Hall Ticket Number :										

R-17

Code: 7G321

I B.Tech. II Semester Supplementary Examinations December 2022

Electronic Devices and Circuits

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. Design a fixed bias circuit and explain why this circuit is unstable, if the transistor is replaced by another of the same type? 14M

OR

2. a) Draw a voltage divider bias circuit and derive an expression for its stability factor. 7M

   b) Name the different types of biasing circuits and give three circuit configurations. 7M

UNIT–II

3. Explain the principle of MOSFET in depletion mode with neat sketches and output characteristics. 14M

OR

4. a) Design a source bias circuit of JFET and explain how it is going to provide solid Q-point with current source bias. 6M

   b) Design a biasing circuit for depletion type MOSFET with required parameters and compare the same with enhancement type MOSFET. 8M

UNIT–III

5. Draw the circuit diagram of common base amplifier and derive the expressions for current gain and voltage gain. 14M

OR

6. 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

UNIT–IV

7. Design a source follower circuit with Rg=100MΩ, Rs=10kΩ and gm=8000μs. and also find the input and output resistance of the circuit. 14M

OR

8. a) A FET amplifier has gm = 2.5mA/V and rd=500kΩ. The load resistance is 10kΩ.find the value of voltage gain. 8M

   b) What are the advantages of FET amplifier over BJT amplifier? 6M

UNIT–V

9. a) What is a UJT? How does it differ from FET? 7M

   b) The 2N5431 UJT has a rating of Ƞ=0.8(max). Determine the maximum value of Vp for the device when it is being used in the circuit with V_{BB}=+18V. take V_D=0.7V. 7M

OR

10. a) What is the working principles of schotkey diode? 6M

    b) Write a note on LED. 8M

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Hall Ticket Number :										

R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations December 2022

Engineering Mathematics-II

(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)

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UNIT–I

1. Change the order of integration in $\int_0^1 \int_x^{\sqrt{2-x^2}} \frac{x}{\sqrt{x^2+y^2}}\,dy\,dx$ and hence evaluate it. 14M

OR

2. a) Change of order of integration and evaluate $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y}\,dx\,dy$ 7M

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

UNIT–II

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

   b) Obtain the Laplace Transform of $f(t)=\begin{cases}(t-1)^2 & ;\ t>1\\ 0 & ;\ 0<t<1\end{cases}$ 7M

OR

4. a) Find the Laplace Transform of $\frac{\mathrm{Cos}\,at-\mathrm{Cos}\,bt}{t}$ 7M

   b) Find the Laplace Transform of t^2e^{-3t}. 7M

UNIT–III

5. Using Convolution Theorem, Find $L^{-1}\left\{\frac{s^2}{(s^2+4)(s^2+9)}\right\}$ 14M

OR

6. a) Find the inverse transform of $\frac{1}{s(s^2+a^2)}$. 7M

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

UNIT–IV

7. Show the vector $(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ is irrotational and find it's scalar potential. 14M

OR

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

   b) Prove that $div\,curl\,\bar{F}=0$ 7M

UNIT–V

9. Verify Green's Theorem in the plane for $\int_c [(3x^2-8y^2)dx+(4y-6xy)dy]$ where 'c' encloses the region bounded by $y=\sqrt{x}$ and $y=x^2$ 14M

OR

10. Verify stoke's theorem for a vector field $\bar{F}=(x^2+y^2)\bar{i}-2xy\,\bar{j}$ taken round the rectangle bounded by the lines $x=\pm a,\ y=0,\ y=b$. 14M

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Hall Ticket Number :										

R-17

Code: 7GC22

I B.Tech. II Semester Supplementary Examinations December 2022

Engineering Chemistry

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

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

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Marks

UNIT–I

1. a) Describe the estimation of hardness of water by EDTA method. 8M
   b) What are boiler troubles? Describe scale and sludge. 6M

OR

2. Describe the process of water treatment by ion exchange method. 14M

UNIT–II

3. a) Differentiate the Primary and secondary batteries 7M
   b) Describe the chemistry of Dry Cell. 7M

