Code No. 15160/AICTE

FACULTY OF ENGINEERING

B.E. I-Semester (AICTE) (Civil Engineering) (Backlog) Examination, October 2021

Subject: Chemistry

Time: 2 hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.

(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.

(iii) Missing data, if any, may suitably be assume.

(4x4=16Marks)

1. (a) Explain briefly the external conditioning of water with an example.
   (b)How does the formation of $CaSO_4$/$Ca(HCO_3)_2$ affect the working of a steam boiler?
   (c)How does chlorination of potable water affect the water line system?
   (d)What are refractories? Give examples of two common refractories.
   (e)Explain glass transition temperature.
   (f) Mention the criteria for adhesive action of materials.
   (g) Give any two precautions for the storage of explosives.

(3x18 = 54 Marks)

2(a) 200 mL of a water sample was boiled with 20mL of N/20 soda reagent. 50 mL of this water requires 8 mL of N/100 HCL for complete neutralization. The sample after boiling is filtered and the filtrate and washings were made upn with distilled water to 200 mL.100mL of this solution requires 8 mL of N/25 HCL for complete neutralization. Estimate the temporary and permanent hardness of water in ppm.
(b)Describe the various steps involved in the treatment of potable water.

3(a) Distinguish chemical and electrochemical corrosions. Explain the mechanism of electrochemical corrosion.
(b) Write a note on (i) Pitting Corrosion (ii) Electro less plating of Nickel.

4(a) Discuss the mechanism of free radical addition polymerization.
(b)How are glasses manufactured? Explain.

5(a) Classify the Adhesives.
(b) Discuss the various physical factors that influence the adhesive action.

6(a) Explain about (i) Low explosives (ii) Blasting fuses
(b)Give an account of Rocket propellants.

7(a) Explain about priming and foaming.

(b)Discuss the preparation, properties and engineering applications of PVC and Teflon.

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OU - 1607 OU - 1607

Code No. 15164/AICTE

FACULTY OF ENGINEERING

B.E. I-Semester (Except Civil) (AICTE) (Backlog) Examination, October 2021

Subject: Chemistry

Time: 2 hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.

(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.

(iii) Missing data, if any, may suitably be assume.

(4x4=16Marks)

1 (a)Differentiate between primary and secondary batteries.
(b) What do you mean by cathodic protection?
(c) Explain condensation polymerization with a suitable example.
(d) Write the compositions of LPG and CNG.
(e) What is Dulong's formula which is used for calculating calorific value?
(f) Explain concept of carbon neutrality regarding biodiesel.
(g) What is Atom economy?

(3x18 = 54 Marks)

2 (a) What is battery? Explain construction and applications of Li-ion battery
(b)Calculate the EMF of the following cell at 25^0C with the help of Nernst equation. Write the cell reactions.
Cu| Cu2+ (0.01M) Ag^+(0.01M) Ag($E^0_{Cu^{2+}}$ CU=0.334V and E0 Ag+ Ag=0.801V)

3 (a) Explain the estimation of temporary hardness of water by EDTA method.
(b)Discuss the mechanism of electrochemical corrosion.

4 (a) Explain preparation, properties and uses of PVC.
(b)Discuss conduction mechanism in poly-acetylene and its applications.

5(a) Explain concept of knocking, octane number and cetane number.
(b)Describe the classification of chemical fuels. Write characteristics of good fuels.

6(a) Explain concept and principles of green chemistry. Give one example for clean technology.
(b)Write the composition and characteristic properties of composites.

7(a)Define biodiesel. Explain preparation and application of Poly-lactic acid.
(b)Explain sacrificial anodic and impressed current cathodic protection methods.

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OU - 1607 OU - 1607

Code No. 15002/AICTE/BL

FACULTY OF ENGINEERING

B.E. I-Semester (AICTE) (Backlog) Examination, October 2021

Subject: Chemistry

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1. What is the difference between chemical and electrochemical corrosion.
2. Draw the structure of Bakelite and give two of its applications.
3. Define Reverse Osmosis.
4. What are the disadvantages of Zeolite process?
5. Define a composite material.
6. Calculate the emf of the given cell at 25^0C,Zn/Zn^{+2}(0.05M)//Cu^{+2}(0.025M)/CU. $E^0(Zn^{+2}/Zn)$= -0.76v,$E^0(Cu^{+2}/Cu)$=0.34v.
7. Write the Nernst equation and label the terms involved in it.
8. Write the structure of Kevlar and give its two uses.
9. Define atom economy and give its significance.
10. What do you understand by trans esterification?

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11(a) What is meant by reference electrode? Construct calomel electrode and write the principle and its cell Reaction.

(b)What is Corrosion? Explain the various factors influencing rate of corrosion?

12(a) What is sterilization of water? How would you achieve this by Chlorination? Discuss.

(b) A sample of water on analysis is found to contain 4mg/L $Ca(HCO_3)$, 8mg/L $CaSO_4$ And 12 mg/L $MgCl_2$. Calculate temporary, permanent and total hardness of water.

13(a) What are conducting polymers? Explain the mechanism of conduction in polyacetylene.

(b)Explain the preparation, properties and uses of Nylon 6:6 and PVC?

14(a) Define the terms HCV and LCV. Calculate LCV of fuel having 4% of hydrogen, whose gross calorific value is 8,828 K cal/kg.

(b)How coal is analyzed by proximate analysis? Explain.

15(a) Discuss the twelve principles of Green Chemistry.

(b) What are composites? Discuss the various components of them.

16(a) Describe the Lead-acid storage battery and write the reaction involved during discharging and charging processes.

