MODULE 4

17. (a) Show that the positive integers N is a lattice with respect to the separations a $a \vee b = lcm\,(a, b)$ and $a \wedge b = gcd\,(a, b)$.

(6 marks)

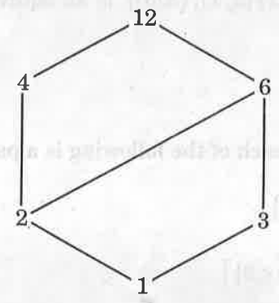
(b) Give *two* examples of a complemented lattice where the complements are not unique.

(6 marks)

Or

18. (a) Show that every finite lattice is bounded. (5 marks)

(b) Consider the lattice $D_{12} = \{1, 2, 3, 4, 6, 12\}$, the divisiors of 12 ordered by divisibility (whose diagram is shown below : Find (i) the lower bound and upper bound of D_{12}, and (ii) the complements of 4 and 6, (iii) Is D_{12} a complemented lattice ?



(7 marks)

MODULE 5

19. (a) Prove that a connected graph G remains connected after removing an edge e_i from G, if and only of e_i is in some circuit in G.

(6 marks)

(b) In a graph G let p_1 and p_2 be two different paths between two given vertices. Prove that $p_1 \oplus p_2$ is a circuit or a set of circuits in G.

(6 marks)

Or

20. (a) Let v be a vertex in a connected graph G. Prove that there exists a spanning tree T in G such that the distance of every vertex from v is the same both in G and in T.

(7 marks)

(b) Show that a Hamiltonian path is a spanning tree. (5 marks)

[5 × 12 = 60 marks]

F 6258 (Pages : 4) Reg. No.....

Name.....

B.TECH DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering/Information Technology

EN 010 301 B—ENGINEERING MATHEMATICS—II (CS, IT)

(New Scheme—Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. Write each of the following in symbolic form :
   (i) Some boys are not good.
   (ii) All men are mortal.
   (iii) It is true that 2 + 2 = 4 and 5 + 6 = 11.
2. What is pigeonhole principle ?
3. Define partial order and total order relations.
4. Determine whether *or* not each of the following set is a lattice with respect to divisibility :

   $C = \{1, 3, 4, 9\}$ and $D = \{1, 2, 3, 9, 18\}$.

5. What is the minimum number of vertices necessary for a graph with six edges to be planar ?

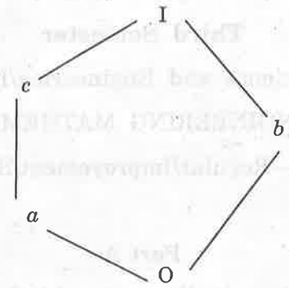
(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries **5** *marks.*

6. Define truth table. Construct the truth table of $\neg(P \vee (Q \wedge R)) \rightleftarrows ((P \vee Q) \wedge (P \vee R))$.
7. Let $f : R \to R$ be defined by $f(x) = 2x - 3$. If f is one-to-one and onto, find inverse of f.
8. Let S be the relation on the set N of positive integers defined by the equation $3x + 4y = 17$. Write S as a set of ordered pairs.

9. Find the Complements of the element b in the following lattice.



10. Draw a diagram of the following directed graph G where $V(G)=\{A, B, C, D, E\}$, and $E(G)=\{[A, B], [A, C], [B, C], [B, D], [C, C][D, B]\}$.

(5 × 5 = 25 marks)

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module 1

11. (a) Find the truth tables for :

(i) $p \vee \sim q$; and (b) $(\sim p \vee q) \wedge r$. (6 marks)

(b) Verify that the proposition $(p \wedge q) \wedge \sim (p \vee q)$ is a contradiction. (6 marks)

Or

12. (a) Negate the following :—

(i) $\exists y\, \exists x\, (p(x) \wedge \sim q(y))$. (ii) $\exists y\, \exists x\, \exists z,\ p(x, y, z)$.

(6 marks)

(b) Determine the truth value of each of the following statements (where R is the universal set)

(i) $\exists x,\ 2x = x$. (ii) $\forall x,\ x - 3 < x$.

(iii) $\exists x,\ x^2 - 2x + 5 = 0$.

(6 marks)

Module 2

13. (a) Given $f : A \to B$ and $g : B \to C$. Show that if g o f is one-to-one, then f is one-to-one.

