**ACTIVE SITE TUTORIALS**

**Date :** 07-09-2019 **TEST ID: 609**

**Time :** 20:09:00 **MATHEMATICS**

**Marks :** 1199

7.INTEGRALS

**Single Correct Answer Type**

| 1. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 2. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 3. | The value of is | | | | | | | |
|  | a) | 0 | b) | 3 | c) | 4 | d) | 1 |
| 4. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 5. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 6. | is equal to | | | | | | | |
|  | a) | 2 | b) |  | c) |  | d) |  |
| 7. | The value of the definite integral equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 8. | If , then equals | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 9. | If is monotonic differentiable function on , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | Cannot be found |
| 10. | If then is equal to | | | | | | | |
|  | a) | constant | b) |  | c) |  | d) |  |
| 11. | If (where denotes the greatest integer function), then the value of is | | | | | | | |
|  | a) |  | b) | 40 | c) | 20 | d) |  |
| 12. | If then equals | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 13. | The value of the definite integral is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 14. | Let for and .  Then, equals | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 15. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 16. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 17. | is equal to | | | | | | | |
|  | a) | log | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 18. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 19. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 20. | Let be a non-negative function defined on the interval . If and , then | | | | | | | |
|  | a) | and | | | | | | | |
|  | b) | and | | | | | | | |
|  | c) | and | | | | | | | |
|  | d) | and | | | | | | | |
| 21. | If , then is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 22. | If are the roots of and is an even function, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 23. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 24. | The range of the function is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 25. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 26. | is a continuous function for all real values of and satisfies , then is equal to | | | | | | | |
|  | a) | 19/2 | b) | 35/2 | c) | 17/2 | d) | None of these |
| 27. | If then equals | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 28. | Given . If , then the values of and are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 29. | Let and g be the inverse of . Then the value of is | | | | | | | |
|  | a) | 1 | | | | | | | |
|  | b) | 17 | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 30. | The value of , where ,where denotes the greatest integer not exceeding is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 31. | The primitive of the function || when is given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 32. | Let , where is such that , for and , for . Then satisfies the inequality | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 33. | Let be a continuous function and is true . If , then the value of is equal to | | | | | | | |
|  | a) | 6 | b) | 0 | c) |  | d) |  |
| 34. | The value of the definite integral is | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 35. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 36. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 37. | If and , then is equal to (it is given that is continuous in ) | | | | | | | |
|  | a) | 7 | b) | 3 | c) | 5 | d) | 1 |
| 38. | If is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 39. | If then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 40. | The value of the definite integral is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 41. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 42. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 43. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 44. | If and , then the value of is | | | | | | | |
|  | a) | 2 | b) |  | c) |  | d) | None of these |
| 45. | The value of , where , is equal to | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 1 | d) | None of these |
| 46. | The number of possible continuous defined in for which , is/are | | | | | | | |
|  | a) | 1 | b) |  | c) | 2 | d) | 0 |
| 47. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 48. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 49. | Let be integrable over for any real value of . If and , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 50. | The value of the integral is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 51. | is equal to (where ) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 52. | where [.] denotes the greatest integer function, is equal to | | | | | | | |
|  | a) |  | b) |  | c) | Zero | d) | None of these |
| 53. | If , then the value of the integral is | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) |  |
| 54. | If , then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 55. | If , where , then the values of are equal to | | | | | | | |
|  | a) |  | b) |  | c) | 2, 2 | d) | 2, 4 |
| 56. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 57. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 58. | If then is equal to | | | | | | | |
|  | a) | 1/3 | b) | 2/3 | c) |  | d) |  |
| 59. | If , given , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 60. | The solution for of the equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 61. | If , then the value of is | | | | | | | |
|  | a) | 1 | b) | 0 | c) |  | d) | None of these |
| 62. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 63. | and is bounded. If  (where ), then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 64. | Let be a positive function. Let , , where . Then is | | | | | | | |
|  | a) | 2 | b) |  | c) |  | d) | 1 |
| 65. | is equal to | | | | | | | |
|  | a) | ln || | | | b) | ln || | | |
|  | c) | ln || | | | d) | None of these | | |
| 66. | If , then the expression for in terms of is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 67. | If , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 68. | Given a function is differentiable, then for some equals to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 69. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 70. | The function and are positive and continuous. If is increasing and is decreasing, then | | | | | | | |
|  | a) | Is always non-positive | | | b) | Is always non-negative | | |
|  | c) | Can take positive and negative values | | | d) | None of these | | |
| 71. | If , then is | | | | | | | |
|  | a) | 3 | b) |  | c) |  | d) | None of these |
| 72. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 73. | Let and be continuous functions. Then the value of the integral  is | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) | 0 |
| 74. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 75. | must be same as | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 76. | Ifthen | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 77. | If means the log being repeated times then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 78. | Let be non-zero real numbers such that  Then, the quadratic equation has | | | | | | | |
|  | a) | No root in (0, 2) | | | b) | At least one root in (0, 2) | | |
|  | c) | A double root in (0, 2) | | | d) | Two imaginary roots | | |
| 79. | If , which of the following is true? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 80. | is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 81. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 82. | If , then is equal to | | | | | | | |
|  | a) | 3/5 | b) | 1/5 | c) | 1 | d) | 2/5 |
| 83. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 84. | If and are continuous functions, the  is | | | | | | | |
|  | a) | Dependent on | b) | A non-zero constant | c) | Zero | d) | None of these |
| 85. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 86. | If , then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 87. | Let , where denotes the fractional part of then is equal to | | | | | | | |
|  | a) | 50 | b) | 100 | c) | 200 | d) | None of these |
| 88. | If is differentiable and , then equals | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) |  |
| 89. | (where )is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 90. | equals (where is a fractional part of ) | | | | | | | |
|  | a) | 13 | b) | 6.3 | c) | 1.5 | d) | 7.5 |
| 91. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 92. | If and then is | | | | | | | |
|  | a) | 2 | b) |  | c) | 1 | d) |  |
| 93. | The value of is, | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) |  |
| 94. | If then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 95. | is equal to (where [.] represents the greatest integer function) | | | | | | | |
|  | a) | 9 | b) |  | c) | 10 | d) |  |
| 96. | The value of the integral must be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 97. | The value of the integral is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 98. | If satisfies the condition of Rolle’s theorem in then is equal to | | | | | | | |
|  | a) | 1 | b) | 3 | c) | 0 | d) | None of these |
| 99. | If , where ( is constant), then is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 100. | The value of , where represents the greatest integral function, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 101. | is equal to (where {.} is the fractional part of ) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 102. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 103. | If, then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 104. | , where [.] denotes the greatest integer function, and , is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 105. | If for , then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) | is continuous and differentiable in | | | | | | | |
|  | d) | is continuous but not differentiable in | | | | | | | |
| 106. | is equal to | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) | None of these |
| 107. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 108. | The value of the integral is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 109. | The value of is | | | | | | | |
|  | a) | 0 | b) | 1 | c) |  | d) |  |
| 110. | is a continuous function for all real values of and satisfies , then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 111. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 112. | then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 113. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 114. | If , then the value of is | | | | | | | |
|  | a) | 1/2 | b) | 0 | c) | 1 | d) |  |
| 115. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 116. | The value of and is equal to (where represents greatest integer function | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 117. | Which of the following is incorrect? | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 118. | For any integer , the integral has the value | | | | | | | |
|  | a) |  | b) | 1 | c) | 0 | d) | None of these |
| 119. | If and , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 120. | If for a real number is the greatest integral function less than or equal to , then the value of the integral is | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) |  |
| 121. | , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 122. | The equation of the curve is The tangents at and make angle and respectively, with the positive direction of -axis, then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | None of these |
| 123. | is an odd function. It is also known that is continuous for all values of and is periodic with period 2  If , then | | | | | | | |
|  | a) | is odd | b) |  | c) |  | d) | is non-periodic |
| 124. | For and a continuous function , let and  . Then is | | | | | | | |
|  | a) |  | b) | 1 | c) | 2 | d) | 3 |
| 125. | Let Then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 126. | then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 127. | is equal to | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 128. | If and then is equal to | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) | None of these |
| 129. | The value of the integral lies in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 130. | If is continuous for all real values of , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 131. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | 2 | | |
| 132. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 133. | If then equals | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 134. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 135. | Let . Then, for an arbitrary constant , the value of equals | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 136. | The value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 137. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 138. | The value of equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 139. | Suppose that is an anti-derivative of , where , then can be expressed as | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 140. | If and when , find the value of when is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 141. | If the function is differentiable, then for is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 142. | If (where ), then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 143. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 144. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 145. | If , then for any equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 146. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 147. | If and, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) | 2 | d) | 1 |
| 148. | The value of the integral is | | | | | | | |
|  | a) | 3/2 | b) | 5/2 | c) | 3 | d) | 5 |
| 149. | The value of the integral for is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 150. | Given , then the value of the definite integral is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 151. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 152. | The value of , where [.] denotes the greatest integer function, is | | | | | | | |
|  | a) | 1 | b) | 1/2 | c) | 2 | d) | None of these |
| 153. | Let and then the value of be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 154. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 155. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 156. | The value of integralis equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 157. | If then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 158. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 159. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 160. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 161. | The value of the integral is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | None of these |
| 162. | Let and Then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 163. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 164. | If , then is equal to | | | | | | | |
|  | a) | 0 | b) |  | c) | 1 | d) | None of these |
| 165. | If then equals | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 166. | If , then is equal to, where | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 167. | ,where . Then the complete set of values of for which In is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 168. | The value of , where , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 169. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | None of these |
| 170. | , where , where , is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 171. | If , then ) is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | Non-existent |
| 172. | is equal to | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 173. | Let and , then the value of is | | | | | | | |
|  | a) | 8 | b) | 200/3 | c) | 100/3 | d) | None of these |
| 174. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 175. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 176. | If | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 177. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 178. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 179. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 180. | is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 181. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 182. | The value of the expression is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 183. | Given that satisfies for and in then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 184. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 185. | The value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 186. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) |  |
| 187. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 188. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 189. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 190. | If is a polynomial of the least degree that has a maximum equal to 6 at ,and a minimum equal to 2 at , then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 191. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 192. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 193. | The value of the integral is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 194. | The value of the integral is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 195. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 0 |
| 196. | If , then the value of is ( denotes the greatest integer function) | | | | | | | |
|  | a) | 4 | b) | 5 | c) | 6 | d) |  |
| 197. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 198. | The value of is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of the above | | | | | | | |
| 199. | If then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 1 |
| 200. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 201. | If , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 202. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 203. | The value of the definite integral is | | | | | | | |
|  | a) |  | b) | 2 | c) |  | d) | None of these |
| 204. | Let be a real-valued function defined on the interval such that , for all and let be the inverse function of . Then, is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 205. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 206. | Let and , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 207. | If , then the value of the integral is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 208. | If and , then , then is | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 3 | d) | None of these |
| 209. | is equal to | | | | | | | |
|  | a) | 0 | b) | 2 | c) |  | d) | None of these |
| 210. | The value of the integral is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) | None of these |
| 211. | , where and denotes the greatest integer function, is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 212. | A function is continuous for all (and not every where zero) such that , then is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 213. | The value of the integral is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 214. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 215. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | None of these |
| 216. | If and, then constants and are | | | | | | | |
|  | a) | and | b) | and | c) | 0 and | d) | and 0 |
| 217. | The value of the integral is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |

