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R-15

Code: 5G121

I B.Tech. II Semester Supplementary Examinations March 2021

C Programming and 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)

UNIT-I

- 1. a) Write a C program to access elements of an array using pointer.
- b) Explain the concept of pointers to pointers.

OR

- 2. a) Define pointer and explain about pointer arithmetic.
- b) List the four dynamic memory allocation functions in C and give their syntax with examples.

UNIT-II

- 3. a) Explain with an example about nested structures.
- b) Explain any four standard library functions for files in C.

OR

- 4. a) Give the tracing of selection sort algorithm for the data [5, 1, 7, 8, 2, 3, 4, 6] to be sorted in ascending order.
- b) Differentiate between structure and union.

UNIT-III

- 5. a) Write a C program to implement operations of a dynamic queue.(Use pointers)
- b) Write a program to implement stack operations using pointers.

OR

- 6. Convert the following infix expressions to postfix expressions.
i) $A / B * C - D$ ii) $(A - B) * (C * D)$ iii) $A + B + C * D$

UNIT-IV

- 7. a) Explain the advantages and disadvantages of linked lists over arrays.
- b) Write the applications of circular linked list.

OR

- 8. a) Write a C program for insertion operation in a singly linked list.
- b) Write C functions for deletion operations in doubly linked list.

UNIT-V

- 9. a) Define the following terms of a graph.
i) Undirected graph ii) In degree iii) Digraph
- b) Explain different types of traversals in a tree.

OR

- 10. Create a binary search tree by inserting following elements into an empty BST: [6, 4, 5, 3, 10, 8, 11].

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R-15

Code: 5G321

I B.Tech. II Semester Supplementary Examinations March 2021

Electronic Devices and Circuits-II

(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)

UNIT-I

- a) Draw a BJT fixed bias circuit and derive the expression for the stability factor S.
b) Differentiate stabilization and compensation techniques.

OR

- The h-parameters of a transistor used in a CE circuit are $h_{ie}=1K$, $h_{re}=10 \times 10^{-4}$, $h_{fe}=50$, $h_{oe}=100K\Omega$. The load resistance for the transistor is $1K$ in the collector circuit. Determine R_i , R_o , A_V and A_I in the amplifier stage (Assume $R_s=1000$).

UNIT-II

- a) Write short notes on different types of FET biasing?
b) Explain how the JFET is used as Voltage controlled device?

OR

- a) Draw the small signal model of JFET in all configurations.
b) A self-biased p-channel JFET has a pinch-off voltage of $v_p=5V$ and $I_{DSS}=12mA$. The supply voltage is $12v$ determine the values of R_D and R_S so that $I_D=5mA$ and $V_{DS}=6v$.

UNIT-III

- a) How can a DC equivalent circuit of an amplifier be obtained?
b) Compare the characteristics of the different configurations of BJT amplifiers

OR

- For a CB transistor amplifier driven by a voltage source of internal resistance $R_s=1200$, the load impedance is a resistor $R_L=1000$. The h-parameters are $h_{ib}=22$, $h_{rb}=3 \times 10^{-4}$, $h_{fb}=-0.98$ and $h_{ob}=0.5\mu A/V$. Compute the current gain A_I , The input impedance R_i , Voltage gain A_V , overall voltage gain A_{VS} , Overall current gain A_{IS} , output impedance Z_o , and power gain A_P using exact analysis and approximate analysis.

UNIT-IV

- Explain the analysis of low frequency response of RC coupled amplifiers.

OR

- Compare different types of coupling.

UNIT-V

- Explain the principle of operation of the following diodes:
 - PIN diode
 - LED diode
 - Photo diode

OR

- a) Write short notes on Schottky Barrier Diode.
b) With a neat sketch explain the characteristics of SCR.

Code: 5G523

I B.Tech. II Semester Supplementary Examinations March 2021

Engineering Drawing-II

(Common to EEE , ECE, CSE & IT)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. Draw the projections of a circle 60 mm diameter resting on V.P on a point on the circumference. The plane is inclined at 45° V.P and perpendicular to H.P. The center of the plane is 45 mm above H.P.

OR

2. A regular hexagonal plane of 35mm side has a corner at 20mm from V.P and 50mm from H.P. Its surface is inclined at 45° to V.P and perpendicular to H.P. Draw the projections of the plane.

UNIT-II

3. Draw the projections of a cone its base 50mm diameter and axis 80mm long. The cone is lying on the H.P by one of its generators with its axis parallel to the V.P.

OR

4. Draw the projections of a pentagonal prism of base 25mm side and axis 50mm long, when it is resting on one of its rectangular faces on H.P. The axis of the solid is inclined at 45° to V.P.

