Total No. of Pages: 2 *Roll No.....CO/252*

THIRD SEMESTER **B. Tech (CO, SE, IT)**
MID SEMESTER EXAMINATION **SEP-2017**

EC-261 ANALOG ELECTRONICS

TIME: 1.5 Hrs **Maximum Marks: 30**

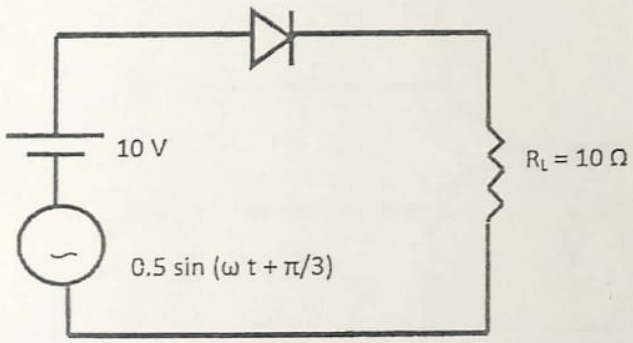
Note:
3) **All questions are compulsory.**
4) **Assume suitable missing data.**

Q.1 (1+2+3=6)

[a] Why holes are less mobile compare to the electrons?
[b] What is the difference between diffusion and drift current?
[c] Verify the Boltzmann relationship for an open circuited graded semiconductor.

Q.2 (3+2+3=8)

[a] Explain physical mechanism which produces (i) avalanche breakdown (ii) zener breakdown.
[b] Why do we use DC model and AC model separately for the diode to determine its total current?
[c] Calculate total current across resistance R_L if $V_y = 0.7$ V, $R_f = 5\ \Omega$, $\eta = 2$ and $T = 27^{\circ}C$.

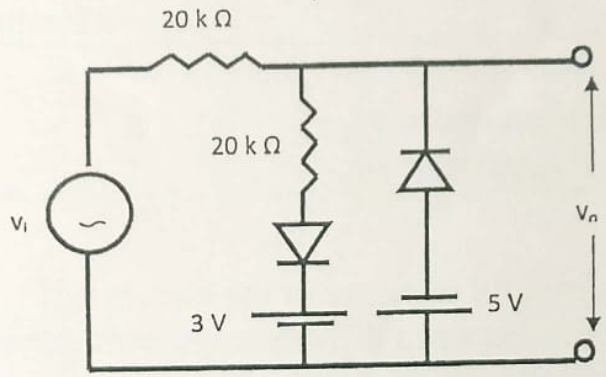


Q. 3 (3+2+3=8)

[a] Derive the value of ripple factor for (i) half wave rectifier (ii) full wave rectifier.

[b] What is a clipper? How can be realize output waveform clipped above V_1 and below V_2.

[c] Find the output voltage and plot the transfer characteristic curve for the given clipper circuit.

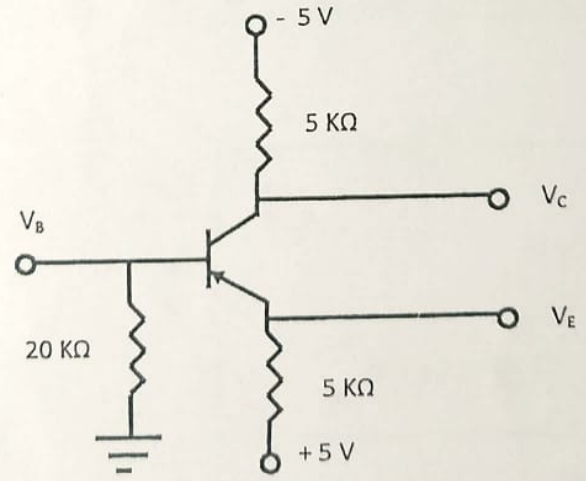


Q. 4 (3+2+3=8)

[a] Why BJT cannot be considered as cascaded combination of two diodes? Explain Ebers Moll model for pnp type transistor.

[b] Define α_F and α_R. Explain dependency of α_F on different parameters.

[c] Calculate V_B, V_C, α and β for given circuit if $V_E = 1$ V and $|V_{BE}| = 0.7$V



Total No. of Pages: 04 Roll No. 60/252

III SEMESTER B.Tech [CSE/SE/IT]

END SEMESTER EXAMINATION ***Nov/Dec-2017***

ANALOG ELECTRONICS (EC-261)

Time: 3:00 Hours ***Max. Marks: 40***

Note : Answer all question by selecting any two parts from each question.
All questions carry equal marks.
Assume suitable missing data, if any.

Q.1[a]Derive the formulae for electron concentration, hole concentration and barrier potential using electron concentrations in step graded p-n junction diode.

