CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024
Course Name: OPERATING SYSTEMS
(Common for CSD, AID & AIM)

Date: 05.02.2024 AN | Time: 3 hours | Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define Operating System and list the objectives of Operating System.	2 M
2.	What does the CPU do when there are no user programs to run?	2 M
3.	List out the data fields associated with process control blocks.	2 M
4.	What are the various states of a process and draw a diagram?	2 M
5.	Outline the requirements that a critical section solution should satisfy.	2 M
6.	What is Inter Process Communication? List out the calls involved in it.	2 M
7.	Define Virtual Memory.	2 M
8.	What are logical and physical addresses?	2 M
9.	What is the role of file organization module in file system architecture?	2 M
10.	List the attributes of a file.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Explain the purpose and importance of system calls in detail with examples.   10M

OR

11. B). Classify the types of system calls and explain any three types of it with its functions.   10M

12. A). Discuss how scheduling algorithms are selected for a system. What are the criteria considered?   10M

OR

12. B). Show how cooperating process can communicate each other via a message passing facility with an example.   10M

13. A). i) Explain Mutual Exclusion using semaphores.   5M
ii) Interpret Dining philosopher problem with an example.   5M

OR

13. B). How does deadlock can be avoided using banker's algorithm?   10M

14. A). Discuss the performance of demand paging. Illustrate the steps involved in handling a page fault   10M

OR

14. B). Explain any two page replacement algorithms.   10M

15. A). Explain how file management is done in Linux.   10M

OR

15. B). i) Explain about the free space management.   5M
ii) Explain in detail about the file allocation methods in operating system.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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B.Tech III Semester Supplementary Examinations February-2024
Course Name: NUMERICAL TECHNIQUES & PROBABILITY DISTRIBUTIONS
(Common for CSM, AID & AIM)

Date: 07.02.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Find an iterative formula for $\sqrt{N}, N > 0$ by Newton-Raphson method.   2 M

2. Show that $\mu = \dfrac{2+\Delta}{2\sqrt{1+\Delta}}$.   2 M

3. What is the order and error of Simpson's rule?   2 M

4. Find $y(0.2)$ if $\dfrac{dy}{dx} = \log(x+y), y(0) = 2$ with $h = 0.2$ use Euler's method.   2 M

5. Find the value of $L\left[\dfrac{\sin at}{t}\right]$.   2 M

6. Find the inverse Laplace transform of $\dfrac{2s-1}{s^2+4s+5}$.   2 M

7. A continuous random variable X has the probability density function $f(x) = kx^2e^{-x}, x > 0$, find the value of k.   2 M

8. If the random variable X which is normally distributed with mean 68 and standard deviation 2.5, then find $P(66 \leq X \leq 71)$.   2 M

9. Define Type-I error and Type – II error.   2 M

10. List any two uses of t −test.   2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Determine the positive root of $x\log_{10}x = 1.2$ lies between 0 and 1, by regula-falsi method into four decimal places.   10M

OR

11. B). Estimate the polynomial $f(x)$ to fix the following data and the value of y at $x = 5$ by using Lagrange's interpolation   10M

x	4	6	10	8
y	1	3	8	16

12. A). Divide the range in to 6 equal parts, to find $\int_4^{5.2} \log_e x \, dx$ using Trapezoidal and Simpson's rule.   10M

OR

12. B). Use Fourth order Runge-Kutta method to find $y(0.2)$, $y(0.4)$ if $\dfrac{dy}{dx} = x^3 + y, y(0) = 2$ (assume that $h = 0.2$).   10M

(P.T.O..)

13. A). Identify the Laplace transform of "triangular wave" function $f(t)$ defined by   10M

$$f(t) = \begin{cases} t & , \ if \ 0 \leq t \leq a \\ 2a - t, \ if \ a \leq t \leq 2a \end{cases} \text{ and } f(t + 2a) = f(t) \text{ for all } t.$$

OR

13. B). Solve $y'' + 2y' - 3y = \sin t$, given $y = y' = 0$ at $t = 0$ using Laplace transform.   10M

14. A). A random variable X has the following probability function: 10M

$X = x_i$	0	1	2	3	4
$P(X = x_i)$	k	$3k$	$5k$	$7k$	$9k$

determine (i) the value of k and   (ii)$P[0 < X < 4]$ and   (iii) $P[X \geq 3]$.