(6 marks)

(b) Using arithmetic modulo 15, evaluate 9 + 13, 7 + 11, 4 – 9, 2 – 10. (6 marks)

Or

14. (a) Check whether the functions u, v, w are injective surjective and bijective, if $f : R \to R$, $g : R \to R$, $u = fog$, $v = gof$, $w = (fog)\, og$, given $f(x) = x^2 - 2$ and $g(x) = x + 4$.

(6 marks)

(b) Find the *gcd* and *lcm* of 1251 and 1006. (6 marks)

Module 3

15. (a) The relation $R = \{(1, 1), (1, 2)(2, 1), (3, 3)\}$ is an equivalence relation of the set $S = \{1, 2, 3\}$. Find the quotient set S/R.

(6 marks)

(b) Determine whether *or* not each of the following is a partition of the set R os real members.

(i) $[\{x : x > 4\}, \{x : x < 5\}]$.

(ii) $[\{x : x > 0\}, \{0\}\{x : x < 0\}]$.

(iii) $\left[\left\{x : x^2 > 11\right\}, \left\{x : x^2 < 11\right\}\right]$.

(6 marks)

Or

16. (a) Suppose R and S are symmetric operations on a set A. Show that $R \cap S$ is also symmetric.

(6 marks)

(b) Let R be the relation on $A = \{1, 2, 3, 4\}$ defined by $R = \{(1, 1), (2, 2), (2, 3), (3, 2), (4, 2)(4, 4)\}$.

Show that R is neither :

(i) Reflexive nor.

(ii) Transitive.

(6 marks)

Turn over

F 6264 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering/Information Technology

CS 010 303
IT 010 306 } PROBLEM SOLVING AND COMPUTER PROGRAMMING (CS, IT)

(New Scheme—Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 3 *marks.*

1. Write the syntax of "switch" statement.
2. What is a nested loop ?
3. Write the general format of fwrite ( ).
4. What are Identifiers ?
5. Write the uses of pointers ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 *marks.*

6. Explain the different control statements in C.
7. Explain the structure of a C program.
8. Define function. Write the general syntax of a function in C with an example.
9. Explain structure and the components of a structure.
10. What is Dynamic Memory Allocation ?

(5 × 5 = 25 marks)

Turn over

Part C

Answer **either** *(a)* **or** *(b) of each question.*
Each question carries 12 *marks.*

11. (a) Write a C program to find whether a given number is odd or even. If even, print its square root.

Or

(b) Write an algorithm and flow chart to find the smallest from a set of 25 numbers.

12. (a) Write a C program to multiply two $m \times n$ matrices.

Or

(b) Write a C program to sort a set of 20 numbers using "bubble sort" method.

13. (a) Write a program to check whether a string is a palindrome or not.

Or

(b) Using function, calculate GCD of any 3 numbers.

14. (a) Write a C program to read in the names and marks of 5 subjects of 10 students. The result should be displayed as "Fail" if the average mark is less than 40 %.

Or

(b) Write a program using pointers to sort a set of 20 numbers and to display the smallest number.

15. (a) Write a C program to read in a set of '*m*' names and their phone numbers. Use a structure variable to store the name and phone number of each customer. Then create a data file.

Or

(b) Explain enumerated data types. Illustrate all the bitwise operators in C with examples.

(5 × 12 = 60 marks)

F 6271 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering

CS 010 304—COMPUTER ORGANIZATION (CS)

(New Scheme—Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. Why carry look ahead adder is more beneficial than the other types of adders ?
2. How floating point numbers are represented using single precision and double precision formats ?
3. What is the significance of horizontal and vertical organization of micro-instructions ?
4. What is the role of cache memory in improving system performance ?
5. What is anticipatory swapping ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain Booth's algorithm for signed multiplication.
7. Explain the construction of 1 bit ALU.
8. Describe the memory transfer operation using micro-instructions.
9. Discuss the concept of memory interleaving and give its advantages.
10. What are the address mapping schemes used for virtual memory ?

(5 × 5 = 25 marks)

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module I

11. Explain how addition is performed by a carry save adder. What are its merits and demerits ?

Or

12. Multiply the following pair of signed 2's complement numbers using Booth's algorithm

A = 010101 (multiplicand)

B = 110101 (multiplier)

Module II

13. With neat flow charts, explain how floating point addition and division are performed in a computer.

Or

14. Draw the block diagram of a typical ALU and explain in detail, how timing and control is achieved.

Module III

15. What is micro-programming ? Discuss the organization of a microprogrammable control unit. How does it compare with hardwired control.