[b] Calculate change in resistivity of silicon bar if it is doped with a pentavalent impurity atoms with 1 atom for 50×10^6 silicon atoms (Silicon has 4.96×10^{22} atoms/cm^3). The given data is

$n_i = 1.52 \times 10^{10}$/cm^3, $\mu_p = 0.048$ m^2/Vs and $\mu_n = 0.135$ m^2/Vs

[c] Calculate the potential difference of step-graded p-n junction diode at room temperature if it is doped with N_A corresponding to 1 acceptor atom per 10^6 Si atoms and N_D corresponding to 1 donor atom per 10^8 Si atoms (Silicon has 5×10^{22} atoms/cm^3 and $n_i = 1.5 \times 10^{10}$/cm^3).

Q.2[a] Explain input and output characteristics of pnp transistor in CB configuration. What is base-width modulation or Early effect? How it effect collector current and emitter current?

[b] Calculate minimum and maximum value of zener diode current of given circuit (Fig-1)

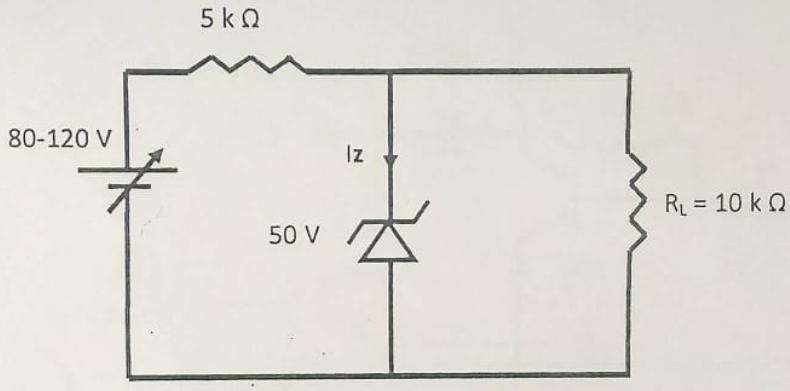


Fig-1

[c] For given circuit (Fig-2) $\beta_F = 50$. Find the value of Rc to obtain Vc = + 5 V. What happen if transistor is replaced with another transistor having $\beta_F = 100$?

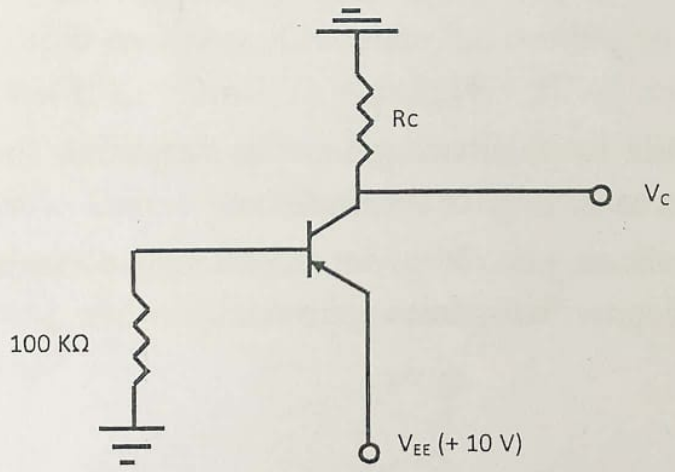


Fig-2

Q.3[a] Define the various *h*-parameters of BJT. Write the conversion formulae for *h*-parameters from CE configuration to CB configuration of BJT.

[b] Define voltage gain, current gain, input resistance and output resistance for CE configuration of BJT. Calculate voltage gain, current gain, input resistance and output resistance for given circuit (Fig-3) using *h*-parameter model.

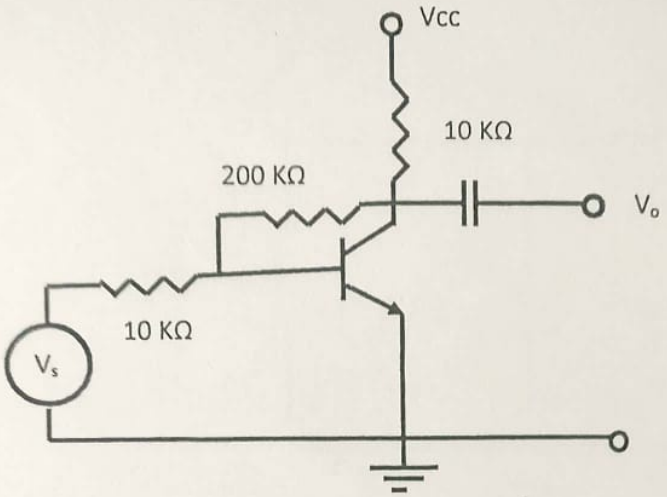


Fig-3

[c] Explain the simplified *h*-parameter model for CC configuration of BJT. Calculate voltage gain, current gain, input resistance and output resistance of circuit (Fig-3) using simplified *h*-parameter model.