**Multiple Correct Answers Type**

| 218. | If and for all and is a function for which , then is equal to | | | | | | | |
|  | a) | 125 | b) |  | c) |  | d) |  |
| 219. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 220. | If , where , which of the following statements hold good? | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 221. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 222. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 223. | If then | | | | | | | |
|  | a) | is an even function | | | | | | | |
|  | b) | is a bounded function | | | | | | | |
|  | c) | The range of is | | | | | | | |
|  | d) | has two points of extrema | | | | | | | |
| 224. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 225. | equals | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 226. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 227. | If ,then | | | | | | | |
|  | a) |  | | | b) | is monotonic | | |
|  | c) | is differentiable at | | | d) | is differentiable at | | |
| 228. | If , then | | | | | | | |
|  | a) | Both and are odd functions | | | b) | is monotonic function | | |
|  | c) | has no real roots | | | d) |  | | |
| 229. | If is integrable over [1, 2], then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 230. | The value of is | | | | | | | |
|  | a) | Same as that of | | | b) |  | | |
|  | c) | Same as that of | | | d) |  | | |
| 231. | If and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 232. | Let , for every real number , where is the integral part of . Then is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 0 | d) | 1/2 |
| 233. | If where is a real constant, then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 234. | If , then the value of is | | | | | | | |
|  | a) | 1/2 | b) | 0 | c) | 1 | d) |  |
| 235. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 236. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 237. | Let and let be a non-decreasing continuous function in , then has the | | | | | | | |
|  | a) | Maximum value | | | b) | Minimum value | | |
|  | c) | Maximum value | | | d) | Minimum value | | |
| 238. | If and is an integer), then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) | are in H.P. | | | d) |  | | |
| 239. | Let and , then | | | | | | | |
|  | a) | is an increasing function | | | b) |  | | |
|  | c) | has a maxima at | | | d) | is a decreasing function | | |
| 240. | The values of for which the integral is satisfied are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 241. | If , for , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 242. | A function which satisfies the relation, then | | | | | | | |
|  | a) |  | | | b) | is a decreasing function | | |
|  | c) | is an increasing function | | | d) |  | | |
| 243. | If , then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) | has fundamental period | | | d) | is an odd function | | |
| 244. | If the primitive of is being the constant of integration), then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 245. | If and , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 246. | Let , then the values of will lie in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 247. | then | | | | | | | |
|  | a) | is inverse trigonomeric function for | | | b) | is logarithmic function for | | |
|  | c) | quadratic function for | | | d) | is rational function for | | |
| 248. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 249. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 250. | Let , where , then | | | | | | | |
|  | a) | For | | | b) | For | | |
|  | c) |  | | | d) |  | | |
| 251. | If and then | | | | | | | |
|  | a) | is an odd function | | | b) | has range | | |
|  | c) | has at least one real root | | | d) | is a monotonic function | | |
| 252. | A curve is passing through origin, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 253. | If , where , then | | | | | | | |
|  | a) | Range of is [0, 1] | | | b) | is differentiable at | | |
|  | c) | has two real roots | | | d) |  | | |
| 254. | Which of the following statement(s) is/are true? | | | | | | | |
|  | a) | If function is continuous at such that , then where is sufficiently small positive quantity | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) | Let be a continuous and non-negative function defined on If then | | | | | | | |
|  | d) | Let be a continuous function defined on such that then there exists at least one for which | | | | | | | |
| 255. | A primitive of is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 256. | The point of extremum of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 257. | If and , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 258. | If , then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 259. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 260. | The value of which satisfy  are equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 261. | If and , then | | | | | | | |
|  | a) |  | | | b) | is continuous for all | | |
|  | c) |  | | | d) | is non-differentiable at infinitely many points | | |
| 262. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 263. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Assertion - Reasoning Type** | | | |
| This section contain(s) 0 questions numbered 264 to 263. Each question containsstatement 1(Assertion) and statement 2(Reason). Each question has the 4 choices (a), (b), (c) and (d) out of which **only one** is correct. | | | |
|  | a) | Statement 1 is True, Statement 2 is True; Statement 2 **is** correct explanation for Statement 1 | |
|  | b) | Statement 1 is True, Statement 2 is True; Statement 2 **is not** correct explanation for Statement 1 | |
|  | c) | Statement 1 is True, Statement 2 is False | |
|  | d) | Statement 1 is False, Statement 2 is True | |

|  |  |  |  |
| --- | --- | --- | --- |
| 264 |  | | |
|  | **Statement 1:** | | lie in the interval |
|  | **Statement 2:** | | is periodic with period |

|  |  |  |  |
| --- | --- | --- | --- |
| 265 |  | | |
|  | **Statement 1:** | | where denotes the greatest integer function |
|  | **Statement 2:** | | is a decreasing function in |

|  |  |  |  |
| --- | --- | --- | --- |
| 266 |  | | |
|  | **Statement 1:** | | If is continuous on , then there exists a point such that |
|  | **Statement 2:** | | For , if and are, respectively, the smallest and greatest values of on , then |

|  |  |  |  |
| --- | --- | --- | --- |
| 267 |  | | |
|  | **Statement 1:** | | is symmetrical about , then is equal to |
|  | **Statement 2:** | | If is symmetrical about , then |

|  |  |  |  |
| --- | --- | --- | --- |
| 268 | Let be a polynomial function of degree | | |
|  | **Statement 1:** | | There exist a number such that |
|  | **Statement 2:** | | is a continuous function |

|  |  |  |  |
| --- | --- | --- | --- |
| 269 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 270 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 271 |  | | |
|  | **Statement 1:** | | A polynomial of least degree that has a maximum equal to 6 at minimum equal to 2 at is |
|  | **Statement 2:** | | The polynomial is everywhere differentiable and the points of extremum can only be roots of derivative |

|  |  |  |  |
| --- | --- | --- | --- |
| 272 |  | | |
|  | **Statement 1:** | | The value of is zero |
|  | **Statement 2:** | | if is an odd function |