Or

16. Explain clearly the different schemes followed in optimizing control memory in microprogram control.

Module IV

17. Explain the different ways of organising cache in a computer. What are the merits and demerits of all of them ?

Or

18. Compare and contrast direct mapping, set associative and fully set associative cache and explain cache masses in each case by taking suitable examples.

Module V

19. Distinguish between segmented and paging memory system. Design a memory system having average access time 0.2 ms with the help of two level memories having 0.2 μs and 2 ms of access time.

Or

20. Explain how virtual address in translated into physical address using fixed length page concept in virtual memory. Explain hit rate and miss penalty.

(5 × 12 = 60 marks)

F 6281 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering/Information Technology

CS 010 305/IT 010 304—SWITCHING THEORY AND LOGIC DESIGN (CS, IT)

(New Scheme—Regular/Improvement/ Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *question briefly.*
Each question carries 3 *marks.*

1. Simplify the following Boolean expressions :

   (a) $RST + RS + (\bar{T} + V)$ (b) $(M + N)(\bar{M} + P)(\bar{N} + P)$

2. What is a multiplexer ? Differentiate between MUX and DEMUX.

3. With a circuit diagram, show how an SR flip-flop can be converted into D flip-flop ?

4. Why are shift registers considered to be basic memory devices ?

5. Explain hazards in combinational circuits.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Find the minimal sum and minimal product forms for the function, using K-map $f = \Sigma(1, 3, 4, 6, 7, 8, 10, 11, 15)$.

7. Draw the full adder circuit using NAND gates only. Explain the functioning of the circuit with its truth table.

8. What are state tables ? Give the state tables for SR, JK, D and T flip-flops ?

9. How can you use a ring counter to get a gate waveform ? Explain with necessary circuit and waveforms.

10. Explain the Boolean difference method of finding test vector for detecting a stuck-at-fault.

(5 × 5 = 25 marks)

Turn over

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

MODULE 1

11. Design and implement a BCD to excess-3 code converter using minimal basic gates. Draw the circuit.

Or

12. Find the minimal sum for the Boolean function using Quine Mc-Clusky technique and prime implicant table reduction :

$f(a,b,c,d) = \sum(3,4,5,7,10,12,14,15) + dc(2)$.

MODULE 2

13. (a) Design and explain a carry look ahead adder. (6 marks)

(b) Implement the following function using 8 to 1 multiplexer. Use a, b, c as select lines

$f(a,b,c,d) = \sum m(0,1,5,6,7,9,10,15)$. (6 marks)

Or

14. Implement the following function using $3 \times 4 \times 2$ PLA with both true and complemented outputs. Write PLA table

$f_1(a,b,c) = \sum m(0,1,3,5)$

$f_2(a,b,c) = \sum m(0,2,3,4)$.

MODULE 3

15. (a) Describe the structure of a clocked synchronous sequential network. (6 marks)

(b) Explain (i) state table ; (ii) state diagram with an example in each case. (6 marks)

Or

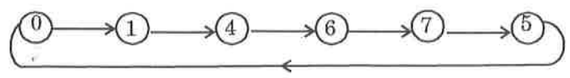
16. Draw the circuit diagram of a master slave clocked JK flip-flop having asynchronous inputs. Use fundamental logic gates. Explain its working with truth tables.

MODULE 4

17. Design a synchronous mod-6 counter using clocked JK flip-flops. Write the excitation table. Draw the circuit and explain its timing diagram.

Or

18. Design and implement a synchronous counter having the following repeated binary sequence.



.Use JK flip-flops.

MODULE 5

19. (a) Give a table for set of all possible single stuck-at-faults and fault free and faulty responses. Explain.

(7 marks)

(b) Explain fault-tolerance techniques. Describe with respect to hardware redundancy and static redundancy.

