Hall Ticket Number :										

Code: 5GC34

R-15

II B.Tech. I Semester Regular Examinations November 2016

Environmental Science

(Common to ECE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) What are different disciplines involved with environment. Explain? 7M
   b) Describe the importance of environmental studies. 7M

OR

2. a) Describe the consequences of over-exploitation of natural resources. 7M
   b) What is pollution? Illustrate the different types of pollution briefly. 7M

UNIT–II

3. a) Summarize the effects of dams on forest and tribal people. 7M
   b) Distinguish between traditional agriculture and modern agriculture. 7M

OR

4. a) How land degradation occurs. Mention few remedial measures to prevent land degradation. 7M
   b) Outline the role of an individual in the conservation of natural resources. 7M

UNIT–III

5. a) Describe the energy flow in an ecosystem with help of a flow chart. 7M
   b) Write notes on conservation of biodiversity. 7M

OR

6. a) What are the characteristic features of forest ecosystem? 7M
   b) What are hot spots? Write notes on the hot spots of India. 7M

UNIT–IV

7. a) Explain the effects caused by air pollution and how air pollution will be prevented. 7M
   b) Write short notes on (a) Noise pollution and (b) Thermal pollution 7M

OR

8. a) Describe the soil pollution and what are the consequences with respect to agriculture? 7M
   b) What are the causes for solid waste production and mention few control measures. 7M

UNIT–V

9. a) Explain any three best practices for rain water harvesting. 7M
   b) What are the preventive measures to be taken for HIV/AIDS? 7M

OR

10. a) What is global warming? Propose the best practices to prevent the global warming. 7M
    b) Write notes on family welfare program. 7M

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Hall Ticket Number :										

Code: 5G236

R-15

II B.Tech. I Semester Regular Examinations November 2016

Electrical Engineering and Electronics Engineering

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) How the Network elements can be classified. Explain it clearly. 7M

   b) In the network shown in figure 1b, find all branch currents and voltage drops across all resistors.

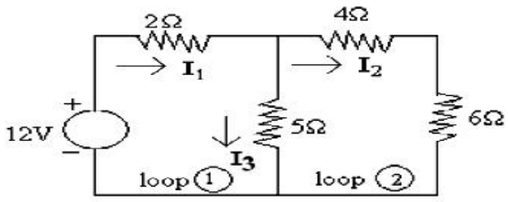

Figure 1b 7M

OR

2. a) Define ohms law and its limitations 4M

   b) A current of 10 A flows through a resistor for 10 min. and the power dissipated by the resistor is 100 W. Find the p.d. across the resistor and the energy supplied to the circuit 5M

   c) Four resistors of 2 ohm, 3 ohm, 4 ohm & 5 ohm respectively, are connected in parallel. What potential difference must be applied to the group in order that total power of 100 W may be absorbed? 5M

UNIT–II

3. a) Explain the principle of operation of generator 8M

   b) A 240V,dc shunt motor takes 32 A of line current of the armature and field resistances are 1.2Ω and 240Ω respectively of the load torque remains constant, find the resistance inserted in series with the armature to have the speed. 6M

OR

4. a) Explain the concept of self- excitation of dc generator and list out the types of generator 7M

   b) A 220V, DC shunt motor taker a total current of 100 A and runs at 750 rpm. The resistance of the armature winding and shunt field winding are 0.1 Ω and 40 Ω respectively. Find the torque developed by armature. 7M

UNIT–III

5. a) What is regulation? Derive an expression for the approximate voltage regulation 7M

   b) 3-phase, 6 pole, 50 Hz induction motor has a slip of 1% at no-load and 3% at full load. Determine (i) Synchronous speed (ii) No-load speed (iii) Full load speed (iv) frequency of motor current at full load 7M

OR

6. a) Explain the principle of operation of an alternator with neat diagram 7M

   b) A single phase transformer working at unity power factor has an efficiency of 90% at half load and full load of 500 W. Determine the efficiency at 75% of full load 7M

UNIT–IV

7. a) Explain V-I characteristics of P-N junction diode. 7M

   b) Write short note on single stage CE amplifier 7M

OR

8. a) Explain the working of P-N-P transistor and mention its input-output characteristics. 7M

   b) Explain the operation of half wave and full wave rectifiers with neat circuit diagrams 7M

UNIT–V

9. Derive the expression for electro static deflection of CRO 14M

OR

10. Explain the operation of CRO with a neat sketch. CRO is used to measure frequency and amplitude of a signal. Explain how 14M

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Hall Ticket Number :										