Q.4[a] Derive formula for feedback gain of an amplifier. Explain effect of feedback on sensitivity of an amplifier.

[b] Calculate voltage gain of given circuit (Fig-4) using feedback amplifier concept with h-parameter model.

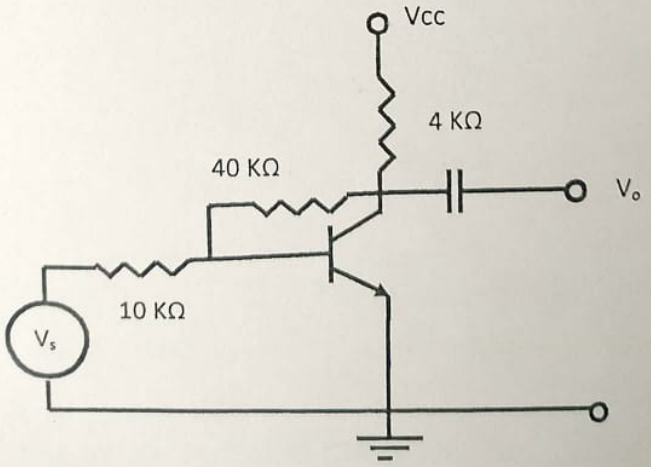


Fig-4

[c] Calculate voltage gain of given circuit (Fig-5) using feedback amplifier concept with h-parameter model.

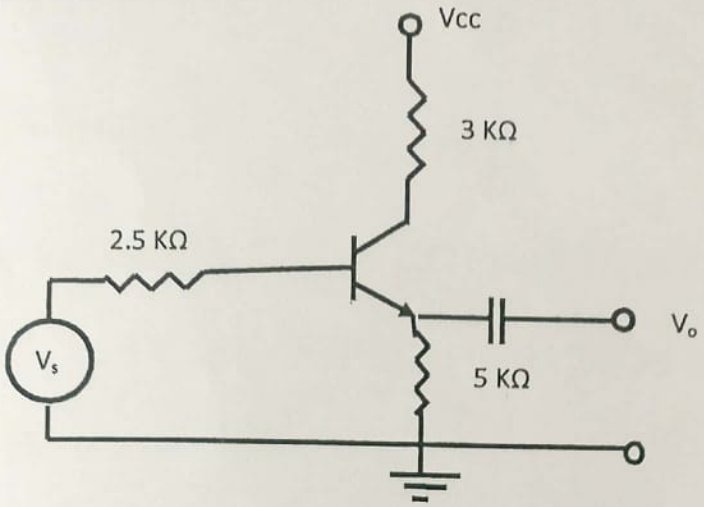


Fig-5

Q.5[a] Derive the formula for oscillation frequency of Hartley oscillator and Colpitt oscillator. Calculate the oscillation frequency of Clapp oscillator if $L_1 = 2mH$, $C_1 = 5pF$, $C_2 = 50$ nF and $C_2 = 100$ nF.

[b] Draw the circuit of ac equivalent circuit of BJT phase shifter oscillator. Derive formula for oscillation frequency and $(h_{fe})_{min}$.

[c] Write the all parameters of ideal and practical OP-AMP. Explain inverting and non-inverting mode function of ideal and practical OP-AMP.

Total No. of Pages:2

IIIrd SEMESTER

MID SEMESTER EXAMINATION

Roll No..... CO/252

B.Tech.(COE/SE)

(Sept. – 2017)

Paper Code: **CO-201/SE-201**

Time: 1:30 Hours

Title: Data Structures

Max. Marks: 30

Note: 1. Attempt all questions. Assume any suitable value(s) for missing data.
2. If asked to write algorithms, write as C functions or in pseudo code.

1. Given an array A of n elements with the following property: There exists an index i∈ [0, n − 1] such that A[0] < A[1] < . . . < A[i − 1] < A[i] > A[i + 1] > . . . > A[n-1]. All elements in the array before the index i are in increasing order and after index i are in decreasing order. Describe an efficient algorithm that can find such an i. (6 Marks)

2. Consider strings constructed using only the following characters '(', ')', '[', and ']'. Character '(' matches with only ')' and '[' matches with only ']'. A string comprising of these characters is 4 complete if every character is followed by its matching character or a substring that is complete followed by its matching character. For example "()", "[]", "([])", "[]([]())" are all examples of complete strings, while "([)]" and "[][(])" are examples of incomplete strings.

(i) Write algorithm using character stack which accepts such strings as input and prints "Complete" or "Incomplete".

