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R22

Course Code: A405308



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular Examinations February-2024

Course Name: **SOFTWARE ENGINEERING**

(Common for CSE, CSM & AIM)

Date: 05.02.2024 AN

Time: 3 hours

Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.

10x1=10M

1. What is Software Engineering? 1 M
2. List the types of software models. 1 M
3. What are kinds of non-functional requirements? 1 M
4. What is feasibility study? 1 M
5. Write about class diagram with an example. 1 M
6. List the design concepts. 1 M
7. Define Alpha testing. 1 M
8. List the metrics for the design model. 1 M
9. Write about software risks. 1 M
10. What is software reliability? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain in detail the capability Maturity Model Integration (CMMI)? 10M

OR

11. B). i) Discuss in brief about the waterfall model. 5M
ii) Explain the Spiral model in detail with a neat sketch. 5M

12. A). i) Describe five desirable characteristics of a good software requirement specification document. 5M
ii) What are the types of requirement validation? 5M

OR

12. B). i) Compare functional requirements with nonfunctional requirements. 5M
ii) Explain about requirements management phases of requirement engineering process. 5M

13. A). What are the design principles of a good software design? Explain. 10M

OR

13. B). i) Explain the architectural patterns. 5M
ii) Explain the guidelines of component level design. 5M

14. A). i) What is testing? How is it different from debugging? 2M
ii) What is integration testing? Explain in detail about types of integration testing. 8M

(P.T.O..)

OR

14. B). i) Differentiate between black box and white box testing? 5M
ii) Discuss about metrics for testing in detail. 5M

15. A). i) List and explain the various software quality factors. 5M
ii) Reactive vs proactive risk strategies. 5M

OR

15. B). i) Illustrate in detail ISO 9000 quality standards. 5M
ii) Discuss about RMMM Plan. 5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular Examinations February-2024

Course Name: COMPUTER ORGANIZATION AND ARCHITECTURE
(Common for CSM, CSD & AIM)

Date: 07.02.2024 AN

Time: 3 hours

Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.

10x1=10M

1. Write the structure of buses used in computer system? 1 M
2. How to specify the internal organization of a digital computer? 1 M
3. Define Microinstruction. 1 M
4. What is the role of control memory in micro programmed control? 1 M
5. Define fixed point representation. 1 M
6. Why do we use dividend alignment while performing division operation of binary numbers. 1 M
7. Define pages, blocks and page frames. 1 M
8. Define asynchronous bus. 1 M
9. Define cache coherence. 1 M
10. What is inter- process arbitration? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Write in detail about Memory Reference Instructions and Register Reference instructions. 10M
- OR**
11. B). Explain in detail about Timing and Control. 10M
12. A). Explain the process of design of Micro Program with example also explain with a timing diagram. 10M
- OR**
12. B). Explain in detail about Instruction formats and addressing modes. 10M
13. A). i) How many bits are needed to store the result addition, subtraction, multiplication and division of two n-bit unsigned numbers. Prove. 5M
ii) Explain about decimal arithmetic unit. 5M
- OR**
13. B). i) IEEE Standard for Binary Floating-Point Representation 5M
ii) Explain Floating point arithmetic for Addition and Subtraction 5M
14. A). i) Explain how I/O devices can be interfaced with a block diagram. 5M
ii) How data transfers can be controlled using handshaking technique? 5M
- OR**
14. B). i) What is DMA? Explain 5M
ii) Explain about serial communication. 5M

(P.T.O.)

15. A). i) Write the major characteristics of RISC processors 5M
ii) Draw a space-time diagram for a four-segment pipeline showing the time it takes to process six tasks and explain. 5M

OR

15. B). i) Write about Vector Processing. 5M
ii) Write about Array processing. 5M

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Course Code: A404203



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular Examinations February-2024

Course Name: ELECTRONICS DEVICES AND CIRCUITS

(Common for CSE, IT, CSC, CSM, CSD & AID)

Date: 09.02.2024 AN

Time: 3 hours

Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.