OR

14. B). If X is normally distributed with mean 8 and variance 16, estimate the value of   10M
(i) $P(5 \leq X \leq 10)$ (ii) $P(10 \leq X \leq 15)$ (iii) $P(X \geq 15)$.

15. A). Before an increase in excise duty on tea, 800 people out of a sample of 1000 were   10M
consumers of tea. After the increase in duty, 800 people were consumers of tea in a
sample of 1200 persons. Test whether there is significant decrease in the consumptions of
tea after the increase in duty.

OR

15. B). Two samples of size 9 and 8 gave the sums of squares of deviations from their respective   10M
means equal to 160 and 91 respectively. Can they be regarded as drawn from the same
normal population?

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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B.Tech III Semester Supplementary Examinations February-2024
Course Name: COMPUTER ORGANIZATION & ARCHITECTURE
(Common for CSE, IT, CSC, CSM, AID & AIM)

Date: 09.02.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define computer organization of a digital computer.	2 M
2.	Write Basic symbols for register transfer.	2 M
3.	Differentiate between restoring and non-restoring division algorithm.	2 M
4.	Represent the number $(+37.8)_{10}$ as a floating point binary number with normalized fraction mantissa 16 bits and exponent 8 bits.	2 M
5.	What is the need of I/O interface?	2 M
6.	Why does DMA have priority over the CPU when both request a memory transfer?	2 M
7.	Define pipelining.	2 M
8.	List the pipeline hazards.	2 M
9.	What is cache memory?	2 M
10.	What is meant by memory interleaving?	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).   i) Explain about Bus and Memory Transfer.   5M
         ii) Explain about Computer instructions.   5M

OR

11. B).   i) Describe Instruction cycle in computer system.   5M
          ii) A Computer uses a memory unit with 256 K words of 32 bits each. A binary   5M
          instruction code is stored in one word of memory. The instruction has four parts: an
          indirect bit, an operation code, a register code part to specify one of 64 registers, and an
          address
          part.
          (a) How many bits are there in the operation code, the
          register code part, and the address part?
          (b) Draw the instruction word format and indicate the
          number of bits in each part.
          (c) How many bits are there in the data and address inputs of the memory?

12. A).   i) Explain the process of floating point number multiplication with flow chart.   5M
          ii) Show the hardware for a 2 bit-by-2 bit array multiplier and explain its working.   5M

OR

12. B).   i) Using booth's multiplication algorithm, multiply the 3 X -4, show all the steps.   7M
          ii) What is the principle of carry look-ahead adder?   3M

(P.T.O..)

13. A). With a neat block diagram, explain the architecture of 8086 Microprocessor.　10M

OR

13. B). i) What is interrupt? Why priority of interrupt is required? How it is restored?　5M

ii) Give the comparison between programmed I/O and interrupt driven I/O.　5M

14. A). Name the two pipeline organizations. Explain about the arithmetic pipeline with the help of an example.　10M

OR

14. B). Explain instruction pipeline with neat timing diagram.　10M

15. A). Draw and explain fully associative cache organization.　10M

OR

15. B). Explain various page replacement algorithms.　10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024
Course Name: OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common for CSC, CSM, AID & AIM)

Date: 12.02.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define the basic characteristics of OOP.	2 M
2.	Define package? Write syntax to create a package.	2 M
3.	What is an Inner class?	2 M
4.	What are the benefits of Exception Handling?	2 M
5.	List out the states of Thread.	2 M
6.	What is the use of PrintStream class?	2 M
7.	What is JDBC?	2 M
8.	What is the use of enum keyword.	2 M
9.	Define the scala.	2 M
10.	Differentiate between the Event sources and Event Listeners.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). What is polymorphism? Explain how polymorphism is implemented in java with suitable example.   10M

