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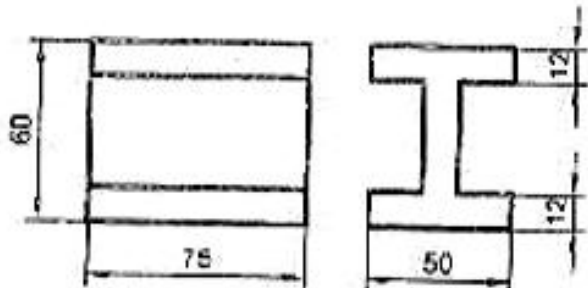
I B.Tech. II Semester Supplementary Examinations February 2022

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. a) Divide a straight line AB of length 70 mm, into 9 equal parts	07M	CO1	L2
b) Bisect a straight line AB of length 65 mm	07M	CO1	L2
OR			
2. The major and minor axes of an ellipse are 100mm and 60mm. Draw an ellipse by Arcs of circles method	14M	CO1	L2
UNIT-II			
3. Draw epicycloid of a circle of 40mm diameter, which rolls outside on another circle of 120mm diameter for one revolution clockwise. Draw a tangent and a normal to it at a point 95mm from the centre of the directing circle	14M	CO2	L2
OR			
4. Draw an involute for a circle of diameter 50 mm. Also draw a normal and tangent to the curve at a distance of 100mm from the center of circle	14M	CO2	L2
UNIT-III			
5. A point P is 15mm above the H.P & 20mm in front the V.P. Another point Q is 25mm behind the V.P & 40mm below the H.P. Draw the projections of these points by taking the distance between the end projectors as 70mm. Also draw the line by joining their front and top views	14M	CO3	L3
OR			
6. The top view of a 75mm long line AB measures 65mm, while the length of its front view is 50mm. Its one end A is in H.P. and 12mm in front of the V.P. Draw the projections of AB and determine its inclinations with the H.P. and the V.P	14M	CO3	L3
UNIT-IV			
7. A hexagonal plate of side 30mm is placed with a side on VP and surface inclined at 45° to VP and perpendicular to HP. Draw the projections	14M	CO4	L3
OR			
8. A semi-circular lamina of 64mm diameter has its straight edge in VP and inclined at an angle of 45° to HP. The surface of the lamina makes an angle of 30° with VP. Draw the projections	14M	CO4	L3
UNIT-V			
9. Draw the projections of a hexagonal prism of base 25mm side and axis 60mm long, when it is resting on one of its corners of the base on HP. The axis of the solid is inclined at 45° to the HP	14M	CO5	L3
OR			
10. Convert the following orthographic views to isometric view			
			
R.S. VIEW	FRONT VIEW		
	***	14M	CO5
			L3

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R-19

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I B.Tech. II Semester Supplementary Examinations February 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) What is computer science? Explain about the Essence of Computational Problem Solving.	7M	CO1	L1
b) Write about the process of computational problem solving	7M	CO1	L2
OR			
2. a) Write a python program to find whether a given number is odd or even.	7M	CO1	L3
b) Illustrate infinite loop with an example	7M	CO1	L2
UNIT-II			
3. a) Summarize in detail about function routine.	14M	CO2	L2
b)			
OR			
4. a) Compare lists and tuples in Python	7M	CO2	L3
b) Describe the typical operations performed on lists	7M	CO2	L3
UNIT-III			
5. a) Explain the use of modular design in software development	7M	CO3	L2
b) Explain the process of top-down design	7M	CO3	L2
OR			
6. a) Distinguish different ways of using import statement	7M	CO3	L3
b) Differentiate between a text file and a binary file	7M	CO3	L3
UNIT-IV			
7. a) Explain the concept of an object	7M	CO4	L2
b) Describe the use of object references	7M	CO4	L2
OR			
8. a) Justify the need of automatic garbage collection in python	7M	CO4	L5
b) Summarize the concept of memory allocation and deallocation.	7M	CO4	L5
UNIT-V			
9. a) Define data structures and list out various types of data structures	7M	CO5	L2
b) Discuss about the common operations performed on data structures	7M	CO5	L2
OR			
10. Examine abstract data type with its types along with the syntax used	14M	CO5	L3

Code: 19AC22T

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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 interference? Mention the conditions to get interference.	6M	CO1	L1
b) Explain the formation of Newton's rings with experimental arrangement.	8M	CO1	L2,L3
OR			
2. a) Explain the interference in thin films by reflection	10M	CO1	L2
b) A parallel beam of light of 6000\AA is incident on thin glass plate of refractive index 1.5 such that the angle of refraction into the plate is 50° . Find the least thickness of the glass plate which will appear dark by reflection.	4M	CO1	L3
UNIT-II			
3. a) Explain the ferroelectricity and its properties	7M	CO2	L2
b) Describe the origin of magnetic moment in magnetic materials	7M	CO2	L1
OR			
4. a) Define and derive local field in dielectrics.	10M	CO2	L1,L6
b) A paramagnetic material has 10^{28} atoms per m^3 . Its susceptibility at 350 K is 2.8×10^{-4} . Calculate susceptibility at 300 K.	4M	CO2	L3
UNIT-III			
5. a) Define Attenuation and explain any three attenuation losses in optical fibers	9M	CO3	L1,L2
b) Derive expression for numerical aperture of an optical fiber	5M	CO3	L6
OR			
6. a) What is acceptance angle? Derive expression for acceptance angle of an optical fiber	10M	CO3	L1,L6
b) Calculate the acceptance angle of given optical fiber if the refractive indices of core and cladding are 1.563 and 1.498 respectively.	4M	CO3	L3
UNIT-IV			
7. a) Explain classification of solids based on energy bands	8M	CO4	L2
b) Summarize applications of Semiconductors	6M	CO4	L2
OR			
8. a) Explain direct and indirect band gap semiconductors	8M	CO4	L2
b) Derive the expressions for intrinsic carrier concentration of intrinsic semiconductor	6M	CO4	L6
UNIT-V			
9. a) State and explain Meissner effect in superconductors	6M	CO5	L1,L2
b) Distinguish type-I and type-II super conductors	8M	CO5	L3
OR			
10. a) Explain construction and working of chemical vapor deposition method to prepare nanomaterials	8M	CO5	L2,L3
b) Explain any two properties of nanomaterials	6M	CO5	L2

