

Code : 1G334

II B.Tech. I Semester Regular Examinations Nov/Dec 2014

**Electronic Devices and Circuits**

(Common to CSE &amp; IT)

**Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Explain V-I characteristics of Practical diode and Ideal Diode 7M  
b) In what respect LED is different from PN junction diode? State applications of LED 7M
2. a) Explain how effectively rectifier can convert A.C to D.C 7M  
b) For a Full Wave capacitor rectifier using large capacitance sketch output waveforms and list advantages and disadvantages. 7M
3. a) Explain transistor Amplifying action 7M  
b) Explain CE configuration of BJT and explain its characteristics 7M
4. a) Explain thermal stability and thermal runaway. 7M  
b) Explain the voltage divider bias and its stability 7M
5. a) Draw the CS drain characteristics of n-channel JFET and explain the shape of these curves qualitatively. 7M  
b) Explain Enhancement type MOSFET 7M
6. a) Explain about Class A, class B, class AB and Class C operation of power amplifiers. 7M  
b) Explain millers theorem 7M
7. a) Draw the circuit diagram of current series feedback circuit and derive the expressions for voltage gain, output resistance and input resistance. 7M  
b) Classify various feedback amplifiers. 7M
8. a) Classify various oscillators based on output waveforms, circuit components, operating frequencies and feedback used 7M  
b) What is the type of feedback incorporated in the Wein-bridge oscillator circuit? Explain working. 7M

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Code : 1GC34

II B.Tech. I Semester Regular Examinations Nov/Dec 2014

***Environmental Science***  
(Common to ECE & IT)

**Max. Marks: 70**

**Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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| 1. a) What is the importance environmental studies? Explain                | 7M |
| b) Discuss the various values of nature.                                   | 7M |
| 2. a) Write note on renewable and non-renewable energy sources             | 7M |
| b) Explain the advantages and disadvantages of dam building construction.  | 7M |
| 3. a) What are the adverse effects of pesticides on modern agriculture?    | 7M |
| b) Enumerate the properties of soil explain its degradation.               | 7M |
| 4. a) What are the various causes for water pollution? Explain.            | 8M |
| b) Write a note on any two pollution case studies.                         | 6M |
| 5. a) Define ecosystem. Explain different components of an ecosystem.      | 8M |
| b) Discuss the structure and functions of forest ecosystem.                | 6M |
| 6. a) What is mean by biodiversity? Explain genetic and species diversity. | 8M |
| b) What are the major threats to biodiversity? Discuss.                    | 6M |
| 7. a) What is meant by "sustainable development"? Explain.                 | 7M |
| b) What is meant by acid rain? Explain with examples.                      | 7M |
| 8. a) What is mean by epidemic diseases? Explain.                          | 8M |
| b) Write note on HIV/AIDS control programme in India.                      | 6M |

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Code : 1G133

II B.Tech. I Semester Regular Examinations Nov/Dec 2014

**Mathematical Foundations of Computer Science**

(Common to CSE &amp; IT)

**Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Define converse, contrapositive and inverse of an implication. 7M  
b) Obtain the principal disjunctive normal form of  $(P \vee [(P \wedge Q) \wedge (\neg Q \vee \neg P)])$ . 7M
2. a) Write the predicate for the statement "Everyone has exactly one best friend." 7M  
b) Using propositional logic, prove that validity of the following argument, 7M  
 $P \wedge (Q \wedge S), \neg R \vee P, Q \Rightarrow R \wedge S$ .
3. a) Define Relation. Explain the properties of binary relations with examples. 7M  
b) Let L be lattice, then prove that  $a \wedge b = a$  if and only if  $a \vee b = b$ . 7M
4. a) If G is a group such that  $(ab)^m = a^m b^m$  for three consecutive integers m, for all  $a, b \in G$ , show that G is abelian. 7M  
b) State and prove Lagrange's theorem. 7M
5. a) How many numbers can be formed using the digits 1, 3, 4, 5, 6, 8 and 9 if no repetitions are allowed? 6M  
b) Prove  $C(n, r) = C(n-1, r-1) + C(n-1, r)$ . 8M
6. a) Determine the sequence generated by  $f(x) = 1 / (1-x) + 3x^7 - 11$ . 8M  
b) Solve the recurrence relation  $S(k) - 0.25 S(k-1) = 0, S(0) = 6$ . 6M
7. a) Define spanning tree. What are its characteristics? 7M  
b) Prove that the complete graph of 5 vertices is non-planar. 7M
8. a) Prove that any two simple connected graphs with n vertices, all of degree 2, are isomorphic. 7M  
b) Write the difference between Hamiltonian graphs and Euler graphs. 7M

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Code : 1G131

II B.Tech. I Semester Regular Examinations Nov/Dec 2014

***Advanced Data Structures Through C++****(Common to CSE & IT)***Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. Distinguish between the following terms
  - (a) Objects and classes
  - (b) Data Abstraction and data encapsulation
  - (c) Inheritance and polymorphism
  - (d) Dynamic binding and message passing 14M
  
