

B. Tech (Honours)

Class Test - II, March, 2022

(AICTE Scheme)

(Computer Science and Engineering Branch)

Fundamentals of Computational Biology

Time Allowed: 1 hour 30 minutes

Maximum Marks: 40

Minimum Pass Marks: 14

Roll No-29

- Note:
- (i) Each question contains four parts. Part (a) of each question is compulsory. Attempt any two parts from (b), (c), and (d) of each question.
 - (ii) Include diagrams and graphs wherever required.
 - (iii) The figure in the right-hand margin indicates marks.

- I. (a) What do you understand by order of a reaction? Explain with example. [4]
- (b) Write MATLAB script for creating and calling a function with an example. [8]
- (c) Write the steps involved in plotting a 2D graph using MATLAB, also write the commands for writing legends, changing the colour of graph. [8]
- (d) In the reaction $\text{H}_2\text{O}_2(aq) \rightarrow \text{H}_2\text{O}(l) + \frac{1}{2} \text{O}_2(g)$, the initial concentration of H_2O_2 is 0.2546 M, and the initial rate of reaction is $9.32 \times 10^{-4} \text{ M s}^{-1}$. What will be $[\text{H}_2\text{O}_2]$ at $t = 35 \text{ s}$? What are the units of the rate constant for a zero order, first order and second-order reaction? [8]
- II. (a) What do you understand by molecular switches? Briefly explain with an example. [4]
- (b) Discuss the different components of blood. What are the factors that determine the rheology of blood? [8]
- (c) What do you understand by Newtonian and Non-Newtonian fluids? Write down the different models of blood flow. [8]
- (d) What do you understand by tidal volume? Discuss the factors that play an important role in modelling respiration. Draw the simulink diagram for Fick's law of diffusion. [8]

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Engineering Mathematics-I

Time Allowed: 1 hour 30 minutes

Maximum Marks: 40

Minimum Pass Marks: 14

- Note: (i) Each question contains four parts. Part (a) of each question is compulsory. Attempt any two parts from (b), (c), and (d) of each question.
(ii) The figure in the right-hand margin indicates marks.

- I. (a) Verifying Green's Theorem for $F_1 = x^2 - \cos y$, $F_2 = y + \sin x$ and C is the rectangle with vertices $(0,0)$, $(\pi, 0)$, $(\pi, 1)$, $(0, 1)$. [4]
(b) What is the importance of divergence of vector field? Verified Gauss's divergence theorem and prove that $\iint [(x^3 - yz)i - 2x^2yj + 2k] \cdot n dS = \frac{a^5}{3}$, Where S is a surface of cube bounded by the plane $x=0$, $x=a$, $y=0$, $y=a$, $z=0$, $z=a$. [8]
(c) State that Milne Thomson's Method. Find the analytic function, its real part $e^{-x}\{(x^2 - y^2)\cos y + 2xy \sin y\}$ [8]
(d) Define Harmonic function. Prove that $u = \frac{\log(x^2 + y^2)}{2}$, is harmonic function. And also find its harmonic conjugate. [8]
- II. (a) State that Stoke's Theorem? Write two importance of curl of vector field. [4]
(b) Define full range Fourier series. Find Fourier series of function $f(x) = x^2$, $-\pi < x < \pi$. [8]
(c) Define Fourier series with period $2l$. Find the Fourier Series, where function

Define as

$$f(x) = \begin{cases} -1, & -3 < x < 0 \\ 0, & x = 0, \\ 1, & 0 < x < 3. \end{cases}$$

- (d) Define Fourier Series of even and odd functions. And find Fourier Series

for $f(x) = x$, $-\pi < x < \pi$.

[8]

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Environmental Science

Time Allowed: 1 hour 30 minutes

Maximum Marks: 40

Minimum Pass Marks: 14

Roll No - 23

- Note: (i) Each question contains four parts. Part (a) of each question is compulsory. Attempt any two parts from (b), (c), and (d) of each question.
(ii) The figure in the right-hand margin indicates marks.
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- I. (a) What are the different types of biodiversity? [4]
- (b) Define land degradation. Explain causes and effects of land degradation. [8]
- (c) What are the different types of natural resources? Describe forest and water resources in brief. [8]
- (d) Write short notes on Environmental Management System. [8]
- II. (a) Draw population growth curve and explain briefly. [4]
- (b) What is EIA? Explain the key elements of an EIA process. [8]
- (c) What are the stages of HIV infection? Draw and explain the transmission cycle of HIV. [8]
- (d) Write short notes on global warming and acid rain. [8]
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Class Test - II, March, 2022