|  |  |  |  |
| --- | --- | --- | --- |
| 273 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | | is an odd function |

|  |  |  |  |
| --- | --- | --- | --- |
| 274 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 275 | Consider , , | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | | For and |

|  |  |  |  |
| --- | --- | --- | --- |
| 276 |  | | |
|  | **Statement 1:** | | If , then |
|  | **Statement 2:** | | If , then , where |

|  |  |  |  |
| --- | --- | --- | --- |
| 277 |  | | |
|  | **Statement 1:** | | = |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 278 |  | | |
|  | **Statement 1:** | | is an even function if is an odd function |
|  | **Statement 2:** | | is an odd function if is an even function |

|  |  |  |  |
| --- | --- | --- | --- |
| 279 |  | | |
|  | **Statement 1:** | | The value of is 0 |
|  | **Statement 2:** | | , if |

|  |  |  |  |
| --- | --- | --- | --- |
| 280 |  | | |
|  | **Statement 1:** | | The function satisfies |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 281 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 282 |  | | |
|  | **Statement 1:** | | If then |
|  | **Statement 2:** | | and |

|  |  |  |  |
| --- | --- | --- | --- |
| 283 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 284 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | | For integrations by parts we have to follow ILATE rule |

|  |  |  |  |
| --- | --- | --- | --- |
| 285 |  | | |
|  | **Statement 1:** | | For where and are constants |
|  | **Statement 2:** | | For is a continuous function |

|  |  |  |  |
| --- | --- | --- | --- |
| 286 |  | | |
|  | **Statement 1:** | | , for is a non-differentiable function |
|  | **Statement 2:** | | is non-differentiable at |

|  |  |  |  |
| --- | --- | --- | --- |
| 287 |  | | |
|  | **Statement 1:** | | The value of |
|  | **Statement 2:** | | The value of |

|  |  |  |  |
| --- | --- | --- | --- |
| 288 |  | | |
|  | **Statement 1:** | | The value of |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 289 | Let is continuous and positive for is continuous for and , then | | |
|  | **Statement 1:** | | The value of can be zero |
|  | **Statement 2:** | | Equation has at least one root for |

|  |  |  |  |
| --- | --- | --- | --- |
| 290 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 291 |  | | |
|  | **Statement 1:** | | Let be any integer. Then the value of is zero |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 292 | Let be an indefinite integral of . | | |
|  | **Statement 1:** | | The function satisfies for all real |
|  | **Statement 2:** | | for all real |

|  |  |  |  |
| --- | --- | --- | --- |
| 293 |  | | |
|  | **Statement 1:** | | On the interval , the least value of the function is 0 |
|  | **Statement 2:** | | If is a decreasing function on the interval , then the least value of is |

|  |  |  |  |
| --- | --- | --- | --- |
| 294 |  | | |
|  | **Statement 1:** | | If |
|  | **Statement 2:** | | When , then |

|  |  |  |  |
| --- | --- | --- | --- |
| 295 |  | | |
|  | **Statement 1:** | | where denotes the fractional part function |
|  | **Statement 2:** | | is a periodic function |

|  |  |  |  |
| --- | --- | --- | --- |
| 296 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 297 |  | | |
|  | **Statement 1:** | | cannot be evaluated |
|  | **Statement 2:** | | Only differentiable functions can be integrated |

|  |  |  |  |
| --- | --- | --- | --- |
| 298 | If then | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 299 |  | | |
|  | **Statement 1:** | | The value of is zero |
|  | **Statement 2:** | | and for odd function |

|  |  |  |  |
| --- | --- | --- | --- |
| 300 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 301 | Consider the function satisfying the relation , | | |
|  | **Statement 1:** | | The possible least value of for which is independent of is 12 |
|  | **Statement 2:** | | is a periodic function |

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| 302 |  | | |
|  | **Statement 1:** | | The value of the integral is |
|  | **Statement 2:** | |  |

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| 303 |  | | |
|  | **Statement 1:** | | Where |
|  | **Statement 2:** | | is continuous in [0, 2] |

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| 304 |  | | |
|  | **Statement 1:** | | If the primitive of has the value 3 for , then there are exactly two values of for which primitive of vanishes |
|  | **Statement 2:** | | has period 2 |

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| 305 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | | , where |

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| --- | --- | --- | --- |
| 306 |  | | |
|  | **Statement 1:** | | If , then |
|  | **Statement 2:** | |  |

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| 307 | Observe the following statements  Then, which of the following is true? | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

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| --- | --- | --- | --- |
| 308 |  | | |
|  | **Statement 1:** | |  |
|  | **Statement 2:** | |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Matrix-Match Type** | | | | | | | | | |
| This section contain(s) 0 question(s). Each question contains Statements given in 2 columns which have to be matched. Statements (A, B, C, D) in **columns I** have to be matched with Statements (p, q, r, s) in **columns II**. | | | | | | | | | |

| 309. |  | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | If is an integrable function for  and  and  ,then | | (p) | | 3 | |
|  | **(B)** | If for , and the value of is independent of then the value of can be | | (q) | | 1 | |
|  | **(C)** | The value of  (where [.] denotes the greatest integer function) is | | (r) | | 2 | |
|  | **(D)** | If  (where ), then is equal to (where [.] denotes the greatest integer function) | | (s) | | 4 | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | Q | r,s | p | p |  |  |
|  | **b)** | r | r | p | q |  |  |
|  | **c)** | s | p | q | s |  |  |
|  | **d)** | p | q | s | r |  |  |

| 310. |  | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | is equal to | | (p) | |  | |
|  | **(B)** | Let be a function satisfying with and g be the function satisfying then the value of the integral  is | | (q) | |  | |
|  | **(C)** | is equal to | | (r) | |  | |
|  | **(D)** | is equal to | | (s) | |  | |
|  | **CODES :** | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | P | r | q | s |  |  |
|  | **b)** | r | p | s | q |  |  |
|  | **c)** | s | q | r | p |  |  |
|  | **d)** | q | s | p | r |  |  |

| 311. | If denotes the greatest integer function, then match the following columns: | | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** |  | | (p) | | 3 | |
|  | **(B)** |  | | (q) | | 5 | |
|  | **(C)** |  | | (r) | | 4 | |
|  | **(D)** |  | | (s) | |  | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | S | s | r | q |  |  |
|  | **b)** | q | p | s | r |  |  |
|  | **c)** | p | q | r | s |  |  |
|  | **d)** | r | s | q | p |  |  |

| 312. |  | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** |  | | (p) | |  | |
|  | **(B)** |  | | (q) | |  | |
|  | **(C)** |  | | (r) | |  | |
|  | **(D)** |  | | (s) | |  | |
|  | **CODES :** | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | P,q,r,s | p,q,r | r,s | p,q |  |  |
|  | **b)** | r,s | p,q,r,s | p,q,r | r,s |  |  |
|  | **c)** | p,q,r | p,q,r | pq,r,s | p,q,r,s |  |  |
|  | **d)** | p,q | r,s | p,q,r | p,q,r,s |  |  |

| 313. |  | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | If then is | | (p) | | Independent of | |
|  | **(B)** | Let be the distinct positive roots of the equation , then  (where ) is | | (q) | | Independent of | |
|  | **(C)** | If , where , then , where , is | | (r) | | Independent of | |
|  | **(D)** | is, where ,  ,  and where denotes the greatest integer function | | (s) | | Depends on | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | p, q | p, q, r | q, s | s |  |  |
|  | **b)** | s | p, q | p, q, r | q, s |  |  |
|  | **c)** | p, q, r | s | p, q | q, s |  |  |
|  | **d)** | q, s | p, q | s | p, q, r |  |  |

| 314. |  | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | If then is greater than | | (p) | | 0 | |
|  | **(B)** | If then is less than | | (q) | | 1 | |
|  | **(C)** | , where is the constant of integration, then is grater than | | (r) | | 3 | |
|  | **(D)** | , then is greater than | | (s) | | 4 | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | P,q | r,s | p | p,q |  |  |
|  | **b)** | r,s | p | p,q | s |  |  |
|  | **c)** | p | p,q | r,s | q |  |  |
|  | **d)** | q | p | q | r,s |  |  |

| 315. |  | | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column-I** | | | **Column- II** | | | |
|  | **(A)** | is equal to | | (p) | |  | |
|  | **(B)** | is equal to | | (q) | |  | |
|  | **(C)** | is equal to | | (r) | |  | |
|  | **(D)** | is equal to | | (s) | |  | |
|  | **CODES :** | | | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **A** | **B** | **C** | **D** |  |  |
|  | **a)** | s | r | p | q |  |  |
|  | **b)** | r | s | q | p |  |  |
|  | **c)** | p | q | r | s |  |  |
|  | **d)** | q | p | s | r |  |  |

