Hall Ticket Number :										

R-19

Code: 19AC11T

I B.Tech. I Semester Supplementary Examinations August 2021

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Define the rank of the matrix and find the rank of $\begin{bmatrix} 0 & 1 & -3 & 1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & -2 & 0 \end{bmatrix}$ by using Echelon form. 7M

b) Investigate the values of ª *and* « so that the equations 2x+3y+5z=9, 7x+3y-2z=8, 2x+3y+ ª z = « , have (i) no solution, (ii) a unique solution and (iii) an infinite number of solutions. 7M

OR

2. Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$ 14M

UNIT–II

3. If $A = \begin{bmatrix} 2 & 1 & 2 \\ 5 & 3 & 3 \\ -1 & 0 & -2 \end{bmatrix}$, verify Cayley-Hamilton theorem. Hence find A^{-1} and A^4. 14M

OR

4. Reduce the Quadratic form $x^2 + 3y^2 + 3z^2 - 2yz$ to a canonical form by an orthogonal transformation and discuss its nature also find the modal matrix. 14M

UNIT–III

5. a) If $U = \log\left(x^3 + y^3 + z^3 - 3xyz\right)$ prove that $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 U = \frac{-9}{(x+y+z)^2}$ 7M

b) In a plane triangle, find the maximum value of $\cos A \cos B \cos C$ 7M

OR

6. a) If $x + y + z = u, y + z = uv, z = uvw, then\ evaluate \frac{\partial(x, y, z)}{\partial(u, v, w)}$ 7M

b) Find the minimum value of $x^2 + y^2 + z^2$ *given* $x + y + z = 3a.$ 7M

UNIT–IV

7. a) Obtain the Taylor's series expansion of sin2x about $x = \frac{®}{4}$. 7M

b) Trace the curve $x^3 + y^3 = 3axy$. 7M

OR

8. a) Obtain the Maclaurin's series expansion of $\log(1+\sin^2 x)$ up to the term containing x^6. 7M

   b) Trace the curve $r^2 = a^2 \cos 2\theta$. 7M

UNIT–V

9. a) Evaluate the double integral $\iint_R x\,y\,dx\,dy$ where 'R' is the region bounded by the lines $x-axis$, ordinate $x = 2a$ and $x^2 = 4a\,y$ 7M

   b) Show that $\Gamma(n) = \int_0^1 \left(\log\frac{1}{y}\right) dy \quad (n.0)$ 7M

OR

10. a) Evaluate the integral by changing the order of integration $\int_0^{4a}\int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy\,dx$ 7M

    b) Show that $(p,q) = \int_0^\infty \frac{y^{q-1}}{(1+y)^{p+q}} dy = \int_0^1 \frac{x^{p-1}+x^{q-1}}{(1+x)^{p+q}} dx$ 7M

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Hall Ticket Number :										

R-19

Code: 19AC12T

I B.Tech. I Semester Supplementary Examinations August 2021

Applied Physics

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *any five* questions by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Derive the expressions for diameters of dark and bright Newton's rings. 8M

   b) Explain construction and working of Nicol prism. 6M

OR

2. Describe the Fraunhofer diffraction due to double slit and derive the conditions for maxima and minima. 14M

UNIT–II

3. a) Define Ionic polarization and derive the expression for ionic polarizability. 7M

   b) Define and derive the Internal field. 7M

OR

4. a) Distinguish the soft and hard magnetic materials. 6M

   b) Explain domain theory of ferromagnetism 8M

UNIT–III

5. a) State and prove Stokes theorem for curl. 7M

   b) Derive expression for propagation of electromagnetic waves in non-conducting media. 7M

OR

6. a) With the help of block diagram, explain an optical fiber communication system and discuss the function of each block. 8M

   b) Illustrate various attenuation mechanisms in optical fibers. 6M

UNIT–IV

7. a) With the help of band diagrams explain p & n type semiconductors and discuss the effect of temperature on charge carrier concentration in n-type semiconductors. 10M

   b) Summarize applications of semiconductors. 4M

OR

8. a) Explain the terms drift and diffusion and obtain their expressions in semiconductors. 8M

   b) Derive Einstein's relation and give significance of it. 6M

UNIT–V

9. a) Explain classification of superconductors into type I and type II. 8M

   b) Discuss essential features of BCS theory of superconductivity. 6M

OR

10. a) Explain the construction and working of Chemical vapor deposition method to prepare nanoparticles. 8M

    b) Explain the working principle of SEM with neat diagram. 6M

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Hall Ticket Number :										

R-19

Code: 19A411T

I B.Tech. I Semester Supplementary Examinations August 2021

Essentials of Electrical & Electronics Engineering

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Classify the types of resistors. Explain fixed resistors with neat diagram. 8M

   b) Determine the color coding for the following resistors.
   i) 4.7KΩ ii) 22KΩ iii) 10KΩ 6M

OR

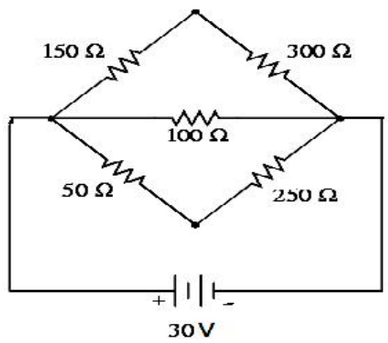
2. a) With neat sketches explain the dependent and independent sources. 7M

   b) Classify the types of capacitors. Explain about any two fixed capacitors with neat sketches. 7M

UNIT–II

3. a) State and explain Kirchhoff's laws with an example. 7M

   b) Determine the current flowing through 100Ω resistor using KCL and KVL in the following circuit.