10x1=10M

1. Show the circuit diagram of the PN junction diode under the forward biased condition. 1 M
2. Recall the PN junction diode current equation. 1 M
3. List the two applications of rectifiers. 1 M
4. Show the circuit diagram of the bridge rectifier. 1 M
5. What is the relationship between α and β of a transistor? 1 M
6. Show the circuit diagram of a transistor when it is in the active region. 1 M
7. What is the Shockley equation of a junction field effect transistor? 1 M
8. Define the pinch-off voltage of a JFET. 1 M
9. Show the circuit diagram of a Zener diode as a voltage regulator. 1 M
10. Show the symbol of a UJT. 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain the operation of a PN junction diode under forward and reverse biased conditions with the help of suitable diagrams. 10M
- OR**
11. B). Illustrate the forward and reverse characteristics of a PN junction diode and also write the equations for static and dynamic resistances. 10M
12. A). Explain the operation of a full-wave rectifier with a suitable diagram and also derive the expressions for the average DC load current and the RMS value of the load current. 10M
- OR**
12. B). Determine the power delivered to the load, the percentage of regulation at full load, the rectification efficiency, and the secondary's TUF when a transformer with a center-tapped secondary winding feeds a full wave rectifier circuit. From either end of the secondary to the center tap, the rms voltage is 25V. Given a load of $2k\Omega$ and a diode with a forward resistance of 4Ω and a secondary resistance of 10Ω . 10M
13. A). Explain the input and output characteristics of a common-emitter configuration with a suitable diagram. 10M
- OR**
13. B). Determine the current will flow in the collector circuit of this transistor when connected in CE configuration with a base current of $30\mu A$ when a transistor operating in CB configuration has $I_C = 2.98mA$, $I_E = 3mA$ and $I_{CO} = 0.01mA$. 10M

(P.T.O..)

14. A). Construct an n-channel JFET and explain its operation in detail with a suitable diagram. 10M

OR

14. B). Choose a datasheet of a JFET gives the following information: $I_{DSS} = 4\text{mA}$, $V_{GS(\text{off})} = -9\text{V}$ and $g_{m(\text{max})} = 4000\mu\text{s}$. Determine the transconductance for $V_{GS} = -3\text{V}$ and find drain current I_D at this point. 10M

15. A). Construct and explain the workings of LEDs in detail with a suitable diagram. 10M

OR

15. B). Construct and explain the workings of a tunnel diode in detail with a suitable diagram. 10M

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Course Code: A400003

**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**
(UGC AUTONOMOUS)

B.Tech III Semester Regular Examinations February-2024

Course Name: **MATHEMATICAL AND STATISTICAL FOUNDATIONS**
(Common for CSM & AIM)

Date: 12.02.2024 AN

Time: 3 hours

Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.

10x1=10M

1. Define Fermat number and write first three Fermat Numbers. 1 M
2. Write the statement of Euclidean Algorithm. 1 M
3. Define the principle of least squares. 1 M
4. Write the physical conditions of Binomial distribution. 1 M
5. Write any two properties of Normal distribution. 1 M
6. Find the sample standard deviation by the following sample data 1 M
10, 10, 10, 10, 10, 10, 10, 10, 10, 10
7. Discuss about level of significance. 1 M
8. Define Type-I and Type -II errors. 1 M
9. Write about transition probability Matrix. 1 M
10. Define Markov chain and give one example. 1 M

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

- 11.A). i) Use Fermat Factorization Method to Factorize 119143 5M
ii) State Fundamental Theorem of Arithmetic and express the following numbers as a product of prime numbers (a) 5544, (b) 5040 5M

OR

11. B). i) State and prove Chinese Remainder Theorem. 5M
ii) Define Linear congruence of two numbers in one variable and find all the possible solutions of the Linear Congruence $9x \equiv 12 \pmod{15}$. 5M

12. A). Determine the constants a, b by the method of least squares such that $y=a+bx$. 10M

x	2	4	6	8	10
y	4.077	11.084	30.128	81.897	222.62

OR

12. B). If a random variable has the probability density $f(x)$ as 10M

$$f(x) = \begin{cases} 2e^{-2x}, & \text{for } x > 0 \\ 0, & \text{for } x \leq 0 \end{cases}$$

Find the probabilities that it will take on a value (i) between 1 and 3 (ii) greater than 0.5.
(iii) mean.

