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R-15

Code: 5G431

II B.Tech. I Semester Supplementary Examinations November 2018

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)

UNIT-I

1. a) Obtain the PCNF of formula $(\sim P \vee R) \wedge (Q \vee P)$ 7M
 b) Define Tautology with example. 7M

OR

2. a) Explain about free and bounded variables in detail in the context of predicate logic. 7M
 b) Show that the following premises are inconsistent.
 If Jack misses many classes through illness, then he fails high school.
 If Jack fails high school, then he is uneducated.
 If Jack reads a lot of books, then he is not uneducated.
 If Jack misses many classes through illness and reads a lot of books. 7M

UNIT-II

3. a) Let A be the set of factors of a particular positive integer m and let relation $R = \{(x, y) \mid x \in A \wedge y \in A \wedge (x \text{ divides } y)\}$. Draw the Hasse diagram for
 i. $m=30$ ii. $m=45$ 7M
 b) Show that $f(y)=y/2$ is a partial recursive function. 7M

OR

4. a) Given $A=\{2, 3, 4\}$, $B=\{2, 5, 6, 7\}$. Construct examples of each of the following
 i. All injective mappings from A to B
 ii. All surjective mappings from A to B which is not injective.
 iii. All bijective mappings from B to A. 6M
 b) Explain the properties of Binary relation with examples. 8M

UNIT-III

5. a) Let $(\{a,b\},=)$ be a semi group ,where $a*a=b$, show that $a*b=b*a$ and $b*b=a$. 7M
 b) Let the set Q of all rational numbers and the operation * is defined by $a*b=a+b-ab$. Show that, under this operation, Q form commutative monoid. 7M

OR

6. a) How many 5 digit number can be composed of the digit in the number 1 2 3 3 4 2 3 3. 7M
 b) How many 6 digit numbers without repetition of digits are there such that the digits are all non zero and 1 and 2 do not appear consecutively in either order? 7M

UNIT-IV

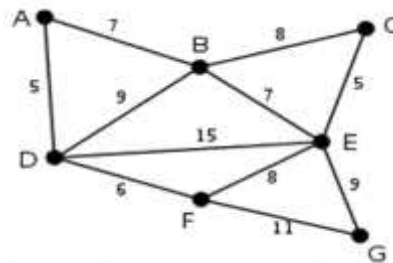
7. a) Find a generating function for the recurrence relation $a_{n+1} - a_n = 3^n$ where $n \geq 0$ and $a_0=1$. Hence solve the relation. 7M
- b) Find the coefficient of x^{27} in the function $(x^4+2x^5+3x^6+\dots)^5$ 7M

OR

8. a) Solve the recurrence relation $a_n - 4a_{n-1} + 3a_{n-2} = 0$ for $n \geq 2$ with initial conditions $a_0=2$ and $a_1=4$ by using generating functions. 7M
- b) Solve the Recurrence Relation $a_n + 6a_{n-1} + 12a_{n-2} + 8a_{n-3} = 3^n$. 7M

UNIT-V

9. a) Define bipartite graph and planar graph. Give an example to show that $K_{3,3}$ is non planar. 7M
- b) Find the minimal spanning tree for the following graph using Kruskal's algorithm.



7M

OR

- 10 a) Show that a tree with n vertices has $n-1$ edges. 7M
- b) Define the following and give suitable example for each
- Euler Circuit
 - Hamiltonian Circuit.

7M

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Code: 5G432

II B.Tech. I Semester Supplementary Examinations November 2018

Digital Logic Design and Computer Organization

(Information Technology)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) How do you evaluate a computer's performance? What are the various metrics that are used to represent a computer's performance?
- b) Convert the following numbers into decimals
 - (i) $(B65F)_{16}$
 - (ii) $(127.4)_8$
 - (iii) $(4021.2)_5$

OR

2. a) Explain the following
 - i) BCD
 - ii) Excess-3-code
 - iii) Gray code
 - iv) Binary code
- b) Explain the floating point representation IEEE standard formats with example.

UNIT-II

3. a) Simplified the following Boolean function. To a minimum no of literals.
 - i) $x + x'y$
 - ii) $x(x'+y)$
 - iii) $xy + x'z + yz$.
- b) Explain about digital logic gates with truth table and graphics symbols.

OR

4. Simplify the Boolean function
 $F(A,B,C,D) = (0,2,5,8,9,13,15)$ and DO-CARE condition $D(A,B,C,D) = (1,7,14)$.
 Implement the above simplified function using NAND and NOR.

UNIT-III

5. a) Explain Booth's Multiplication Algorithm with an example.
- b) With suitable examples list and explain various addressing modes.

OR

6. a) Devise an algorithm for fixed point subtraction representation.
- b) Represent the number $(+43.2)_{10}$ as a floating point binary number with 32 bits

UNIT-IV

7. a) Differentiate between hard wired control and micro programmed control.
- b) Explain the concept of memory hierarchy in a computer system with neat diagram.

OR

8. a) How the instructions are executed in the processor? Explain with instruction life cycle.
- b) What are the memory management requirements? Explain.

UNIT-V

9. a) What is the difference between Isolated I/O and Memory-Mapped I/O.
- b) Write a short notes on DMA controller.

OR

10. a) What are interrupts? Why do we need them? How interrupts are commonly handled?
- b) Explain standard I/O interfaces.