(b)What is Galvanising? Discuss this with the help of a neat diagram.

17(a)Discuss the construction and working of Glass electrode.

(b)Explain the specification of potable water with reference to WHO and BIS guidelines.

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Code No. 14419/BL

FACULTY OF ENGINEERING

B.E. BRIDGE COURSE-I Semester (Backlog) Examination, October 2021

Subject: Programming in C

Time: 2 hours **Max. Marks: 75**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any seven questions. **(7x3 = 21 Marks)**

1. What is an algorithm? Write its characteristics.
2. How is memory divided in computers? Explain.
3. Write syntax and example for gets() and put().
4. Write the rules for naming an identifier.
5. Differentiate while and do-while loop.
6. Write an example to demonstrate goto statement.
7. What is a recursive function?
8. Differentiate predefined and user defined functions.
9. Write syntax and example for fopen() and fclose().
10. What is Union?

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11. Draw the block diagram of digital computer and explain the functions of various units.

12(a) Write the structure of C program. Explain the structure with the help of a C program.

(b) Explain pre-processor commands in detail.

13. Explain in detail bitwise, Relational, Logical and conditional operators with example.

14.(a) Explain three types of loops with syntax and example program.

(b) Write the syntax for switch.

15.(a) Write in detail about Automatic, External and Static Variables.

(b) Explain any four string handling functions.

16.(a) What is a structure? Write a program to create a structure for student.

(b) Write a program to demonstrate passing functions to other functions.

17.(a) Draw a flowchart to find maximum of three numbers.

(b) Write an example program to demonstrate if-else.

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Code No.14502/CBCS/BL

FACULTY OF ENGINEERING

B.E. I - Semester (CBCS) Backlog) Examination, October 2021

Subject: Computer Programming & Problem Solving

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1 Give the command to compile and link multiple source program files.

2 Determine the value of the following logical expression if a=5, b=10 and c=-6

(a) a==c || b>a b) a<b & a>c

3 Rewrite the following without using compound relations

if (number>100 || number<0)

print f("out of range");
else
sum = sum + number;

4 Differentiate while and do while loop and also give the syntax for each.

5 Define inline function with an example.

6 Explain the need for array variables. Give the syntax of an array.

7 How do an element in a two-dimensional array can be represented using pointer. Give an pointer expression.

8 Mention the limitations of get char ( ) and scan f ( ) function for reading strings.

9 Does C permits the use of arrays as structure numbers? Justify?

10 Define streams and list various streams.

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11 a) Mention the differences between an algorithm and a flow chart.

b) Which of the following arithmetic expressions are valid? If valid given the value of the expression.

(i) 25/3%2

(ii) 14%.3+7%2

12 a) Write a program that will read a positive integer and determine and print its binary equivalent.

b) Distinguish between global and extern variables.

13 a) Which is better to use a macro (or) a function? Justify

b) Write a program to merge two dimensional arrays A & B which are sorted in ascending order into a single sorted array C, that contains every item from arrays A & B in ascending order.

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14 a) Write a program using pointers to read in an array of integers and print its elements in reverse order.

b) Describe the limitations of using get char and scan f functions for reading strings.

15 What is meant by the following terms?

a) Nested structure

b) Array of structures

16 What do you mean by sorting? Mention the algorithms of bubble sort with an example.

17 a) What are the different steps followed in the program development?

b) Write a brief note on auto and static storage classes?

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FACULTY OF ENGINEERING

B.E. I - Year (Backlog) Examination, October 2021

Subject: Mathematics - II

Time: 2 Hours **Max. Marks: 75**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Solve $2xydx+\left(x^2+1\right)dy=0$.

2 Solve $x^2y'+xy=2x^2e^{x^2}$.

3 Solve $y''+9y'+14y=e^{-2x}$.

4 Solve $y''+16y=\sin 4x$.

5 Determine the nature of the singularity of the differential equation $xy''+y'+xy=0$

6 Evaluate $8P_3(x)+4P_2(x)-7P_1(x)$ as a polynomial of x

7 Evaluate $\Gamma\left(\frac{1}{2}\right)$.

8 Show that $\beta(m+1,n)+\beta(m,n+1)=\beta(m,n)$.

9 Find $L\{\sin^3 t\}$

10 Find $L^{-1}\left\{\frac{1}{s^2+8s+17}\right\}$.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 (a) Solve $y(x+y+1)dx+x(x+3y+2)dy=0$.

(b) Find the orthogonal trajectories of the family of curves $y=\frac{x}{1+cx}$.

12 (a) Solve $y'''+y''-y'-y=\cos 2x$.

(b) Solve $x^2y''-2xy'+2y=4x^3$.

13 Find the Frobenius series solution about $x=0$, of the equation

$x^2y''+xy'+\left(x^2-\frac{1}{16}\right)y=0$.

14 (a) Evaluate $\int_0^t erf(\alpha x)dx$.

(b) Evaluate $J_2'(x)$ in terms of $J_0(x)$ and $J_1(x)$.

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15 (a) Find $L\{t^3\cos t + e^{2t}\sin t\cos 3t\}$.

(b) Find $L^{-1}\left\{\frac{4s}{(s^2+4)^2}\right\}$.

16 (a) Find the general and singular solutions of the equation $y = xy' - \frac{(y')^2}{2}$.

(b) Solve $y'' + 9y = \csc 3x$ by the method of variation of parameters.

17 (a) Show that $\int_{-1}^{1} P_m(x)P_n(x)dx = 0$ if $m \neq n$.

(b) Solve $y'' + y = t,\ y(0) = 0,\ y'(0) = 1$ by using Laplace transform.

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