(AICTE Scheme)

(Computer Science and Engineering Branch)

Learning Programming Concept using C

Time Allowed: 1 hour 30 minutes

Maximum Marks: 40

Minimum Pass Marks: 14

Roll No - 29

- Note:
- (i) Each question contains four parts. Part (a) of each question is compulsory. Attempt any two parts from (b), (c), and (d) of each question.
 - (ii) Include suitable header file/s in all your program.
 - (iii) The figure in the right-hand margin indicates marks.

I. (a) What is the output of the following program. Explain the output. [4]

```
void main () {  
    int m, n, p;  
    for ( m = 0; m < 3; m++ )  
        for ( n = 0; n < 3; n++ )  
            for ( p = 0; p < 3; p++ )  
                if ( m + n + p == 2 )  
                    goto print;  
    print:  
    printf ("%d, %d, %d", m, n, p);  
}
```

(b) Write a program to multiply two matrices and print the result in matrix form. [8]

(c) What is recursion? Write a program that calculates factorial for a given number using recursive function. [8]

(d) Explain declaration and initialization of a one-dimensional integer array. Write a function to search an element in an array. [8]

II. (a) Explain the difference between structure and union. [4]

(b) Explain Dynamic Memory Allocation using malloc(), calloc(), free(), and realloc(). [8]

(c) Explain with suitable examples the concept of call by value and call by reference and differentiate between them. [8]

(d) Write a program in C to copy the content of a file to another file. [8]

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Professional Ethics & Life Skills

Time Allowed: 1 hour 30 minutes

Maximum Marks: 40

Minimum Pass Marks: 14

Roll No - 29

- Note:
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- I. (a) Define value education? [4]
- (b) What are the morals & values required in life for dealing with people? [8]
- (c) What is the role of gratitude & forgiveness in our life? [8]
- (d) Define any Two: [8]
- a) Humility
 - b) Sympathy
 - c) Self-reliance
- II. (a) Define Society? [4]
- (b) Explain Communities with reference to change in Ancient to Modern Era? [8]
- (c) Why Security is important for any society & Community? [8]
- (d) Explain Social consciousness & responsibility for society? [8]

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Foundation of electronics

Time Allowed: 1 hour 30 minutes

Maximum Marks: 40

Minimum Pass Marks: 14

Roll No - 29

- Note:
- (i) Each question contains four parts. Part (a) of each question is compulsory. Attempt any two parts from (b), (c), and (d) of each question.
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- I. (a) Explain the Ebers-Mall model. [4]
- (b) Explain in a detail (A) Linear and non linear devices. [4]
(B) PNP transistor with input and output characteristics. [4]
- (c) Explain Fermi Dirac statistic and Boltzmann approximation to the Fermi dirac statistic. [8]
- (d) Solve A and B
- (A) Find the value of α and β for transistor having the value of $I_c = 4.85$ mA and $I_E = 5$ mA. [4]
- (B) Find the value of I_{CBO} when collector current is 5mA and base current is $30\mu A$ with $\beta = 150$. [4]
- II. (a) Derive the Poisson's equation. [4]
- (b) Explain the source follower in detail. [8]
- (c) Explain the common emitter amplifier in detail [8]
- (d) Solve A and B
- (A) Find the value of drain current if $I_{DSS} = 10$ mA, $V_{GS(\text{cut off})} = -8$ V and $V_{GS} = -2$ V. [4]
- (B) Explain the P channel D-MOSFET and drain and transfer characteristics. [4]

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Language Writing Skills

Time Allowed: 1 hour 30 minutes

Maximum Marks: 40

Minimum Pass Marks: 14

Roll No - 29

- Note:
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- I. (a) What is speaking? . [4]
- (b) Discuss the various aspect of speaking skills. [8]
- (c) What is Group Discussion? Discuss the Do's and Don'ts of Group Discussion. [8]
- (d) What is presentation? Discuss the various steps used for making a presentation. [8]
- II. (a) What is reading and its types. [4]
- (b) Discuss the elements of business letter. [8]
- (c) What are the elements of formal report writing? [8]
- (d) Discuss the importance of reading. [8]
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