(ii) Also write declaration of stack used in your algorithm in C and code for all stack operations. (4+4=8 Marks)

3. Let S be a stack of size n ≥ 1. Starting with the empty stack, suppose we Push the first n natural numbers in sequence, and then perform n Pop operations. Assume that PUSH and POP operations take X seconds each, and Y seconds elapse between the end of one such stack operation and the start of the next operation.

(i) For m ≥ 1, define the stack-life of m as the time elapsed from the end of PUSH(m) to the start of the Pop operation that removes m from S.

(ii) Find out the average stack-life of an element of this stack. Write all your steps/ calculations. (3+3=6 marks)

4. Let A be a two dimensional array declared as follows: int A[10][15]; Assuming that each integer takes one memory locations the array is stored in row-major order and the first element of the array is stored at location 100, what is the address of element A[i][j]? (5 marks)

5. The following C function takes a singly linked list of integers as a parameter and rearranges the elements of the list. The list is represented as pointer to structure. The function is called with the list containing integers 1, 2, 3, 4, 5, 6, 7 in the given order. What will be the contents of the list after the function completes?

```
struct node
{
        int value;
        struct node *next;
};
void rearrange(struct node *list)
{
        struct node *p, *q;
         int temp;
        if (list==NULL || list → next==NULL) return;
        p = list;
        q = list → next;
        while(q!=NULL)
        {
                temp = p → value;
                p → value = q → value;
                q → value = temp;
                p = q → next;
                if (p!=NULL) q=p → next;
                else q= NULL;
        }
}
```

(5 Marks)

Total No. of Pages

Roll No. CO/252

IIIRD SEMESTER

B.Tech.(Computer Engg/Software Engg.)

END SEMESTER EXAMINATION

(Nov. – 2017)

Paper Code: COE-201/SE-201

Title of the subject: **Data Structures**

Time: 3:00 Hours

Max. Marks: 40

Note: Answer any five questions. Write pseudo code/C code for all algorithms asked. Assume suitable missing data, if any.

1. (a) Implement insertion sort using linked list to perform insertion sort as follows: remove an element from the input list and insert it to the correct position in the output linked list. Write an algorithm for this insertion sort to sort n elements stored in a linked list.

   (b) Describe Overflow(stack full) and Underflow(stack empty) conditions in STACK data structure implemented (i) using array, (ii) using linked list. **[4,2+2]**

2. Consider a list of numbers: 62, 31, 70, 91, 25, 11, 9, 61, 73, 6
   Show the result of inserting the numbers in the list in the same order specified above into an initially empty **minimum heap**. Note that you need to show how the heap looks like after each number is inserted. **[8]**

3. (a) You are planning the seating arrangement for a wedding given a list of guests, V. Suppose you are also given a lookup table T where T[u] for u ∈ V is a list of guests that u knows. If u knows v, then v knows u. You are required to arrange the seating such that any guest at a table knows every other guest sitting at the same table either directly or through some other guests sitting at the same table. For example, if x knows y, and y knows z, then x, y, z can sit at the same table. Describe an efficient algorithm that, given V and T, returns the minimum number of tables needed to achieve this requirement. Analyze the running time of your algorithm.

   (b) Describe different methods for handling collision in Hash table. **[5,3]**

4. (a) Write an algorithm which checks if a given binary tree is a binary search tree (BST) or not. Algorithm should return true/false.

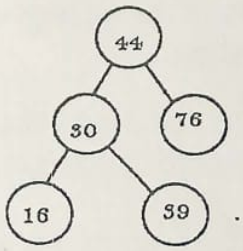
   (b) Write an algorithm that takes two linked lists, sorted in increasing order and merge the two into one linked list which is in decreasing order, and return it.

   [4,4]

5. Write algorithm to evaluate a postfix expression using suitable data structure. Your algorithm should detect and display error messages if given postfix expression in not valid/correct. [8]

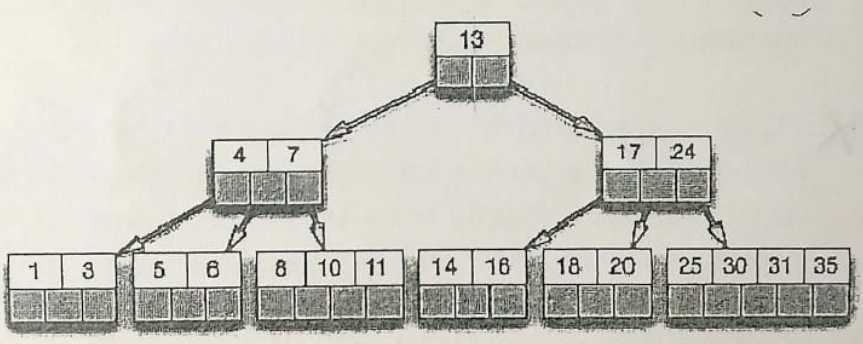
6. (a) Write algorithm which takes input a binary search tree T and value K and returns K^{th} smallest number in binary search tree. Return 0 if tree contains less than K elements. (assuming BST does not contain key 0).

