B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, JANUARY 2024
II B.Tech I Semester
COMPUTER ORGANIZATION
(Common to CSE & IT)

Time: 3 hours   Max. Marks: 60

*Answer **SIX** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
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SECTION - I

1 (a) Convert the following numbers into equivalent decimal numbers
        (i) $(B65F)_{16}$ (ii) $(110101)_2$ (iii) $(165.15)_8$

   (b) Perform the following binary subtraction of X=1010110 and Y=101010
        (i) X-Y   (ii) Y+X

2 (a) Discuss the Canonical and Standard forms with examples.

   (b) Explain with examples, minterms and maxterms for three binary variables

SECTION - II

3 (a) Reduce the following Boolean Expression using K-Map
        $F(P, Q, R, S) = \sum (0, 3, 5, 6, 7, 11, 12, 15)$

   (b) Design half adder with two binary inputs and two binary outputs.

4 (a) What is encoder? Write truth table for octal-to-binary encoder and Explain it

   (b) Implement a full Subtractor circuit with a decoder and two OR gates.

SECTION - III

5 (a) Explain briefly about SR Flip-Flop

   (b) Design a 4-bit binary ripple counter with D flip-flops.

6 (a) Draw and Explain about JK flip flops.

   (b) Write about binary ripple counter with logic diagram.

SECTION - IV

7 (a) Explain the components of the Computer system in detail.

   (b) Write short notes on Instruction codes.

8 (a) Explain addressing modes with examples.

   (b) Write short notes on i) RISC ii) CISC

SECTION - V

9 (a) Explain the basic organization of micro programmed control unit.

   (b) Discuss about the concept of cache memory.

10 (a) Write about various update/write strategies in cache memory.

   (b) Distinguish between micro programmed control and hardwired control.

SECTION - VI

11 (a) With a neat sketch explain the working principle of DMA.

   (b) Describe the various hazards that might arise in a pipeline.

12 (a) Explain Arithmetic Pipeline mechanism

   (b) Write short notes on RISC Pipeline.

R-19   **Code : 19SH2101**

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, JANUARY 2024
II B.Tech I Semester

ENGINEERING MATHEMATICS - III
(Common for CE, EEE, ECE & ME)

Time: 3 hours   Max. Marks: 60

Answer SIX Questions, Choosing ONE Question from each section
All Questions carry equal marks
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SECTION - I

1 (a) Apply Gauss-Jordan method to solve the equations.
$x + y + z = 9, 2x - 3y + 4z = 13, 3x + 4y + 5z = 40.$

   (b) Apply factorization method to solve $3x + 2y + 7z = 4, 2x + 3y + z = 5, 3x + 4y + z = 7.$

2   Solve the following equations by using Gauss-Seidal iteration method.
$10x_1 - 2x_2 - x_3 - x_4 = 3; -2x_1 + 10x_2 - x_3 - x_4 = 15$
$-x_1 - x_2 + 10x_3 - 2x_4 = 27; -x_1 - x_2 - 2x_3 + 10x_4 = -9$

SECTION - II

3 (a) Find by Taylor's series method the value of y at x=0.1 and x=0.2 to four places of
decimals from $\dfrac{dy}{dx} = x^2 y - 1, y(0) = 1.$

   (b) Using Picard's method, solve $\dfrac{dy}{dx} = -xy \; with \; x_0 = 0, y_0 = 1$ up to third approximation.

4   Using R-K method of fourth order, solve for y at
$x = 1.2, 1.4 \; from \; \dfrac{dy}{dx} = \dfrac{2xy + e^x}{x^2 + xe^x}$ given $x_0 = 1, y_0 = 0.$

SECTION - III

5   Show that the function $f(z)$ defined by $f(z) = \sqrt{|xy|}$ is not analytic at the origin,
although Cauchy's Riemann equations are satisfied at that point.

6 (a) Evaluate $\displaystyle\int_{1-i}^{2+i} (2x + 1 + iy) dz$ along $(1, -i)$ to $(2, i)$.

   (b) Evaluate by using Cauchy's theorem $\displaystyle\int_C \dfrac{z^3 e^{-z}}{(z-1)^3} dz$ where C is $|z - 1| = \dfrac{1}{2}$

SECTION - IV

7 (a) Find the Laurent Series Expansion of $f(z) = \dfrac{z^2 - 1}{(z+2)(z+3)}$ for $|z| > 3$.

