UG-797	BMC–13

B.Sc. DEGREE EXAMINATION – JUNE, 2009.

First Year

Mathematics with Computer Applications

COMPUTER FUNDAMENTALS AND PC SOFTWARE

Time : 3 hours   Maximum marks : 75

PART A — ($5 \times 5 = 25$ marks)

Answer any FIVE questions.

1. Explain the structure of a computer.

2. Write a short notes on the following

   (a) Main Memory.

   (b) Secondary Memory.

3. Define software. What are the types of software?

4. Explain EBCDIC code.

5. How to configure the windows and programs in win98?

6. How to sorting the Files and folders?

7. What are the steps involved to find and replace string in word?

8. What are the steps involved to insert a Slide in Power Point?

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

9. Define ROM. Explain the various types of ROM.

10. Explain the RISC Architecture.

11. Explain the Evolution of Operating System.

12. Mention any four applications of networks.

13. Explain briefly about windows 98 operating system.

14. Explain the various operation on files and folders.

15. Explain the Mail Merging in MS-WORD.

16. Explain the various components of Power point.

UG–798 **BMC–22**

B.Sc. DEGREE EXAMINATION — JUNE, 2009.

(AY 2007–08 batch onwards)

Second Year

Mathematics with Computer Applications

CLASSICAL ALGEBRA AND NUMERICAL METHODS

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

17. Show that $\frac{1}{2!} + \frac{1+2}{3!} + \frac{1+2+2^2}{4!} + \ldots \text{to } \infty = \frac{1}{2}(e-1)^2$.

18. Show that $\log(\sqrt{12}) = 1 + \left(\frac{1}{2} + \frac{1}{3}\right)\frac{1}{4} + \left(\frac{1}{4} + \frac{1}{5}\right)\frac{1}{4^2} + \left(\frac{1}{6} + \frac{1}{7}\right)\frac{1}{4^3} + \ldots$.

19. If $a_1, a_2 \ldots a_n$ be an Arithmetic progression, show that $a_1^2 \cdot a_2^2 \ldots a_n^2 > a_1^n \cdot a_n^n$. Deduce that if $n > 2$, prove that $(n!)^2 > n^n$.

20. If ~, ,¥ are the roots of the equation $x^3 + px^2 + qx + r = 0$, find (a) $\Sigma\sim^3$ (b) $\Sigma \frac{1}{\sim^2 \ {}^2}$.

21. Solve the equation $x^4 + 4x^3 + 5x^2 + 2x - 6 = 0$ by removing the second term.

22. Use Newton–Raphson method to obtain a root correct to three decimal places of the equation $x^3 + 3x^2 - 3 = 0$.

23. Given the table of values :

x	150	152	154	156
$y = \sqrt{x}$	12.247	12.329	12.410	12.490

Evaluate $\sqrt{155}$ using Newton's Divided Difference formula.

24. From the following table of values of x and y, find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ when $x = 6$.

x	0	1	2	3	4	5	6
y	6.9897	7.4036	7.7815	8.1291	8.4510	8.7506	9.0309

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

25. Find the sum to infinity of the series

$$\frac{1}{9 \cdot 18} - \frac{1 \cdot 3}{9 \cdot 18 \cdot 27} + \frac{1 \cdot 3 \cdot 5}{9 \cdot 18 \cdot 27 \cdot 36} - \dots.$$

26. (a) State and prove Weirstrass inequalities.

(b) If a, b, c are positive quantities, prove that $\frac{2a}{b+c} + \frac{2b}{c+a} + \frac{2c}{a+b} \geq 3$.

27. Show that the equation $x^4 - 5x^3 + 9x^2 - 5x - 1 = 0$ can be transformed into a reciprocal equation by diminishing the roots by 2. Hence solve the equation.

