II B.TECH. I SEMESTER REGULAR EXAMINATIONS, AUGUST 2021

SOFTWARE ENGINEERING
(Computer Science and Engineering)

Time: 3.00 Hrs.   Max. Marks: 60

Answer **ONE** Question from each unit
All questions carry equal marks

SECTION – I

1. (a) Define Software? List out supporting characteristics. Explain Software myths with suitable example.
    (b) Differentiate between software process models.

2. (a) Discuss briefly CMMI? List out and explain supporting levels and process areas.
    (b) How the Unified Process is different from other models? Sketch the diagram and explain supporting phases.

SECTION – II

3. (a) What is the essence of practice? List out and explain supporting core principles.
    (b) Explain the role of construction practices briefly.

4. (a) Briefly explain Requirement Engineering Tasks with suitable example.
    (b) Define use case? List out the procedure for negotiation and validation of requirements.

SECTION – III

5. List and explain types of analysis modeling elements with an example?

6. (a) Write a short note on Data modeling concepts with suitable example
    (b) Explain the fundamental concepts of design briefly?

SECTION – IV

7. Sketch the diagram and explain various types of Architectural styles and patterns.

8. (a) Explain the mapping of data flow into software architecture with neat sketch.

    (b) What is OCL? Explain the procedure for designing conventional components with suitable example.

SECTION – V

9. (a) List the testing objectives. Discuss the importance of Validation and System testing activities.

(b) Explain in detail about the art of debugging.

10. (a) What is a Metric? Discuss its role in software quality. List out metrics for analysis model?

(b) Explain various types of metrics for design model with an example.

SECTION – VI

11. (a) What is a risk? How it happens? Explain types of risks with suitable example.

(b) What is RMMM plan? Explain supporting risk information sheet with suitable details.

12. (a) Define quality? How it is different from design and conformance? Explain the terms quality control, Quality assurance and cost of Quality.

(b) What is the need of Defect Amplification and Removal? How it is used to remove errors? Explain them.

B.TECH DEGREE EXAMINATION, AUGUST 2021
II B. Tech. I Semester
OPERATING SYSTEMS
(Common to CSE & IT)

Time: 3 Hrs.   Max. Marks: 60

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

SECTION – I

1. (a) Define an operating system and describe its operations.
   (b) Discuss about various computing environments.

2. (a) What is a system call? Describe various types of system calls.
   (b) List and explain any two operating system structures that are prevalent in the society.

SECTION – II

3. (a) What do you mean by a process? Give the various states of the process with a neat diagram.
   (b) How do you accomplish Interprocess Communication in OS?

4. Assume you have the following jobs to be executed by one processor. The jobs are assumed to have arrived in the order 1,2,3,4.
   Give a grant chart illustrating the execution of the jobs using FCFS ,SJF, Priority, Round Robin (Time slice=3) and calculate Average waiting time and Turnaround time for each.

Process	Burst time	Priority
P1	5	3
P2	3	1
P3	8	3
P4	6	4

SECTION – III

5. (a) Define and explain critical section problem
   (b) Solve Readers-Writers problem using Semaphores.

6. (a) What are the necessary conditions for deadlock to occur ? Explain.
   (b) Illustrate Banker's algorithm with a suitable example.

SECTION – IV

7   (a)   Describe the working principle of swapping.

      (b)   What is Contiguous memory allocation ? Explain.

8   (a)   What is Demand paging? Explain.

      (b)   Discuss LRU page replacement technique with a suitable example.

9   (a)   What do you mean by a file? Discuss file access methods.

      (b)   List and explain the various Directory structures.

10   (a)   Discuss about directory implementation.

      (b)   How do you allocate disk space to files? Explain.

SECTION – VI

11   (a)   Explain the following disk scheduling algorithms with a suitable example.
         (i) FCFS (ii) SSTF

      (b)   Discuss about RAID levels.

12   (a)   Briefly discuss about the security issues in OS.

      (b)   Write a short note on program threats.

B.TECH DEGREE EXAMINATION, AUGUST 2021
II B. Tech. I Semester
PULSE AND ANALOG CIRCUITS
(Common to EEE & ECE)

Time: 3 Hrs.   Max. Marks: 60

Answer SIX Questions Choosing ONE Question from each Section
All Questions carry equal marks

SECTION-I

1 (a) Sketch the response of high pass RC circuit for square wave input and derive the expression for critical frequency.

  (b) A 10 V step is switched on to a 50 KΩ resistor in series with a 500 pF capacitor. Calculate the rise time of the capacitor voltage, the time for the capacitor to charge to 63.2% of its maximum voltage, and the time for the capacitor to be completely charged.

2 (a) Demonstrate how a RC low pass circuit works as integrator.

  (b) Derive the expression for rise time of RC low pass circuits and write the relation between rise time and upper 3-dB frequency.

SECTION-II

3 (a) Illustrate the diode switching times in detail.