(5 marks)

Or

20. (a) Draw and explain the circuit of a CMOS NOR gate. (6 marks)

(b) Describe the circuit diagram of an exclusive-OR gate using RTL family. (6 marks)

($5 \times 12 = 60$ marks)

F 6290 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering

CS 010 306—ELECTRONIC DEVICES AND CIRCUITS (CS)

(New Scheme—Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. In what kind of loads the C fitler is used ? Give reasons.
2. How the Q-point is fixed for the maximum symmetrical signal swing ? Explain.
3. Write any *three* properties of op-amp. Give the values in ideal as well as practical cases.
4. State and explain Barkhausen conditions for oscillator.
5. Write three different applications of a bistable, multivibrator.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Draw the circuit of a voltage regulator using 7805. Specify the input voltage range and circuit component values.
7. Draw the *h*-parameter equivalent circuit model for a BJT and define the parameters. Give their typical values.
8. Draw the non-inverting amplifier using op-amp. Derive its voltage gain.
9. Sketch the circuit diagram of a crystal oscillator. Give any *two* places where it is used.
10. With a circuit diagram and waveforms, describe a high pass RC circuit for a step input.

(5 × 5 = 25 marks)

Part C

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module I

11. With a complete neat circuit diagram and waveforms, describe the working of a bridge rectifier using a π filter.

Or

12. Draw the series pass voltage regulator circuit with feedback control. Explain the function of each component. Show how it provides regulation of output voltage against variations in load current.

Module II

13. Draw a CB amplifier and state its properties. Sketch its input and output characteristics and explain their shapes.

Or

14. Compare the (i) Emitter feedback bias and (ii) Voltage divider bias amplifiers with their circuit diagrams. Draw the load lines and comment on the stability factors of your circuits.

Module III

15. (a) Draw the internal functional block diagram of an op-amp and describe the function of each block.

(6 marks)

(b) Design the circuit for an inverting op-amp for a voltage gain of 10 and input resistance 100 Ω.

(6 marks)

Or

16. Draw the circuit of an inverting adder with three inputs. Derive the expression for its output voltage.

Module IV

17. Draw the block schematics of four types of feedback and describe what happens to their input and output resistances.

Or

18. With neat circuit diagrams, explain Wien bridge and Colpitt's oscillators. Compare and contrast them.

Module V

19. Draw the circuit of a monostable multivibrator using op-amp. Explain its working with necessary waveforms.

Or

20. Explain the working of a 555 astable multivibrator with necessary waveforms. Derive expression for its frequency.

(5 × 12 = 60 marks)

F 6294 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science/Information Technology

ENGINEERING MATHEMATICS—II (R, T)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Answer any **one** *full question from each module.*
Each full question carries 20 *marks.*

Module 1

1. (a) Prove that $((P \vee Q) \wedge \neg (P \wedge (\neg Q \vee \neg R))) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$ is a tautology.

   (b) Prove that there is no rational number p/q whose square is 2. Use the method of proof by contradiction.

Or

2. (a) Show that for every integer n, if n^2 is odd, then n is odd.

   (b) Negate : If the teacher is absent then some students do not complete then home work.

   (c) Write the contrapositive of only if Johny studies will pass the test.

   (d) Determine the truth value of the statement : It is false that 5 + 5 = 10 and 3 + 3 = 8

Module 2

3. (a) State and explain euclidean algorithm. Also find the *gcd* of 24140 and 16762.

   (b) Suppose S and T are two sets and f is a function from S to T. Let R_1 be an equivalence relation on T. Let R_2 be a binary relation on S such that $\{x, y\} \in R_2$ if and only if $\{f(x), f(y)\} \in R_1$ .Show that R_2 is also an equivalence relation.

Or

4. (a) Show that among $n + 1$ positive integers less than *or* equal to $2n$, there are two of them that are relatively prime.

   (b) Let A be a set of books. Let R_2 be a binary relation on A such that (a, b) is in R_2 if book a costs more or contains fewer pages than book b. In general, examine if R_2 is reflexive ? Symmetric ? Antisymmetric ? Transitive ?

Turn over

Module 3

5. (a) Let $\langle L, *, \oplus \rangle$ be a distributive lattice for any $a, b, c \in L$, show that $a * b = a * c$ and $a \oplus b = a \oplus c \Rightarrow b = c$.

(b) Let a, b, c be elements in a lattice $(A, \leq)$. Show that

(i) $a \vee (b \wedge c) \leq (a \vee b) \wedge (a \vee c)$.

(ii) $(a \wedge b) \vee (a \wedge c) \leq a \wedge (b \vee c)$.

