Hall Ticket Number :										

R-17

Code: 7G321

I B.Tech. II Semester Supplementary Examinations February 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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Marks

UNIT–I

1. a) Explain thermal instability. What are the factors affecting the stability factor?
   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.

OR

2. a) Compare the relative stability of (i) emitter bias and fixed bias circuit, (ii) emitter bias and voltage divider bias circuits.
   b) How do you select a heat sink for a given circuit and what are its limitations?

UNIT–II

3. a) List the advantages and disadvantages of FET over bipolar transistors.
   b) What are the biasing schemes available to achieve the required bias in a JFET? Explain any one of them.

OR

4. a) Bring out the relation between drain resistance, amplification factor and transconductance.
   b) A JFET has parameters of $V_{GS(off)}$= -6V and I_{DSS} = 3mA. Plot the transconductance curve for the device using V_{GS} values of 0V, -1V, -3V, -5V and -6V.

UNIT–III

5. a) What are the unique features of CC amplifier circuit?
   b) What is the function of emitter by pass capacitor? If removed how it effects the response?

OR

6. a) Draw the equivalent circuit for CE and CC configuration subject to the restoration that the input is open circuited. Show that the output impedances of the two circuits are identical.
   b) The voltage gain of an amplifier decreases at 20dB/decade above 100kHz,if the mid frequency gain is 80dB, what is the value of the voltage gain at 2MHz?

UNIT–IV

7. a) What are the advantages of common drain amplifier over common gate amplifier and also give limitations.
   b) A FET amplifier has gm = 2.5mA/V and rd=500kΩ. The load resistance is 10kΩ.find the value of voltage gain.

OR

8. a) Draw the small signal equivalent circuit of FET amplifier in CD connection and derive the equation for voltage gain, input impedance and output impedance.

UNIT–V

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

OR

10. a) discuss the VI characteristics of SCR.
    b) Discuss the two transistor analogy of a SCR.

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Hall Ticket Number :										

R-17

Code: 7GC22

I B.Tech. II Semester Supplementary Examinations February 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) Explain the process of a phosphate, carbonate and sodium aluminate conditioning of boiler feed water 7M
   b) Give detailed procedure for the determination of dissolved oxygen in water. 7M

OR

2. a) Write short notes on
      i) Scale and sludge
      ii) Caustic embrittlement 7M
   b) Discuss in brief the boiler corrosion. How is it controlled? 7M

UNIT–II

3. 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

OR

4. Give reasons for the following
   (i) Corrosion of water-filled tank occurs below the waterline
   (ii) A Copper equipment should not possess a small Steel bolt 14M

UNIT–III

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

OR

6. a) Explain Chain polymerization and Step growth polymerization with examples. 7M
   b) Discuss the functions of various ingredients used in the compounding of rubber 7M

UNIT–IV

7. a) Write short note on octane number and cetane number. 7M
   b) Compare the liquid fuels with gaseous fuels. 7M

OR

8. a) Describe the Production and uses of water gas and Biogas. 7M
   b) What is knocking? Describe how we can minimize knocking? 7M

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. What is meant by Lubrication Process? Describe thick-film Lubrication and thin-film Lubrication. 14M

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Hall Ticket Number :										

R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations February 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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Marks

UNIT–I

1. a) Trace the curve $a y^2 = x^2\left(a^2 - x^2\right)$ 7M

   b) Change the order of integration in $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 dy\, dx$ and hence evaluate. 7M

OR

2. a) Trace the curve $y^2\left(x-a\right) = x^2\left(x+a\right)$ 14M

UNIT–II

3. a) Find the Laplace Transform of $t\,e^{-t}\,\mathrm{Sin}\,t$ 7M

   b) Find the Laplace Transform of $\mathrm{Cos\,h}^2\,2t$ 7M

OR

4. a) Find the Laplace Transform of $\int_0^t \frac{\sin t}{t} dt.$ 7M

   b) Evaluate $\int_0^\infty t\,e^{-2t}\,\mathrm{Cos}\,t dt$ 7M

UNIT–III

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

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

OR

6. Find $L^{-1}\left\{\frac{2s^2-6s+5}{s^3-6s^2+11s-6}\right\}$ 14M

UNIT–IV

7. a) Find the angle between the surface $x^2+y^2+z^2=12$ and $x^2+y^2-z=12$ at the point $(2,2,2)$ 7M

   b) Show that $\nabla^2\left(\frac{1}{r}\right)=0$ 7M

OR

8. a) Show that $div\left(grad\ r^n\right)=n(n+1)r^{n-2}$ 7M

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

UNIT–V

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

OR

10. Verify Divergence thermo for $\bar{F}=\left(x^2-yz\right)\bar{i}+\left(y^2-zx\right)\bar{j}+\left(z^2-xy\right)\bar{k}$ taken over the rectangular parallelepiped $0\le x\le a$, $0\le y\le b$, $0\le z\le c$ 14M

