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R-19

Code: 19AC21T

I B.Tech. II Semester Supplementary Examinations July/August 2022

Differential Equations and Vector Calculus

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

		Marks	CO	Blooms Level
UNIT-I				
1.	Solve $\frac{d^2y}{dx^2} + y = e^{-x} + e^x \sin x$	14M	CO1	L3
OR				
2.	Solve $(D^2 + 1)x = t \cos t$ given $x = 0, \frac{dx}{dt} = 0$ at $t = 0$.	14 M	CO1	L3
UNIT-II				
3.	Solve $x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 6y = x^2$	14M	CO2	L3
OR				
4.	Solve $(2x + 3)^2 \frac{d^2y}{dx^2} - (2x + 3) \frac{dy}{dx} - 12y = 6x$	14M	CO2	L3
UNIT-III				
5.	Solve $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$	14M	CO3	L3
OR				
6.	Using the method of separation of variables, solve $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ where $u(x,0) = 6e^{-3x}$	14M	CO3	L3
UNIT-IV				
7.	Evaluate the line integral $\int_c [(x^2 + xy)dx + (x^2 + y^2)dy]$ where c is the square formed by the lines $x = \pm 1$ and $y = \pm 1$.	14M	CO4	L2
OR				
8.	Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point (2,-1,2)	14M	CO4	L2
UNIT-V				
9.	Verify Gauss divergence theorem for $\vec{F} = x^2 \vec{i} + y^2 \vec{j} + z^2 \vec{k}$, over the cube formed by the planes $x=0, x=a, y=0, y=b, z=0, z=c$.	14M	CO5	L3
OR				
10.	Verify Green's theorem in the plane for $\oint (3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is the region bounded by $x = 0, y = 0$ and $x + y = 1$.	14M	CO5	L3

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R-19

Code: 19A324T

I B.Tech. II Semester Supplementary Examinations July/August 2022

Engineering Graphics & Design
(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. Construct a hyperbola, when the distance of the focus from the directrix is 65mm and eccentricity is 3/2. Also draw tangent and normal to the curve as a point 45mm from directrix	14M	CO1	L2
OR			
2. a) Divide a straight line AB of length 70 mm, into 9 equal parts	7M	CO1	L2
b) Bisect a straight line AB of length 65 mm	7M	CO1	L2
UNIT-II			
3. Construct a cycloid having a generating circle diameter as 50mm for one revolution clockwise. Draw a normal and tangent to a curve at a point 35mm above the base line	14M	CO2	L2
OR			
4. Draw an involute for a pentagon of side 20mm. Also draw a normal and tangent to the curve at a distance of 75mm from the center of pentagon	14M	CO2	L2
UNIT-III			
5. A 100mm long line is parallel to and 40mm above the H.P. Its two ends are 25mm and 50mm in front of the V.P respectively. Draw its projections and find its inclination with the V.P	14M	CO3	L3
OR			
6. A line PQ, 50mm long is perpendicular to H.P. and 15mm in front of V.P. The end P, nearer to H.P is 20mm above it. Draw the projections of a line	14M	CO3	L3
UNIT-IV			
7. A square ABCD of 40mm side has a corner on the HP and 20mm in front of the VP. All the sides of the squares are equally inclined to the HP and parallel to the VP. Draw its projections	14M	CO4	L3
OR			
8. Draw the projections of a regular hexagon of 25mm side, having one of its sides in the HP and inclined at 60° to the VP and its surface making an angle of 45° with the HP	14M	CO4	L3
UNIT-V			
9. Draw the projections of a right circular cylinder diameter of base 30mm and height 60mm resting on HP on its base, such that the axis is parallel to VP and inclined at 30° to HP	14M	CO5	L3
OR			
10. a) Draw the projections of a cone of base 30mm diameter and axis 50mm long, when it is resting on HP on its base	7M	CO5	L3
b) Draw the projections of a cylinder of base 30mm diameter and axis 50mm long, when it is resting on HP on its base	7M	CO5	L3

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Code: 19A521T

I B.Tech. II Semester Supplementary Examinations July/August 2022

Python Programming
(Common to CE, ME & CSE)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Describe and illustrate Boolean operators with examples.	7M	CO1	L2
b) Write a program using if statements in Python.	7M	CO1	L3
OR			
2. Difference between sequential, selection, and iterative control	14M	CO1	L4
UNIT-II			
3. Define set and illustrate set in Python with suitable example	14M	CO2	L2
OR			
4. Define dictionary data type in python? Illustrate dictionary with suitable example.	14M	CO2	L3
UNIT-III			
5. a) Write a python program to write some text into a file.	7M	CO3	L2
b) Discuss about string traversal in python	7M	CO3	L2
OR			
6. a) How to deal with text files in python?	7M	CO3	L3
b) Write a python program to read the lines of a file.	7M	CO3	L3
UNIT-IV			
7. Illustrate encapsulation with suitable example.	14M	CO4	L3
OR			
8. a) Explain the difference between a reference and dereferenced value	7M	CO4	L3
b) Infer about constructors in Python	7M	CO4	L4
UNIT-V			
9. What is stack? Demonstrate stack operations with the example.	14M	CO5	L3
OR			
10. Outline the concept of queue implementation using python list.	14M	CO5	L4