7M

OR

4. a) Explain about the source transformation technique with an example. 7M

   b) State and explain Maximum power transfer theorem with an example. 7M

UNIT–III

5. a) Demonstrate how temperature effect the characteristics of PN junction diode? 8M

   b) The voltage across a silicon diode at room temperature of 300^0K is 0.62V when 2mA current flow through it. If the voltage increases to 0. 8V, calculate the new diode current 6M

OR

6. a) Explain energy band diagrams of intrinsic and extrinsic semiconductors with neat sketches. 7M

   b) Differentiate the avalanche breakdown and Zener breakdown. 7M

UNIT–IV

7. Explain the working of full wave bridge rectifier with neat diagram. Derive the expression for ripple factor and efficiency. 14M

OR

8. a) Compare L-filter and C-filter. 5M

   b) The Half wave rectifier circuit is supplied with a 230V AC through 3:1 Step down Transformer with a resistive load of 10KΩ, the diode forward resistance is 75Ω and transformer secondary winding resistance 10Ω. Calculate step- down voltage, V_{DC}, I_{DC}, V_{RMS}, I_{RMS}, Rectifier efficiency, and P_{DC}. 9M

UNIT–V

9. a) Explain the construction and operation of NPN transistor. 7M

   b) Explain the Input and Output characteristics of transistor in CE configuration. 7M

OR

10. a) With block diagram explain the operation of function generator. 7M

    b) Explain the operation of CRO with neat block diagram. 7M

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Hall Ticket Number :										

R-19

Code: 19A312T

I B.Tech. I Semester Supplementary Examinations August 2021

Engineering Graphics & Design

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.		Construct an ellipse, when the distance of the focus from the directrix is equal to 65mm and eccentricity is 2/3. Also draw tangent and normal to the curve at a point 40mm from the directrix	14M	CO1	L3
		OR			
2.	a)	Divide a straight line AB of length 50 mm, into 9 equal parts	7M	CO1	L4
	b)	Construct a regular Pentagon.	7M	CO1	L3
		UNIT–I			
3.		A circle of 40mm diameter rolls on a horizontal line without slipping. Draw the curve traced by a point R on the circumference of the circle for one half revolution. For remaining half revolution the circle rolls on the vertical line. The point R is vertically above the centre of the circle in the initial position.	14M	CO2	L3
		OR			
4.		A string is unwound from a drum of 30mm diameter. Draw the locus of the free end of the string for unwinding through an angle of 360^0.	14M	CO2	L3
		UNIT–I			
5.	a)	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
	b)	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
		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–I			
7.		A rectangular plane ABCD inclined to HP by an angle 30°, its shorter edge being parallel to HP and inclined to VP by an angle 45°. Draw its projections.	14M	CO 4	L3
		OR			
8.		A semicircular plate of 80 mm diameter has its straight edge in the VP and inclined at 45° to the HP. The surface of the plate makes an angle of 30° with the VP. Draw its projections.	14M	CO4	L3
		UNIT–I			
9.		A square prism with side of base 30 mm and axis 50 mm long has its axis inclined at 60° to HP on one of the edges of the base which is inclined at 45° to VP.	14M	CO5	L3
		OR			
10.		Study the isometric view of the Figure 1 and draw the front, top and right side views.			

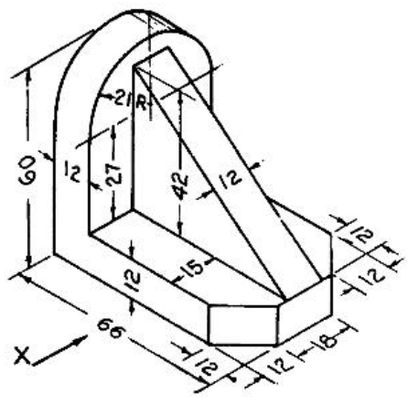

Figure 1 14M CO5 L3

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Hall Ticket Number :										

