JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
[A GOVERNMENT AUTONOMOUS COLLEGE]
JGEC/B.TECH/CSE/ESC501/2022-23
2022
SIGNALS AND SYSTEMS

Times: 3 Hours

Full Marks: 70

The figures in the margin indicate full marks.
Candidates are instructed to write the answers in their own words as far as practicable.

GROUP-A
[OBJECTIVE TYPE QUESTIONS]

5x2=10

Answer ***all*** questions

1. Prove that $r(t-2) = (t-2).u(t-2)$ — 2
2. Prove that $Sgn(t) = u(t) - u(-t)$ — 2
3. Find the even and odd components of the following: $x(t) = 1 - 3t - 5t^2 + 4t^3 - 6t^4$ — 2
4. Draw the following signal. $u(-t).e^{at}$ — 2
5. If a signal $x(n) = \{1,1,-1\}$ is convoluted with an unknown signal $h(n)$ and the convolution result is $y(n) = \{1,3,1,-2\}$; Find $h(n)$. — 2

GROUP-B
[LONG ANSWER TYPE QUESTIONS]

12x5 =60

Answer any ***five*** questions

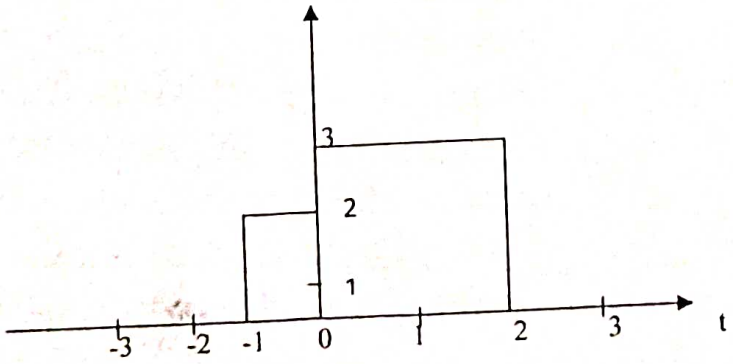
6. Find the circular convolution of the following data sequence by circle or graphical method only. — 4+1+5+2=12
$x_{1(n)} = \{1,3,5,7\}$ and $x_{2(n)} = \{2,4,6,8\}$.

What is zero padding? Perform the linear convolution of the given data sequences using only graphical method.
$x(n) = \{1,2,2,1\}$; $h(n) = \{1,2,2,2,1\}$

Determine whether the signal is energy or power. $x(t) = A\cos(wt + \theta)$.

7. a) Find the Fourier transform of i) $x(t) = A\,rect(\frac{t}{\tau})$ ii) $x(t) = e^{-at}.u(t)$ — 5+4+3=12
   b) Prove that the Fourier series expansion of an even periodic signal contains only cosine terms and a constant.
   c) Write down the frequency shifting property of continuous Time Fourier Series.