Or

6. (a) A lattice $(A, \leq)$ is called a modular lattice if for any a, b, c in A, where

$a \leq c, a \vee (b \wedge c) = (a \vee b) \wedge c$. Show that a lattice is modular if and only if the following condition holds : $a \vee (b \wedge (a \vee c)) = (a \vee b) \wedge (a \vee c)$.

(b) Find all the sublattices of $\langle S_n, D \rangle$ for $n = 12$.

Module 4

7 (a) Find a simple expression for the generating function of the discrete numeric function :

1, 1, 2, 2, 3, 3, 4, 4 .....

(b) Given that $a_0 = 0, a_1 = 1, a_2 = 4$ and $a_3 = 12$ satisfy the recurrence relation

$a_r + C_1 a_{r-1} + C_2 a_{r-2} = 0$. Determine a_r.

Or

8. (a) Determine the discrete numeric function corresponding to the generating function

$$A(z) = \frac{1}{(1-z)(1-z^2)(1-z^3)}.$$

(b) Solve the recurrence relation :

$a_r - a_{r-1} - a_{r-2} = 0$, given that $a_0 = 1$ and $a_1 = 1$.

Module 5

9. (a) Show that the sum of the squares of the in-degrees over all vertices is equal to the sum of the squares of the out-degrees over all vertices in any directed complete graph.

(b) Show that in a linear planar graph with less than 30 edges has a vertex of degree 4 or less.

Or

10. (a) Construct an optimal ternary tree for the weights 1, 2, 3, 4, 5, 6, 7, 8, 9.

(b) Prove that the complement of a spanning tree does not contain a cut-set and that the complement of a cut-set does not contain a spanning tree.

(5 × 20 = 100 marks)

F 6299 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering

MICROPROCESSOR SYSTEMS (R)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries **4** *marks.*

1. Indicate and explain the purpose of the following in a microprocessor :—
   (i) Accumulator ; (ii) Flag register ; (iii) Program counter ; and (iv) Stack pointer.
2. Why AD0-AD7 lines are multiplexed ? How the address and data are identified ?
3. Explain DAA instruction with example.
4. What do you mean by looping, counting and indexing ? Explain with examples.
5. Explain the use of stack in CALL and RETURN instructions.
6. Explain restart as a software instruction. Show the implementation of RST4.
7. Explain polling as used in 8085.
8. What do you mean by masking interrupt ? How is it achieved in 8085 ?
9. Compare and contrast between full and partial decoding techniques.
10. Explain the synchronous and asynchronous data transfer.

(10 × 4 = 40 marks)

Part B

Answer any **one** *full question from each module.*
Each full question carries **12** *marks.*

Module 1

11. Explain ALU of 8085 and describe how the different operations are performed by it.

Or

12. Describe a suitable memory organisation if 2 K ROM, 8 K RAM and 16K EPROM are to be used. Indicate the address ranges for your design and show how the chip select signals are obtained.

Turn over

Module 2

13. Explain the operation of the following instructions and specify their addressing modes and indicate the machine cycles :

(i) INR r ; (ii) XRA M ; (iii) SPHL ; (iv) ADC r.

Or

14. Explain the operations performed by 8085 when the following instructions are executed :

(i) SBB C ; (ii) XTHL ; (iii) RAL ; (iv) STC.

Also show how the flags are affected in each case.

Module 3

15. With an ALP to clear all flags, load the data byte FFH into the accumulator ; increment the accumulator, mask all the flags except the carry flag and display the carry flag at PORT 0. Again load the accumulator the data byte FFH ; add 01 H to it and display the carry flag at PORT 1. Explain the difference between them.

Or

16. Draw and explain the (i) memory read and (ii) I/O write cycle of 8085.

Module 4

17. With a neat block diagram, describe the interrupt structure of 8085.

Or

18. Explain the five modes of operation of 8259.

Module 5

19. Interface 8K bytes of EPROM and 8K bytes of RAM to 8085. Draw the circuit and design the address decoding logic.

Or

20. The 8085 microprocessor is to be interfaced to four different peripherals. Using 8257, show the method of interfacing to the microprocessor. Indicate the address, data and the RD and WR lines.