(b) Insert key 37 in following AVL tree and draw final AVL tree after required rotation(s) if any.



[4,4]

7. (a) Consider following B-Tree of degree 6 (max 6 children)



(i) Draw tree after deleting key=6.

(ii) Draw tree after deleting key =16 (without applying (i) i.e. key=6 is still present in tree).

(b) A given string contains all types of printable characters. Write an algorithm to remove all characters other than alphabets from string with fixed amount of additional storage area. (e.g. "He4l*l%=O" to be converted to "HellO"). What is time complexity of your algorithm? [2+2,4]

8. (a) Write an algorithm to count number of leaf nodes in a given binary tree.

(b) Write an algorithm to concatenate two doubly circular linked lists L1 and L2. L1 and L2 are pointers to first node of linked lists respectively. After concatenation (L1 followed by L2), L1 points to first node of final linked list.

[4,4]

Total No. of Pages: 1

Roll No. CO-252

B.Tech.(CSE)

3RD SEMESTER

MID SEMESTER EXAMINATION

(September – 2017)

CO/SE 203: Object Oriented Programming

Time: 1:30 Hours **Max. Marks: 30**

Note: Answer all questions.
Assume suitable missing data, if any.

Q 1. Show how data encapsulation supports reusability. (2)

Q 2. What is a namespace? (2)

Q 3. List the operators that cannot be overloaded. (2)

Q 4. What is inline function? Explain situations where inline expansion may not work. (3)

Q 5. Explain the Object Oriented programming concepts. (5)

Q 6. Ramesh's basic salary is input through the keyboard. His dearness allowance is 40% of basic salary, and house rent allowance is 20% of basic salary. WAP to calculate this gross salary. Use Constructor, Destructor and Member Functions. (5)

Q 7. Explain copy constructor with suitable C++ coding. (5)

Q 8. Write a C++ program to create a class called STRING and implement the following operations. Display the results after every operation by overloading the operator.

STRING s1 = "HELLO"

STRING s2 = "WORLD"

STIRNG s3 = s1 + s2 ; (Use copy constructor) (6)

Total no. of pages 2
THIRD SEM

Roll No: CO 252
B.TECH(CO/SE)

ENS SEMESTER EXAMINATION

November 2017

CO/SE-203 OBJECT ORIENTED PROGRAMMING

Time: 3 Hours

Max. Marks : 40

Note : Answer any five questions
Assume suitable missing data, if any.

Q1. (a) Explain copy constructor, dynamic constructor, constructor with default arguments with suitable examples. 4

(b) How the constants are declared in C++? Give suitable code for declaring constants in different ways. Is there any difference between these constants? Explain. 4

Q2. (a) "Constructors are not inherited". Explain the statement and write code to show how parameters are passed to the base class(es) constructors and in which order? 5

(b) What is inline function? Write a program using inline function, to find sum of two numbers. 3

Q3 (a) Explain the difference between overloading and overriding. Give relevant code for both. 4

(b) What is function overloading? Write a program to overload function area using function overloading. 4

Q4. (a) Explain keywords - new, template, throw, 3

(b) Write a program to add, show details of faculty and student using inheritance where class "person" is inherited by two different classes "faculty" and "student" 3

(c) What is the purpose of pure virtual function? Explain. 2

Q5 (a) What are the rules for overloading template function? 3

(b) Explain the following: 5

i) Abstraction
ii) Encapsulation
iii) objects
iv) this pointer
v) virtual base class

Q6. (a) Write a program to overload post and pre increment operator. 5

(b) Explain different visibility modes available in C++. How the inheritance changes the visibility of members. 3

Q7. Write short notes on any two :- 8

(a) Array of pointers

(b) Templates

(c) Features of Java

Total No. of Pages: 01

Roll No: CO-252

THIRD SEMESTER

B.Tech. [COE]

MID SEMESTER EXAMINATION

Sept., 2017

CO-205, Discrete Mathematics

Time: 1.5 Hours

Max. Marks: 30

Note: *Attempt **ALL** questions. All questions carry equal marks. Assume suitable missing data, if any.*

1. Show that the set R of real numbers with the composition $\circ$ and $\star$ by

$$a \circ b = a + b + 1 \text{ and } a \star b = ab + a + b$$

is a ring. Determine 0 and 1 elements of the ring.