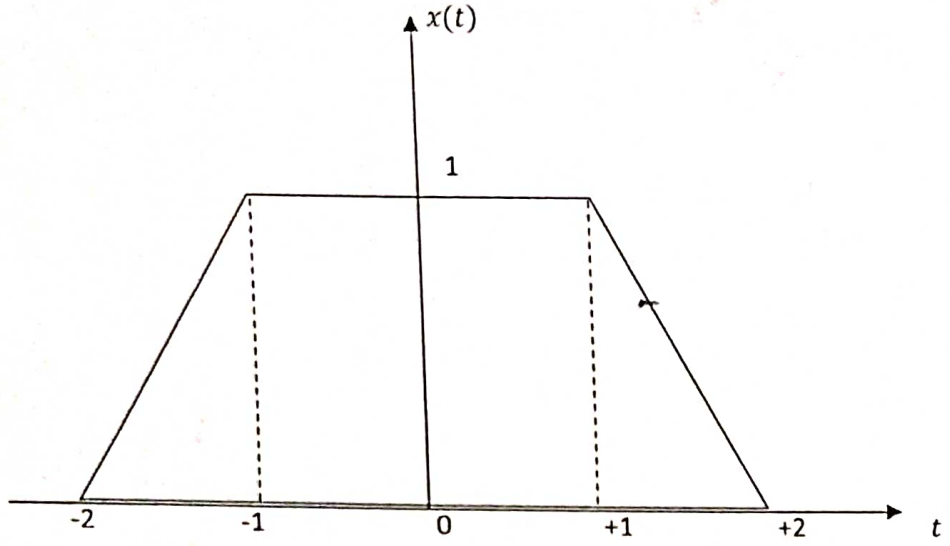
8. a) If, $x(t)$ *is* — 3+5+4=12



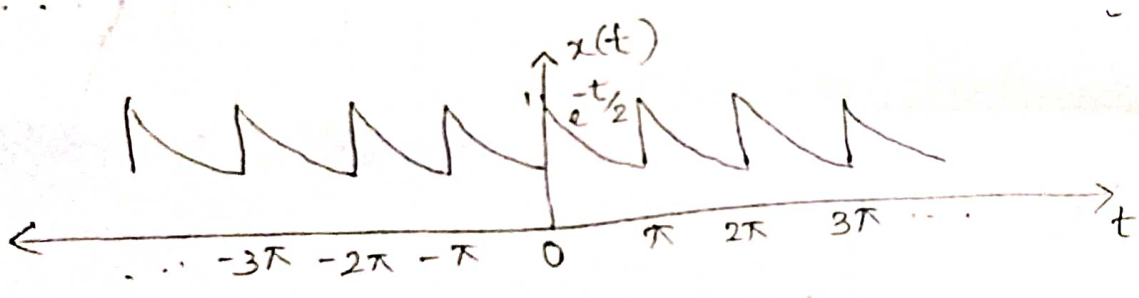
Then, draw the signal for $-\frac{2}{5}x(-3t-4)$.

   b) Prove the following signals with examples.
   i) even.odd = odd signal and ii) odd.odd = even signal

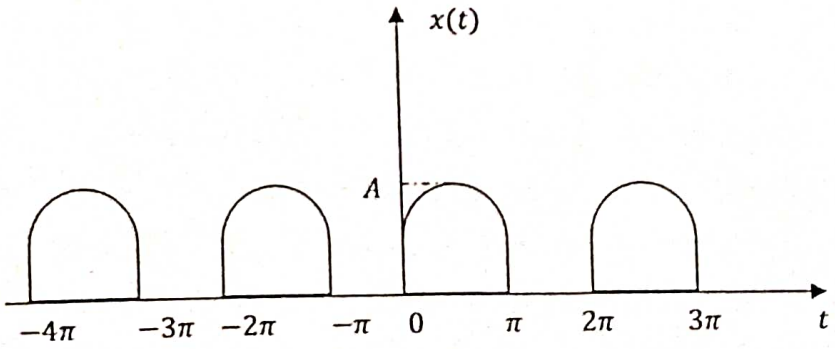
c) Determine the energy of the given signal below.



9. Write down the Dirichlet's conditions for Fourier series existence with examples. Find the trigonometric Fourier Series for the periodic signal $x(t)$ shown below and sketch the line spectrum 5+7=12



10. a) Find the trigonometric Fourier series for the half-wave rectified sin wave shown in the following figure and sketch the line spectrum. 6+2+4=12



b) Determine the fundamental period of the following signals.

i) $x(t) = e^{j4\pi t}$ and ii) $\sin(10t + 1) + 2\cos(5t - 2)$

c) Check whether the system $y(n) = a^n u(n)$ is;

i)Static or dynamic, ii) Linear or non-linear, iii)Casual or non-casual,

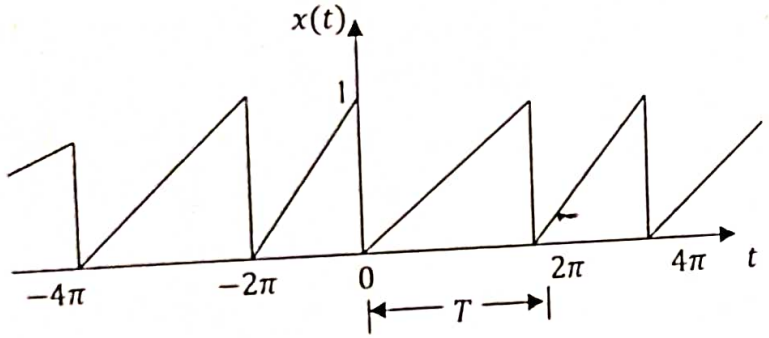
iv) Time-variant or time-interval.

4+3+5=12

a) Determine the time period of the following signals.
i) $\cos 2t + \cos 3t + \cos 5t$ and ii) $30 \sin 100t + 10 \cos 300t + 6 \sin (500t + \frac{\pi}{4})$

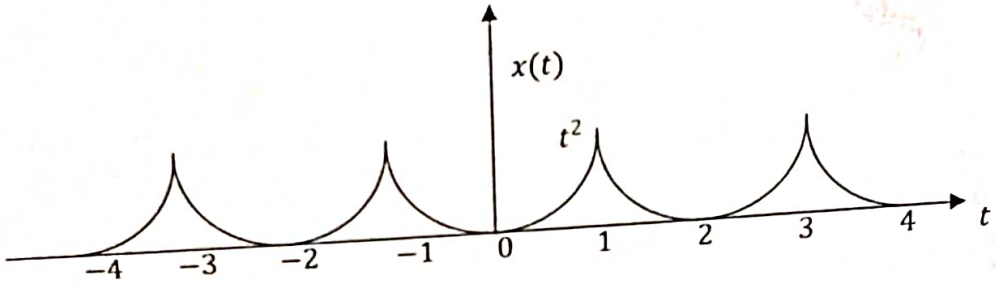
b) Find whether the system is linear or not. i) $y(t) = e^{x(t)}$ and ii) $y(t) = x(t^2)$

c) Determine the Fourier series coefficient of exponential representation of the following signal.