(5 × 12 = 60 marks)

F 6308 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering/Information Technology

SOLID STATE ELECTRONICS (R,T)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 4 *marks.*

1. Define the three stability factors and also give equations for each.
2. Clearly explain the reasons for the reduction of gain of an RC coupled amplifier at high frequencies.
3. Draw and explain the constructional diagram for an *n*-channel enhancement MOSFET.
4. What is VVR ? Explain how JFET is used as above ?
5. In a colpits oscillator, the desired frequency is 600 kHz. Calculate the inductance value, if $c = 1000\ pF$.
6. For RC phase shift oscillator, why three sections of RC circuits are cascaded ?
7. Under what conditions an RC circuit acts as a differentiator or as an integrator ? Draw and explain the circuit diagram of an RC integrator.
8. In an astable multivibrator, the base resistors are of $12\ k\Omega$ and the capacitors are of $0.1\ \mu F$. Determine the pulse repetition rate.
9. Why series regulators are called linear voltage regulators ? What are its limitations ?
10. What is the origin of the name DIAC ? List some applications of DIAC.

(10 × 4 = 40 marks)

Turn over

Part B

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module 1

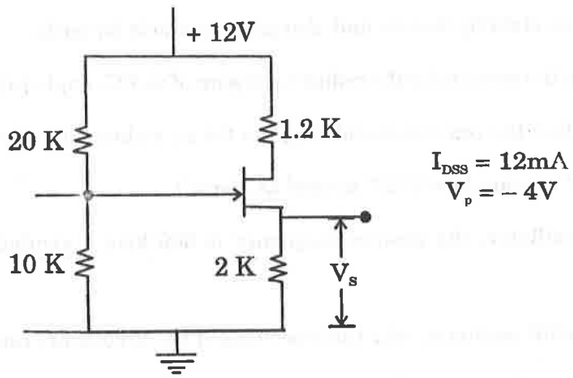
11. A Si transistor with $\beta = 75$ is used in potential divider bias arrangement with $V_{CC} = 15$ V, $R_C = 4.7\ k\Omega$. The operating point is at $V_{CE} = 8.2$ V, $I_C = 1.2$ mA. Calculate the values of R_1, R_2 and R_E in the circuit and draw the circuit diagram.

Or

12. Starting from fundamentals, derive the expression for the gain bandwidth product of a CE, RC coupled amplifier and show that it is a constant.

Module 2

13. For the circuit shown below, calculate I_D, V_{GS}, V_G, V_{DS} and V_S :



Or

14. With the help of neat sketches, explain the construction and operation of depletion and enhancement type of *p*-channel MOSFETs.

Module 3

15. In a Hartley oscillator $L_1 = 20\,\mu H$ and $L_2 = 2$ mH and C is variable. Find the range of C if the frequency is to be varied from 1 MHz to 3 MHz. Neglect mutual inductance. Draw the circuit and explain how sine waves are produced in it ?

Or

16. Find the capacitor C and h_{fe} of the transistor to produce 10 kHz sine waves in a RC phase-shift oscillator. $R_1 = 21\ k\Omega$, $R_2 = 56\ k\Omega$, $R_c = 20\ k\Omega$, $R = 7.1\ k\Omega$, $h_{ie} = 1.8\ k\Omega$. Explain the working of the circuit.

Module 4

17. With the help of neat circuit diagrams explain the working of transistorised monostable multivibrator. Draw its waveforms. Explain what causes the rounded leading edge in the output waveforms of a multivibrator ?

Or

18. With the help of neat circuit diagram, explain the working of a fixed bias transistorised bistable multivibrator. Show the input and output waveforms indicating the voltage levels at each point.

Module 5

19. (a) With a circuit diagram, explain how 7805 can be used as a 0.5 Amp current source ? Explain the working of the circuit. (8 marks)

    (b) Explain the working principle of a phototransistor. (4 marks)

Or

20. Using LM 317, design an adjustable voltage regulator to satisfy the following specifications : Output voltage $V_0 = 12$ V to 15 V and output current $I_0 = 0.5$ Amp. Draw the complete circuit diagram.

$(5 \times 12 = 60$ marks)

F 6317 **(Pages : 2)** **Reg. No.....**

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering/Information Technology

PROBLEM SOLVING AND COMPUTER PROGRAMMING (RT)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Write neat and efficient C programs wherever necessary.