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Hall Ticket Number :										

R-17

Code: 7G523

I B.Tech. II Semester Supplementary Examinations February 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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Marks

UNIT–I

1. a) Construct an ellipse with major axis 120mm and minor axis 80mm by using Concentric circles method. 7M

   b) Construct an ellipse with major axis 100mm and minor axis 60mm by using Oblong method. 7M

OR

2. Show by means of a drawing when the diameter of the rolling circle is equal to the radius of the base circle, the hypocycloid is a straight line. Take the diameter of the rolling circle equal to 40mm. 14M

UNIT–II

3. Draw the projections of a line BC, 75mm long in the following positions
   i) Parallel and 30mm above HP and in the VP.
   ii) Inclined at 45º to the VP, in the HP and its one end in the VP 14M

OR

4. The top view of a 75mm long line AB measures 65mm, while the length of its front view is 50mm. It's 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

UNIT–III

5. A semicircular plate of 80 mm diameter has its straight edge in the VP and inclined at 45^0 to the HP. The surface of the plate makes an angle of 30^0 with the VP. Draw its projections. 14M

OR

6. Draw the projections of a circle of 50mm diameter, having its plane vertical and inclined at 30^0 to the VP. Its centre is 30mm above the HP and 20mm in front of the VP. 14M

UNIT–IV

7. A hexagonal pyramid of side of base 25 mm and axis 60 mm long is resting on an edge of the base on H.P. Draw the projections of the solid, when the axis makes an angle of 45^0 with V.P and the base of the solid is nearer to the V.P. 14M

OR

8. Draw the projections of a cylinder of base 30 mm diameter and axis 40 mm long, which lies on H.P on a point of its rim, with its axis inclined at 30^0 to H.P. The top view of the axis is perpendicular to V.P. 14M

UNIT–V

9. Draw the orthographic views of the following Fig. 1. All dimensions are in mm.

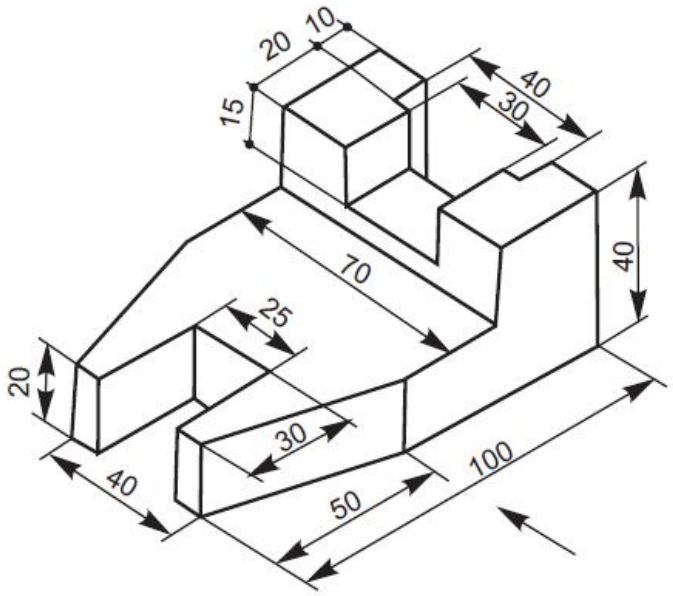

Fig. 1. 14M

OR

10. a) Draw an isometric drawing of a cone with 40 mm diameter of the base and a 55mm long axis, when it is resting on its base. 7M

    b) Draw the isometric view of a hexagonal prism, with side of base 25 mm and axis 60mm long. The prism is resting on its base on H.P, with an edge of the base parallel to V.P. 7M

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Hall Ticket Number :										

R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations February 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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Marks

UNIT–I

1. a) Using pointers write a C program which finds the maximum among the list of elements. 10M
   b) Write a C program to swap two numbers using pointers. 4M

OR

2. a) What is a pointer? What are the features of pointers? Write a C program to print address of a variable 7M
   b) Explain dynamic memory allocation functions in C in detail. 7M

UNIT–II

3. 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

OR

4. a) Define Structures. Explain with an example how structure members are initialized and accessed 7M
   b) Write a C program to copy the contents from one file to another file. 7M

UNIT–III

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

OR

6. a) What is Data Structure? Explain in detail about different type of data structures. 7M
   b) Write the steps for evaluating postfix expression 7M

UNIT–IV

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

OR

8. Write a C program to implement the following operations on a singly Linked List
   i) Insert at beginning ii) deletion at end iii)Traversing a List 14M

UNIT–V

9. a) Define and describe the terms: Tree, Binary Tree, Complete Binary Tree and Degree of a tree. 7M
   b) Draw a complete undirected graph having five nodes. 7M

OR

10. Construct Binary search tree for the following elements: 67, 12, 45, 98, 80, 73, 7, 120, 85, 30, 42 then Delete 73, 67, 12, 98. 14M

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