|  |  |  |  |  |  |  |  |  |
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| **Linked Comprehension Type**  This section contain(s) 22 paragraph(s) and based upon each paragraph, multiple choice questions have to be answered. Each question has atleast 4 choices (a), (b), (c) and (d) out of which **only one** is correct.  **Paragraph for Question Nos. 316 to -316** | | | | | | | | |
| Let fx be a continuous function defined on the closed interval a, b, then limn→∞r=0n-11n frn=01fxdx | | | | |

| 316. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| **Paragraph for Question Nos. 317 to - 317** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| If m and M are the smallest and greatest values of a function f(x) defined on an interval a, b, then answer the following questions | | | | |

| 317. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| **Paragraph for Question Nos. 318 to - 318** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| If fx and g(x) be two functions, such that fa=ga=0 and f and g are both differentiable at everywhere in some neighbourhood of point a except possibly 'a'.Then limx→afxgx=limx→af'xg'x provided f'aand g'(a) are not both zero | | | | |

| 318. | The value of is | | | | | | | |
|  | a) | 0 | b) | 2/9 | c) | 1/3 | d) | 2/3 |
| **Paragraph for Question Nos. 319 to - 319** | | | | | | | | |

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| Repeated application of integration by parts gives us, the reduction formula if the integrand is dependent of n, n∈N.On the basis of above information, answer the following question : | | | | |

| 319. | If and , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 320 to - 320** | | | | | | | | |

|  |  |  |  |  |
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| If the integrand is a rational function of x and fractional powers of a linear fractional function of the form ax+bcx+d, then rationalization of the integral is affected by the substitution ax+bcx+d=tm, where m is LCM of fractional powers of ax+bcx+d.on the basis of above information, answer the following questions : | | | | |

| 320. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| **Paragraph for Question Nos. 321 to - 321** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| y=f(x) is a polynomial function passing through point (0, 1) and which increases in the intervals (1, 2) and (3,∞) and decreases in the interval (-∞,1) and (2, 3) | | | | |

| 321. | If then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| **Paragraph for Question Nos. 322 to - 322** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| If A is square matrix and eA if defined as eA=I+A+A22!+A33!+…=12fx gxgx f(x), where A=x xx x and 0<x<1, I is an identify matrix | | | | |

| 322. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 323 to - 323** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Euler’s substitutionIntegrals of the formR(x, ax2+bx+c)dx are calculated with the aid of one of the three Euler substitutions1. ax2+bx+c=t±x aif a>0;2. ax2+bx+c=tx±c if c>0;3. ax2+bx+c=x-at if ax2+bx+c=ax-ax-b i.e., if α is a real root of ax2+bx+c=0 | | | | |

| 323. | Which of the following functions does not appear in the primitive of if *t* is a function of ? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 324 to - 324** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| y=f(x) satisfies the relation 2xftdt=x22+x2t2 ftdt | | | | |

| 324. | The range of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| **Paragraph for Question Nos. 325 to - 325** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Let f:R→R be a differentiable function such thatfx=x2+0xe-1 f(x-t)dt | | | | |

| 325. | increases for | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 326 to - 326** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| f(x) satisfies the relation fx-0π/2sinxcost ftdt=sinx | | | | |

| 326. | If , then decreases in which of the following interval? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 327 to - 327** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Let fx and ϕx are two continuous functions on R satisfying ϕx=axftdt, a≠0and another continuous function gx satisfying gx+α+gx=0 ∀ x∈R, α>0and h2kg(t)dt is independent of b | | | | |

| 327. | If is an odd function, then | | | | | | | |
|  | a) | is also an odd function | | | | | | | |
|  | b) | is an even function | | | | | | | |
|  | c) | is neither as even nor an odd function | | | | | | | |
|  | d) | For to be an even function, it must satisfy | | | | | | | |
| **Paragraph for Question Nos. 328 to - 328** | | | | | | | | |

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| --- | --- | --- | --- | --- |
| Evaluating integrals Dependent on a ParameterDifferentiate I with respect to the parameter within the sign of integrals taking variable of the integrand as constant. Now, evaluate the integral so obtained as a function of the parameter and then integrate the result to get I. Constant of integration can be computed by giving some arbitrary values to the parameter and the corresponding value of I | | | | |

| 328. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| **Paragraph for Question Nos. 329 to - 329** | | | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| fx=sinx+-π/2π/2sinx+tcosxftdt | | | | |

| 329. | The range of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |

**Integer Answer Type**

| 330. | Let and be the inverse of , then the value of is | | | | | | | |
| 331. | If , then is equal to | | | | | | | |
| 332. | The value of is equal to | | | | | | | |
| 333. | If . Then the value of is | | | | | | | |
| 334. | If the value of the definite integral (where ), then the value of is | | | | | | | |
| 335. | If then the value of is | | | | | | | |
| 336. | If , then the value of is | | | | | | | |
| 337. | The value of the definite integral equals | | | | | | | |
| 338. | Let be a continuous strictly increasing function, such that for every , then value of is | | | | | | | |
| 339. | If is continuous function and  , then is equal to | | | | | | | |
| 340. | If , then is | | | | | | | |
| 341. | equals | | | | | | | |
| 342. | A continuous real function f satisfies . If , then the value of definite integral is | | | | | | | |
| 343. | The value of is | | | | | | | |
| 344. | Let and , then the value of is | | | | | | | |
| 345. | If the value of is equal to , then the value of is | | | | | | | |
| 346. | If the value of the definite integral is equal to where , then the value of is | | | | | | | |
| 347. | Let and , then the value of is | | | | | | | |
| 348. | Let and , then equals | | | | | | | |
| 349. | If and , then the value of is | | | | | | | |
| 350. | Let .Then the value of is | | | | | | | |
| 351. | Let is a derivable function satisfying and , then the possible integers in the range of is | | | | | | | |
| 352. | Let be differentiable on and , where . Then the value of is | | | | | | | |
| 353. | If , then | | | | | | | |
| 354. | Consider the polynomial . If , then the minimum value of is | | | | | | | |
| 355. | If and , then is equal to | | | | | | | |
| 356. | Let and , then the value of is | | | | | | | |
| 357. | If , then the value of is equal to | | | | | | | |
| 358. | If , then the value of is | | | | | | | |
| 359. | If , then the value of is | | | | | | | |
| 360. | Consider a real valued continuous function such that . If M and m are maximum and minimum value of the function , then the value of is | | | | | | | |
| 361. | If and , and if , then the value of is | | | | | | | |

