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| **PB-T2/MAQP/1221/B 7-APR-2022** |
| **PRE-BOARD EXAMINATION 3 - TERM-II (2021-22)** |

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| **SUBJECT : MATHEMATICS**  **GRADE : XII** | **Maximum Marks: 40****Time Allowed: 2 Hours** |
| **General Instructions**:    1. This question paper contains **three sections – A, B and C**. Each part is compulsory.  2. **Section - A** has 6 **short answer type (SA1) questions** of **2** marks each.  3. **Section – B** has 4 **short answer type (SA2) questions** of **3** marks each.  4. **Section - C** has 4 **long answer type questions (LA)** of **4** marks each.  5. There is an **internal choice** in some of the questions.  6. Q14 is a **case-based problem** having 2 sub parts of **2** marks each. | |

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| **Section– A** | | |
| **1.** | Evaluate dx  **OR**  Evaluate: dx | **2** |
| **2.** | If the sum of two unit vectors is a unit vector, prove that the magnitude of their difference is | **2** |
| **3.** | Find the general solution of differential equation | **2** |
| **4.** | Find the equation of a plane which is at a distance of 3 units from origin and the normal to which is equally inclined to coordinate axes. | **2** |
| **5.** | Probability of solving specific problem independently by A and B are ½ and 1/3 respectively. If both of them try independently, then find the probability that the problem is solved. | **2** |
| **6.** | The probability distribution of a random variable X is given as:  where K is a constant.  Calculate | **2** |
| **Section– B** | | |
| **7.** | If = +,= -2 and = -2,find a vector of magnitude 6 units which is parallel to the vector 2. | **3** |
| **8.** | Solve the following differential equations:    **OR**  Show that the differential equation is homogeneous and also solve it | **3** |
| **9.** | Evaluate | **3** |
| **10.** | Find the equation of the plane passing through the line of intersection of the planes and and is parallel to the line  **OR**  Find the distance of the point (-2, 3,-4) from the line == measured parallel to the plane 4x + 12y - 3z + 1 = 0. | **3** |
| **Section– C** | | |
| **11.** | Find the coordinates of foot of perpendicular drawn from the point (0, 2, 3) on the line  . Also find the length of perpendicular. | **4** |
| **12.** | Using integration, find the area of the region in the first quadrant enclosed by the x-axis , the line y = x and the circle x2+ y 2 = 32  **OR**  Using integration find the area of the region included between the parabola and the line x + y=2 | **4** |
| **13.** | Evaluate | **4** |
| **14.** | A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both diamonds. | |
|  | i) Find the probability of the lost card being a diamond. | **2** |
|  | ii)Find the probability of getting two diamonds after the card is lost? | **2** |

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