R-15

Code: 5G433

II B.Tech. I Semester Regular Examinations November 2016

Operating Systems and Linux Administration

(Information Technology)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Draw and explain the general structure of a clustered system. 8M

   b) Some computer systems do not provide a privileged mode of operation in hardware. Is it possible to construct a secure operating system for these computers? Give arguments for both that it is and that it is not possible. 6M

OR

2. a) What system calls have to be executed by a command interpreter or shell in order to start a new process? Explain. 7M

   b) Would it be possible for the user to develop a new command interpreter using the system call interface provided by the operating system? Justify your answer. 7M

UNIT–II

3. a) Write the solution to the critical section problem that satisfies all three conditions of critical section problem to two processes that alter execution between their critical section and remainder sections 10M

   b) List and explain the benefits of multithreaded programming. 4M

OR

4. a) Is it possible to have a deadlock involving only a single process? Explain your answer. 4M

   b) Give the solution to the dining philosopher's problem using monitors. 10M

UNIT–III

5. a) In a paged memory, the page hit ratio is 0.35. The time required to access a page in secondary memory is equal to 100nS. The time required to access a page in physical memory is 10nS. What is the average time required to access a page? 4M

   b) Discuss the hardware support required to support demand paging. 10M

OR

6. a) Under what circumstances do page faults occur? Describe the actions taken by the operating system when a page fault occurs. 7M

   b) Explain why sharing a reentrant module is easier when segmentation is used than when pure paging is used. 7M

UNIT–IV

7. a) Why must the bit map for file allocation be kept on mass storage, rather than in main memory? 7M

   b) Explain the functioning of file system. 7M

OR

8. a) Discuss the different techniques used to improve the efficiency and performance of secondary storage. 7M

   b) What are the advantages and disadvantages of supporting memory mapped I/O to device control registers? 7M

UNIT–V

9. a) Briefly explain the VMware on Linux host and adding guest OS. 10M

   b) Give a brief note on setting Up Xen. 4M

OR

10. a) Write the requirements of Linux system administrator. 8M

    b) Define Virtualization. List and explain the types of Virtualization. 6M

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Hall Ticket Number :										

R-15

Code: 5G432

II B.Tech. I Semester Regular Examinations November 2016

Digital Logic Design & Computer Organization

(Information Technology)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

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UNIT–I

1. a) Computers are referred to 32-bit computer, 64-bit computer and vice versa. Here, what this 32 or 64 convey technically and programmers point of view. 5M

   b) While doing computer addition and subtraction how overflow or underflow is detected. Represent all the possible situations in both addition and subtraction with appropriate truth table. 9M

OR

2. a) How do you evaluate a computer's performance? What are the various metrics that are used to represent a computer's performance? 5M

   b) Give generalized steps to represent a decimal number in any base system. Represent decimal number 197 in binary, octal, hexadecimal while simultaneously verifying them. 9M

UNIT–II

3. What are universal gates? Why they are called as universal gates? Prove that they are universal along with supporting diagrams and Boolean theorems. 14M

OR

4. a) Prepare truth table and draw circuit for the following circuit X=A'BC(A+D)' 7M

   b) Simplify the following Boolean equations while mentioning which Boolean theorem is used during the simplification.

   (*a + a'·b' + b'·c' + c'*)' + *a'·b·c·* (*e·f + g·h + m·n + p·q*)

   A.(B + B'.C) + (A'.B + B').C'

   xyz + x'y'z + xz + xyz' 7M

UNIT–III

5. a) Explain how floating numbers are represented giving explanations about exponent, mantissa. Also, explain IEEE 754 representation of float and double type numbers. What do you know about precision, accuracy, NaN? 4M 3M 3M

   b) What is the binary code of the number 6.25 and how it is stored as single precision float number in current day computers? 4M

OR

6. a) Explain how two decimal numbers 99.99 and 0.1610 are added in the computer. 7M

   b) What are various types of addressing modes commonly employed in computers? 7M

UNIT–IV

7. a) Assume that a computer's address bus is n-bits wide. How much RAM, ROM, RAM+ROM it can support really? What do you really understand by virtual memory? Why virtual memory systems have developed? Is your Windows 10 is virtual memory system? What about Linux? 7M

   b) Explain how a program is executed in reality. Do make sure that your explanation details about PC, MAR, MBR, IR, etc registers. 7M