(P.T.O.)

13. A). i) If the Probability of a bad reaction from a certain injection is 0.001, determine the chance that out of 2000 individuals more than two will get a bad reaction. 5M
 ii) In a Normal Distribution 31% of the items are under 45 and 8% of the items are over 64. Find the mean and standard deviation of the distribution. 5M

OR

13. B). If the population is 1,2,3,4,5 10M
 i) List all possible samples of size 2 that can be drawn without replacement from the finite population.
 ii) Calculate the mean of each of the sampling distribution of means.
 iii) Find the SD of sampling distribution of means.

14. A). Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favor of the proposal. Test the hypothesis that proportion of men and women in favor of the proposal are same, at 5% level. 10M

OR

14. B). The mean life of a Sample of 100 electric bulbs was found to be 1456 hours with S.D of 432 hours A Second Sample of 117 bulbs chosen from a different batch showed a mean life of 1280 hours with S.D of 398 hours. Is there any Significant difference between the means of two batches. 10M

15. A). Which of the following matrices are regular. Give reasons. 10M

$$(i) \begin{bmatrix} \frac{1}{2} & \frac{1}{4} & \frac{1}{4} \\ 0 & 1 & 0 \\ \frac{1}{2} & 0 & \frac{1}{2} \end{bmatrix} \quad (ii) \begin{bmatrix} \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{4} & \frac{1}{4} & \frac{1}{2} \end{bmatrix} \quad (iii) \begin{bmatrix} 0 & 0 & 1 \\ \frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 1 & 0 \end{bmatrix}$$

OR

15. B). A gambler has Rs. 2. He bets Rs. 1 at a time and wins Rs. 1 with probability 1/2. He stops playing if he loses Rs. 2 or wins Rs. 4. 10M
 (i) What is the transition probability matrix of the related Markov chain?
 (ii) What is the probability that he has lost his money at the end of 5 plays?

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Course Code: A405305



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular Examinations February-2024

Course Name: OPERATING SYSTEMS

(Common for CSM & AIM)

Date: 14.02.2024 AN

Time: 3 hours

Max.Marks: 60

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark.

10x1=10M

1. List the main components of an Operating System. 1 M
2. Define Process Scheduling. 1 M
3. What is the role of the wait system call? 1 M
4. What are the common methods for handling deadlocks? 1 M
5. What is the Critical Section problem in process synchronization? 1 M
6. Write a short note message queues? 1 M
7. Define Segmentation. 1 M
8. What is demand paging? 1 M
9. List common file allocation methods. 1 M
10. What is the significance of fork system call? 1 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain the various components of an operating system and their functions. 10M
- OR**
- 11.B). Explain the importance of process scheduling and explain about scheduling queuing diagram. 10M
 - 12.A). Discuss the various scheduling criteria and explain about FCFS and priority scheduling algorithms without arrival time with example. 10M
- OR**
- 12.B). State and explain the methods involved in recovery from deadlocks. 10M
 - 13.A).
 - i) Explain critical section problem and its conditions and general structure. 5M
 - ii) Explain about classical problem of dining philosopher problem. 5M
- OR**
- 13.B). Explain interprocess communication (IPC) mechanisms for processes on a single computer system, such as shared memory and message passing. 10M

(P.T.O.)

14. A). i) Explain the concept of demand paging and its role in efficient memory utilization. 5M
ii) Explain page replacement algorithm optimal for reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,3 with frames = four. 5M

OR

14. B). Describe the process of swapping and its significance in memory management. 10M

15. A). Compare the different allocation methods used for file storage. 10M

OR

15. B). i) Explain the following: 5M

a) lseek

b) stat

c) ioctl

- ii) Explain about any two directory structure. 5M
