Hall Ticket Number :										

R-17

Code: 7G321

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

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)

****

UNIT–I

1. a) Compare CB CE and CC Configurations of a BJT. 7M

   b) Explain DC load line analysis of a transistor. 7M

OR

2. a) Find the stability factor of a fixed bias silicon transistor with the following specifications: V_{CC} = 9V, R_C = 3 K Ohms, R_B = 8 K Ohms, ß=50, and V_{BE}=0.7 V. 7M

   b) What is meant by operating point of a Transistor? Explain its significance in amplification. 7M

UNIT–II

3. With neat circuit diagram explain the principle of operation of JFET. Find out Transconductance of Common Source Configuration having its drain resistance r_d = 20 K Ohms and Amplification factor is 40. 14M

OR

4. a) Explain the operation of N channel MOSFET with necessary diagrams. 7M

   b) Explain Source self bias of a FET. 7M

UNIT–III

5. a) Draw and explain AC and DC equivalent circuits of an amplifier. 7M

   b) What are the various parameters of an amplifier? Explain the significance of Input resistance. 7M

OR

6. a) Draw the input and output characteristics of single stage CE amplifier. Explain how h-parameters can be evaluated from them. 7M

   b) Explain the role of C_E , C_B and C_C capacitors in an amplifier. 7M

UNIT–IV

7. a) Explain the FET small signal model with necessary equations and circuit diagram. 7M

   b) Derive expressions for Voltage gain, Input and Output admittances of Common Drain FET amplifier. 7M

OR

8. a) Why biasing is required, briefly explain how JFET can be biased. 7M

   b) Compare A_V ,Z_I and Z_O of Common Drain and Common Source FET amplifiers. 7M

UNIT–V

9. a) Explain the principle of operation of SCR. 4M

   b) Write short notes on i) Shottky Diode ii) Photo Transistor. 10M

OR

10. a) Draw the circuit symbol of a Varactor diode and explain its operation. 6M

    b) Draw the symbol, construction and equivalent circuit of UJT and explain its operation. 8M

*****

Hall Ticket Number :										

R-17

Code: 7GC22

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

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) Evaluate the hardness (permanent & temporary) of a water sample whose 25ml consumed 10 ml of 0.01M EDTA. 25 ml of boiled sample required 4 ml of same EDTA. 8M

   b) Explain caustic embrittlement type of boiler corrosion 6M

OR

2. a) A sample of water on analysis is found to contain 78 mg/L of $Mg(HCO)_3$, 146mg/L of $Ca(HCO)_3$, 58 mg/L of $MgCl_2$ and 106 mg/L of $CaSO_4$. Calculate the permanent & temporary hardness of the water. 7M

   b) Describe the Zeolite process of water treatment. Mention the advantages and disadvantages of this method. 7M

UNIT–II

3. a) At what concentration of Ag^+(aq), will the e.m.f. of the Cu-Ag cell be zero at 25^0C, if concentration of Cu^{2+}(aq) is 0.1M? Given $E^0_{(Cu^{2+},cu)} = 0.34V, E^0_{(Ag^+,Ag)} = 0.79V.$ 7M

   b) What are fuel cells? Explain the working of Methanol-oxygen fuel cell. 7M

OR

4. a) Describe the process of electroplating of Nickel. 7M

   b) Discuss the factors affecting corrosion. 7M

UNIT–III

5. a) Write a note on synthesis of Nylon 6, 6 from 1,3-butadiene and uses of it. 7M

   b) Differentiate between addition polymerization & condensation polymerization. 7M

OR

6. a) Describe the synthesis, application & mechanism of conducting nature of polyacetylene. 7M

   b) Write a note on thermoplastics and thermosetting plastics. 7M

UNIT–IV

7. a) Write a note on octane and cetane rating of fuel. How can they be improved? 7M

   b) Calculate the gross and net calorific values of a coal sample containing 75% carbon, 8% nitrogen, 10% hydrogen, 5% sulphur and 2% oxygen. 7M

OR

8. Describe the Otto Hoffmann's method of manufacture of metallurgical coke with a neat labelled diagram. How do you recover the byproducts in this method? 14M