OR

8. a) Why do we need cache memories? Explain how they will help of programs execution giving details about where they are really used. 7M

   b) Explain how a group of RAM and ROM ICs are organized in a computer. 7M

UNIT–V

9. a) Explained about memory mapped and processor controlled I/O? Give live examples of devices which uses this style of I/O 5M 2M

   b) What are interrupts? Why do we need them? How interrupts are commonly handled? Assuming that currently an instruction is in it's decode cycle and an interrupt has arrived. Are we going to stop the current instruction there itself? If not, why? 7M

OR

10. a) Explain the terms
       (i) vectored interrupts 2M
       (ii) interrupt masking 2M
       (iii) DMA 3M

    b) Explain about
       (i) UART 3M
       (ii) PCI bus 4M

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Hall Ticket Number :										

R-15

Code: 5G131

II B.Tech. I Semester Regular Examinations November 2016

Advanced Data Structures Through C++

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

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UNIT–I

1. a) What is a Function? Discuss about various parameter passing methods in C++. 10M
   b) Write short notes on Friend Function. 4M

OR

2. a) Explain in detail about Exception Handling Mechanism with an example. 9M
   b) Discuss about Dynamic Memory Allocation and De allocation 5M

UNIT–II

3. a) Differentiate between Constructor Overloading and Function Overloading 8M
   b) Discuss in detail about Polymorphism 6M

OR

4. a) What is inheritance? Explain the different types of inheritance with examples. 10M
   b) Write an algorithm for Bubble sort. 4M

UNIT–III

5. a) What is a Stack ADT? Write the ADT implementation of Stacks in C++. 7M
   b) What is a Queue ADT? Explain the various Operations of Queue with an example. 7M

OR

6. a) Explain the various operations of Dictionaries with an example. 10M
   b) Compare and contrast between Chaining and Open Addressing. 4M

UNIT–IV

7. a) What is a Binary Tree? Explain in detail about Binary Trees Traversals with an example. 6M
   b) Construct Max heap and Min Heap for the following data.
   20,15,95,60,35,43,12,75,34,59 8M

OR

8. a) Explain in detail about Binary Search Trees and its operations. 7M
   b) What is an AVL tree? Discuss the various rotations of AVL Trees. 7M

UNIT–V

9. a) Discuss about Splay Trees with an example 8M
   b) What is a B-Tree? Explain the various operations of B-Trees. 6M

OR

10. Explain in detail about ant two Fixed pattern Matching Algorithms 14M

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Hall Ticket Number :										

R-15

Code: 5G431

II B.Tech. I Semester Regular Examinations November 2016

Discrete Mathematics

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Prove that $p \rightarrow (q \rightarrow r)$ and $(p \wedge \neg r) \rightarrow \neg q$ are logically equivalent

   b) Prove that the following is a valid argument:

$$(p \Rightarrow q) \vee r \equiv (p \vee r) \Rightarrow (q \vee r)$$

OR

2. a) If P, Q and R are three atomic variables, obtain the principal disjunctive normal form for $(P \rightarrow (Q \wedge R)) \vee (\sim P \rightarrow (Q \vee R))$

   b) Examine the validity of the following argument. "If prices are higher than wages are high. Prices are high or there are price controls. If these are price controls then there is not an inflation. There is an inflation therefore wages are high.

UNIT–II

3. a) Define group, monoids, semi groups and subgroups.

   b) Define cyclic group, permutation group and dihedral group.

OR

4. a) Prove that

   b) If function f is one-one onto then inverse of f i.e

UNIT–III

5. a) Prove that theorem 'If X is an odd integer, x^2 is odd integer.

   b) Prove that in a room of 13 people, 2 or more people have their birthdays in the same month.

OR

6. a) Show that 1+2+3+… +n = for all integer, n≥1 by the principle of mathematical induction.

   b) Prove that 5^n+3 is divisible by 4 for all integers $n \geq 0$.

UNIT–IV

7. Solve the recurrence relation $a^n - 4a^{n-1} + 3a^{n-2} = 0$ for n >= 2 with initial conditions $a_0 = 2$ and $a_1 = 4$ by using generating functions.

OR

8. Solve the recurrence relation

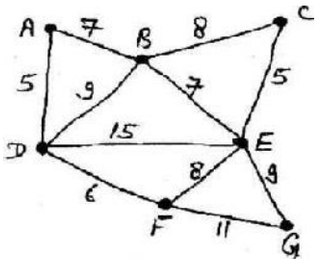
UNIT–III

9. a) Define union, intersection and product of two graphs.

   b) A simple graph with n vertices and k components cannot have (n–k)(n–k +1) more than edges.

OR

10. a) Find the minimal spanning tree of the following weighted graph



   b) If a connected graph G is Eulerian then every vertex of G has even degree.

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