**ACTIVE SITE TUTORIALS**

**Date :** 07-09-2019 **TEST ID: 609**

**Time :** 20:09:00 **MATHEMATICS**

**Marks :** 1199

7.INTEGRALS

|  |
| --- |
| **: ANSWER KEY :** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1) a 2) b 3) c 4) a**  **5) a 6) a 7) b 8) c**  **9) b 10) c 11) a 12) b**  **13) b 14) a 15) b 16) c**  **17) c 18) b 19) a 20) c**  **21) b 22) b 23) a 24) d**  **25) c 26) b 27) b 28) b**  **29) c 30) b 31) b 32) b**  **33) a 34) c 35) b 36) b**  **37) b 38) c 39) a 40) b**  **41) a 42) c 43) b 44) c**  **45) c 46) d 47) b 48) c**  **49) b 50) b 51) a 52) b**  **53) d 54) c 55) a 56) d**  **57) c 58) a 59) b 60) d**  **61) b 62) d 63) c 64) c**  **65) d 66) a 67) a 68) b**  **69) c 70) a 71) a 72) b**  **73) d 74) b 75) a 76) d**  **77) a 78) b 79) c 80) a**  **81) a 82) a 83) d 84) c**  **85) d 86) a 87) a 88) a**  **89) b 90) c 91) a 92) b**  **93) c 94) b 95) a 96) b**  **97) c 98) c 99) a 100) b**  **101) b 102) c 103) b 104) a**  **105) c 106) a 107) c 108) c**  **109) d 110) d 111) a 112) a**  **113) a 114) a 115) b 116) c**  **117) d 118) c 119) a 120) c**  **121) a 122) a 123) c 124) b**  **125) c 126) c 127) c 128) d**  **129) c 130) a 131) a 132) d**  **133) d 134) d 135) c 136) c**  **137) b 138) d 139) a 140) a**  **141) c 142) a 143) a 144) c**  **145) c 146) c 147) c 148) b**  **149) a 150) c 151) b 152) c**  **153) b 154) a 155) c 156) a**  **157) b 158) b 159) c 160) b**  **161) a 162) c 163) c 164) a**  **165) d 166) b 167) a 168) c**  **169) b 170) c 171) a 172) b**  **173) c 174) b 175) d 176) c**  **177) c 178) b 179) c 180) c**  **181) c 182) d 183) b 184) b**  **185) c 186) c 187) c 188) d**  **189) d 190) c 191) c 192) c**  **193) a 194) a 195) a 196) b**  **197) d 198) c 199) a 200) c**  **201) c 202) b 203) d 204) b**  **205) a 206) c 207) d 208) b**  **209) a 210) a 211) a 212) c**  **213) a 214) b 215) a 216) d**  **217) a 1) a,b,d 2) b,d 3) a,b,d 4) a,c,d**  **5) b,d 6) a,b,c 7) b,c,d 8) a,d**  **9) a,c 10) a,b,c 11) a,c,d 12) b,c**  **13) b,c 14) a,d 15) a 16) b,d**  **17) a 18) a,d 19) a,c 20) a,b**  **21) b,c,d 22) a,b 23) a,b,c 24) a,d**  **25) a,b 26) a,c 27) a,b,c,d 28) a,b,d**  **29) c 30) a,b,d 31) a,c,d 32) a,c**  **33) a,d 34) a,b,c,d 35) a,c 36) a,b,d**  **37) a,c,d 38) b,c,d 39) a,b,c,d 40) a,b,c**  **41) a,d 42) a,b,d 43) a,b,c,d 44) c,d**  **45) a,b 46) a,b,c 1) b 2) d 3) a 4) a**  **5) a 6) c 7) d 8) a**  **9) b 10) b 11) a 12) c**  **13) c 14) c 15) c 16) b**  **17) a 18) a 19) d 20) d**  **21) b 22) d 23) d 24) c**  **25) a 26) a 27) a 28) a**  **29) d 30) d 31) a 32) d**  **33) a 34) b 35) b 36) a**  **37) a 38) a 39) c 40) d**  **41) b 42) b 43) c 44) c**  **45) b 1) a 2) b 3) a 4) c**  **5) a 6) a 7) b 1) c 2) d 3) d 4) d**  **5) d 6) d 7) a 8) d**  **9) d 10) b 11) c 12) b**  **13) b 14) b 1) 6 2) 8 3) 0 4) 3**  **5) 4 6) 4 7) 6 8) 2**  **9) 6 10) 7 11) 8 12) 2**  **13) 5 14) 4 15) 1 16) 8**  **17) 8 18) 4 19) 0 20) 9**  **21) 4 22) 3 23) 2 24) 7**  **25) 2 26) 0 27) 2 28) 9**  **29) 0 30) 2 31) 3 32) 5** | | | | |