OR

11. B). Define Interface? Illustrate the implementation of interface with example.   10M

12. A). Define Exception? Create a java program using try, catch and finally blocks.   10M

OR

12. B). Distinguish static Inner Class and Local Inner class with examples.   10M

13. A). Explain the different ways of creating Threads with example.   10M

OR

13. B). i) Classify the stream classes in java?   5M
ii) Develop a java program to read input from the user using Scanner class?   5M

14. A). i) Outline significance of collection interface.   5M
ii) List and explain the various methods defined in collection interface.   5M

OR

14. B). Explain the steps involved in building JDBC application.   10M

15. A). What is a Layout manager? Explain the different types of Layout manager.   10M

OR

15. B). Develop a java program to handle mouse events.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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B.Tech III Semester Supplementary Examinations February-2024
Course Name: BASIC ELECTRICAL ENGINEERING
(Common for CSM & AIM)

Date: 14.02.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Define Ohm's Law and its limitations.   2 M
2. Explain Kirchhoff's Current Law.   2 M
3. Define Form factor and peak factor of an alternating quantity.   2 M
4. An alternating voltage is given by $v = 300 \sin(377t+30^0)$ V find i) maximum voltage ii) Frequency.   2 M
5. Classify the Generators based on Excitation.   2 M
6. List out the Essential parts of DC machine.   2 M
7. List the properties of an Ideal Transformer.   2 M
8. The primary winding of transformer has 400 turns and secondary winding has 50 turns .If the primary voltage is 120V(RMS) find the secondary voltage.   2 M
9. Define Slip.   2 M
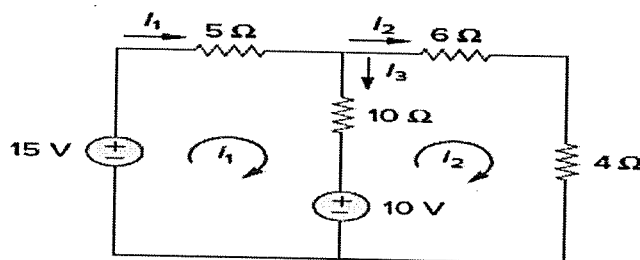10. Classify the Single phase Induction motors.   2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). State and Explain Thevenin's theorem with an example.   10M

OR

11. B). For the circuit shown in fig. solve for the branch currents i_1, i_2 & i_3 using Mesh Analysis.   10M

12. A). A 220 V, 1-φ, 50 Hz AC supply is applied across series connection of $R = 10\ \Omega, L =$ 10M
0.1 H. Determine impedance, current, voltage across R, voltage across L, power factor, active power, reactive power and apparent power. Also draw the phasor diagram.

OR

12.B). Develop the relation between phase and line values of a 3-phase balanced star connected   10M
and delta connected system.

(P.T.O..)

13. A). Explain the construction and principle and operation of DC generator. 10M

OR

13. B). A 10 KW,250 V D.C shunt machine has an armature resistance as 0.1 Ω and field 10M
resistance of 100 Ω. Determine the armature power developed when i) it runs as a
generator delivering 10 KW, ii) it runs as a motor taking an input of 10 KW.

14. A). Draw and explain the phasor diagram of a transformer, on no load. 10M

OR

14. B). A 25KVA ,2200/220 V,50Hz transformer, has the following test data: 10M
        OC test:220 V, 4 A,150 W
         SC test :90 V, 10 A,350 W
Determine:
i) the efficiency at full load,unity power factor
ii) the efficiency at half full load,0.8 p.f .lag
iii) the efficiency at half full load , 0.8 p.f .lead.
iv) find the regulation at full load, unity p.f

15. A). Explain the production of rotating magnetic field in a three phase induction motor. 10M

OR

15. B). Explain briefly about single phase induction motors with the help of neat circuit diagrams. 10M

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