OR

4. a) Write short notes on i) electrode ii) electrolyte iii) salt bridge. 6M
   b) What are conductometric titrations? Describe strong acid Vs Strong base titration. 8M

UNIT–III

5. a) Illustrate the conducting mechanism of poly-acetylene 7M
   b) Discuss the differences between Thermoplastics and Thermo settings 7M

OR

6. Describe the processing of Natural rubber. What are its disadvantages? 14M

UNIT–IV

7. a) Explain the process of Flue gas analysis by Orsat's apparatus. 7M
   b) Write a note on a) Octane Number b) Cetane Number. 7M

OR

8. Describe the manufacture of Coke by Otto Hoffmann by product Oven. Also explain the recovery of by products. 14M

UNIT–V

9. Describe the manufacture of Portland cement. 14M

OR

10. a) What are lubricants Describe any two properties of lubricants. 7 M
    b) Define refractories. Describe their classification with examples. 7 M

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Hall Ticket Number :										

R-17

Code: 7G523

I B.Tech. II Semester Supplementary Examinations December 2022

Geometrical Drawing

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Construct a regular Hexagon of given side 30mm. 7M

   b) Divide a given line of 75mm long in to TEN equal parts 7M

OR

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

UNIT–II

3. A line AB of 50mm long is parallel to both H.P and V.P. The line is 40mm above H.P and 30mm in front of V.P. Draw the projections of the line. 14M

OR

4. One end A of a line AB, 75mm long is 20mm above the H.P. and 25mm in front of the V.P. The line is inclined at 30^0 to the H.P. and the top view makes 45^0 with the V.P. Draw the projections of the line and find the true inclinations with the vertical plane. 14M

UNIT–III

5. An equilateral triangular plane ABC of 30mm side is parallel to V.P & perpendicular to H.P and 25mm away from V.P. Draw its projections when one of its sides is (i) Parallel to H.P (ii) Perpendicular to H.P (iii) inclined at 45^0 to the HP. 14M

OR

6. A square plane of side 40mm has its surface parallel to VP and perpendicular to HP. Draw its projections when one of the sides is inclined at 30^0 to HP. 14M

UNIT–IV

7. A cylinder of base diameter 40mm and axis 70mm long lies on a point of its base such that its axis is 30^0 inclined to HP and 45^0 to VP. Draw its projections. 14M

OR

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

UNIT–V

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

OR

10. Convert the following orthographic view in to isometric view as shown in Fig.2

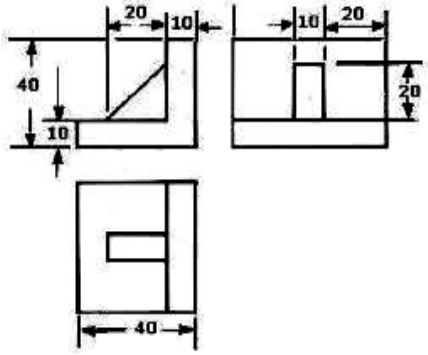

Fig.2 (All dimensions are in 'mm') 14M

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Hall Ticket Number :										

R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations December 2022

Data Structures

(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)

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UNIT–I

1. a) Write a program to perform addition of array elements using pointer to array. 7M

   b) Explain the declaration of pointers and pointer to pointer with examples. 7M

OR

2. a) Explain dynamic memory allocation functions in C in detail. 7M

   b) What is the use of command line arguments 7M

UNIT–II

3. a) Write a program for sorting given numbers using selection sort technique 7M

   b) Write an algorithm for Binary search? Validate it with suitable data set? 7M

OR

4. Write a C program that defines a structure **employee** containing the details such as **empno, empname, department name and salary**. The structure has to store 20 employees in an organization. Use the appropriate method to define the above details and define a function that will display the contents? 14M

UNIT–III

5. Write an algorithm to convert a given infix expression into prefix expression. 14M

OR

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

UNIT–IV

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

OR

8. What are different types of linked list? Write a C function to count number of elements present in single linked list. 14M

UNIT–V

9. State binary search tree property. And construct the binary search tree for the following keys: G , K, L ,R, A, C, T, F, J, T, Y, E. 14M

OR

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

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