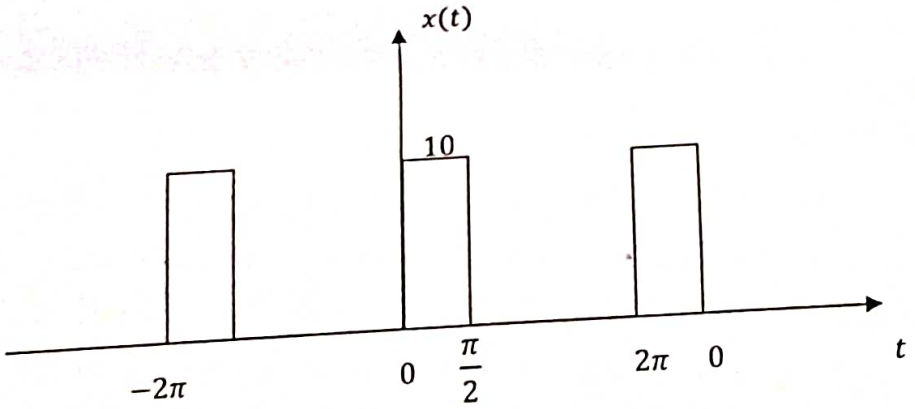


12. Find the values of trigonometric Fourier series coefficients (a_0, a_n, b_n) for the following signals. 4+4+4=12

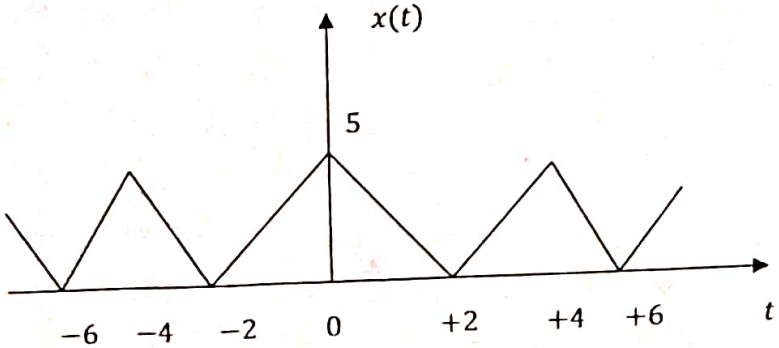
i.



ii.



iii.



JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
[A GOVERNMENT AUTONOMOUS COLLEGE]

JGEC/B.TECH/CSE/HSMC-501/2022-23

2022

Introduction to Industrial Management (Humanities-III)

Full Marks: 70 Times: 3 Hours

The figures in the margin indicate full marks.
Candidates are instructed to write the answers in their own words as far as practicable.

GROUP-A
[OBJECTIVE TYPE QUESTIONS]

Answer *all* questions 5x2=10

1. What is tender? 2
2. What is service tax? 2
3. Explain VAT. 2
4. What is Excise duty? 2
5. What is Income Tax? 2

GROUP-B
[LONG ANSWER TYPE QUESTIONS]

Answer any *four* questions 4x15=60

6. What do you mean by intellectual property? State which are include in intellectual property right? 5+10
7. i) What do you mean by globalization? 5
   ii) State the advantages and disadvantages of globalization. 10
8. State and describe in brief the various level of management. 15
9. Explain various steps in selection procedure adopted by an industry? Define budget? 12+3
10. i) Explain the term training and development. 5
    ii) Discuss the various recruitment. Procedure 10
11. What is safety consciousness? What method can be adopted to make workers safety conscious? 5+10

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
[A GOVERNMENT AUTONOMOUS COLLEGE]
JGEC/B.TECH/ CSE/IT/ MC-CS501/2022-23
2022
CONSTITUTION OF INDIA

Full Marks: 70 Times: 3 Hours

The figures in the margin indicate full marks.
Candidates are instructed to write the answers in their own words as far as practicable.