2. State and prove the Lagrange's theorem. Also discuss the theorem with a suitable example.

3. Solve $a_{n+2} - 5a_{n+1} + 6a_n = 2$ with initial condition $a_0 = 1$ and $a_1 = -1$.

4. Check whether the relation $(x, y)R(a, b) \Leftrightarrow x^2 + y^2 = a^2 + b^2$ is an equivalence relation on the plane? If yes, Describe the class.

5. Define Pigeonhole Principle and using this show that in any set of eleven integers, there are two whose difference is divisible by 10.

6. Discuss the following with examples:
   (a) Generating functions
   (b) Homeomorphism. [2+3]

— — * * — — * * — — * * — — * * — — * * ——

Total No. of Pages: 02

Roll No: Co - 252

THIRD SEMESTER

B.Tech. [COE]

END SEMESTER EXAMINATION

NOV., 2017

CO205, Discrete Structures

Time: 3.0 Hours

Max. Marks: 50

Note: *Attempt **ANY** two parts from each questions. All questions carry equal marks. Assume suitable missing data, if any.*

1. (a) Discuss the followings:

(a) Give an example of a relation which is symmetric, transitive but not reflexive on $\{a, b, c\}$.

(b) Define normal subgroup of a group.

(c) Write the negation of the statement $(\exists x)(\forall y)p(x, y)$ [1+2+2]

(b) (I) Verify the validity of the inference. If one person is more successful than another, then he has worked harder to deserve success. Rakesh has not worked harder them Sham. Therefore, Rakesh is not succesful than Sham.

(II) A survey of 500 television watchers produced the following information: 285 watch football games, 195 watch hockey games, 115 watch basket ball games, 45 watch football and basket games, 70 watch football and hockey games, 50 watch hockey and basket ball , 50 don't watch any of the three games. How many people watch exactly one of the three games? [3+2]

(c) Let G be a group. Prove that the map $f : G \Rightarrow G$ given by $f(a) = a^{-1}$ for all $a \in G$ is an isomorphic iff G is commutative.

2. (a) (I) Is $(P \Rightarrow Q) \wedge (Q \Rightarrow R) \Rightarrow (P \Rightarrow R)$ a Tautology?

(II) If S denotes the set of positive intergers ≤ 100, for $x, y \in S$. Define $x * y = \min(x, y)$. Check whether $(S, *)$ is a monoid? [2+3]

(b) Determine whether the conclusion C is valid in the following premises:

$$H1 : P \Rightarrow (Q \Rightarrow R), \quad H2 : P \wedge Q, \quad C : R$$

(c) Prove that distinct equivalence classes are disjoint.

3. (a) Show that if we take $n+1$ numbers from the set $\{1, 2, ..., 2n\}$, then there will be some pair in which one number is a multiple of the other one.

(b) Prove that a connected graph G is Eulerian if and only if all the vertices are of even degree.

(c) Find all solutions of the recurrence relation $a_{n+2} - 4a_{n+1} + 4a_n = 2^n$.

4. (a) Prove that set of all rational numbers under usual addition and scalar multiplication is a field.

(b) Prove that every chain is a distributive lattice.

(c) (I) Find the generating function of a sequence a_k if $a_k = 2 + 3k$
(II) Find the chromatic number of the graphs: complete graph K_n, a bipartite graph. [3+2]

5. (a) (I) Check whether the relation given by $\Rightarrow$ (implies) is associative?
(II) Define the following with examples:
- Modus ponens
- Modus tollens. [3+2]

(b) Prove that a simple graph G with atleast one edge is bipartite if and only if chromatic number $\chi(G) = 2$.

(c) Consider the poset $A = (1, 2, 3, 4, 6, 9, 12, 18, 36, /)$. Draw its Hesse diagram and find the greatest lower bound and the least upper bound of the sets $\{6, 18\}$ and $\{4, 6, 9\}$.

– – –ALL THE BEST– – –

Total No. Of Pages 2

Roll no. 60/252

THIRD SEMESTER

B.TECH (CO/SE)

MID SEMESTER EXAMINATION

September 2017

CO-207 SIMULATION AND MODELLING

Time 1:30 hours

Max. Marks: 25

Note: All Questions are Compulsory. All Questions Carry Equal Marks.
Assume suitable missing data ,if any:

Q1. i) Explain the concept of Next Event Time Advance Mechanism in Discrete Event Simulation Models?

ii) Discuss the random number using mid square method with an example and also write down the limitations or challenges? (2.5*2=5)

Q2. Consider a single server queuing for which inter arrival time and service time are A_i values are 0.9, 1.0, 2.9, 2.0 and S_i values 1.2, 3.5, 1.4 and stopping condition is n=4 delay in queue desired and also calculate the average no. of customer in queue, percentage utilization of server and Average delay in queue of n customer by Graphical Method. (5)

