UG–340	BMC–13

B.Sc. DEGREE EXAMINATION — DECEMBER, 2019.

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 various characteristics of RISC.

2. Write short notes on E-Mail.

3. List and explain any one multimedia tools and their usage.

4. What is table? Mention the advantages of table.

5. Explain the main features of MS word.

6. Define the software. List and explain the types of software.

7. List out the various functions normally performed by an operating system.

8. What are the steps involved in a slide show using power point?

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

9. Short notes on :

   (a) Machine Language

   (b) High-Level Language

   (c) Assembly Language

10. Differentiate the following:

    (a) Analog and Digital transmission

    (b) Parallel processing and Vector processing.

11. Write a step-by-step procedure to do the following activities in WINDOWS-95:

    (a) Add/Remove applications

    (b) Controlling Access to files, folders

    (c) To record, play and edit sound files

12. Discuss in detail about mail merge in MS-Word.

13. How can you correct the spelling and grammatical mistakes in MS Word?

14. With the help of a diagram, explain any two LAN topologies.

15. Discuss in detail about different data communication modes.

16. Explain point in MS-windows in detail.

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UG–329 BMS–12/BMC–12

B.Sc. DEGREE EXAMINATION –
DECEMBER, 2019.

First Year

Maths

TRIGONOMETRY, ANALYTICAL GEOMETRY AND VECTOR CALCULUS

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Prove that

$$\frac{\sin 7\theta}{\sin\theta} = 64\cos^6\theta - 80\cos^4\theta + 24\cos^2\theta - 1.$$

2. Find the image of the point (1, –2, 3) in the plane $2x - 3y + 2z + 3 = 0$.

3. Find the equation of the sphere passing through the four points $(2, 3, 1), (5, -1, 2), (4, 3, -1)$ and $(2, 5, 3)$.

4. Find the constants a, b, c so that the vector

$$\vec{F} = (x + 2y + az)\vec{i} + (bx - 3y - z)\vec{j} + (4x + cy + 2z)\vec{k}$$

is irrotational.

5. Evaluate $\iiint_V \Delta \cdot \vec{F} dv$ if $\vec{F} = x^2\vec{i} + y^2\vec{j} + z^2\vec{k}$ and if V is the volume of the region enclose by the cube $0 \le x \le 1$, $0 \le y \le 1$, $0 \le z \le 1$.

6. If $\sin(A + iB) = x + iy$, prove that

(a) $\dfrac{x^2}{\cosh^2 B} + \dfrac{y^2}{\sinh^2 B} = 1$

(b) $\dfrac{x^2}{\sin^2 A} - \dfrac{y^2}{\cos^2 A} = 1$

7. Find the symmetrical form of the equations of the lines $x + 5y - z - 7 = 0$, $2x - 5y + 3z + 1 = 0$.

8. If $\vec{F} = 3xy\vec{i} - y^2\vec{j}$, evaluate $\int_c \vec{F} \cdot d\vec{r}$, where c is the curve on the xy plane $y = 2x^2$ from (0, 0) to (1, 2).

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

9. Sum to infinity the series

$$\cos\alpha + \frac{1}{2}\cos(\alpha+\beta) + \frac{1.3}{2.4}\cos(\alpha+2\beta) + \dots.$$

10. Prove that the lines

$$\frac{x+1}{-3} = \frac{y+10}{8} = \frac{z-1}{2}; \frac{x+3}{-4} = \frac{y+1}{7} = \frac{z-4}{1}$$

are co-planar. Find also their point of entersection and the plane through them.

11. Find the equation of the sphere having the circle $x^2+y^2+z^2-2x+4y-6z+7=0$, $2x-y+2z=5$ for a great circle.

12. Find the directional derivative of $xyz - xy^2z^3$ at the point (1, 2, –1) in the direction of the vector $\vec{i} - \vec{j} - 3\vec{k}$.

13. Verify Green's theorem in the plane for $\int (xy - x^2)\,dx + x^2 y\,dy$, where C is the boundary of the region bounded by $y = 0$, $x = 1$, $y = x$.

14. Prove that

$$\sin^3\theta\cos^5\theta = \frac{-1}{2^7}(\sin 8\theta + 2\sin 6\theta - 2\sin 4\theta - 6\sin 2\theta)$$

15. Find the perpendicular distance from (3, 9, –1) to the line $\frac{x+8}{-8} = \frac{y-31}{1} = \frac{z-13}{5}$.

16. Evaluate $\iint_s \vec{F}\cdot\hat{n}ds$, where $\vec{F} = 4x\vec{i} - 2y^2\vec{j} + z^2\vec{k}$ and s is the surface of the region bounded by $x^2 + y^2 = 4$, $z = 0$, $z = 3$.