R-17

Code: 7G321

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020
Electronic Devices and Circuits
(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)	Name the different types of biasing circuits and give three circuit configurations.	7M
	b)	List the three sources of instability of collector current and hence define the three stability factors.	7M

OR

2.	a)	Explain thermal instability. What are the factors affecting the stability factor?	6M
	b)	What is a load line? Discuss how the load line can be drawn on the I_C versus V_{CE} characteristics for a bipolar transistor amplifier.	8M

UNIT–II

3.	a)	Draw the VI characteristics of an N-channel JFET and explain the working of JFET.	8M
	b)	Define Dynamic drain resistance r_d and amplification factor μ for a JFET.	6M

OR

4.	a)	Draw the two biasing circuits for an enhancement type MOSFET and explain	8M
	b)	How do you set a Q-point in a self-biased JFET?	6M

UNIT–III

5.	a)	With a neat circuit diagram, explain the working of a transistor amplifier.	8M
	b)	Discuss the merits and limitations of common base amplifier.	6M

OR

6.		Derive the expressions for input resistance, output resistance and voltage gain of an emitter follower circuit.	14M

UNIT–IV

7.	a)	What are the advantages of FET amplifier over BJT amplifier?	8M
	b)	The gain of a certain FET amplifier with a source resistance of zero is 25. Determine the value of drain resistance, if the transconductance is 5500μs.	6M

OR

8.	a)	If properly biased, FET will act as a voltage controlled voltage source, justify.	6M
	b)	A certain FET has a transconductance of 2500μs. with an external drain resistance of 2k , find the value of ideal voltage gain.	8M

UNIT–V

9.	a)	What are the applications of Tunnel diode?	6M
	b)	Write a note on LED.	8M

OR

10.	a)	In what respect is an LED different from an ordinary PN junction diode? State applications of LED.	8M
	b)	What is the working principles of schotkey diode?	6M

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Code: 7GC22

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020

Engineering Chemistry

(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) What are boiler troubles? How are they caused? Give suggestions to minimize the troubles. **7M**
    b) What is the principle of EDTA titration? Briefly describe the estimation of hardness of water by EDTA method. **7M**

OR

2. a) What is break point chlorination? State its significance. **7M**
    b) Write brief account on Priming and foaming. **7M**

UNIT–II

3. a) What is meant by molar Conductance and Equivalent conductance? Write their Units? **7M**
    b) Explain the composition, working and applications of Ni-Cd cell **7M**

OR

4. a) Write a note on the mechanism of hydrogen evolution type of wet corrosion. **7M**
    b) Explain rusting of iron with the help of electrochemical theory of corrosion **7M**

UNIT–III

5. Write a note on
    (a) Degree of polymerization.
    (b) Functionality.
    (c) Tacticity of polymer **14M**

OR

6. a) Write the characteristics of co-polymerization **7M**
    b) Write a note on polydispersive index **7M**

UNIT–IV

7. a) Write a note on synthesis of petrol by Fischer Tropsch's method. **7M**
    b) What are the characteristics of a good fuel? **7M**

OR

8. What is the main raw material for the metallurgical coke? Describe the Otto Hoffmann's method of manufacture of metallurgical coke. How do you recover the byproducts in this method? **14M**

UNIT–V

9. a) What is the significance of flash & fire point, cloud & pour point of a good lubricant? **7M**
    b) Write functions of lubricants **7M**

OR

10. Describe the manufacture of Portland cement by wet method with a neat labelled diagram of rotary kiln. **14M**

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Code: 7GC24

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020

Engineering Mathematics-II

(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) Trace the curve $r = a(1 - \cos_n)$.   7M

    b) Evaluate the integral by changing the order of integration $\int_0^1 \int_{x^2}^{2-x} xy\,dx\,dy$.   7M

OR

2. a) Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\,dx\,dy$ by changing to polar coordinates.   7M

    b) Evaluate $\int_0^1 \int_0^{1-z} \int_0^{1-x-y} x + y + z\,dx\,dy\,dz$ 7M

UNIT–II

3. a) Find the Laplace Transform of sin2t sin3t   7M

    b) Find the Laplace Transform of $\dfrac{\cos at - \cos bt}{t}$ 7M

OR

4. a) Evaluate $\int_0^\infty e^{-2t} \sin^3 t\,dt$ 7M

    b) Find the Laplace Transform of the periodic function defined by the triangular wave

    $f(t) = \begin{cases} t & ; 0 \le t \le 1 \\ 2-t & ; 1 \le t \le 2 \end{cases}$ and $f(t+2) = f(t)$ 7M