GROUP-A
[OBJECTIVE TYPE QUESTIONS]

Answer ***all*** questions 5x2=10

1. Define the terms "Government" & "Constitution". 2
2. What do you mean by "Indian Federalism". 2
3. What are the directive principles of State policy 2
4. Define INDIAN CITIZENSHIP 2
5. What is Public Interest Litigation (PIL) 2

GROUP-B
[LONG TYPE QUESTIONS]

Answer any **four** from the following 15x4=60

6. a) Briefly explain Partition and Indian Independence 2+3
   b) Briefly discuss the main Provisions of Indian Independence Act,1947 5
   c) Write down the significance of our Constitution. 5
7. a) Discuss the Draft Constitution submitted by the Draft Committee 8
   b) Briefly explain the Preamble of Indian Constitution 7
8. a) Discuss the eligibility, election processes, powers, vetoes, actions on victim applications of the President of India. 10
   b) Discuss the Union Judiciary as per Indian Constitution. 5
9. a) Discuss Panchayat raj System / Local Self-Government/Self-Help Government systems 9
   b) Describe "Center –State relationship" in light of Indian Federalism. 6
10. a) Write the points on Principles of Democracy, Values of Democracy and Defects of democracy. 5
    b) Explain the Enforcing Rights through Writ. 5
    c) Describe the provisions for Women in Constitutional Provision. 5
11. a) Discuss the Adult Franchise / Suffrage system & Electoral process in India. 9
    b) Describe Fundamental Rights of Indian Citizenship. 6
12. a) Discuss the provisions for Schedule Caste & Schedule tribes in Constitutional Provision. 5
    b) Discuss provisions for Minority in Constitutional Provision. 5
    c) Write notes on (i) Human Rights (ii) Emergency Provisions by Indian Constitution. 5

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
[A GOVERNMENT AUTONOMOUS COLLEGE]
COE/B.TECH./CSE/PEC-IT501B/2022-23
2023
Artificial Intelligence

Full Marks: 70 Times: 3 Hours

The figures in the margin indicate full marks.
Candidates are requested to write their answers in their own words as far as practicable.

GROUP-A
[OBJECTIVE TYPE QUESTIONS]

Answer ***all*** questions 5x2=10

1. What is Artificial intelligence? 2
2. What do you mean by heuristic cost and generation cost? 2
3. Define constraint satisfaction problem. 2
4. Explain AND-OR graph with example. 2
5. What do you mean by reinforcement learning? 2

GROUP-B
[LONG ANSWER TYPE QUESTIONS]

Answer any ***four*** questions 4x15=60

6. i) Write down the differences between blind search and heuristic search. 4
   ii) Explain Best First Search with example. 5
   iii) Using Constraint Satisfaction problem, solve the following crypt-arithmetic problem: SEND + MORE = MONEY 6

7. i) What do you mean by agent and ideal rational agent? 2
   ii) Explain goal based agent and utility based agent with diagram. 7
   iii) What is AI environment? Explain various types of AI environment. 2+4

8. i) What do you mean by reasoning? Explain forward reasoning and backward reasoning with example. 2+3+3
   ii) What do you mean by learning in AI? Explain the different forms of learning. 2+3
   iii) Write down the goals of AI. 2

9. i) Write down the truth table for Disjunction, Implication and for if and only if. 6
   ii) Represent the following facts in propositional logic: 3
   a) Children like candy
   b) If humid, then it is hot
   c) If it is hot and humid then it is raining
   iii) Represent the following facts in predicate logic: 6
   d) Some child likes every candy
   e) Anyone who loves some candy is not a nutrition fanatic
   f) Every person who buys a policy is smart
   g) All boys like cricket
   h) No person buys expensive policy
   i) Some girls hate football

10. i) Explain Hill Climbing Algorithm. Write down the limitations of Hill Climbing Algorithm. Explain how Simulated Annealing is used in searching technique. 3+2+2
    ii) Calculate the time complexity for MINI-MAX problem. Show how alpha-beta pruning differ from MINI-MAX problem. 2+2
    iii) Draw a semantic network representing the following knowledge: Sima has a cat. Sima is a girl. The cat is white in color. The cat caught a bird. Sima is 10 years old. A cat is a mammal. A bird is an animal. All 4

mammals are animals.

11. i) Write down the different approaches for representing knowledge. Write down their limitations 4
ii) Write an algorithm for A* searching technique. Explain with the help of suitable example. 3+3
iii) What is NLP? Write down the different phases of NLP. 2+3

12. i) Given two jugs, one 4 litters and the other 3 litters with no markings in them. Also given a water supply with a large storage. Write down all production rules that are used to measure 2 liters of water in 4litters jugs. 7
ii) What is Fuzzy Logic? Draw and explain Fuzzy Logic System architecture. 5
iii) Differentiate between Fuzzy set and Crisp set. 3

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE

[A GOVERNMENT AUTONOMOUS COLLEGE]

COE/B.TECH/CSE/PCC-CS503/2022-23

2022

Object Oriented Programming

Full Marks: 70 Times: 3 Hours

The figures in the margin indicate full marks.
Candidates are instructed to write the answers in their own words as far as practicable.

