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R-20

Code: 20AC11T

I B.Tech. I Semester Supplementary Examinations September 2022

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. In Part-A, each question carries **Two mark**.3. Answer **ALL** the questions in **Part-A** and **Part-B****PART-A****(Compulsory question)**1. Answer **ALL** the following short answer questions (5 X 2 = 10M)CO Blooms
Level

a) If $A = \begin{bmatrix} 1 & 2 & 5 \\ 0 & 3 & 2 \\ 0 & 0 & 4 \end{bmatrix}$ then find the Eigen values of A.

CO1 L3

b) Define quadratic form and Write matrix of a quadratic form of

$$Q = 6x_1^2 + 3x_2^2 + 3x_3^2 - 4x_1x_2 - 2x_2x_3 + 4x_3x_1$$

CO2 L2

c) Differentiate Taylor's and Maclaurin's power series expansion

CO3 L2

d) Evaluate $\int_{z=0}^1 \int_{y=0}^2 \int_{x=1}^2 xyz \, dz dy dx$.

CO4 L3

e) Evaluate $\Gamma\left(-\frac{1}{2}\right)$

CO5 L3

PART-BAnswer **five** questions by choosing one question from each unit (5 x 12 = 60 Marks)Marks CO Blooms
Level**UNIT-I**

2. Reduce the matrix $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & 7 \end{bmatrix}$ into normal form.

12M L3

OR

3. Find the Eigen values and Eigen vectors of the matrix

$$A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$$

12M

L2

UNIT-II

4. Reduce the matrix $A = \begin{bmatrix} -1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$ to a Diagonal form

12M

L2

OR

5. Reduce the quadratic form

$$3x^2 + 3y^2 + 3z^2 + 2xy + 2xz - 2yz \text{ to canonical form by an orthogonal transformation}$$

12M

L3

UNIT-III

6. a) If $u = f(e^{y-z}, e^{z-x}, e^{x-y})$, prove that

$$\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0.$$

6M

L3

- b) If $u = x^2 + y^2 + z^2$, $v = xy + yz + zx$, $w = x + y + z$, find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$

$$\frac{\partial(u,v,w)}{\partial(x,y,z)}$$

6M

L2

OR

7. Find the minimum value of $x^2 + y^2 + z^2$, given that $xyz = \alpha^3$

12M

L2

UNIT-IV

8. a) Evaluate $\int_0^{\infty} \int_0^{\infty} e^{-(x^2+y^2)} dx dy$ by changing to polar coordinates

6M

L3

- b) Evaluate $\int_{y=1}^e \int_{x=1}^{\log y} \int_{z=1}^{e^x} \log z dz dx dy$

6M

L4

OR

9. Evaluate $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy dx$ by changing the order of integration.

12M

L3

UNIT-V

10. a) Prove that $\int_0^1 \frac{dx}{\sqrt{1-x^4}} = \frac{\sqrt{f}}{4}$

6M

L3

- b) Evaluate $\int_0^1 \left(\log \frac{1}{x}\right)^{n-1} dx, n > 0$ in terms of Gamma functions.

L2

OR

6M

11. a) Symmetry of Beta function $B(m, n) = B(n, m)$

4M

L3

- b) Prove that $\int_0^{\frac{\pi}{2}} \sin^2 x \cos^4 x = \frac{f}{32}$

8M

L2

*** End ***

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Code: 20AC12T

I B.Tech. I Semester Supplementary Examinations September 2022

Applied Physics

(Common to EEE, ECE and AI&ML)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two mark**.
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | | | |
|--|-----------------|-----|--------------|
| 1. Answer ALL the following short answer questions | (5 X 2 = 10M) | CO | Blooms Level |
| a) List the engineering applications of interference. | | CO1 | L1 |
| b) Draw hysteresis of a magnetic material. | | CO2 | L4 |
| c) Explain total internal reflection of an optical fiber. | | CO3 | L2 |
| d) Distinguish between direct and indirect bandgap semiconductors. | | CO4 | L4 |
| e) Why nanomaterials are differ compared to bulk materials? | | CO5 | L3 |