UNIT–V

9. a) What do you mean by setting and hardening of cement? Explain with the reactions involved. 7M

   b) What are refractories? Discuss about refractoriness & RUL and briefly describe their measurement process. 7M

OR

10. a) What is Portland cement? Describe the manufacture of Portland cement by dry method with a neat labelled diagram of rotary kiln. 8M

    b) Discuss the following properties of lubricants.

       i) cloud and pour point, ii) flash and fire point, iii) Viscosity 6M

****

Hall Ticket Number :										

R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

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) What is a pointer? List out the advantages and disadvantages using a pointer. 7M
   b) Distinguish between call by value and call by reference by means of a program. 7M

OR

2. a) What is Dynamic Memory Allocation? Write syntax for malloc(), calloc() and free(). 7M
   b) Discuss command line arguments with an example. 7M

UNIT–II

3. a) Distinguish between Structure and Union and also mention their applications. 4M
   b) Explain Quick sort with the help of an example 10M

OR

4. a) Briefly explain File handling in C 10M
   b) Compare Linear search and Binary search. 4M

UNIT–III

5. a) What is stack? Specify any four applications where stacks are extensively used. 4M
   b) Write a routine to convert the following infix expression in to postfix expression: **a+b*c/(e+f*g)** 10M

OR

6. a) What is Queue? Specify any four applications where queues are extensively used. 4M
   b) Write a routine to implement circular queue. 10M

UNIT–IV

7. a) What is the difference between singly, doubly & circular linked lists? 7M
   b) Write a program to delete a node from the beginning of the linked list 7M

OR

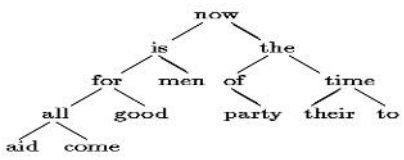
8. a) Write a program to create a singly linked list in sorted order. 7M
   b) Summarize doubly linked list. 7M

UNIT–V

9. a) Explain Array representation of Binary tree 7M
   b) Define Graph and explain various graph representations. 7M

OR

10. Write the in order, preorder, and post order sequence of nodes for the following binary tree



14M

*****

Hall Ticket Number :										

R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

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 the order of integration and evaluate $\int_0^1 \int_{x^2}^{2-x} xydxdy$ 14M

OR

2. a) Evaluate $\int_3^4 \int_1^2 \frac{xdxdy}{(x+y)^2}$ 7M

b) Evaluate $\int_0^3 \int_1^2 \int_0^{x+y} (x+y+z)dz\,dy\,dx$. 7M

UNIT–II

3. a) Find the Laplace transform of $te^{-2t}Sint$ 7M

b) Evaluate $\int_0^\infty \frac{Cos\,6t - Cos\,4t}{t} dt$ by using Laplace transforms 7M

OR

4. Express $f(t) = \begin{cases} t^2, 0 < t < 2 \\ 4t, t > 2 \end{cases}$ interms of heavisides unit step function hence find its Laplace transform. 14M

UNIT–III

5. Use convolution theorem to evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)^2}\right]$. 14M

OR

6. Solve the differential equation $y'' + y = e^{-2t}Sin\,t, y(0) = 0\ y'(0) = 0$ using Laplace Transforms. 14M

UNIT–IV

7. a) Show that $F = (e^x \cos y + yz)i + (xz - e^x \sin y)j + (xy + z)k$ is conservative over its natural domain and find potential function for it. 7M

b) Find the unit outward drawn normal to the surface $(x-1)^2 + y^2 + (z+2)^2 = 9$ at the point (3,1,-4). 7M

OR

8. Find the total work done in moving a particle in a force field $\bar{A} = 3xyi - 5zj + 10xk$ along the curve $x = t^2 + 1, y = 2t^2, z = t^3$ from $t=1$ to $t=2$. 14M

UNIT–V

9. Verify Stokes theorem for the function $\bar{f} = x^2 i + xyj$, integrated round the square in the plane $z=0$, whose sides are along the lines $x=0, y=0, x=a, y=a$. 14M

OR

10. Verify Green's theorem for $\int_C (y - Sinx)dx + Cos\,x\,dy$, where C is the plane triangle enclosed by the lines $y=0$, $x=\frac{\pi}{2}$ and $y=\frac{2}{\pi}x$. 14M

****