Q3. For the following multiplicative generator, compute Z_i for enough values of i >=1 to cover an entire cycle and find the period of the generator.

a) Z_0=1, a=11, m=16
b) Z_0=2, a=11, m=16
c) Z_0=1, a=2, m=13
d) Z_0=2, a=3, m=13
e) Z_0=3, a=2, m=13

(5)

Q4. Differentiate with example

i) Continuous and Discrete system
ii) Deterministic and Stochastic Simulation Models (2.5*2=5)

Q5. A company produces component A which is then installed to end product. Historical data indicates that the indicates that the average production time for component A is 4 hour but fluctuation in average time follows following probability distribution

Hours	2	3	4	5	6	7
Probability	0.10	0.25	0.40	0.10	0.10	0.05

Average time to install it is 3 hours but fluctuations in average time follows following probability distribution.

Hour	2	3	4	5
Probability	0.30	0.45	0.15	0.10

Simulate for 10 arrivals on the current system and 10 installations for idle time and queue time with the help of following random, numbers 20, 74, 94, 22, 93, 45, 33, 16, 4, 32, 3, 62, 61, 89, 1, 27, 49, 50, 90 ,98. (5)

Total No. Of Pages 3

Roll no. 60/252

THIRD SEMESTER

B.TECH (CO/SE)

END SEMESTER EXAMINATION

November 2017

CO-207/SE-207 SIMULATION AND MODELLING

Time 3:00 hours

Max. Marks: 50

Note: Attempt any five questions. All Questions Carry Equal Marks. Assume suitable missing data ,if any:

Q1. A store has one counter. The probability of inter-arrival time and service time of customers are given in the following table:

Inter-arrival time (min)	Probability	Service time (min)	Probability
1	0.2	3	0.2
2	0.3	5	0.5
3	0.3	7	0.3
4	0.1		
5	0.1		

Random numbers used for prediction of inter-arrival time and service time are as per the table given below:

Customer	1	2	3	4	5	6	7	8	9	10
R.N. for Arrival		61	55	1	33	19	25	79	93	18
R.N. for Service	28	1	61	85	67	53	62	79	66	63

P.T.O.

It is assumed that first customer comes at 0 time. Random numbers used are from the set of 100 random numbers from **00 to 99**. Simulation is to be carried out to find the performance measures of a queueing system.

a) What is the service start time for 10^{th} customer?
b) What is the waiting time in queue for 6^{th} customer?
c) What is the arrival time of the 7^{th} customer?
d) What will be the time spend by 5^{th} customer in the system?
e) What is the waiting time in queue for 8^{th} customer? **(2*5=10)**

Q.2 a) Explain the components of a Discrete event simulation models? **(5)**

b) Draw the flow of control for the next-event time-advance approach. **(5)**

Q.3 For a particular shop, the daily demand of an item with associated probabilities is given below:

Daily demand	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

If random number stream **(X_1, X_2 ..... X_{10})** is generated using linear congruential generator **($X_i = a*X_{i-1} + c$)mod m** with $X_0 = 27$, a = 17, c = 4, and m = 100.

a) What is the average daily demand for first 4 days?
b) What is the average daily demand for first 10 days?
c) What is the demand on 5^{th} day is to be expected?
d) What is the demand on 8^{th} day is to be expected?
e) What is the average daily demand for first 6 days?

(2*5=10)

P.T.O.

Q.4 Suppose that X and Y are jointly continuous random variables with

$$f(x, y) = y - x \qquad \text{for } 0 < x < 1 \text{ and } 1 < y < 2$$

a) Compute $F_X(x)$ and $F_Y(y)$? (2)
b) Compute E(X), Var(X), E(Y), Var(Y)? (4)
c) Compute Cov(X,Y) and Cor(X,Y)? (4)

Q.5 Explain the following:

a)Queue disciplines in a Queueing system. (3)
b) Fixed Increment time advance Mechanism. (3)
c) Steps in a sound simulation study. (4)

Q.6 a) Compute the mean and variance for uniform distribution? (5)

b) What are the different steps in developing model from input data? (3)

c) Difference between simulation and modeling? (2)

Q.7 Explain any four:-

a) Binomial distribution
b) Gamma Distribution
c) Goodness-of-fit tests
d) Poisson Distribution
e) Inverse Transform Technique. **(2.5*4=10)**

-END-

Total No. of Pages- One

Roll No. CO/252

IIIrd Semester **B. Tech -(BT/CO/EC/EE/EL/IT/SE/ENE)**

MID SEMESTER EXAMINATIO2017-18 (Odd) **September -2017**

HU - 201 - Engineering Economics

Time: 1Hours30 Minutes Max Marks: 25

Note:	Answer all questions. Assume suitable missing data, if any

1. Fill in the blanks: (5)

a. Sand near construction site is a ---------- commodity.

b. Labour gets ---------- for its contribution in production.

c. In ---------- , there are large number of producers producing homogenous product.

d. Cost of producing additional unit is called as ---------- cost.

e. Good and Services Tax (GST) is ---------- tax.

f. State Bank of India is ---------- bank.

g. Opportunity cost is the -------- of the next best option.

h. If value of export is -------- than import for a country, its Balance of Payment is known as Surplus Balance of Payment.

i. Value of money -------- in case of Inflation.

j. Cross Elasticity of Demand is negative in case of ---------- goods.