GROUP-A
[OBJECTIVE TYPE QUESTIONS]

5x2=10

Answer ***all*** questions

1. What do you mean by constructor and destructor? 2
2. What are the purposes of ***this*** keyword and ***super*** key word? 2
3. What is friend function? 2
4. What do you mean by Data abstraction and Data encapsulation? 2
5. What is scope resolution operator? 2

GROUP-B
[LONG ANSWER TYPE QUESTIONS]

4x15=60

Answer any ***four*** questions

6. i) What do you mean by structure-oriented programming and object-oriented programming? Explain different features of object-oriented programming. [2+4]
   ii) What do you mean by method overloading and method overriding? Explain with programming code. [6]
   iii) What is friend class? Explain with an example. [3]

7. i) What is polymorphism? Explain different types of polymorphisms. [1+3]
   ii) Explain different forms of inheritances in object-oriented programming. [6]
   iii) What is the main drawback of multiple inheritance for classes and how it can be resolved? Explain with suitable programming code. [5]

8. i) Explain the life cycle of thread object with suitable diagram. [5]
   ii) Explain the different ways used to create user define thread class with programming code. [5]
   iii) What is operator overloading? Overload * operator function to carry out multiplication of two matrices using friend function. [5]

9. i) What do you mean by throw and throws statements? How are they used in Exception handling? Explain with programming code. [3+3]
   ii) What is thread synchronization? Explain with example. [6]
   iii) Explain checked and unchecked exception with examples. [3]

10. i) What is virtual class? Explain with programming code. [5]
    ii) Explain differences between abstract class and interface. [5]
    iii) How are static members executed in object-oriented programming? Explain with suitable examples. [5]

11. i) Explain the different levels of access modifiers available in Object Oriented Language with examples. [8]
    ii) How can you create your own package and add classes in that? Explain with suitable programming code. [4]
    iii) What is copy constructor? Explain with programming code. [3]

12. i) Explain life cycle of applet object with suitable diagram. [5]
    ii) Explain major differences between Java stand-alone application programs and java applet programs. [4]
    iii) What is finally block? When and how is it use? Define a custom exception called **"NoMatchException"** that is thrown when a given string is not equal to string "Object Oriented Programming". Write a program that uses this exception. [2+4]

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
[A GOVERNMENT AUTONOMOUS COLLEGE]
COE/B.TECH./CSE/ PCC-CS501/2022-2023
2022
Compiler Design

Full Marks: 70 Times: 3 Hours

The figures in the margin indicate full marks.
Candidates are requested to write their answers in their own words as far as practicable.

GROUP-A
[OBJECTIVE TYPE QUESTIONS]

Answer ***all*** questions 5x2=10

1. Identify the lexemes and their corresponding tokens in the following statement:
printf ("Simple Interest=%f\n", si);
2. What is the difference between Compiler & Interpreter?
3. Differentiate leftmost derivation and rightmost derivation. Show an example for each.
4. Define cross-compilers.
5. Is the grammar S→S(S)S | Ɛ ambiguous? Justify your answer.

GROUP-B
[LONG ANSWER TYPE QUESTIONS]

Answer any ***four*** questions 4x15=60

6. i) What is handle? Find the handles of the right sentential forms of the reduction for the string **id + id * id** for the grammar **E - > E+E | E*E | id** 2+3
ii) What is left recursive grammar? Give a generic example. What are the steps in removing left recursion? 2+3
iii) Eliminate the left-recursion for the following grammar: 5
S -> (L) | a
L -> LS | S

7. i) Explain different code optimization techniques available in local and global optimizations? 3+3
ii) Define Context Free Grammar (CFG) with example. Prove that $L = \{a^i b^i \mid i \geq 0\}$ is not regular. 1+3
iii) Differentiate between S-attributed and L-attributed definitions with suitable examples. 5

8. i) Consider the grammar with the following translation rules and E as the start symbol.
E -> E1#T {E.value = E1.value * T.value} |T {E.value = T.value}
T -> T1 & F {T.value = T1.value + F.value} |F {T.value = F.value}
F -> num {F.value = num.value}
What is syntax directed translation? Compute **E.value** for the root of the parse tree for the expression: **2 # 3 & 5 # 6 & 4**. 3+3
ii) Write the SDT rules for converting infix to postfix of a string **2+3*4**. 3
iii) Show that the grammar G2 = ({a, b, c}, {S, T}, R, S) is LR(1) but not LALR(1). 6
S -> aSa | bSb | aTb | b | a | c
T -> c

9. i) Construct the DAG and three address code for the expression: **a+a*(b-c)+(b-c)*d.** 2+3
ii) Explain the three representations of three-address code statements. 5
iii) What is a static allocation strategy? What are its limitations? 2+3

10. i) What is recursive descent parsing? Describe the drawbacks of recursive descent parsing for generating the string '**abc**' from the grammar: 5
S -> aBc
B -> bc | b

ii) Write the algorithm to compute **FIRST** and **FOLLOW**? Construct a predictive parsing table for the grammar: 5+5

