different between sum of product and product of sum? | 4 | 1 |
| e) | Define active and passive components with examples. | 1 | 1 |
| f) | What is the difference between a latch and a flip-flop? | 4 | 1 |
| g) | State Demorgan's Theorem. | 4 | 1 |
| h) | Convert the number (ABCD) ₁₆ to (4318) ₁₀ . | 4 | 2 |
| i) | Mention any two applications of moisture sensor. | 6 | 1 |
| j) | What is the role of the ALU and CU in a microprocessor? | 5 | 1 |

Marks CO BTL

02	Part – II (Answer any eight questions)	(06 x 08)	CO	BTL
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- | | | | |
|----|--|---|---|
| a) | Write the industrial applications of RADAR. Also mention its advantages and disadvantages. | 1 | 2 |
| b) | What do you mean by a depletion layer in a semiconductor? Differentiate between Zener and avalanche breakdown. | 1 | 2 |
| c) | Analyse the ideal OPAMP and practical OPAMP characteristics and compare the results? | 3 | 3 |
| d) | Derive the output voltage of an OPAMP as an inverting amplifier. If $V_1 = 10V$, $R_f = 100K\Omega$, $R_1 = 10K\Omega$, then, calculate V_o . | 3 | 3 |
| e) | Explain the working of a centre-tap rectifier with its circuit diagram. | 1 | 2 |
| f) | Discuss the current amplification factor in a common emitter configuration of BJT with its circuit diagram. Also explain its input and output characteristics. | 2 | 2 |
| g) | Derive the Boolean expression and the truth table for the SOP form. | 4 | 3 |

$$F(a, b, c, d) = \sum (5, 4, 2, 6, 11, 13, 14, 15)$$

- | | | | |
|----|---|---|---|
| j) | Draw and explain a full adder circuit. Find the expression for sum and carry. | 4 | 2 |
|----|---|---|---|



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4 3

j) Perform the arithmetic operations.

- $(1011011)_2 + (1011011)_2$
- $(1110001)_2 - (0111011)_2$
- $(10001)_2 * (01011)_2$

5 2

k) Explain the differences between a Microprocessor and a Microcontroller.



k) Explain an IR sensor with proper diagrams.

6 3

l) Implement the following function

4 3

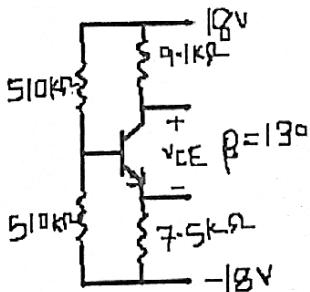
- $F = A + B'C$ using NOR gates only
- $F = A'B + C'$ using NAND gates only

Part - III

Answer any Two questions from the Q-3 to Q-6

Marks CO BTL
(16 x 2)

- 03 a) Draw and explain different clipper and clamper circuits. 1 3
- b) Explain bridge type full wave Rectifier with its working principle and derive its efficiency. 1 3
- 04 a) Explain the OPAMP as an inverting amplifier and non-inverting amplifier, derive the formula for its gain. Also find V_0 if $R_f = 10K\Omega$, and $R_1 = 4K\Omega$. 3 3
- b) Calculate the values of V_E , I_B , I_C , V_C , V_{CE} , I_E for the circuit shown below, 2 3



- 05 a) Explain the half and full subtractor circuits using neat diagrams. Also find the expression of their outputs. 4 2
- b) Find the MIN term & MAX term of following Boolean Expression, $F(A,B,C,D) = A(B'+C')(A'+C+D')(B+C'+D')$ 4 3
- 06 a) Draw the block diagram of a Microcontroller and Explain different units of a Microcontroller. 5 2
- b) Write a short notes on,
i. Temperature Sensor.
ii. LDR. 6 2

** BTL: Bloom's Taxonomy Level



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BTech
BTBS-T-ES-107

1st Semester End Semester Examination: 2023-24

Subject Name: Basic Civil Engineering

BRANCH (All): BTech

Time: 3 Hour

Max Marks: 100

Q. Code: B24109

Answer Question No. I (Part-I) which is compulsory, any eight from Part-II and any two from Part-III

The figures in the right hand margin indicate marks.

Part - I		Marks		
01	Answer the following questions:	(02 x 10)	CO	BTL
a)	Write the disadvantages of steel.	1	1	
b)	Convert WCB to QB $145^{\circ}30'$ 280°	6	2	
c)	Write different index properties of soil.	3	2	
d)	Write down the different types of pump.	5	2	
e)	What do you mean by 53 grade of cement?	1	1	
f)	What are the principles of chain surveying?	6	3	
g)	Explain About the Aeolian Soil.	3	2	
h)	What is the use of relay in water tank?	5	2	
i)	Write down the ingredients of concrete.	1	1	
j)	Define bearing of a line.	1	2	
02	Answer any 8 out of 12	(06 x 08)	CO	BTL
a)	Write down the different properties of cement.	1	1	
b)	Write short note on workability test of concrete.	1	2	
c)	Write about common bases used for paints.	1	2	
d)	The following were the interior angles of a closed traverse ABCD: $\angle A = 78^{\circ}36'$, $\angle B = 101^{\circ}24'$, $\angle C = 96^{\circ}45'$, $\angle D = 83^{\circ}15'$ If the fore bearing of the line BC is $135^{\circ}15'$, find the bearings of all the remaining sides, assuming the work done in a clock-wise direction.	6	2	
e)	Describe the classification of roads according to material of construction.	2	3	
f)	Describe about field procedure of setting up a level.	6	2	
g)	Write down the differences between weir and dam.	4	2	
h)	Write a short note about combined footing.	3	3	
i)	Write about cohesive and non-cohesive soil with examples.	3	2	
j)	What are the objectives of waste water treatment?	5	3	
k)	Explain about the water level controller sensor.	6	4	
l)	Write advantages of water supply system.	4	2	
		Marks		



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Answer any Two questions from the Q-3 to Q-6			(16 x 2)	CO	
03	a)	What is curing of concrete? Describe about various curing methods of concrete.	8	1	2
	b)	Briefly discuss battened, ledged and braced door with neat sketch.	8	1	3
04	a)	Discuss merits and demerits of highways as compared to railways.	8	2	2
	b)	Write short notes on GIS & GPS.	8	6	3
05	a)	What do you mean by deep foundation? Write the different types of deep foundation with neat sketch.	8	3	3
	b)	Write a note on siphon.	8	4	2
06	a)	Explain about the water level controller sensor.	8	4	3
	b)	What are the different sources of water?	8	4	2

** BTL: Bloom's Taxonomy Level

** CO: Course Outcomes