Part A

Answer **all** *questions briefly.*
Each question carries 4 *marks.*

1. Explain top-down approach in computer programming with the help of an example.
2. What is pseudo codes ? Explain their properties with the help of examples.
3. Write notes on the different types of constants available in C, with suitable examples.
4. With an example, show how the "putchar" function can be used to write multicharacter strings.
5. Explain with examples, the difference between "for" and "while" loop structures.
6. Give different methods for passing parameters to function and vice versa.
7. What are the points to be noted while using index in an array ? Illustrate with suitable examples.
8. How can structure variables be defined ? How do structure declarations differ from structure type declaration ? Explain.
9. Explain pointer arithmetic. How the arithmetic operators + and – behave when both the operands are pointers.
10. Name and explain any four I/O file functions.

(10 × 4 = 40 marks)

Part B

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module 1

11. Write an algorithm and draw the flow chart to find the sum of all digits of a given number.

Or

12. Write the algorithm and give the flow chart to compute the factorial of a given number.

Turn over

Module 2

13. Using formatted I/O, write a C program to print the sum of a set of real numbers inputted through the keyboard.

Or

14. Summarize a convenient method for entering a string of undetermined length, which may contain whitespace characters and all printable characters and which is terminated by a carriage return. Explain relative to the type of conversion required with the control using of a "scanf" function.

Module 3

15. Write a C program to compute and print all Fibonacci numbers upto a number which is to be received from the keyboard.

Or

16. Define recursion. What are its merits ? Write C programs by recursive and iterative methods to calculate ${}^{n}C_{r}$.

Module 4

17. Write a C program that has a structure "date" with members day, month and year. The program uses functions to read data to structure members, validate the data and print the date in the format "July 16, 2015".

Or

18. Write a function in C for sorting the names stored in a two-dimensional array.

Module 5

19. Write a function using pointers to add two matrices and return the resultant matrix to the calling function.

Or

20. Write a C program that reads a file containing integers and appends at its end, the sum of all the integers.

(5 × 12 = 60 marks)

F 6325 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering/Information Technology

HUMANITIES (R,T)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Answer Part A and Part B in **separate** *answer-books.*
Part A and Part B carry 50 *marks each.*
All full questions carry equal marks.

Part A (Principles of Management)

Answer any **one** *full question from each module.*

Module I

1. (a) Differentiate between line organization and line-staff organization. Give examples. Write the advantages and disadvantages of both.

Or

(b) (i) What is merit rating ? Explain the different techniques of merit rating.

(ii) Why is job evaluation important ? Elaborate any two methods of job evaluation.

Module 2

2. (a) Define TQM and explain its relevance. List various ISO 9000 system of standards and explain their meaning.

Or

(b) (i) Explain the concept of small q and big Q.

(ii) Describe the steps in constructing any two types of SQC control charts.

(50 marks)

Part B (Engineering Economics)

Answer any **one** *full question from each module.*

Module 3

3. (a) What is a commercial bank ? What are its functions ? What economic advantages does a commercial bank confer to the community ?

Or

(b) Discuss the impacts of the public sector and private sector insurance companies in India.

Module 4

4. (a) (i) Distinguish between organised and unorganised labour and critically examine their problems in Indian industrial sector.

(ii) What are the causes for industrial sickness ? What are the remedies ?

Or

(b) Evaluate the performances of Indian industries in the past and present. Suggest your views for the improvement in future.

Module 5

5. (a) (i) Account for the phenomenal growth of public debt. Illustrate with India's public debt.

(ii) Explain the meaning of 'incidence of tax'. Distinguish it from the effect of the tax.

Or

(b) (i) What are the merits and demerits of indirect taxes in the public finance of a poor country ?

(ii) What is deficit financing ? Discuss its role and limitations in the economic development of an underdeveloped country.

(50 marks)

F 6333 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Computer Science and Engineering

LOGIC SYSTEM DESIGN (R)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 4 *marks.*

1. Convert the following hexadecimal numbers into decimal and BCD numbers :—
   (i) ABBA. (ii) BAD.
   (iii) 725. (iv) EEE.
2. Express the following decimals in Gray code form :—
   (i) 324 ; (ii) 2012.
3. Simplify using Boolean laws :
   (i) $A + AB + A\overline{B}C$.
   (ii) $\overline{\overline{A + B + \overline{C} + D(E + F)}}$.
4. Reduce to minimum sum of products form, using Boolean laws
   $\overline{A}\,\overline{B}\,\overline{C}\,\overline{D} + \overline{A}\,\overline{B}C\overline{D} + A\,\overline{B}\,\overline{C}\,D + \overline{A}C\overline{D} + A\,\overline{B}C\overline{D}$.
5. List any four different applications of shift registers.
6. Define counter. What are the classification of counters ?
7. With a neat diagram, describe the principle of a carry propagation adder.
8. Realise a half-adder using only two-input NAND gates.
9. Explain how shift registers can be used for generating time delays.
10. Explain 4 bit twisted ring counter, mentioning its applications.