$S \rightarrow iEtSS_1 \mid a$

$S_1 \rightarrow eS \mid e$

$E \rightarrow b$

11. i) Write algorithm for SLR paring table construction. 5+5+5
ii) Construct syntax directed translation (SDT) scheme for simple type checker.
iii) Construct canonical collection of LR(1) items for the following grammar:

$S \rightarrow AA$

$A \rightarrow Aa \mid b$

12. Write short notes on any three of the following topics: 3x5=15
i. Regular Expression and Regular Grammar Definition
ii. Three-address code
iii. CLR(1) vs. LALR(1) parsing
iv. Indirect triples
v. Operator grammar

Jalpaiguri Govt. Engg. College
(A Govt. Autonomous College)
COE/B.Tech/CSE/PCC-CS502/2022-23
2022
OPERATING SYSTEM

FM: 70 Time Allotted: 3 hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group – A
[Objective Type Questions]

Answer **all** questions 5 X 2 = 10

1. "Compaction is not always possible"-Justify.
2. "A cycle in a resource allocation graph leads to deadlock"- Justify.
3. When semaphore solution may lead to deadlock?
4. What are overlays?
5. What are the advantages of multiprocessor system?

Group – B
[Long Answer Type Questions]

Answer any **four** of the following 4 X 15 = 60

6. a. What is race condition? Explain with an example.
   b. What is demand paging?
   c. On a disk with 1000 cylinders, numbered 0 to 999, compute the number of tracks the disk arm must move to satisfy all requests in the disk queue using C-SCAN scheduling. Assume the last request serviced was at track 345 and the head is moving towards track 0. The disk queue contains request for the following tracks:
   123, 874, 692, 475, 105, 376

5 + 5 + 5

7. a. Explain the necessary and sufficient conditions for deadlock? Why are they called necessary and sufficient?
   b. Consider a system consisting of 4 resources of the same type that are shared by 3 processes, each of which needs at most two resources. Show that the system is deadlock free.
   c. Consider the snapshot of a system.

Processes	Allocation A B C D	MAX A B C D	Available A B C D
P1	0 0 1 2	0 0 1 2	1 5 2 0
P2	1 0 0 0	1 7 5 0	
P3	1 3 5 4	2 3 5 6	
P4	0 6 3 2	0 6 5 2	
P5	0 0 1 4	0 6 5 6	

i) Calculate the need matrix.
ii) Is the system currently in a safe or unsafe state? Why?
iii) Is the system currently deadlocked? Why?
iv) If a request (0 4 2 0) from process P2 arrives can it be allocated immediately?

4 + 3 + 8

PTO

8. a. What is Semaphore? What are different types of semaphore?
   b. Write a solution for second reader-writers problem using semaphore. Describe all the semaphores used in the solution.
   c. Suppose we have a system with 32 bit virtual addresses, in which the least-significant bits are used to indicate a 10-bit page offset.

      i) what is the page size in this system?

      ii) how many pages would it take to cover the entire virtual address space?

      iii) if you only bought 16MB of physical memory, how many page frames do you have?

      iv) if page table entries are 64 bits long, how big of a single-level page table would you require to map all of virtual memory?

   4 + 7 + 4

9. a. What is the cause of thrashing? How the problem can be solved?
   b. For a system with 'n' processes, how many possible ways can those processes be scheduled?
   c. Assume that we have a demand paged memory. The page table is held in registers. It takes 8 milliseconds to service a page fault if an empty frame is available or if the replaced page is not modified and 20 milliseconds if the replaced page is modified. Memory access time is 100 nanoseconds.

      Assume that the page to be replaced is modified 70 percent of the time. What is the maximum acceptable page fault rate for an effective access time of no more than 200 nanoseconds?
   d. Why page size is always a power of two?

   5 + 2 + 5 + 3

10. a. What is different types of address binding? Describe them.
    b. Draw the diagram of paging hardware with TLB.
    c. What is Belady's anomaly?
    d. What is busy waiting? How it can be overcome?

    5+4+3+3

11. a. What is thrashing and what is the cause of thrashing?
    b. Explain how does working set window helps to avoid thrashing?
    c. Consider the following sequence of memory references from a 460 byte program: 10, 11, 104, 170, 73, 309, 185, 245, 246, 434, 458, 364
       a) Give the reference string assuming page size of 100 bytes.
       b) Find the page fault rate for the reference string given, assuming 200 bytes (2 pages) of main memory available to the program and FIFO page replacement algorithm.

    Calculate the page fault rate if the page fault rate is LRU.

    5+5+(1+2+2)

.....END.....

Department of Computer Science & Engineering
Jalpaiguri Government Engineering College

2ND Class Test 2022

Paper Code: PCC-CS502 Subject: Operating System F.M-15

Answer any three questions. All question carry equal marks.