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

- | | Marks | CO | Blooms Level |
|--|-------|-----|--------------|
| UNIT-I | | | |
| 2. a) Define Newton's rings in interference of light. | 4M | CO1 | L1 |
| b) Deduce an equation for wavelength of light from Newton's rings. | 8M | CO1 | L3 |

OR

- | | | | |
|---|----|-----|----|
| 3. a) Define polarization by double refraction. | 4M | CO1 | L1 |
| b) Explain Nicol's prism of double refraction. | 8M | CO1 | L2 |

UNIT-II

- | | | | |
|---|----|-----|----|
| 4. a) Derive Claussius-Mosotti relation in dielectrics. | 6M | CO2 | L3 |
| b) Mention the applications of dielectrics. | 6M | CO2 | L1 |

OR

- | | | | |
|---|----|-----|----|
| 5. a) Distinguish between hard and soft magnetic materials. | 8M | CO2 | L4 |
| b) Write a short note on magnetic bubble memory? | 4M | CO2 | L1 |

UNIT-III

- | | | | |
|--|----|-----|----|
| 6. a) Discuss Stroke's theorem for curl-Maxwell's equations. | 8M | CO3 | L2 |
| b) Explain electromagnetic wave propagation. | 4M | CO3 | L2 |

OR

7. a) Define acceptance angle and numerical aperture of a fibre. 4M CO3 L1
 b) Explain propagation of light through an optical fibre. 8M CO3 L2

UNIT-IV

8. a) Distinguish between intrinsic and extrinsic semiconductors. 6M CO4 L4
 b) Calculate density of majority charge carriers of a n-type semiconductor. 6M CO4 L3

OR

9. a) Explain drift and diffusion currents of a semiconductor. 8M CO4 L2
 b) List the applications of semiconductors. 4M CO4 L1

UNIT-V

10. a) Discuss the properties of superconductors. 6M CO5 L2
 b) Explain Meissner's effect of superconductors. 6M CO5 L2

OR

11. a) Describe the synthesis of nanomaterials by chemical vapor deposition. 8M CO5 L2
 b) Mention the applications of nanomaterials. 4M CO5 L1

*** End ***

Hall Ticket Number :

R-20

Code: 20A312T

I B.Tech. I Semester Supplementary Examinations September 2022

Engineering Drawing
(Common to CE, EEE & ECE)

Max. Marks: 70

Time: 3 Hours

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

Marks CO Blooms Level

UNIT-I

1. Draw the locus of a point P moving so that the ratio of its distance from a fixed point F to its distance from a fixed straight line is $\frac{4}{3}$. Name the curve and draw a tangent and normal to the curve from any point on it. 14M CO1 L1,L2

OR

2. Draw a hypocycloid generated by a rolling circle of diameter 50 mm and the diameter of the directing circle is 240 mm. Also draw a tangent and normal to the curve from any point on it. 14M CO1 L1,L2

UNIT-II

3. Mark the projections of the following points on a common reference line:
P, 40 mm in front of VP and 20 mm below the HP
Q, 35 mm behind VP and 25 mm below the HP.
R, 40 mm in front of VP and 20 mm above the HP.
S, 30 mm above the HP and in the VP. 14M CO2 L1,L2

OR

4. A line NS, 80 mm long has its end N 10 mm above the HP and 15 mm in front of VP. The other end S is 65 mm above the HP and 50 mm in front of VP. Draw the projections of the line and find its true inclination with HP and VP. 14M CO2 L1,L2

UNIT-III

5. A regular hexagonal lamina of 40 mm side is resting on one its corner on HP. Its surface is inclined at 45° to HP. The plan of the diagonal through the corner which is on HP makes an angle of 45° with XY. Draw its projections. 14M CO3 L2,L4