(10 × 4 = 40 marks)

Turn over

Part B

Answer any **one** *full question from each module.*
Each full question carries 12 *marks.*

Module 1

11. Explain Hamming code. Encode data bits 0101 into a 7 bit even parity hamming code. Illustrate how it can be used as an error correcting code.

Or

12. (a) What are the characteristics of excess-3 code ?

(b) Express the following decimals in excess-3 code form :

(i) 625 ; (ii) 1947 ; (iii) 5099.

(c) Express the following excess-3 codes as decimals :—

(i) 0110 1010 ; (ii) 0011 0101 1010 0100 ; (iii) 1100 1010 0011.

Module 2

13. (a) Simplify the following expression :—

$F = (A+B)\left(A+\overline{A}\,\overline{B}\right)C + \overline{A}\left(B+\overline{C}\right) + \overline{A}B + ABC$ using Boolean algebra.

(b) Simplify using K-map $F = \pi M\,(0, 1, 3, 5, 6, 7, 10, 14, 15)$.

Or

14. Minimise using Quine Mc Cluskey method :

$f\,(x_4, x_3, x_2, x_1, x_0) = \Sigma\,(0,1,2,8,9,15,17,21,24,25,27,31)$.

Module 3

15. Design a synchronous mod-6 counter with the following binary sequence :

[000, 010, 011, 110, 101, 001].

Or

16. Draw the circuit of a master slave JK flip-flop using AND-OR-NOT gates. Explain how it overcomes race around.

Module 4

17. Explain a 2 bit fast adder with equations for sum and carry bits. Compute the gate delay required for n-bit addition using serial adder and parallel adder.

Or

18. Draw and design a circuit diagram for addition/subtraction. Use a control signal W. The circuit will function as a full-adder when W = 1 and as a full subtractor when W = 0.

Module 5

19. Draw and explain the circuit diagram of a 4 bit Johnson counter with function table and timing diagram.

Or

20. Data 11010 is input to 5 bit serial-in-parallel-out shift register. Draw the timing diagram to show the states of registers after 1, 2, 3, 4, 5 clock pulses and explain with the circuit diagram.

(5 × 12 = 60 marks)

F 6259 (Pages : 2) **Reg. No**.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Third Semester

Branch : Common for all Branches

EN 010 302—ECONOMICS AND COMMUNICATION SKILLS

(AI, AN, AU, CE, CS, EC, EE, EI, IC, IT, ME, MT, PE and PO)

(New Scheme—Regular/Improvement/Supplementary/)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 3 *marks.*

1. Mention any *six* Nationalised Banks.
2. What do you mean by an MNC ?
3. Explain the merits of direct tax.
4. Discuss the reasons for inflation.
5. What is TRIPS and TRIMS ?

(5 × 3 = 15 marks)

Part B

Each question carries 5 *marks.*

6. Discuss the importance of mutual funds.
7. Distinguish between Direct and Indirect taxes.
8. Explain the steps involved in tax evasion.
9. What is meant by demand pulls and cost push effects of inflation ?
10. Comment on the international trade systems.

(5 × 5 = 25 marks)

Part C

Each question carries 12 *marks.*

11. Explain the major roles of small scale industries (SSI).

Or

12. What are the problems facing by Indian stock markets (BSE and NSE) ?

Turn over

13. Discuss the effects of MNC's in the Indian economy.

Or

14. Explain the Government of Indian's policy on LPG. (Liberalisation Privatisation and Globelisation).

15. Explain the problems associated with deficit financing.

Or

16. What are the functions of tax system in India ? Discuss different types of indirect taxes.

17. Write notes on the following :

    (a) GNP.

    (b) NNP and

    (c) NI.

Or

18. Explain the methods of estimating National Income.

19. Explain the imparts of WTO decisions on Indian industry.

Or

20. Explain the different aspects of BOP (Balance of payments).

(5 × 12 = 60 marks)