UNIT-III

5. An equilateral triangular prism of side of base 25mm and axis 50mm long is resting on an edge of its base on H.P. The face containing that edge is inclined at 30° to H.P. Draw the projections of the prism, when the edge on which the prism rests is inclined at 60° with V.P.

OR

6. A pentagonal prism is resting on one of the corners of its base on H.P. The longer edge containing that corner is inclined at 30° to H.P and the vertical plane containing that edge is inclined at 45° to V.P. Draw the projections of the prism of side of the base is 30mm and height is 80mm.

UNIT-IV

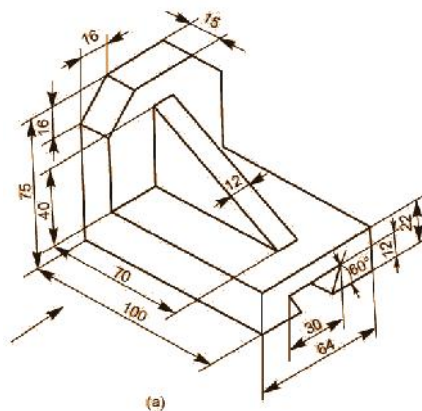
7. Draw the isometric projection of a hexagonal plane of side 25mm ,assuming the surface of the plane to be (i) parallel to V.P and (ii) parallel to H.P

OR

8. Draw the isometric view of a circle of 50mm diameter , when it is (i) parallel to V.P and (ii) parallel to H.P.

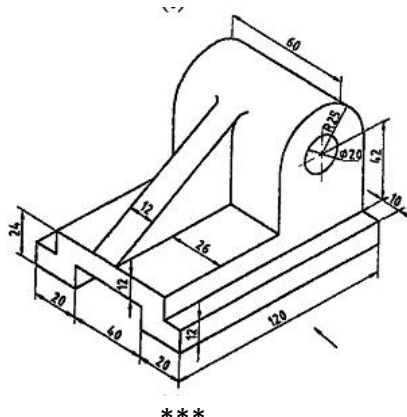
UNIT-V

9. The Figure shows a machine block. Draw its (i) Front view (ii) Top view (iii) Side view. Assume all the dimensions are in 'mm '.



OR

10. The Figure shows an object. Draw its (i) Front view (ii) Top view (iii) Side view. Assume all the dimensions are in 'mm '.



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Code: 5GC22

I B.Tech. II Semester Supplementary Examinations March 2021

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)

UNIT-I

1. a) Explain the process of a phosphate, carbonate and sodium aluminate conditioning of boiler feed water
b) Give detailed procedure for the determination of dissolved oxygen in water.

OR

2. Describe the principle and procedure involved in the zeolite process used for the treatment of water. Give its advantages over other methods.

UNIT-II

3. a) What is the principle underlying conductometric titration? Discuss the titration curve obtained for a titration between HCl and NaOH.
b) Explain the construction and working of H₂-O₂ fuel cell with neat sketch and chemical reactions

OR

4. Explain the following
(a) Nickel electrolessplating
(b) Copper electroplating

UNIT-III

5. a) What is vulcanization of rubber? Explain why natural rubber needs vulcanization. How is it carried out?
b) Write a note on the classification of polymers with examples

OR

6. Describe the method of preparation, properties & applications of the following
(i) polyphosphaes
(ii) Buna-S

UNIT-IV

7. a) Explain various steps involved in refining of petroleum
b) Describe how synthetic petrol is synthesized from Bergius process

OR

8. With a neat diagram describe the Orsat's gas analysis method. What are the special precautions to be taken in the measurement?

UNIT-V

9. a) What is cement? How do you classify the cement?
b) How are lubricants classified? Give examples
10. a) Define refractory? Discuss the criteria of good refractory materials
b) Explain the hardening and setting of cement using the chemical equations

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R-15

Code: 5GC24

I B.Tech. II Semester Supplementary Examinations March 2021

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)

UNIT-I

1. Change of order of integration and evaluate $\int_0^{\infty} \int_x^{\infty} \frac{e^{-y}}{y} dx dy$

OR

2. Evaluate $\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z} dz dy dx$

UNIT-II

3. Find the Laplace Transform of $\frac{\cos 2t - \cos 3t}{t}$

OR

4. State and Prove the convolution Theorem of Laplace Transform

UNIT-III

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

OR

6. Solve the differential equation $y'' + 3y' + 2y = e^{-t}$ given that $y(0) = 0$, $y'(0) = 1$ using Laplace Transform

UNIT-IV

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

OR

8. Prove that $\nabla r^n = nr^{n-2}\bar{r}$ where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$ and $r = |\bar{r}|$

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 $y = x^2$

OR

10. Verify by Green's Theorem for $\int_c [(xy + y^2)dx + x^2dy]$ where 'c' is bounded by $y = x$ and $y = x^2$
