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Total No. of Pages : 02

Total No. of Questions : 18

MCA (2015 to 2018) (Sem.-2)
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
 Subject Code : MCA-201
 M.Code : 72876

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.
3. Use of non-programmable scientific calculator is allowed.

SECTION-A

1. Define Simple and Multi-graph. Prove that an undirected graph possesses an Eulerian path if it is connected and has either zero or two vertices of odd degree.
2. a) State and prove Five color theorem.
b) Explain the shortest path problem and also explain the algorithms used to find shortest path.

SECTION-B

3. a) Show that $A \cap (B \cap C) = (A \cap B) \cap C$.
b) Define intersection and union of sets. Prove that $A \cup B = A \cap B$ if $A = B$.
4. a) Define Minsets. Let B_1, B_2, B_3 are the subsets of a universal set U . Find all minsets generated by B_1, B_2 and B_3 .
b) Define Partitions of sets. Give all the partitions of $\{a, b, c, d, e\}$.

SECTION-C

5.
 - a) Test the validity of: If he works hard then he will be successful. If he is successful then he will be happy. Therefore, hard work leads to happiness.
 - b) Prove that disjunction distributes over conjunction.
6.
 - a) Use Mathematical induction to show that $1 + 2 + \dots + 2^n = 2^{n+1} - 1$.
 - b) Define Quantifiers. Explain different types of quantifiers along with examples.

SECTION-D

7. Solve by Gauss Elimination method : $x - 2y - 6z = 12$, $2x + 4y + 12z = -17$, $x - 4y - 12z = 22$.
8. Solve by matrix inversion method : $x - y + 3z = 2$, $2x + y + 2z = 2$, $-2x - 2y + z = 3$.

SECTION-E

Answer briefly :

9. Define Complete Bipartite graph and give one example.
10. Define Euler and Hamilton graphs.
11. Define Complement of set and give example.
12. Can we say that Cartesian product is commutative? Justify.
13. Define Uncountable set.
14. Define tautologies and contradictions.
15. Prove that $p \wedge q = q \wedge p$.
16. Define Symmetric and Skew-Symmetric.
17. If $A = \begin{bmatrix} 1 & -2 \\ 3 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ -3 & 1 \end{bmatrix}$, Find AB .
18. Define inverse of a Square matrix and find the inverse of $\begin{bmatrix} 1 & -1 \\ 3 & 4 \end{bmatrix}$.



NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

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MCA (2015 to 2018) (Sem.-2)
LINUX OPERATING SYSTEM

Subject Code : MCA-205

M.code : 72880

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION-A

- Q1) Discuss how to interface a printer through operating systems and the basics of Lpd and its clients.
- Q2) Differentiate between editor and Word processor. Discuss the ways of invoking the vi editor. Explain the various modes in it and explain how one can move from one mode to another.

SECTION-B

- Q3) Discuss the concept of troubleshooting Linux in GRUB mode.
- Q4) How we can install multiple operating systems along with Linux? Explain the procedure to install new kernel to boot.

SECTION-C

- Q5) Explain the features of GNOME configuration tool.
- Q6) Write the steps to install a binary package in TAR format.

SECTION-D

- Q7) Explain the Linux system calls and architecture of Linux.
- Q8) Discuss the file structure used in Linux. How diverse directory files are linked with Root Directory? Explain the importance of each.

SECTION-E

Write briefly :

- Q9) How are passwords managed in Linux?
- Q10) List the various types of users in Linux.
- Q11) What is the difference between single and multiuser operating systems?
- Q12) What are the various dual boot issues?
- Q13) Write a short note on shell and shell scripts.
- Q14) What is the difference between internal command and external command?
- Q15) What is the difference between setUID and setGID?
- Q16) What are the capabilities of super computer?
- Q17) What is the difference between user and group?
- Q18) What do you mean by change ownership?



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