OR

6. Rectangle 30 mm and 50 mm sides is resting on HP on one small side which is 30° inclined to VP, while the surface of the plane makes 45° inclination with HP. Draw its projections. 14M CO3 L2,L4

| |
|---------|
| UNIT-IV |
|---------|

7. A right pentagonal pyramid of side 20 mm and altitude 50 mm rests on one of its edges of the base in the HP. The base being tilted up such that the apex is 30 mm above HP. Draw the projection of the pyramid when the edge on which it is resting is perpendicular to VP.

14M CO4 L2,L3

OR

8. A cylinder of diameter 30 mm and axis length 50 mm is resting on the HP on a point so that its axis is inclined at 45° to HP and parallel to VP. Draw its top and front views.

14M CO4 L2,L3

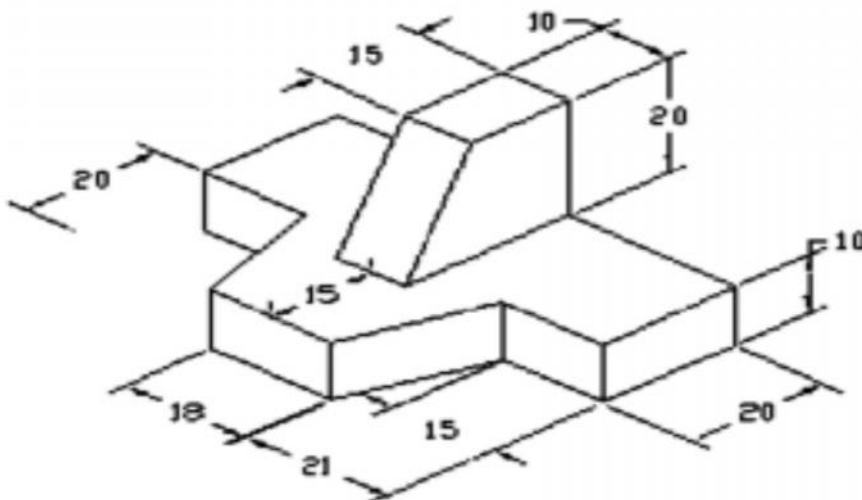
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|--------|
| UNIT-V |
|--------|

9. A frustum of a square pyramid of bottom edge 50 mm, top edge 25 mm and height 50 mm. Draw the isometric projection of the frustum.

14M CO5 L2,L3

OR

10.



Draw the Front view, Top view and Right side view of the above figure.

14M CO5 L2,L3

*** End ***

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Code: 20A511T

I B.Tech. I Semester Supplementary Examinations September 2022

Problem Solving through C Programming

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. In Part-A, each question carries **Two mark**.
 3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

- | | | CO | Blooms Level |
|---|---|----|--------------|
| 1. Answer ALL the following short answer questions (5 X 2 = 10M) | | | |
| a) Consider the following program | | | |
| #include<stdio.h> | | | |
| main() | | | |
| { | | | |
| int a=5; | | | |
| b = a << 2; | | | |
| printf("a=%d b=%d \n", a,b); | | | |
| } | | | |
| What is the output of above program? Explain it in two lines. | 1 | | L1 |
| b) What is the difference between 'getchar()' and 'scanf()' in C | 1 | | L1 |
| c) What is meant by Scope of Variable in C? | 2 | | L2 |
| d) What is a void pointer? | 4 | | L1 |
| e) How do we identify the end of file in C. Illustrate with an example? | 4 | | L2 |