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Code: 19AC22T

I B.Tech. II Semester Supplementary Examinations July/August 2022

Applied Physics

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) What is Diffraction grating? Explain how the wavelength is determined by using grating.	8M	CO1	L1,L2
b) Write the engineering applications of diffraction	6M	CO1	L1
OR			
2. a) Describe the formation of Newton's rings with necessary theory.	10M	CO1	L1
b) In a Newton's rings experiment, the diameter of the 5 th dark ring is 0.3 cm and diameter of 25 th ring is 0.8 cm. If the radius curvature of the Plano cove lens is 100 cm. Find the wavelength of the light is used.	4M	CO1	L3
UNIT-II			
3. a) Define the ionic polarization and derive the expression for ionic polarizability	8M	CO2	L1,L6
b) Describe Frequency dependence of polarizability of dielectrics	6M	CO2	L1
OR			
4. a) What is Electronic polarization? Derive the expression for electronic polarizability.	9M	CO2	L1,L6
b) Explain Clausius-Mossotti relation in dielectrics.	5M	CO2	L2
UNIT-III			
5. a) State and prove the Gauss theorem for divergence	7M	CO3	L1,L3
b) Derive expression for propagation of electromagnetic wave in non-conducting medium	7M	CO3	L2
OR			
6. a) State and prove the Stoke's theorem for curl	7M	CO3	L1,L3
b) Explain pointing theorem in electromagnetics	7M	CO3	L2
UNIT-IV			
7. a) Explain the formation of P-type and N-type semiconductors with suitable band diagrams	8M	CO4	L2,L3
b) Discuss the effect of temperature on charge carrier concentration in N-type semiconductor	6M	CO4	L2
OR			
8. a) State and explain Hall effect in semiconductors and derive expression for hall coefficient	10M	CO4	L1,L2
b) Write the applications of hall effect	4M	CO4	L1,L2
UNIT-V			
9. a) Define the following terms i) superconductivity ii) critical temperature iii) critical magnetic field and iv) Nanomaterials	8M	CO5	L1
b) Mention the properties of superconductors	6M	CO5	L3
OR			
10. Describe the various types of superconductors	14M	CO5	L2

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Code: 19A221T

I B.Tech. II Semester Supplementary Examinations July/August 2022

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

UNIT-I

- | | Marks | CO | Blooms Level |
|---|-------|-----|--------------|
| 1. Two resistors of 4 , 6 are connected in parallel. if the total current is 30A, find the current through each resistor? | 14M | CO1 | L3 |
| OR | | | |
| 2. Derive the expression for star to delta transformation | 14M | CO1 | L3 |

UNIT-II

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|---|----|-----|----|
| 3. a) Derive the EMF equation of DC generator. | 7M | CO2 | L3 |
| b) Explain brake test of DC motor. | 7M | CO2 | L2 |
| OR | | | |
| 4. a) Describe the various methods of speed control of DC shunt motor. | 7M | CO2 | L3 |
| b) A 4-pole lap wound d.c generator is running at 1500 rpm, flux is 7 mwb, number of slots is 52, conductors per slot is 20. Calculate the generated voltage. | 7M | CO2 | L3 |

UNIT-III

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|--|-----|-----|----|
| 5. a) Explain the working principle of an alternator? | 7M | CO3 | L2 |
| b) Explain the working principle of three phase induction motor with a neat sketch? | 7M | CO3 | L2 |
| OR | | | |
| 6. Discuss the Principle of operation of 1- Transformer with constructional diagram. | 14M | CO3 | L3 |

UNIT-IV

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|--|----|-----|----|
| 7. a) Classify the diodes and draw the V-I characteristics of diode. | 7M | CO4 | L1 |
| b) Mention the applications of PN junction diode? | 7M | CO4 | L3 |
| OR | | | |
| 8. a) Explain the operation of Half wave rectifier with relevant diagrams. | 7M | CO4 | L2 |
| b) Discuss the input and output characteristics of a transistor in CE configuration. | 7M | CO4 | L2 |

UNIT-V

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|--|----|-----|----|
| 9. a) Discuss the working of CRO with neat sketch. | 8M | CO5 | L2 |
| b) Explain various applications of CRO. | 6M | CO5 | L2 |
| OR | | | |
| 10. a) Discuss the principle of operation of dielectric heating with its advantages. | 7M | CO5 | L2 |
| b) Mention the industrial applications of dielectric heating? | 7M | CO5 | L3 |