R-19

Code: 19AC15T

I B.Tech. I Semester Supplementary Examinations August 2021

Functional English and Life Skills

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	What does the author say about despising people in the lesson, 'On Conduct of Life'? What justification does he provide for his advice?	7M	CO1	L2
	b)	I. **Change the following statements into questions.** i. Ramesh had a very happy childhood. ii. My sister enjoys playing tennis. iii. I can have a pear. iv. Parents and teachers help children to form good habits. II. **Identify the parts of speech of the underlined words in the following sentences**. i. The <u>carved</u> table and chairs are too ornate for my taste. ii. Nidhi went home to fetch her <u>luggage</u>. iii. Some people find it easy <u>learning</u> languages.	7M	CO3	L4
		OR			
2.		Can you think of the three ways suggested by Rudyard Kipling in his poem "If", are practically possible? Justify your answer.	7M	CO2	L2
		UNIT–II			
3.	a)	. Write the summary of Alfred Lord Tennyson's poem 'The Brook'	7M	CO1	L1
	b)	**Fill in the blanks with correct articles/zero article:** i. Ramanath is an Indian but his wife Katherina _____ European. ii. Danush plays cricket very well. He is _____ Virat Kohli of our college.	2M	CO3	L3
	c)	Write a paragraph in about 70 words on 'Self Discipline'.	5M	CO4	L4
		OR			
4.	a)	How did GB Shaw, a Nobel Prize winner in literature, who was nervous to speak in public, transform himself into a great public speaker?	7M	CO2	L2
	b)	**Fill in the blanks with appropriate connectors/linkers:** i. After spending two months at home, the thought of returning to work is tiring. Obviously I don't want to go. _____, I have decided to go as I am in need of money. ii. Ramesh is honest and kindhearted. He always wants to help the people around him. Many of his friends, classmates and neighbours got help from him._____, his brother is a cruel man and he always has evil thoughts about others.	2M	CO3	L3
	c)	Write a Paragraph in about 70 on 'Reading Books'	5M	CO4	L4
		UNIT–III			
5.		What can you tell about the prince's character from the drama, "The Death Trap"? Use examples from the text to support your answer.	14M	CO1	L3
		OR			
6.	a)	How is time regarded in the extract, "On Saving Time" by Seneca?	7M	CO2	L2

b) **Rearrange each group of jumbled sentences below so as to have well-written paragraphs.**

i. It contains, of course, the meanings of difficult words.
ii. One of the most important reference books that you must possess is a dictionary.
iii. It also gives you the pronunciation of the words.
iv. You do possess one, perhaps, but L doubt whether you are aware of the different kinds of information it contains.
v. The dictionary can be referred to for the various grammatical forms of words as well.
vi. Every college dictionary should provide at least these four kinds of information about words, namely pronunciation, grammatical patterns and usage.
vii. Finally, a good dictionary contains illustrative sentences or phrases. Showing how phrases are actually used. 7M CO4 L4

UNIT–IV

7. Identify the instances in which Yellamma breaks gender and caste barriers in her life. Why and how do you think she does this? 14M CO1 L2

OR

8. Prepare an analytical essay on the topic, "Climate Change and its Impact" 14M CO4 L4

UNIT–V

9. a) What are the questions, according to George Orwell, a scrupulous writer asks himself in every sentence he writes? 7M CO1 L1

b) **Correct the following sentences:**

i. The doctor and the philosopher has been felicitated this morning.
ii. If my father will permit, I will attend the function.
iii. The students are learning English for two years
iv. All the articles which has been placed on the table needs repair.
v. Teja prefers money than fame.
vi. My father is a MP and my elder sister is an MLA.
vii. Rao's father congratulated him for his success. 7M CO3 L3

OR

10. a) Narrate Mrunalini Sarabai's motivated life story. 7M CO1 L1

b) Write an Essay in about 150 words on the topic 'The social Responsibilities of Multinational Companies' using the following claims.

Earning money should not be the sole aim of the companies- they can hold the entire nation's political power in their grip – they themselves should be ready to take up socially benefited schemes- they need to give something back to the society- smile on the lips of the people should be the goal of MNCs. 7M CO4 L5

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Hall Ticket Number :										

R-19

Code: 19A511T

I B.Tech. I Semester Supplementary Examinations August 2021

Problem Solving and C programming

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Define Algorithm. Explain the characteristics of algorithm 7M

   b) List and explain briefly about various computer languages 7M

OR

2. a) What is meant by flow chart? Explain the symbols used in flowchart with an example. 7M

   b) Discuss about C data types. 7M

UNIT–II

3. a) What are the different types of arrays in C? Explain with a suitable example. 7M

   b) Write a C program to find the factorial of a given number. 7M

OR

4. a) Explain conditional statements with an example. 7M

   b) Write a c program to print array of elements in ascending order using bubble sort. 7M

UNIT–III

5. a) Define string. Explain declaration of string. Explain any three string handling functions. 6M

   b) What is recursion? Explain with an example 8M

OR

6. Explain the following key words with example. i) auto ii) register iii) static iv) extern. 14M

UNIT–IV

7. a) What is pointer? How to initialize and declare pointer variables? 7M

   b) Explain dynamic memory allocation functions. 7M

OR

8. a) Write a C program to demonstrate array of pointers. 7M

   b) Explain different parameter passing techniques with suitable examples. 7M

UNIT–V

9. Define structure and union. Explain the syntax and accessing elements from structure and union with an example. Write the differences between structures and unions 14M

OR

10. a) Define file. Write a C program to write character to a file and reading character from file. 8M

    b) Give brief description about the various modes of a file. 6M

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