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

- | | | Marks | CO | Blooms Level |
|--|----|-------|----|--------------|
| UNIT-I | | | | |
| 2. a) Write briefly about the C Tokens with suitable examples | 6M | | 1 | L2 |
| b) How many keyword and identifiers does C Language support? Explain. | 6M | | 1 | L2 |
| OR | | | | |
| 3. a) Explain the Structure of C program. | 6M | | 1 | L2 |
| b) Describe the various operators in C language along with its priority. | 6M | | 1 | L2 |
| UNIT-II | | | | |
| 4. a) What are Multi-dimensional arrays? How do we represent a Matrix using arrays? | 6M | | 3 | L2 |
| b) Write a program to print the series in the following form for a number 'n' : Example(n=4) | 6M | | 2 | L3 |

1
1 2
1 2 3
1 2 3 4
1 2 3
1 2
1

OR

5. a) Explain Bubble sort algorithm with a suitable example. 6M 3 L3
 b) Your teacher has conducted a test having a total of N questions, each question carries 3 marks for a correct answer and -1 for an incorrect answer. Students have decided to attempt all the questions. It is known that each student got X questions correct and the rest of them incorrect. For student to pass the course he must score at least P marks. Write a C program to simulate the above.
 (Input: N, X, P
 Output: Marks Obtained: _____, Status: Pass/ Fail) 6M 2 L3

UNIT-III

6. a) What is recursion? What is the format of a recursive function? Explain its advantages and limitations? 6M 3 L2
 b) Explain any four basic string functions with examples. 6M 3 L2

OR

7. a) What are the various types of preprocessor directives? 6M 4 L2
 b) Write a program to find GCD of Two numbers using recursion. 6M 3 L3

UNIT-IV

8. a) Explain pointer to function and function returning pointer with example. 6M 3 L2
 b) Write a program to concatenate two strings using pointers. 6M 4 L3

OR

9. a) What is advantage of representing an array of string by an array of pointer to string? 6M 4 L3
 b) Distinguish between call by value and call by reference. Illustrate it with an example in C. 6M 4 L3

UNIT-V

10. a) Define a structure with the name 'student'. Assume appropriate fields in student structure. Develop a program which reads 'n' students data and displays all 'n' students' information. 6M 5 L3
 b) Write about different built-in functions used in Files concept. 6M 5 L2

OR

11. a) What are self-referential structures? Explain them with an example. 6M 4 L2
 b) Write a program to copy one file data into another file. 6M 5 L3

*** End ***

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Code: 20A211T

I B.Tech. I Semester Supplementary Examinations September 2022

Basic Electrical Engineering
(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. In Part-A, each question carries **Two mark**.
 3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

- | | | | |
|---|-----------------|-----------|---------------------|
| 1. Answer ALL the following short answer questions | (5 X 2 = 10M) | CO | Blooms Level |
| a) Define Active and Passive Elements. | | CO1 | BL1 |
| b) Find the equivalent inductance of series combination of Three inductances with 3mH each. | | CO2 | BL4 |
| c) Define i)Fuse ii)MCB | | CO3 | BL1 |
| d) Distinguish between Thermal power station and Hydro power station. | | CO4 | BL2 |
| e) Draw the VI Characteristics of PV Cell | | CO5 | BL2 |

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

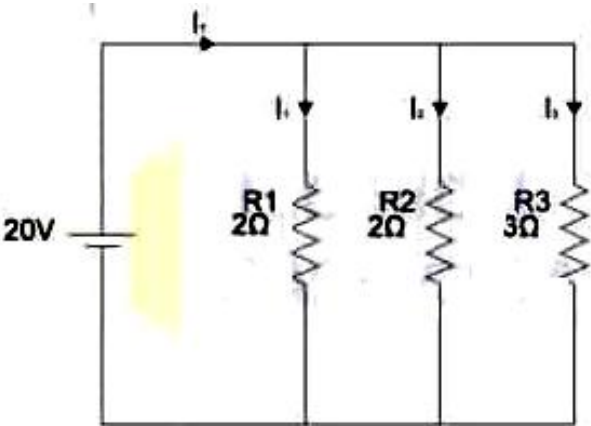
| | | |
|-------|----|--------------|
| Marks | CO | Blooms Level |
|-------|----|--------------|

| |
|---------------|
| UNIT-I |
|---------------|

- | | | | |
|--|----|-----|-----|
| 2. a) Define | | | |
| i) Fleming's right hand rule | | | |
| ii) Fleming's left hand rule | | | |
| iii) Lenz's law | 6M | CO1 | BL1 |
| b) Discuss the magnetic hysteresis loop using B-H Curve. | 6M | CO1 | BL1 |