2. Write a C++ program that contains a class string and overloads the following operators on strings:
  - + to concatenate two strings
  - to delete a substring from the given string
  - == to check for the equivalence of both strings 14M
  
3. a) Define friend class and specify its importance. Explain with suitable example. 7M  
 b) Discuss Virtual function and polymorphism with example. 7M
  
4. a) What are the applications of dictionary with duplicates and without duplicates? 5M  
 b) Explain with suitable examples double hashing, rehashing and extendible hashing? 9M
  
5. a) What is a heap? Differentiate between min heap and max heap? 7M  
 b) Sort the list of numbers 20, 12, 35, 10, 80, 30, 17, 2, 1 using heap sort method? 7M
  
6. a) What are the differences between tree, binary tree and binary search tree? 5 M  
 b) Explain the operations of Binary Search tree with an example 9 M
  
7. Explain the operations insert and deletion of a B-Tree with an example 14M
  
8. a) Give a suitable example illustrating the computational overhead in Brute-Force method in pattern matching. 7M  
 b) Give a detailed note about Compressed Tries. 7M

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**Basic Electrical Engineering**

(Common to CSE &amp; IT)

**Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Define the following terms :
  - i) Electric Field 8M
  - ii) Electric current
  - iii) Potential difference
  - iv) Electric Power
- b) Derive the expression for star to delta transformation 6M
2. a) State and explain Kirchhoff's Law's 6M
- b) Explain the voltage and current source Transformation Techniques 8M
3. a) Define the frequency, time period, phase, average and RMS values 6M
- b) A Voltage wave is given by equation  $V = 50 + 30 \sin \theta$  Volts find the RMS Value of the Wave 8M
4. a) What are the advantages of Star and Delta Connected Systems? 6M
- b) A balanced three phase, Delta Connected Load has per phase impedance of  $(25 + j 40)$  . If 400 V, 3 Phase supply is connected to this load. Find
  - (i) Phase Current
  - (ii) Line Current
  - (iii) Power Supplied to the Load 8M
5. What are the different types of DC Generators, explain them with Circuits and Equations? 14M
6. a) What is the working principle of a Transformer? Give its Constructional details? 6M
- b) A 250/500V Transformer gave the following test results:-  
 Short Circuit Test: with low voltage winding short circuited: 20V, 12A, 100W,  
 Open circuit test: 250V, 1A, 80W on low voltage side.  
 Draw the circuit Constants, insert them on the equivalent circuit diagram and calculate the applied voltage and efficiency when the output is 10A at 500V and 0.8 P.f lagging. 8M
7. a) Explain the working principle of a 3 phase Induction Motor 6M
- b) A three phase Induction Motor is wound for 4 poles and is supplied from 50 HZ System calculate
  - (i) the synchronous speed
  - (ii) The Speed of the Motor when slip is 4% and
  - (iii) the rotor current frequency when motor runs at 600 rpm 8M
8. Explain the principle, Construction and working of PMMC instrument with neat diagram? 14M

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Code : 1G431

II B.Tech. I Semester Regular Examinations Nov/Dec 2014

**Digital Logic Design and Computer Organization**

(Information Technology)

**Max. Marks: 70****Time: 03 Hours**Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Describe and differentiate multiprocessors and multi computers. 8M  
 b) Convert the following numbers into decimal.  
 i)  $(9B2.1A)_H$   
 ii)  $(3102.12)_4$   
 iii)  $(614.15)_7$  6M
2. a) Prove the following  
 i)  $AB + ABC + A\bar{B} = A$   
 ii)  $A\bar{B} + \bar{A}B + \bar{A}\bar{B} + AB = 1$   
 iii)  $\bar{A}B\bar{C}D + ABCD + AB\bar{C}D + \bar{A}BCD = BD$  6M  
 b) Reduce the following function using K-map technique and implement using gates.  
 $f(P, Q, R, S) = \sum m(0, 1, 4, 8, 9, 10) + d(2, 11)$  8M
3. a) What are SR and D flip-flops? Convert D flip-flop to S R flip-flop. 7M  
 b) How keyboard debouncing is eliminated using flip-flop? Explain with suitable circuit diagram. 7M
4. a) Explain hardware implementation for signed magnitude data addition & subtraction. 8M  
 b) Perform the subtraction with the following unsigned binary numbers by taking the 10's complement of the subtrahend.  
 i.  $11010 - 10000$       ii.  $11010 - 1101$       iii.  $100 - 110000$  6M
5. a) What is an Addressing mode? Explain different types of addressing modes in detail. 7M  
 b) Explain the instruction cycle with a neat flow chart. 7M
6. a) With a neat block diagram, explain micro programmed control unit in detail. 7M  
 b) Explain the data transfer and manipulation instructions. 7M
7. a) Draw the neat sketch of memory hierarchy and explain the need of cache memory. 7M  
 b) Give the structure of semiconductor RAM memories. Explain read and write operations. 7M
8. a) What is cycle stealing & explain DMA with the neat diagram. 7M  
 b) Differentiate Isolated and memory mapped I/O. 7M

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