28. Find the positive root of the equation $x^3 - 2x^2 - 3x - 4 = 0$ correct to three places of decimals.

29. Solve the following system of equations by Gauss–Jordan method :

$3x + 2y + 4z = 7$
$2x + y + z = 4$
$x + 3y + 5z = 2.$

30. From the following table of values of x and $y = e^x$, interpolate the value of y when $x = 1.91$ using Stirling's formula :

x	1.7	1.8	1.9	2.0	2.1	2.2
$y = e^x$	5.4739	6.0496	6.6859	7.3891	8.1662	9.0250

31. Find, from the following table, the area bounded by the curve $y = f(x)$ and the x-axis from $x = 7.47$ to $x = 7.52$, using Trapezoidal and Simpson's $\frac{1}{3}$rd rules.

x	7.47	7.48	7.49	7.50	7.51	7.52
y	1.93	1.95	1.98	2.01	2.03	2.06

32. Given the differential equation $\frac{dy}{dx} = \frac{x^2}{y^2 + 1}$ with $y(0) = 0$. Obtain $y(0.25)$, $y(0.5)$ and $y(1.0)$ correct to four decimal places by Picard's method of successive approximations.

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UG-799 **BMC-23**

B.Sc. DEGREE EXAMINATION
JUNE 2009.

(AY – 2007-08 batch onwards)

Second Year

Mathematics with Computer Applications

PROGRAMMING IN C AND C++

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

33. Illustrate printf statement in *C* including formatted output.

34. Write a *C* program to read the age of the students in a school and print their average.

35. Explain the switch statement in *C* with example.

36. Explain (a) pointer operators (b) pointer expression (c) pointer comparison (d) pointer to array (e) array of pointer.

37. Write a C program to print all the prime numbers between 2 to 50,000 using a function prime( ) that checks whether a given number in prime or not.

38. Explain call by value and call by reference.

39. Illustrate function over loading with suitable example.

40. Write a C++ program to create a class with field members seconds, minutes and hours. Read the time in seconds and print it in hours, minutes and seconds.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

41. Explain the various operators available in C with examples.

42. Write a C program to read the marks of the students in a class and print in according to the rank.

43. Write *C* functions (a) to read a $m \times n$ matrix (b) to print a $m \times n$ matrix (c) to find the product of two matrices. Use it in the main program to read two matrices and to print their product if possible.

44. Explain static and external storage class.

45. Write a C program to create a structure with field members name of an item, item code, cost of each item and quantity in stock. Read the data and update the data using a function and calculate the total value using another function and print the output.

46. Explain (a) fopen (b) fclose (c) fseek (d) fprintf (e) fscanf.

47. Illustrate friend function with suitable example.

48. Illustrate Hybrid inheritance with a suitable program.

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UG–789 **BMS-21/BMC-21**

B.Sc. DEGREE EXAMINATION – JUNE 2009.

(AY 2006 – 07 batch onwards)

Second Year

Mathematics/Mathematics with Computer Applications

GROUPS AND RINGS

Time : 3 hours Maximum marks : 75

PART A — ($5 \times 5 = 25$ marks)

Answer any FIVE questions.

49. Define

(a) Partial order relation

(b) Characteristics function

(c) Surjective map.

50. If G is a group in which $(ab)^m = a^m b^m$ for three consecutive integers and for all $a, b \in G$, then prove that G is abelian.

51. If A_n is the set of all even permutations in S_n, then prove that A_n is a group containing $\frac{n!}{2}$ permutations.

52. Define a normalize of an element in a group and prove that it is a subgroup.

53. If N is a normal subgroup of a group G, then prove that $\frac{G}{N}$ is a group under the operation define by $NaNb = Nab$.

54. Prove that a finite commutative ring R without Zero-divisors is a field.

55. If R is a integral domain and a and b are two non-zero elements of R, then prove that a and b are associates if and only if $a = bu$ where u is a unit in R.

56. Prove that every ideal of an Euclidean domain is a principal ideal.

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

57. (a) If R is an equivalence relation defined on S, then prove that a R b $\Leftrightarrow [a] = [b]$.

(b) If $f : A \to B$, $g : B \to C$ are bijections, then prove that $g \circ f : A \to C$ is a bijection. (5 + 5)

58. (a) Prove that any permutation can be expressed as a product of disjoint cycles.

(b) If H is a non-empty finite subset of G and if H is closed under the operation in G, then prove that H is a subgroup of G. (5 + 5)

59. State and prove Lagrange's theorem.

60. State and prove Cayley's theorem.

61. State and prove fundamental theorem of homomorphism in a ring.

62. If R is a commutative ring with unity, then prove that an ideal M of R is maximal if and only if $\frac{R}{M}$ is a field.

63. Prove that any integral domain can be embedded in a field.

64. Prove that any Euclidean domain R is a unique factorization domain.