   (b) Expand e^z as a Taylor's series about $z=1$

8

   Using Residue Theorem, Evaluate $\displaystyle\int_{0}^{2\pi} \dfrac{1}{5 + 4\cos\theta}\, d\theta$.

SECTION - V

9 (a) Find $Z[n^2 a^n]$.

   (b) Find $Z\left[\dfrac{1}{n!}\right]$.

10 Using Z-transform, solve the difference equation
    $u_{n+2} - u_n = 2^n$ when $u_0 = 0, u_1 = 1$.

SECTION - VI

11 For the discrete probability distribution

x	0	1	2	3	4	5	6	7
f	0	k	2k	2k	3k	K^2	$2K^2$	$7K^2+k$

Find (I) k (ii) Mean (iii) Variance (iv) P(X<6) (v) P(0<X<5).

12 (a) Out of 800 families with 5 children each , how many would you expect to have (a) 3 boys (b) 5 girls © Either 2 or 3 boys . Assume equal probabilities for boys and girls.

    (b) 1. If a random variable has a poisson distribution such that P(1)=P(2), Find (I) Mean of the distribution. (ii) P(4) (iii)P(1<X<4).

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, JANUARY 2024
II B.Tech I Semester

OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CSE & IT)

Time : 3 hours   Max Marks: 60

Answer SIX Questions, Choosing ONE Question from each section
All Questions carry equal marks
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SECTION - I

1   Explain about the data types in java language with appropriate example.

2   Explain about the various control statements with example.

SECTION - II

3   Differentiate between methods and constructors.
     Explain recursion in java.

4   What is a method overloading? Explain about garbage collection in java.

SECTION - III

5   Define inheritance. What are the benefits of inheritance? What costs are associated
     withinheritance? How to prevent a class from being inherited?

6   What is a package? Explain the creation of package with example.

SECTION - IV

7   How to design and implement an interface in Java? Give an example.

8   Explain various exceptions handling mechanism in java with example.

SECTION - V

9   Explain the concept of thread priorities and thread synchronization.

10   What is a String? Explain about the various string handling functions with example.

SECTION - VI

11   Explain the delegation event model of handling events.

12   Write a java program to perform button event action.

R-19 **Code : 19ME2102**

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, JANUARY 2024
II B.Tech I Semester

BASIC MANUFACTURING PROCESSES
(Mechanical Engineering)

Time : 3 hours Max.Marks: 60

*Answer **SIX** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
* * *

SECTION - I

1   (a)   Why pattern allowances are provided on the pattern? Explain briefly different pattern allowances.

   (b)   Explain cold chamber die casting with neat line diagram.

2   (a)   Explain the shell moulding process in detail with neat stepwise diagrams. Write its applications.

   (b)   Explain the working principle, advantages and disadvantages of pressure die-casting and investment casting.

SECTION - II

3   Draw the schematic sketch of Gating system for casting. Mention the working function of each gating system elements?

4   (a)   Discuss different types of casting defects observed during the sand casting process.

   (b)   Explain the working principle and operation of Cupola furnace.

SECTION - III

5   Describe with neat sketch the various components of Oxy Acetylene gas welding equipment and explain the welding process.

6   (a)   Describe the arc welding process. What role does electrode coating play in producing a satisfactory weld?

   (b)   Classify resistance welding. Explain the working principle of Resistance welding.

SECTION - IV

7   (a)   Explain the process of MIG welding. When do you prefer this process.

   (b)   Compare and contrast TIG and MIG welding.

8   (a)   What is laser beam welding process? Explain the steps involved in the process and state it's applications.

   (b)   Discuss the causes and remedies of welding defects.

SECTION - V

9   (a)   What is the significance of recrystallization temperature in metal working? Explain how it effects the grain growth?

   (b)   Why strain hardening occurs in cold working of metals? Suggest the ways to overcome this phenomenon.

10   (a)   Distinguish between bending and forming of sheet metal.

      (b)   Discuss the process of shallow and deep drawing.

SECTION - VI

11   (a)   Explain extrusion process and discuss forward and backward extrusion processes.

      (b)   Compare and contrast foward textrusion and backward extrusion.

12   (a)   Explain working principle of drop forging and press forging. Illustrate the applications of those processes.

      (b)   Describe and specify the merits and limitations of different kinds of rolling mills.