  (b) Design a clipper circuit that clips any portion of the input AC waveform below +3V. Also draw the necessary waveforms.

4 (a) State and prove the clamping circuit theorem.

  (b) Elaborate the response of the clamping circuit when square wave input is applied under steady state conditions.

SECTION-III

5 (a) Review the operation of mono-stable multi-vibrator using BJT.

  (b) Evaluate the working of Schmitt trigger using transistor.

6 (a) Explore the triggering methods and collector catching diodes with respect to multi-vibrator in detail.

  (b) The fixed bias Bi-stable multi-vibrator uses V_{CC}= 12 V. V_{BB} = -8 V, R_1 = 10 KΩ, R_2 = 50 KΩ, R_C = 2.2 KΩ. The transistors are silicon transistor with a minimum valve of h_{fe} = 30. Calculate the stable state currents and voltages when $V_{CE(Sat)}$ = 0.2 V and $V_{BE(Sat)}$ = 0.7 V

P.T.O

SECTION-IV

7   (a)   Explain the operation of transistor Miller time base generator.

     (b)   Derive the slope error in Boot-strap sweep circuit.

8   (a)   With the help of a neat circuit diagram and waveforms, explain the working of a UJT relaxation oscillator.

     (b)   Discuss the operation of a current sweep circuit with help of diagram and waveforms.

SECTION-V

9   (a)   Define Q factor. Discuss the importance of tuned amplifiers.

     (b)   Sketch and explain the operation of stagger tuned amplifier.

10   (a)   State and explain conditions for generating oscillations. Discuss about the operation of RC phase oscillator.

     (b)   Draw the feedback circuit of a Hartley oscillator. Derive the expression for frequency of oscillations in Hartley oscillator.

SECTION-VI

11   (a)   Classify the power amplifiers.

     (b)   Derive an expression for efficiency in complementary class-B push pull amplifier.

12   (a)   With suitable diagram explain the operation of class-A power amplifier.

     (b)   Write short notes on distortions in power amplifiers.

BTECH DEGREE EXAMINATION, AUGUST 2021
11 BTECH 1 SEMESTER

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

Time: 3 Hours.   Max. Marks: 60

Answer ONE Question from each Section
All Questions carry equal marks

SECTION – I

1.   What is an Abstraction? Explain the programming paradigms in java.

2.   Explain about the various control statements with example.

SECTION – II

3.   What is an object? Explain about the Methods and Constructors with example.

4.   What is a method overloading? Explain the Access controls with example.

SECTION – III

5.   What is inheritance ? Explain the super keyword and Multilevel hierarchy with example.

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

SECTION – IV

7.   What is an interface? Explain the Nested interfaces and extending interfaces.

8.   Explain various exceptions handling mechanism in java with example.

SECTION – V

9.   What is a thread? Explain the life cycle of a thread.

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

SECTION – VI

11.   Explain about the various event handling mechanisms with example.

12.   Write a java program to perform button event action.

II B.TECH. I SEMESTER REGULAR EXAMINATIONS, AUGUST 2021

COMPUTER ORGANIZATION
(Common to CSE and IT)

Time: 3 Hours.   Max. Marks: 60

*Answer **ONE** Question from each Section*
All Questions carry equal marks

SECTION – I

1.   a)   Convert the following numbers into equivalent decimal numbers

        (i) $(B65F)_{16}$ (ii) $(110101)_2$ (iii) $(165.15)_8$

    b)   Define Boolean Algebra? Define basic terms of it.

2.   a)   Convert the following decimal numbers to base three and to base five

        (i) 73 (ii) 10.333

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

SECTION – II

3.   Simplify the following functions by using K-maps. $F(w,x,y,z)=\pounds\,(1,3,7,11,15)$
Which has don't care conditions $d(w,x,y,z) = X\,(0,2,5)$

4.   a)   Design half adder with two binary inputs and two binary outputs.
    b)   What is encoder? Write truth table for octal-to-binary encoder and Explain it

SECTION – III

5.   a)   What is a register? Explain about four bit registers using four D flip flops

    b)   Write about binary ripple counter.

6.   a)   Explain briefly about SR Flip-Flop
    b)   Explain briefly about JK Flip-Flop.

SECTION – IV

7. Explain the components of the Computer system and Write short notes on Instruction codes.

8. Explain any Five addressing modes with examples.

SECTION – V

9. What is meant by Address Sequencing? Explain

10. a) What is the need of cache and explain any one ache mapping function with an example?

    b) Write about various update/write strategies in cache memory.

SECTION – VI

11. a) Differentiate between isolated versus memory mapped I/O.

    b) Explain with block diagram the DMA transfer in a computer system.

12. a) What is Pipeline processing?

    b) Explain Arithmetic Pipeline mechanism

B.TECH DEGREE EXAMINATION, AUGUST 2021
II B.TECH. I SEMESTER

ENVIRONMENTAL SCIENCE
(Common to CE, EEE, ECE, 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) Describe the various components of environment?

   (b) Define environment. Discuss the scope of environmental science.