OR

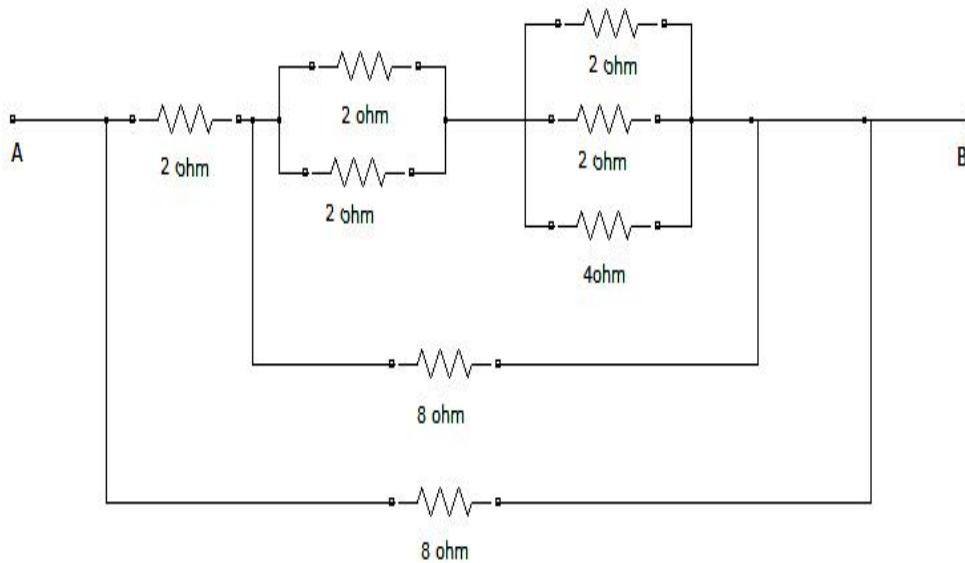
3. Calculate the current flow in each branch of the circuit shown below:



| | | |
|-----|-----|-----|
| 12M | CO1 | BL2 |
|-----|-----|-----|

UNIT-II

4. a) Calculate the equivalent Resistance between terminals A and B for the below circuit.



- b) Define i)KCL ii)KVL iii)Ohms Law

8M CO2 BL4

4M CO2 BL2

OR

5. Find the total current passed through the circuit consisting of three resistors connected in parallel across the supply of 25V. Where $R_1=12$, $R_2=10$, $R_3=20$. Also find the current passed through individual resistances R_1 , R_2 and R_3 .

12M CO2 BL4

UNIT-III

6. a) List out the Measuring instruments.
b) Distinguish between Wires and Cables.

5M CO3 BL2

7M CO3 BL2

OR

7. a) Distinguish between Electrical and Electronic Instruments
b) Write a short notes on i) Function Generator ii)Oscilloscope

7M CO3 BL2

5M CO3 BL2

UNIT-IV

8. a) Draw the structure of the power system
b) Discuss the working principle of Nuclear power station

6M CO4 BL2

6M CO4 BL2

OR

9. a) Discuss the Principle of Operation of Nuclear Reactor.
b) Discuss the working principle of Thermal power station

6M CO4 BL2

6M CO4 BL2

UNIT-V

10. Discuss the horizontal and vertical axis wind turbines with applications

12M CO5 BL2

OR

11. Discuss the i)Solar Power Generation ii)Wind power Generation

12M CO5 BL2

*** End ***