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R-19

Code: 19A221T

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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)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Define the following i) Resistance ii) Inductance iii) capacitance	6M	CO1	L1
b) Derive the expression for an equivalent resistance if any two resistors R1, R2 are connected in parallel?	7M	CO1	L3
OR			
2. a) Three inductors of 2mH, 5mH and 10mH are connected in series. Find the equivalent inductance.	7M	CO1	L3
b) Three capacitors of 2uF, 5uF and 10uF are connected in series. Find the equivalent capacitance.	7M	CO1	L3
UNIT-II			
3. a) Classify and explain the different types of self-excited DC generators?	8M	CO2	L2
b) Derive the torque expression of a DC motor	6M	CO2	L3
OR			
4. a) Explain the operation of principle of DC generator.	10M	CO2	L2
b) List the applications of DC motors	4M	CO2	L1
UNIT-III			
5. a) Explain the working principle of Transformer?	8M	CO3	L2
b) List out different types of losses present in transformer	6M	CO3	L1
OR			
6. Describe the Brake test that can be performed on a 3- induction motor in detail.	14M	CO3	L1
UNIT-IV			
7. a) Define PNP and NPN transistors along with symbols?	7M	CO4	L1
b) Draw the full wave rectifier and discuss the operation of circuit.	7M	CO4	L3
OR			
8. a) Discuss the operation of PN junction under forward bias condition with its characteristics.	7M	CO4	L2
b) Draw the Bridge rectifier and discuss the operation of circuit.	7M	CO4	L3
UNIT-V			
9. a) Explain about induction heating with relevant diagrams.	8M	CO5	L2
b) List out the applications of Dielectric heating.	6M	CO5	L1
OR			
10. a) Draw the block diagram of CRO and discuss the operation.	7M	CO5	L3
b) Discuss the voltage and current measurements of CRO.	7M	CO5	L2

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R-19

Code: 19AC21T

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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)

UNIT-I

- | | Marks | CO | Blooms Level |
|-----------------------------------------|-------|-----|--------------|
| 1. a) Solve $(D^2 + 6D + 9)y = e^{-3x}$ | 7M | CO1 | L3 |
| b) Solve $(D^2 - 1)y = 3x$ | 7M | CO1 | L3 |

OR

- | | | | |
|------------------------------------------------------------------------|-----|-----|----|
| 2. Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = xe^{3x} + \sin 2x$ | 14M | CO1 | L3 |
|------------------------------------------------------------------------|-----|-----|----|

UNIT-II

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|-------------------------------------------------------------------|-----|-----|----|
| 3. Solve $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + y = \log x$. | 14M | CO2 | L3 |
|-------------------------------------------------------------------|-----|-----|----|

OR

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|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|
| 4. Solve the simultaneous equations $\frac{dx}{dt} + 2y + \sin t = 0, \frac{dy}{dt} - 2x - \cos t = 0$
given that $x = 0$ and $y = 0$ when $t = 0$. | 14M | CO2 | L3 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|

UNIT-III

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|---------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
| 5. a) Form the partial differential equation by eliminating arbitrary constants a and b from $(x-a)^2 + (y-b)^2 = z^2 \cot^2 r$ | 7M | CO3 | L3 |
| b) Form the partial differential equation by eliminating arbitrary function from $z = f(x^2 + y^2)$ | 7M | CO3 | L3 |

OR

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|------------------------------------------|-----|-----|----|
| 6. a) Solve $x(y-z)p + y(z-x)q = z(x-y)$ | 7 M | CO3 | L3 |
| b) Solve $p \tan x + q \tan y = \tan z$ | 7 M | CO3 | L3 |

UNIT-IV

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|------------------------------------------------------------------------------------------------|----|-----|----|
| 7. a) Find $\text{div } \vec{f}$ where $\vec{f} = \text{grad}(x^3 + y^3 + z^3 - 3xyz)$ | 7M | CO4 | L2 |
| b) If $\vec{f} = (x+3y)\vec{i} + (y-2z)\vec{j} + (x+pz)\vec{k}$ is solenoidal, then find p . | 7M | CO4 | L2 |

OR

- | | | | |
|---------------------------------------------------------|-----|-----|----|
| 8. Prove that $r^n \vec{r}$ is solenoidal if $n = -3$. | 14M | CO4 | L2 |
|---------------------------------------------------------|-----|-----|----|

UNIT-V

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|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|
| 9. Verify Green's theorem in the plane for $\oint (3x^2 - 8y^2)dx + (4y - 6xy)dy$
where C is the region bounded by $y = \sqrt{x}$ and $y = x^2$ | 14M | CO5 | L3 |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|

OR

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|
| 10. Verify stokes theorem for the function $\vec{F} = x^2\vec{i} + xy\vec{j}$ integrated around the square in the plane $z=0$ whose sides are along the lines $x=0, y=0, x=a, y=a$. | 14M | CO5 | L3 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|