2 (a) Describe the interrelationship of hydrosphere with the other components of environment.

   (b) Write short notes on lithosphere and biosphere.

SECTION – II

3 (a) Describe various causes of land degradation.

   (b) What are the effects of modern agriculture by using fertilizers?

4 (a) Discus the use of alternate energy sources.

   (b) Differentiate between renewable energy resources and non renewable energy resources

SECTION - III

5 (a) What is an ecosystem? How can you classify an ecosystem?

   (b) Explain about the functions of ecosystem.

6 (a) Distinguish between in-situ and ex-situ conservation.

   (b) What are the Indian hotspots of biodiversity and describe the conservation methods of biodiversity?

SECTION - IV

7   What are the various sources of water pollution, effects and control measures of water pollution?

8 (a) Summarize the steps involved in solid waste management?

   (b) What are the causes of floods and how floods can be controlled?

SECTION - V

9 (a) Illustrate the rainwater harvesting process.

  (b) Explain various causes and control measures of global warming.

10 Summarise the case study of Silent valley project.

SECTION - VI

11 (a) Describe the role of information technology in environment and human health.

  (b) What are the provisions and penalties of air act?

12 Based on your field visit, summaraise your observations and findings of water resource ecosystem in your region.

B.TECH. DEGREE EXAMINATION, AUGUST 2021
II B.Tech I Semester
ENGINEERING MATHEMATICS – III
(Common to CE, EEE, ECE & ME)

Time: 3Hrs   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 elimination method to solve the equations

$2x + y + z = 10$; $3x + 2y + 3z = 18$; $x + 4y + 9z = 16$.

(b) Apply factorization method to solve the equations

$3x + 2y + 7z = 4$; $2x + 3y + z = 5$; $3x + 4y + z = 7$.

2 (a) Apply Gauss- Seidal iteration method to solve the equations

$20x + y - 2z = 17$; $3x + 20y - z = -18$; $2x - 3y + 20z = 25$.

(b) Use Newton – Raphson method to solve the equations $x = x^2 + y^2$, $y = x^2 - y^2$ correct to two decimal places, starting with the approximation (0.8, 0.4).

SECTION – II

3 (a) Find by Taylor's series method the value of y at x = 0.1 and x = 0.2 to five places of decimals

from $\dfrac{dy}{dx} = x^2 y - 1$, y (0) = 1.

(b) Apply Euler's method to solve for y at x = 0.1 from $\dfrac{dy}{dx} = x + y + xy$, y (0) = 1, taking step size h = 0.025.

4 Apply Runge-Kutta method to find an approximate value of y for x = 0.2 in steps of 0.1, if

$\dfrac{dy}{dx} = x + y^2$, given that y (0) = 1.

SECTION – III

5 (a) If f (z) is an analytic function with constant modulus, show that f (z) is constant.

(b) If f (z) is a regular function of z, prove that $\left(\dfrac{\partial^2}{\partial x^2} + \dfrac{\partial^2}{\partial y^2}\right)|f(z)|^2 = 4|f'(z)|^2$.

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

(b) Evaluate $\int_C \dfrac{e^{2z}}{(z-1)(z-2)} dz$, where C is the circle $|z| = 3$.

SECTION – IV

7 (a) Find the Laurent's expansion of $f(z) = \dfrac{7z-2}{(z+1)z(z-2)}$ in the region $1 < z+1 < 3$.

(b) Evaluate $\int_C \tan z \, dz$, where C is the circle $|z| = 2$, using Residue theorem.

8 Show that $\int_0^{2\pi} \dfrac{\cos 2\theta \, d\theta}{1 - 2a\cos\theta + a^2} = \dfrac{2\pi a^2}{1 - a^2}, (a^2 < 1)$.

SECTION – V

9 (a) Find Z- transform of (i) $e' \sin 2t$ (ii) $n^2 e^{an}$.

(b) Find the inverse Z- transform of $\dfrac{2z^2 + 3z}{(z+2)(z-4)}$.

10 Using the Z- transform, solve $u_{n+2} + 4u_{n+1} + 3u_n = 3^n$ with $u_0 = 0, u_1 = 1$.

SECTION – VI

11 A random variable X has the following probability function:

x	0	1	2	3	4	5	6	7
P(x)	0	K	2K	2K	3K	K^2	$2K^2$	$7K^2+K$

Determine: (i) the value of K (ii) $P(X < 6)$, $P(X \geq 6)$, $P(0 < X < 5)$ and $P(0 \leq X \leq 4)$

(iii) Mean (iv) Variance (v) if $P(X \leq k) > \dfrac{1}{2}$, find the minimum value of k.

12 (a) In 256 sets of 12 tosses of a coin, in how many cases one can expect 8 heads and 4 tails.

(b) For a normally distributed variate with mean 1 and S.D. 3, find probability that

(i) $3.43 \leq x \leq 6.19$ (ii) $-1.43 \leq x \leq 6.19$.