**ACTIVE SITE TUTORIALS**

**Date :** 07-09-2019 **TEST ID: 609**

**Time :** 20:09:00 **MATHEMATICS**

**Marks :** 1199

7.INTEGRALS

|  |
| --- |
| **: HINTS AND SOLUTIONS :** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | **(a)**  Put  When  (1)  Now changing equation (1) into and | | | | | | | |
| 2 | **(b)** | | | | | | | |
| 3 | **(c)**  Put, | | | | | | | |
| 4 | **(a)**  Let | | | | | | | |
| 5 | **(a)**  and | | | | | | | |
| 6 | **(a)**  (1)  (2)  Adding (1) and (2), we get | | | | | | | |
| 7 | **(b)**  (1)  (2)  Adding equations (1) and (2), we get | | | | | | | |
| 8 | **(c)** | | | | | | | |
| 9 | **(b)**  (1)  Now, put  and and adjust the limits  Therefore, by (1) | | | | | | | |
| 10 | **(c)**  Integrating by parts, we have  But , so  Therefore,  Or 7 | | | | | | | |
| 11 | **(a)** | | | | | | | |
| 12 | **(b)**  Put so that | | | | | | | |
| 13 | **(b)**  (1)  (2)  Adding equations (1) and (2), we get  (where ) | | | | | | | |
| 14 | **(a)**  Here,  and  Let | | | | | | | |
| 15 | **(b)**  Given | | | | | | | |
| 16 | **(c)**  Putting and, we have | | | | | | | |
| 17 | **(c)** | | | | | | | |
| 18 | **(b)**  Let | | | | | | | |
| 19 | **(a)**  Let Multiplying and by , we get | | | | | | | |
| 20 | **(c)**  Given,  Applying Leibnitz theorem, we get  On integrating both sides, we get  givenfor  It is known that | | | | | | | |
| 21 | **(b)** | | | | | | | |
| 22 | **(b)**  ( is even function ) | | | | | | | |
| 23 | **(a)**  Putting | | | | | | | |
| 24 | **(d)**  We have  Now, we know that  Hence, range of is | | | | | | | |
| 25 | **(c)**  and | | | | | | | |
| 26 | **(b)** | | | | | | | |
| 27 | **(b)**  Put so that and | | | | | | | |
| 28 | **(b)**  (integrating by parts)  (1)  Replacing by  (2)  From equations (1) and (2), we have  and | | | | | | | |
| 29 | **(c)**  Now  When i.e., then    Hence, | | | | | | | |
| 30 | **(b)**  Let  Let , where , and | | | | | | | |
| 31 | **(b)**  because is negative in  the required primitive function =  Now, use integration by parts | | | | | | | |
| 32 | **(b)**  Now, for  (1)  Again, for  From equations (1) and (2), we get | | | | | | | |
| 33 | **(a)**  So, when ( is continuous)  i.e., is a constant function | | | | | | | |
| 34 | **(c)**  Put | | | | | | | |
| 35 | **(b)**  We have  Put | | | | | | | |
| 36 | **(b)**  Put , then | | | | | | | |
| 37 | **(b)**  (given) | | | | | | | |
| 38 | **(c)**  If  [ is an odd function] | | | | | | | |
| 39 | **(a)**  Now | | | | | | | |
| 40 | **(b)** | | | | | | | |
| 41 | **(a)**  Differentiating, we get  Integrating both sides w.r.t. x | | | | | | | |
| 42 | **(c)**  Also | | | | | | | |
| 43 | **(b)**  Let  Integrating w.r.t. , we get | | | | | | | |
| 44 | **(c)**  We have  Now, | | | | | | | |
| 45 | **(c)**  is a constant function | | | | | | | |
| 46 | **(d)**  Since  Hence, no such positive function | | | | | | | |
| 47 | **(b)**  , putting i.e., | | | | | | | |
| 48 | **(c)**  , let | | | | | | | |
| 49 | **(b)**  Put | | | | | | | |
| 50 | **(b)**  Putting in the given integral, we have | | | | | | | |
| 51 | **(a)**  function is symmetric about the line | | | | | | | |
| 52 | **(b)**  For  For  Clearly,  Thus, the given integral | | | | | | | |
| 53 | **(d)**  (Integrating by parts)  Now | | | | | | | |
| 54 | **(c)**  Putting ,  We get  Since,  Therefore, | | | | | | | |
| 55 | **(a)**  Therefore,  L.H.S. is a function of , whereas R.H.S. is a constant. Hence, we must have and | | | | | | | |
| 56 | **(d)**  Putting  where | | | | | | | |
| 57 | **(c)**  Let | | | | | | | |
| 58 | **(a)**  Putting we get | | | | | | | |
| 59 | **(b)**  Differentiating, we get  (1)  (2)  Now, | | | | | | | |
| 60 | **(d)** | | | | | | | |
| 61 | **(b)**  Given | | | | | | | |
| 62 | **(d)** | | | | | | | |
| 63 | **(c)** | | | | | | | |
| 64 | **(c)**  Given is a positive function, and  Now, (1)  (2)  Adding equations (1) and (2), we get | | | | | | | |
| 65 | **(d)**  let | | | | | | | |
| 66 | **(a)**  Here, | | | | | | | |
| 67 | **(a)**  Putting , we get | | | | | | | |
| 68 | **(b)**  , then  From Lagrange’s Mean Value Theorem  for some  (where , and using intermediate Mean Value Theorem) | | | | | | | |
| 69 | **(c)**  where | | | | | | | |
| 70 | **(a)** | | | | | | | |
| 71 | **(a)**  Given,  Now,    [by Leibnitz formula]  Put | | | | | | | |
| 72 | **(b)** | | | | | | | |
| 73 | **(d)**  Since  is odd function, | | | | | | | |
| 74 | **(b)**  Put | | | | | | | |
| 75 | **(a)**  On integrating by parts taking as first function and as second function, we get  Now, , and  Thus,  Now, put , then | | | | | | | |
| 76 | **(d)**  Let | | | | | | | |
| 77 | **(a)**  Putting,  andwe get | | | | | | | |
| 78 | **(b)**  Let  (1)  From the given conditions  (2)  and (3)  From equations (2) and (3), we get  **By Rolle’s theorem for in [0, 1] :**, at least one such that  **By Rolle’s theorem for in [1, 2] :**, at least one such that  Now, from equation (1),  i.e., is a root of the equation  Similarly, is a root of the equation  But equation being a quadratic equation cannot have more than two roots  Hence, equation has one root between and and other root between 1 and 2 | | | | | | | |
| 79 | **(c)**  Given  In put  (1)  Now, (2)  From equations (1) and (2), we get | | | | | | | |
| 80 | **(a)**  Let (1)  (2)  Adding equations (1) and (2) gives  Put , therefore  When | | | | | | | |
| 81 | **(a)**  Putting , we get | | | | | | | |
| 82 | **(a)** | | | | | | | |
| 83 | **(d)** | | | | | | | |
| 84 | **(c)**  (as function inside the integration is odd) | | | | | | | |
| 85 | **(d)** | | | | | | | |
| 86 | **(a)** | | | | | | | |
| 87 | **(a)**    The graph with solid line is the graph of and the graph with dotted lines is the graph of . Now the graph of min is the graph with dark solid lines  area of 200 triangles shown as solid dark lines in the diagram | | | | | | | |
| 88 | **(a)**  Here,  (Using Newton Leibnitz formula): differentiating both sides, we get    [neglecting negative] | | | | | | | |
| 89 | **(b)**  Let then | | | | | | | |
| 90 | **(c)**  Put | | | | | | | |
| 91 | **(a)**  For | | | | | | | |
| 92 | **(b)** | | | | | | | |
| 93 | **(c)**  We have  for all | | | | | | | |
| 94 | **(b)**  Write  and put so that | | | | | | | |
| 95 | **(a)**  When  When | | | | | | | |
| 96 | **(b)**  On putting , we get  Integral (without limits)  where  Definite integral | | | | | | | |
| 97 | **(c)**  Let  Put | | | | | | | |
| 98 | **(c)**  As satisfies the conditions of Rolle’s theorem in [1, 2], is continuous in the interval and  Therefore, | | | | | | | |
| 99 | **(a)** | | | | | | | |
| 100 | **(b)**    From the graph in figure | | | | | | | |
| 101 | **(b)**  (1)  Replacing by , we have (2)  Adding equations (1) and (2), we get  asforis not an integer] | | | | | | | |
| 102 | **(c)** | | | | | | | |
| 103 | **(b)**  We have  Put | | | | | | | |
| 104 | **(a)**  Let where | | | | | | | |
| 105 | **(c)**  (1)  Replacing by and then adding with equation (1)  Let | | | | | | | |
| 106 | **(a)** | | | | | | | |
| 107 | **(c)**  , then | | | | | | | |
| 108 | **(c)**  Given integral | | | | | | | |
| 109 | **(d)**  Let  (1)  (2)  Adding equation (1) and (2), we get | | | | | | | |
| 110 | **(d)**  (1)  For  Differentiating both sides of equation (1) w.r.t. we get, | | | | | | | |
| 111 | **(a)**  Putting so that | | | | | | | |
| 112 | **(a)**  Differentiating both sides, we get  Comparing the coefficient of like terms on both sides, we get | | | | | | | |
| 113 | **(a)**  . Put  (integrating by parts) | | | | | | | |
| 114 | **(a)**  [using Leibnitz’s Rule] | | | | | | | |
| 115 | **(b)** | | | | | | | |
| 116 | **(c)** | | | | | | | |
| 117 | **(d)**  , we get  Putting ,  We get  As is even and is odd | | | | | | | |
| 118 | **(c)**  (1) | | | | | | | |
| 119 | **(a)**  We have | | | | | | | |
| 120 | **(c)**    we have | | | | | | | |
| 121 | **(a)**  Putting , i.e.,, we get | | | | | | | |
| 122 | **(a)**  Given  Now, | | | | | | | |
| 123 | **(c)**  , thus gis even  Also,  Now,  is periodic with period 2 | | | | | | | |
| 124 | **(b)** | | | | | | | |
| 125 | **(c)**  Here,  and  On adding, we get | | | | | | | |
| 126 | **(c)**  as is odd | | | | | | | |
| 127 | **(c)**  Putting in and in we get | | | | | | | |
| 128 | **(d)**  By rationalizing the integrand, the given integral can be written as  Putting we haveso  and | | | | | | | |
| 129 | **(c)**  Since is an increasing function on (0, 1), therefore and are minimum and maximum values of in the interval  , for all | | | | | | | |
| 130 | **(a)** | | | | | | | |
| 131 | **(a)** | | | | | | | |
| 132 | **(d)**  , let | | | | | | | |
| 133 | **(d)**  Let  But | | | | | | | |
| 134 | **(d)**  Putting  Putting ,  We get | | | | | | | |
| 135 | **(c)**  Since, | | | | | | | |
| 136 | **(c)**  Let | | | | | | | |
| 137 | **(b)** | | | | | | | |