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Code: 5G236

II B.Tech. I Semester Supplementary Examinations November 2018

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)

UNIT-I

1. a) Define the terms
i) Electric Current ii) Potential Difference iii) Electric Power iv) Energy 8M
b) Three capacitors of 2 mF, 5 mF and 10 mF are connected in series. Find the equivalent capacitance. 6M

OR

2. a) How the Network elements can be classified. Explain it clearly with a suitable example. 7M
b) Three resistances of 4 , 5 & 6 are connected in delta determine the resistances for an equivalent star connection. 7M

UNIT-II

3. a) Derive the emf equation of DC generator. 7M
b) A 4-pole, lap wound, DC generator has a useful flux of 0.07Wb per pole, armature consists of 440 numbers of conductors. Calculate the generated emf when it is rotated at a speed of 900 rpm with the help of prime mover. 7M

OR

4. Explain classification of a DC generator along with suitable diagrams and voltage and current relationship. 14M

UNIT-III

5. a) Explain the various losses that occur in single phase transformer. 7M
b) Describe the production of RMF in three phase induction motor. 7M

OR

6. a) A 2500/250 V, 25 KVA has a core losses of 130W & full load copper losses of 320W. Calculate the efficiency of full load when it is operating at 0.8 PF lagging? 7M
b) Explain the working principle of three phase alternator. 7M

UNIT-IV

7. A Bridge rectifier is applied with input from a step down transformer having turns ratio 8 : 1 and input 230 V, 50 Hz. If the $R_f = 1$, $R_s = 10$ and $R_L = 2 K$. Find a) DC Power output b) % of Efficiency c) % Regulation at full load c) PIV across the each diode. 14M

OR

8. a) Explain the working of N-P-N transistor and mention its input-output characteristics. 7M
b) Explain in detail about frequency response of CE amplifier. 7M

UNIT-V

9. Explain the principle of CRT with a neat sketch. 14M

OR

10. Explain the principle & theory of induction heating with necessary diagrams and list out the industrial application of induction heating. 14M

Hall Ticket Number :

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R-15

Code: 5GC34

II B.Tech. I Semester Regular Examinations November 2018

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)

UNIT-I

1. a) What is an environment and what are the factors affecting it. 7M
b) Write a brief note on various institutions and its contributions towards environmental safety.

OR

2. a) Write the importance of environmental studies. 7M
b) Describe the various methods to create environmental awareness in the public. 7M

UNIT-II

3. a) Write a note on world food problems and its consequences. 7M
b) What is chipko movement and write a note on preservation of resources. 7M

OR

4. a) Explain with examples the types of energy with relevant case studies. 7M
b) Write a note on Energy conservation 7M

UNIT-III

5. a) What is an ecosystem and explain the degradation of the same. 7M
b) Explain with relevant examples the structure and functions of an eco-system. 7M

OR

6. a) Explain the energy flow of an eco-system 7M
b) What is an energy cycle and explain the features of the same 7M

UNIT-IV

7. a) How groundwater gets polluted and suggest few measure for it. 7M
b) Explain briefly the causes for soil pollution. 7M

OR

8. a) Explain marine pollution and causes of it. 7M
b) Write down the effects of noise pollution 7M

UNIT-V

9. a) How urban areas are affected due to energy issues. 7M
b) Write a note on rain water harvesting 7M

OR

10. a) Write a note on climate change and global warming 7M
b) Discuss the methods and advantages of rain water harvesting 7M

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Code: 5G433

II B.Tech. I Semester Supplementary Examinations November 2018

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)

UNIT-I

1. a) What are the differences between the operating system for mainframe computers and personal computers? Also describe the common functions of Operating systems. 9 M
- b) What are the advantages and disadvantages of using the same system call interface for manipulating both files and devices? 5 M

OR

2. a) How could a system be designed to allow a choice of operating systems from which to boot? What would the bootstrap program need to do? 7 M
- b) Describe three general methods for passing parameters to the operating system with example? 7 M

UNIT-II

3. a) Describe the actions taken by a kernel to context-switch between processes 5 M
- b) Provide two programming examples in which multithreading does not provide better performance than a single-threaded solution 9 M

OR

4. Show how wait() and signal() semaphore operations could be implemented in multiprocessor environments , using the Test and Set() instruction. The solution should exhibit minimal busy waiting. Develop Pseudo code for implementing the operations 14 M

UNIT-III

5. Discuss situations in which the least frequently used (LFU) page replacement algorithm generates fewer page faults than Least Recently Used (LRU) page replacement algorithm. Also discuss under what circumstances the opposite holds good. 14 M

OR

6. a) Describe about free space management on I/O buffering and blocking? 7 M
- b) Discuss the concept of buddy system allocation with neat sketch? 7 M

UNIT-IV

7. a) Discuss about the various file access methods 6 M
- b) With neat sketch explain about the
- Directory structure
 - File sharing
- 8 M

OR

8. Compare the functionalities of FCFS, SSTF, CSCAN and C-LOOK disk scheduling algorithms with an example for each? 14 M

UNIT-V

9. a) how to install Xen on a single machine to manage two operating systems. 7 M
- b) What are the steps involved in setting up VM Ware software in Linux Host for successful virtualization? 7 M

OR

10. a) Why is live migration possible in virtual environments but much less possible for a native operating system? 7 M
- b) What are the primary goals of the conflict-resolution mechanism used by the Linux kernel for loading kernel modules? 7 M