2. What do you mean by International Trade? How it is different from Internal Trade? (5)

3. What do you mean by Microeconomics? How it is different from Macroeconomics? (5)

4. What do you mean by Trade Cycle? Discuss. (5)

5. What do you mean by Production Function in Economics? (5)

Total No of Pages 02 Roll. No. CO/252

SEMESTER- THIRD B.TECH BT/CO/EC/EE/EL/EN/IT/SE

"ENE SEM EXAMINATION" NOVEMBER.-2017

HU201 ENGINEERING ECONOMICS

Time: 03: 00 Hours Max. Marks: 50

Note: *Answer any five questions. Assume suitable missing data if any.*

1(a)	Discuss those aspects which need to be considered while deciding price of a product in the market?	5
1(b)	If cost of the machine for producing a component of the production process is Rs. 20, 00, 000 and making a workshop for making the machine operational is Rs. 5, 00,000. The cost of a labour, raw material and electricity required for producing an unit is 1000, 750 and 250 respectively. The component is available at Rs. 27, 000/ unit in the market. If the company's annual demand is 1300. Whether the company should make or purchase from the market.	5
2(a)	Discuss production processes in the age of information and Communication Technology (ICT) and enhanced role for engineers in such production process in developing economies like India.	5
2 (b)	A company has to replace a machine in the production line after 11 years at the cost of Rs. 60,00,000/-. It plans to deposit an equal amount at the end of every year for the next 11 years at an interest rate of 11 per cent which is compounded annually. Find the equivalent amount that must be deposited at the end of every year for next 11 years.	5
3(a)	Discuss the nature of computer soft ware market in India. As it is one of highest foreign reserve earner for India, what incentive may be given by the Government to encourage Indian producer?	5
3(b)	If the demand law is given by $x=20/(x+1)$, find elasticity of demand with respect to price at the point when $p=3$.	2
3(c)	What amount of money saved today will yield Rs. 40,000/- in third year and Rs. 55,000/- after five year at the 12% rate of interest compounded annually.	3
4(a)	What do you mean by Inflation? Discuss role of Fiscal policy in control of Inflation	5
4(b)	A Company wants to deposit money to create an R&D reserve. The company will get 15,00,000 every year for next 15 years for R&D. The reserve will grow at the rate of 12 per cent annually. Find out the single payment which should be made now.	5
5(a)	Environmental problems are macro level problems. Discuss the role of appropriate technology in this regard. Also suggest framework to impose taxes to control environmental hazards.	5

5(b) A firm, Prime Manufacturing is planning to expand its production operation. It has identified three machines which are technologically capable to serve the purpose. The initial outlay and annual revenues with each of the machines are given below: 5

	Initial Outlay (Rs.)	Annual revenue	Life (in years)
Machine I	Rs. 5,45,000	Rs. 2,50,000	15
Machine II	Rs. 6,14,000	Rs. 3,30,000	12
Machine III	Rs. 6,00,900	Rs. 3,50,000	10

If the rate of interest is 12%, which machine the company should opt for? Find out the result by Present Worth method.

6(a) Discuss application of Engineering & Technology to improve life at slum. 5

6(b) A company must decide whether to buy machine A or Machine B 5

	Machine A	Machine B
Initial Cost (Rs.)	3,00,000	6,00,000
Useful Life (years)	4	4
Salvage value at the end of machine life (Rs.)	2,00,000	3,00,000
Annual Maintenance (Rs.)	30,000	0

At 15% interest rate, which Machine should be purchased? Use Annual Equivalence Method.

7(a) Discuss Business Risk which you will consider while deciding location for your foreign venture. 5

7(b) A man owns a corner plot. He must decide which of the several alternatives to select in trying to obtain a desirable return on his investment. After much study and calculations, he decides that the two nest alternatives are as follows: 5

	Build Gas station	Build Soft ice-cream stand
Initial Cost (Rs.)	20,00,000	36,00,000
Annual Property Taxes (Rs.)	89,000	1,50,000
Annual Income (Rs.)	8,00,000	9,80,000
Life of Building (years)	20	20

There is no salvage value. Evaluate the alternatives based on the future worth method at rate of interest = 12%.

END