UNIT–III

5. a) Find the inverse transform of $\dfrac{s+2}{s^2 - 4s + 13}$.   7M

    b) Find the inverse transform of $\dfrac{s^2 - 3s + 4}{s^3}$.   7M

OR

6.   Solve the differential equation $y'' + y = t,\ y(0) = 1,\ y'(0) = 2$ Using Laplace Transform   14M

UNIT–IV

7. a) Find the angle between the surface $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point $(2, -1, 2)$ 7M

    b) Evaluate $curl\ of\ \overline{V} = e^{xyz}(\overline{i} + \overline{j} + \overline{k})$ at the point $(1,2,3)$.   7M

OR

8.   Find $div\ \overline{F}$ and $curl\ \overline{F}$ where $\overline{F} = grad(x^3 + y^3 + z^3 - 3xyz)$ 14M

UNIT–V

9.   Evaluate by Green's theorem $\int_c [(x^2 - \cos hy)dx + (y + \sin x)dy]$, where 'c' is the rectangle

        with vertices $(0,0),\ (f,0),\ (f,1),\ (0,1)$.   14M

OR

10.   Verify stoke's theorem for a vector field $\overline{F} = y^3\overline{i} - x^3\overline{j}$ in the region $x^2 + y^2 \le 1,\ z = 0$.   14M

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R-17

Code: 7G523

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020
Geometrical Drawing
(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) Divide a given line of 75mm long in to TEN equal parts   7M

    b) Construct a regular Pentagon of given side 35mm.   7M

OR

2. Construct a cycloid having a rolling circle diameter as 50mm. Also draw a normal and a   14M
    tangent to a curve at a point 35mm above the base line.

UNIT–II

3. a) A point A is 25mm above the H.P & 35mm in front of the V.P and 30mm in front of P.P. Draw   8M
        its (i) front view (ii) Top view (iii) Left side view.

    b) A line AB of 50mm long is parallel to both H.P and V.P. The line is 40mm above H.P and   6M
        30mm in front of V.P. Draw the projections of the line.

OR

4. a) A line AB, 55mm long has its end A is 15mm above H.P and 20mm in front of the V.P. The   7M
        line is inclined at 45^0 to the H.P. Draw the projections.

    b) A line CD, 60mm long has its end C is 10mm above H.P and 15mm in front of the V.P. The   7M
        line is inclined at 30^0 to the V.P. Draw the projections.

UNIT–III

5. A Regular pentagonal plane of 30mm side is parallel to H.P and perpendicular to V.P. The
    plane is 15 mm above the H.P and an edge of it lies on V.P. Draw the projections of the
    plane   14M

OR

6. A Regular hexagonal plane of 25mm side is parallel to V.P and perpendicular to H.P. The
    plane is 25 mm in front of V.P and an edge of it lies on H.P. Draw the projections of the
    plane   14M

UNIT–IV

7. Draw the projections of a cylinder of base 30mm diameter and axis 50mm long, when it is
    resting on HP on its base.   14M

OR

8. Draw the projections of a pentagonal prism, base 25mm side and axis 50mm long, resting on
    one of its rectangular faces on the HP, with the axis inclined at 45^0 to the VP.   14M

UNIT–V

9. Draw the isometric projection of a circle of diameter 50mm with its plane horizontal and
    vertical   14M

OR

10. Draw the isometric projection of a cylinder of base diameter 30mm and axis 70mm long.   14M

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Code: 7G121

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020
Data Structures
(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) What is a pointer? Explain in detail about pointer arithmetic.   7M
    b) Write a program to read and display array elements using pointers   7M

OR

2. a) What is the use of command line arguments   4M
    b) Explain in detail about dynamic memory allocation functions in C.   10M

UNIT–II

3. a) Define Structures. Explain with an example how structure members are initialized and accessed   8M
    b) Explain different modes to open a file   6M

OR

4. a) Write a C Program to sort the given array in descending order using Bubble Sort. 7M
    b) Write a C program to find the given element using linear searching.   7M

UNIT–III

5. What is a stack? How it can be represented in "C" using arrays?   14M

OR

6. Write a C Program to perform the following operations on a queue
    i) Insert   ii) Delete   14M

UNIT–IV

7. What is a Singly Linked List.? Explain different operations of a singly linked list with suitable examples.   14M

OR

8. Write C functions to perform the following operations:
    i. Create a circular singly linked list
    ii. Display Circular singly linked list   14M

UNIT–V

9. Define binary search tree. Explain with example deletion of an element from a binary search tree.   14M

OR

10. Define Graph and describe various representations of a graph with suitable examples. 14M

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