| 138 | **(d)**  The given integrand is a perfect differential coeff. of | | | | | | | |
| 139 | **(a)**  Let  Put  But given | | | | | | | |
| 140 | **(a)**  Let then  Now  Hence, (1)  Given when from equation (1),  from equation (1),  when | | | | | | | |
| 141 | **(c)**  Let  Now | | | | | | | |
| 142 | **(a)** | | | | | | | |
| 143 | **(a)** | | | | | | | |
| 144 | **(c)** | | | | | | | |
| 145 | **(c)** | | | | | | | |
| 146 | **(c)**  Differentiating both sides, we get  Comparing the like powers of on both sides, we get | | | | | | | |
| 147 | **(c)**  and  Let  Now, | | | | | | | |
| 148 | **(b)**  Let  For  For | | | | | | | |
| 149 | **(a)** | | | | | | | |
| 150 | **(c)** | | | | | | | |
| 151 | **(b)**  Let …(i)  …(ii)  On adding Eqs. (i) and (ii), we get | | | | | | | |
| 152 | **(c)**    From graph, | | | | | | | |
| 153 | **(b)**  Let  Given | | | | | | | |
| 154 | **(a)**  Put  If , and  Put | | | | | | | |
| 155 | **(c)**  Putting we get | | | | | | | |
| 156 | **(a)**  Using we get | | | | | | | |
| 157 | **(b)**  and put so that | | | | | | | |
| 158 | **(b)**  Here,  Let and | | | | | | | |
| 159 | **(c)**  Diff. both sides , we get | | | | | | | |
| 160 | **(b)** | | | | | | | |
| 161 | **(a)**  Let  Putting  (1)  Replacing by or , we get  (2)  Adding equation (1) and (2), we get | | | | | | | |
| 162 | **(c)** | | | | | | | |
| 163 | **(c)**  (Dividing and by) | | | | | | | |
| 164 | **(a)** | | | | | | | |
| 165 | **(d)** | | | | | | | |
| 166 | **(b)**  (as has a period ) | | | | | | | |
| 167 | **(a)**  and  Let  is increasing for ,  and | | | | | | | |
| 168 | **(c)**  Adding equations (1) and (2), we get  Adding equations (3) and (4), we get | | | | | | | |
| 169 | **(b)** | | | | | | | |
| 170 | **(c)**  (as lies in either 1st or 2nd quadrant) | | | | | | | |
| 171 | **(a)**  (1)  (2)  Also, differentiating equation (1) w.r.t. , we get | | | | | | | |
| 172 | **(b)** | | | | | | | |
| 173 | **(c)**  In , Put , then  (The other integrals are zero, being integrals of odd functions) | | | | | | | |
| 174 | **(b)** | | | | | | | |
| 175 | **(d)**  Put | | | | | | | |
| 176 | **(c)** | | | | | | | |
| 177 | **(c)**  Let | | | | | | | |
| 178 | **(b)** | | | | | | | |
| 179 | **(c)** | | | | | | | |
| 180 | **(c)**  Put  When  given integral  Also, | | | | | | | |
| 181 | **(c)** | | | | | | | |
| 182 | **(d)**  (Integrating by parts with as first function and as second function) | | | | | | | |
| 183 | **(b)** | | | | | | | |
| 184 | **(b)** | | | | | | | |
| 185 | **(c)**  Put | | | | | | | |
| 186 | **(c)**  Let  (1)  Now let  (by property IV)  or or or  from equation (1), | | | | | | | |
| 187 | **(c)**  Write and put  So that | | | | | | | |
| 188 | **(d)** | | | | | | | |
| 189 | **(d)**  Hence, and | | | | | | | |
| 190 | **(c)**  The polynomial function is differentiable everywhere. Therefore, the points of extremum can only be the roots of the derivative. Further, the derivative of a polynomial is a polynomial. The polynomial of the least degree with roots and has the form  Hence,  Since at , we must have , we have  Also, so . Hence,  Thus, | | | | | | | |
| 191 | **(c)**  Differentiating both sides, we get  Comparing like terms on both sides, we get | | | | | | | |
| 192 | **(c)**  We have  , where  (1)  Since, is an increasing function for , therefore,  when  (2)  From equations (1) and (2), we find that L.H.S. of equation (1) is positive and lies between 1 and . Therefore, is a positive real number.  Now, from equation (1), (3)  The denominator of equation (3) is greater than unity and the numerator lies between 0 and 1. Therefore, | | | | | | | |
| 193 | **(a)** | | | | | | | |
| 194 | **(a)**  Let  Put  (Here  Put | | | | | | | |
| 195 | **(a)** | | | | | | | |
| 196 | **(b)**  Differentiating both sides w.r.t.  Now is attained when | | | | | | | |
| 197 | **(d)**  Let  If , then | | | | | | | |
| 198 | **(c)**  Let  On dividing Nr and Dr by , we get  Put | | | | | | | |
| 199 | **(a)**  Differentiating both sides, we get | | | | | | | |
| 200 | **(c)** | | | | | | | |
| 201 | **(c)**  Putting , we get  Adding, we get | | | | | | | |
| 202 | **(b)**  Let  Putting we get | | | | | | | |
| 203 | **(d)**  Clearly ‘’ is the correct alternative | | | | | | | |
| 204 | **(b)**  We have,  On differentiating w.r.t , we get    is the inverse of  As  and | | | | | | | |
| 205 | **(a)**  let | | | | | | | |
| 206 | **(c)**  In , put | | | | | | | |
| 207 | **(d)**  Put  When  When | | | | | | | |
| 208 | **(b)** | | | | | | | |
| 209 | **(a)**  , put | | | | | | | |
| 210 | **(a)**  Let | | | | | | | |
| 211 | **(a)**  is periodic with period | | | | | | | |
| 212 | **(c)**  (differentiating w.r.t. using Leibnitz rule)  [as is not zero everywhere]  Put we have , or | | | | | | | |
| 213 | **(a)**  Given that  or  Now put | | | | | | | |
| 214 | **(b)**  Let | | | | | | | |
| 215 | **(a)**  Apply L’Hospital Rule | | | | | | | |
| 216 | **(d)**  (given)  Also, given | | | | | | | |
| 217 | **(a)**  (1)  (2)  Adding equation (1) and (2), we get | | | | | | | |
| 218 | **(a,b,d)**  is a period of  (in second integral replacing by and then using )  Also | | | | | | | |
| 219 | **(b,d)**  For  On comparing, we get | | | | | | | |
| 220 | **(a,b,d)**  Also | | | | | | | |
| 221 | **(a,c,d)**  (1)  From equation (1), | | | | | | | |
| 222 | **(b,d)** | | | | | | | |
| 223 | **(a,b,c)**  where  The graph of is given in Fig 7.1    From the graph, is even, bounded function and has the range (0,1] | | | | | | | |
| 224 | **(b,c,d)** | | | | | | | |
| 225 | **(a,d)** | | | | | | | |
| 226 | **(a,c)**  For | | | | | | | |
| 227 | **(a,b,c)**  Clearly, continuous and differentiable at  Also, which is non-differentiable at | | | | | | | |
| 228 | **(a,c,d)**  In the first integral, put  and in the second integral put  then  Here and  Both the function are one-one  Also . Hence, is monotonic  Also | | | | | | | |
| 229 | **(b,c)** | | | | | | | |
| 230 | **(b,c)**  Put  Adding equations (1) and (2), we get  , put | | | | | | | |
| 231 | **(a,d)** | | | | | | | |
| 232 | **(a)**  [is an odd function] | | | | | | | |
| 233 | **(b,d)**  Put | | | | | | | |
| 234 | **(a)**  Differentiating both sides w.r.t. , we get | | | | | | | |
| 235 | **(a,d)**  (intergrating by parts) | | | | | | | |
| 236 | **(a,c)**  Let and Thus  So,  or | | | | | | | |
| 237 | **(a,b)**  Here, in So, is monotonically increasing.  Hence, | | | | | | | |
| 238 | **(b,c,d)**  where  are in H.P.  For , we have  So that | | | | | | | |
| 239 | **(a,b)**  is an increasing function | | | | | | | |
| 240 | **(a,b,c)**  For ,  Given equation becomes  For ,  For , | | | | | | | |
| 241 | **(a,d)** | | | | | | | |
| 242 | **(a,b)**  where  , thus  Obviously,  Also, for  Hence, is a decreasing function  Also, | | | | | | | |
| 243 | **(a,c)** | | | | | | | |
| 244 | **(a,b,c,d)**  Let  Put  Then,  On comparing, we get  **Option (a)**  **Option (b)**  **Option ( c )**  **Option (d)** | | | | | | | |
| 245 | **(a,b,d)**  We know represents the area under the curve from to . We also know that area from to is 2  (1)  Similarly, (2)  From (1) and (2), and  and | | | | | | | |
| 246 | **(c)**  Let  Clearly, is increasing in  The least value of the function,  and the greatest value of the function,  Therefore,  Here, | | | | | | | |
| 247 | **(a,b,d)** | | | | | | | |
| 248 | **(a,c,d)**  Differentiating both sides, we get | | | | | | | |
| 249 | **(a,c)** | | | | | | | |
| 250 | **(a,d)** | | | | | | | |
| 251 | **(a,b,c,d)** | | | | | | | |
| 252 | **(a,c)**  let | | | | | | | |
| 253 | **(a,b,d)**  Given that  Also , where  Thus,  Thus, is continuous as well as differentiable at Also, has one real root, draw the graph and verify  **For range of :**  is the value of area bounded by the curve and -axis between the limits and  Obviously, minimum area is obtained when and coincide or  Maximum value of area occurs when ,  Hence area of shaded region = 1  **Z:\Data Typing Files\Sujata\Cengage Physics\12.jpg** | | | | | | | |
| 254 | **(a,c,d)**  The expression where is equivalent to which equals to because is continuous  Therefore, where  **a.** We have  **c.** Given  But given , so this can be true only when  **d.** cuts axis at least once  So, there exists at least one for which | | | | | | | |
| 255 | **(b,c,d)**  Also, derivative of is . | | | | | | | |
| 256 | **(a,b,c,d)**  Let  For extremum | | | | | | | |
| 257 | **(a,b,c)**  Now given that  From  But  Also,  Also, | | | | | | | |
| 258 | **(a,d)**  for  ( has period ) | | | | | | | |
| 259 | **(a,b,d)** | | | | | | | |
| 260 | **(a,b,c,d)**  and  and | | | | | | | |
| 261 | **(c,d)**  Then,  and is non-differentiable at  Or | | | | | | | |
| 262 | **(a,b)**  Integrating by parts choose ‘1’ as the second function  = R.H.S. | | | | | | | |
| 263 | **(a,b,c)**  Let (1)  (2)  Adding equations (1) and (2), we get  (given) | | | | | | | |