1. What is page fault? Explain with a suitable diagram what happens in a system when page fault occurs?
2. What is thrashing? Explain in terms of Global and Local allocation of frames. What is Belady's anomaly?
3. Consider a paging system with the page table stored in memory.
   a) If a memory reference takes 200 ns, how long does a paged memory reference take?
   b) If we add associative registers, 75% of all page-table references are found in associative registers, what is the effective memory reference time? (Assume that finding a page-table entry in the associative registers take zero time, if the entry is there.)
4. Consider the following sequence of memory references from a 460 byte program: 10, 11, 104, 170, 73, 309, 185, 245, 246, 434, 458, 364
   a) Find the page fault rate for the reference string given, assuming 200 bytes (2 pages) of main memory available to the program and FIFO page replacement algorithm.
   b) Calculate the page fault rate if the page replacement algorithm is LRU.

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ODD SEM 2022

Paper Name: Operating System | **Paper code:** PCC-CS502 | **Time:** 40 minutes

Full Marks: 15 | **Class Test:** 1ST | **Date:** 21/09/2022

Answer all the questions.

1. What is semaphore? Show that if wait() and signal() operations are not executed automatically then mutual exclusion may be violated. Give a solution of second reader-writers problem with semaphore.

(1 + 3 + 4)

2. What is indefinite postponement? What is the solution of it? Write an algorithm to find out safe sequence of a system when several process request for several resources.

(2 +2 + 3)

OR

suppose that a scheduling algorithm favours those processes that have used the least processor time in recent past. Why will this algorithm favour IO-bound programs and yet not permanently starve CPU-bound programs? What will happen in Round Robin scheduling if the time quantum is zero? Is the system will be in deadlock or not? Justify your answer.

(4 + 3)

Department of Computer Science & Engg...

Compiler Design (PCC-CS501) 21th September 2022

1st Class Test. Full Marks - 15. Time - 40 min. Odd Semester

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1. The number of tokes in the following C statement **printf("i = %d, &i = %x", i, &i)** [2]
2. A language $L = W_x W^R$ over x, W$\in$ {a, b}$^+$ and R denotes reverse function. Is the L regular language? What would be the regular expression for the L? if so, design the DFA for the L. [1+2+4]
3. Which of LL(1), LR(0), and SLR(1) can parse strings in the following grammar, and justify your answer? [4]

$$E -> A/B, A -> a/c, B -> b/c$$

4. Find out the operator precedence in **descending order** of the following expression. [2]

$$E -> E * F/F - E/F, F -> -F/id$$

Compiler Design (pcc-cs501)

Consider the following grammar G: **S** → **aA / cAb / cd / adb** and **A** → **d**

(a) Construct canonical collection of LR(0) items and show that G is not an LR(0) grammar. **[3]**

(b) Compute **FOLLOW** sets of the non-terminals and show that G is not an SLR(1) grammar. (You need nc construct the complete SLR parser table. Just highlight all the state(s) with conflict and justify). **[3]**

(c) Construct canonical collection of LR(1) items and justify that G is an LALR(1) grammar. **[3]**

(d) Construct the LALR(1) parser table for G. **[3]**

(e) Using the LALR(1) parser table, parse the following strings: (i). **cdb** and (ii). **ad** **[2]**

(f) From the parsing of the strings above, justify why G is LALR(1) while it is not SLR(l). **[1]**

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE

Subject: Object Oriented Programming **Subject code: PCC-CS503**

Full Marks: 15 **Time: 45 minutes**

Answer any three questions:

1. What do you mean by structure oriented programming and object oriented programming? Explain different features of object oriented programming. [2+3]
2. What is operator overloading? Overload * operator function to carry out multiplication of two matrices using friend function. [1+4]
3. What is constructor? What are its special properties? Explain method overloading. [1+1+3]
4. What is the role of *"this"* keyword? How are static members executed in object oriented programming? Explain with suitable examples. [2+3]

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE

Subject: Object Oriented Programming **Subject code: PCC-CS503**

Full Marks: 15 **Time: 45 minutes**

Answer any three questions:

1. What are the major differences between **interface** and **abstract class**? Write a program where interface can be used to implement multiple inheritances? [2+3]
2. Explain different levels of access protection available in object oriented programming. [5]
3. Explain checked and unchecked exception with examples. Define a custom exception called **"NoMatchException"** that is thrown when a given string is not equal to "JGEC". Write a program that uses this exception. [2+3]
4. What is thread? Describe the complete life cycle of a thread. [1+4]

JGEC/CSE/First Class Test/ESC-501/Signal and System

Answer any three. **3*5=15**

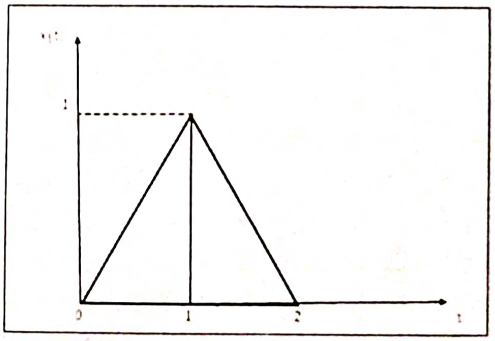
1) Find the energy and power of the following signals.