| 264 | **(b)**  Least and greatest value of  Hence, | | | | | | | |
| 265 | **(d)**  = | | | | | | | |
| 266 | **(a)**  For . If and are the smallest and greatest values of on  Then  or  Since is continuous on , it takes on all intermediate values between and  Therefore, some values , we will have or  Hence, both the statements are true and statement 2 is a correct explanation of statement 1 | | | | | | | |
| 267 | **(a)**  Statement 2 is a fundamental concept, also we have | | | | | | | |
| 268 | **(a)**  Let , where  We have and  Clearly, is continuous in and  It implies that will becomes zero at least once in . Hence, for at least one value of  Hence, both the statements are true and statement 2 is a correct explanation of statement 1 | | | | | | | |
| 269 | **(c)**  Therefore, statement is true only when which holds in statement 1  Therefore, statement 2 is false and statement 1 is true | | | | | | | |
| 270 | **(d)**  cannot be expressed in terms of elementary function, then integral is known as inexpressible or that is “ cannot be found “. | | | | | | | |
| 271 | **(a)**  Let  Since, , then  Statement II is also true and it is a correct explanation for Statement I | | | | | | | |
| 272 | **(b)**  Put | | | | | | | |
| 273 | **(b)**  Put  Then, | | | | | | | |
| 274 | **(a)**  Statement II is true.  Now, | | | | | | | |
| 275 | **(c)** | | | | | | | |
| 276 | **(c)**  Given,  Put | | | | | | | |
| 277 | **(c)**  Let | | | | | | | |
| 278 | **(c)**  Statement 1 is true as it is a fundamental property.  Let  If is an even function  Then  Hence, statement 2 is false | | | | | | | |
| 279 | **(b)**  Let  Then,  Now, | | | | | | | |
| 280 | **(a)** | | | | | | | |
| 281 | **(a)** | | | | | | | |
| 282 | **(d)**  Period of | | | | | | | |
| 283 | **(d)**  Hence, statement 1 is false. However, statement 2 is true | | | | | | | |
| 284 | **(b)**  Let  Thus, both the statements are true but statement 2 is not a correct explanation of statement 1 | | | | | | | |
| 285 | **(d)**  For  If  oror  Thus for these value of cannot be factorized, hence  Hence, statement 1 is false and statement 2 is true | | | | | | | |
| 286 | **(d)**  Obviously, is non-differentiable at  But  Which is continuous as well as differentiable at  Hence, statement 1 is false | | | | | | | |
| 287 | **(c)**  Both the statements are true independently, but statement 2 is not a correct explanation of statement 1 | | | | | | | |
| 288 | **(a)** | | | | | | | |
| 289 | **(a)**  Given that cuts the graph at least once, then changes sign at least once in , hence can be zero | | | | | | | |
| 290 | **(a)** | | | | | | | |
| 291 | **(a)**  Let , Then,  for all  But,  for all | | | | | | | |
| 292 | **(d)**  Since,  Hence, statement I is false.  But statement II is true as is possible with period . | | | | | | | |
| 293 | **(d)**  These values of are in third quadrant where both sin and are negative  Then, for  Hence, is decreasing for these values of  Then, the least value of function occurs at | | | | | | | |
| 294 | **(a)**  On differentiating both sides . then  or  If | | | | | | | |
| 295 | **(d)**  ( is periodic with period 1) | | | | | | | |
| 296 | **(a)** | | | | | | | |
| 297 | **(b)**  cannot be evaluated as there does not exist any method for evaluating this (integration by parts also does not works);however, is a differentiable function. Hence, both the statements are true but statement 2 is not a correct explanation of statement 1 | | | | | | | |
| 298 | **(b)**  In LHS, put  In RHS, put  Hence, option (b) is correct | | | | | | | |
| 299 | **(a)**  To prove  Put , then  When and when  Thus, statement 2 is true  Putting and , we get  =0 [ is an odd function] | | | | | | | |
| 300 | **(a)**  Statement II is true.  Now,  (By using statement II) | | | | | | | |
| 301 | **(a)**  Given  Replace by , we have (1)  Now, replace by , we have (2)  From equations (1) and (2), we have (3)  Hence, is periodic with period 12  is independent of if is positive integral multiple of then possible value of is 12 | | | | | | | |
| 302 | **(c)**  Statement I is true.  when is odd | | | | | | | |
| 303 | **(d)**  is continuous in [0, 2] | | | | | | | |
| 304 | **(b)**  Also    Hence, both the statements are true but statement 2 is not a correct explanation of statement 1 | | | | | | | |
| 305 | **(b)**  is an even function. | | | | | | | |
| 306 | **(c)**  Let  ….(i)  Also,  …..(ii)  Given,  Now, from Eq. (ii),  ….(iii)  It is true from Eq. (i).  is variable. | | | | | | | |
| 307 | **(c)**  Let  put  (R) Let  Put  Thus, A is true but R is false | | | | | | | |
| 308 | **(b)**  For , then  If , then | | | | | | | |
| 309 | **(a)**  **a.**  Applying property  **b.**  is periodic with period 2  Then is independent of , for which is multiple of 2  **c.** Let (1)  Applying , we get  (2)  Adding equations (1) and (2), we get  **d.** Let | | | | | | | |
| 310 | **(b)**  **a.**  **b.** and since  and hence  Thus,  **c.**  Let  **d.** | | | | | | | |
| 311 | **(a)**  **a.** (use property if is integer)  (as )  **b.**  **c.**  Hence,  **d.** Let | | | | | | | |
| 312 | **(c)**  **a**.  **b**.  **c**.  **d**.  Where is constant and is polynomial of degree less than 4 | | | | | | | |
| 313 | **(a)**  **a.**  is an odd function  **b.**  (1)  Also, and  and  and  Substituting these values, we get,  **c.**  is periodic with period  **d.** Let  [where [⋅] denotes the greatest integer function]  depends on and | | | | | | | |
| 314 | **(a)**  **a**. Let  Putting  **b**.  Put  **c.**Add and subtract in the numerator, then and  **d.**  Let | | | | | | | |
| 315 | **(b)**  **a**.  **b**.  Put we get  **c**.  Put  **d.**  Put | | | | | | | |
| 316 | **(c)** | | | | | | | |
| 317 | **(d)**  For , we have | | | | | | | |
| 318 | **(d)** | | | | | | | |
| 319 | **(d)** | | | | | | | |
| 320 | **(d)**  Given,  Put | | | | | | | |
| 321 | **(d)**  From the given data, we can conclude that at  Hence,  Also  (1)  (2)  The graph is symmetrical about line and the range is  (from(2)) | | | | | | | |
| 322 | **(a)**  and so on  Then  and | | | | | | | |
| 323 | **(d)**  Here therefore we make the substitution Squaring both sides of this equality and reducing the similar terms, we get  Substituting into the integral, we get  Now let us expand the obtained proper rational fraction into partial fractions: | | | | | | | |
| 324 | **(d)**  Differentiating w.r.t. we get    Since is real,  Also, is an odd function, hence | | | | | | | |
| 325 | **(b)**  (1)  Differentiating w.r.t. , we get  [using equation (2)]  Also [from equation (1)]  has real roots, hence is non-monotonic. Hence is many-one, but range is , hence surjective | | | | | | | |
| 326 | **(c)**  , where  3 | | | | | | | |
| 327 | **(b)**  is an odd function  , put | | | | | | | |
| 328 | **(b)**  Let (1)  Differentiating w.r.t. keeping as constant  Integrating both sides w.r.t. , we get  For [from equation (1)] | | | | | | | |
| 329 | **(b)**  Thus,  (1)  (2)  From equations (1) and (2), we get  Thus, the range of is  is invertible if  or  or | | | | | | | |
| 330 | **(6)**  Given | | | | | | | |
| 331 | **(8)** | | | | | | | |
| 332 | **(0)**  Integrand is discontinuous at , then  and | | | | | | | |
| 333 | **(3)** | | | | | | | |
| 334 | **(4)**  (1)  (2)  On adding equations (1) and (2), we get  Hence, | | | | | | | |
| 335 | **(4)**  Differentiating both sides, we get | | | | | | | |
| 336 | **(6)**  Put | | | | | | | |
| 337 | **(2)**  where ;  Put | | | | | | | |
| 338 | **(6)**  Given  Differentiating,  But | | | | | | | |
| 339 | **(7)** | | | | | | | |
| 340 | **(8)** | | | | | | | |
| 341 | **(2)** | | | | | | | |
| 342 | **(5)**  We have (1)  and (2)  From equations (1) and (2),  Put  Hence, | | | | | | | |
| 343 | **(4)**  (1)  And  Put  Now put | | | | | | | |
| 344 | **(1)**  If | | | | | | | |
| 345 | **(8)** | | | | | | | |
| 346 | **(8)**  Let  Integrating by parts again 6 more times | | | | | | | |
| 347 | **(4)** | | | | | | | |
| 348 | **(0)**  We have  Put , we get  Now,  Put , we get  Hence, | | | | | | | |
| 349 | **(9)**  Now | | | | | | | |
| 350 | **(4)**  Given  (1)  Replacing by we have  (2)  Now (3)  Also(4)  {using (1)}  Adding (3) and (4), | | | | | | | |
| 351 | **(3)**  Range of is  Number of integers in the range is 3 | | | | | | | |
| 352 | **(2)**  We have (1)  Differentiating both the sides of (1) with respect to ‘’, we get  (2)  Putting in (2),  We get | | | | | | | |
| 353 | **(7)** | | | | | | | |
| 354 | **(2)** | | | | | | | |
| 355 | **(0)** | | | | | | | |
| 356 | **(2)**  Put | | | | | | | |
| 357 | **(9)**  ; where and  Now,  (1)  Again  (2)  Solving equations (1) and (2) we have | | | | | | | |
| 358 | **(0)**  Put  Or  Or  Or | | | | | | | |
| 359 | **(2)** | | | | | | | |
| 360 | **(3)**  We have  (1)  Now,  Hence,  Therefore,  and | | | | | | | |
| 361 | **(5)**  Given  In put  (1)  Now (2)  From equations (1) and (2) we get | | | | | | | |