   i) $e^{-|t|}.u(t)$,

   ii) Unit ramp signal (2.5*2=5)

2) Prove that - i) Even. Even= Even Signal, ii) odd. Odd= Even Signal (2.5*2=5)

3) Determine the total Energy of the following signal:- 5



4) Prove that – i) r(t-2)= (t-2). U(t-2)

   ii) u(t) – u(-t) = Sgn(t) (2.5*2=5)

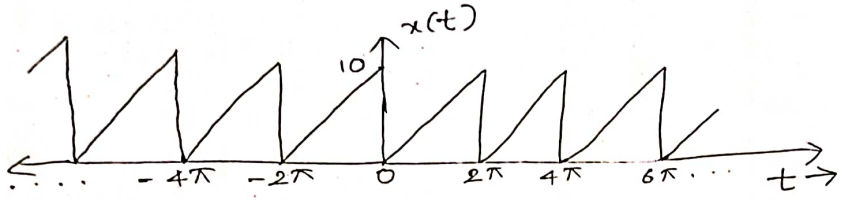
5) Find the circular convolution of the following using only graphical or circle method.

   $x_1(n)$= {1, 2, 3, 4} and $x_2(n)$ = {2, 4, 5} (5)

JGEC/CSE/ESC-501/2022-23/SIGNAL AND SYSTEM

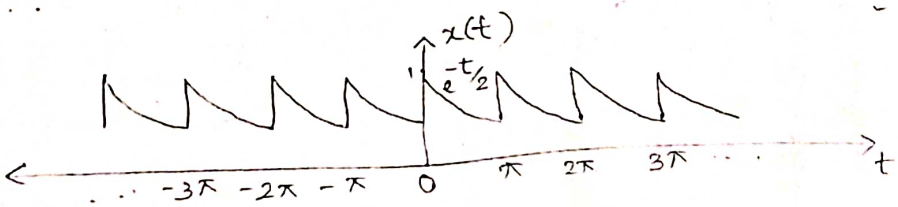
Marks: 15 Time: 45 minutes

1. Write down the Dirichlet's conditions for Fourier Series existence with examples. Find the trigonometric Fourier Series for the following waveform of amplitude 10 shown below. 5+5=10



OR

Find the trigonometric Fourier Series for the periodic signal x(t) shown in the figure below and sketch the line spectrum. 10



2 Check whether the following systems are linear or not. 2.5 X 2 = 5

a. $(dy(t)/dt) + 5y(t) = x^2(t)$

b. $y(t) = e^{x(t)}$

OR

2. Find whether the following systems are stable or not. 2.5 X 2 = 5

a. $h(t) = e^{2t}.u(t)$

b. $y(t) = \int_{-\infty}^{t} x(\tau)d\tau$

JGEC/B.TECH/ CSC/HSMC-501/ 2022

INTRODUCTION TO INDUSTRIAL MANAGEMENT

Full Marks: 15

Times: 45 Minutes

Write short note on the following:

7.5

5x3

a) VAT
b) Income Tax
c) Custom Duty
d) Service Tax
e) Excise Tax

JGEC/B.TECH/ CSE/HSMC-501/ 2022-23

Introduction to industrial management

Full Marks: 15 TIME-45MINS

1. What do you mean by globalization? State the advantage and disadvantage of globalization. (5+10)

1st Internal Assessment Examination (2022)

Dept: CSE Semester: 5th

Sub: Artificial Intelligence (PEC-IT501B)

Answer any three

1. What is AI? Explain the different components of AI machine with examples. What is environment? 1+3+1
2. Explain the different components and their working principles of learning agent. Write down the difference between goal based agent and utility based agent. 4+1
3. Differentiate between static environment and dynamic environment with examples. Write down the differences between Informed search and Uninformed search. 2+3
4. Write an algorithm for A* search technique. Explain with a suitable example. 3+2

2nd Internal Assessment Examination (2022)

Dept: CSE Semester: 5th

Sub: Artificial Intelligence (PEC-IT501B)

Answer any **three**

1. Explain MINI-MAX problem with suitable example. Write down the differences between MINI-MAX problem and alpha-beta pruning. 3+2
2. What is reasoning? Explain different types of reasoning with examples. 1+4
3. Given two jugs, one 4 litres and the other 3 litres with no markings in them. Also given a water supply with a large storage. Write down all production rules that are used to measure 2 litres of water using these two jugs. 5
4. Represent the following facts in predicate logic: 5
   - i. Every child like every candy
   - ii. Some child likes every candy
   - iii. Anyone who loves some candy is not a nutrition fanatic
   - iv. All boys like cricket
   - v. Some boys like football