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| RIT-logo-1.png | **MOBILES ARE BANNED**   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **USN:** | **1** | **M** | **S** |  |  |  |  |  |  |  | |

**DEPARTMENT OF MATHEMATICS**

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| --- | --- | --- | --- | --- | --- |
| **Sub Code:** | CS41 | **Sub:** | ENGINEERING MATHEMATICS IV | **Test:** | I |
| **Time:** | 9.30 to 10.30 am | **Term:** | 8.03.2021 to 26.06.2021 | **Marks:** | 30 |
| **Date:** | 9.06.2021 | **Semester:** | IV | **Section:** | CSE |

**Note: Answer any TWO full questions. Each main question carries 15 marks**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | | **Questions** | **Bloom’s**  **Level** | **CO’s** | **Marks** |
| 1. | (a) | Given , write Lagrange’s inverse interpolation formula. | L1 | CO1 | 2 |
|  | (b) | Estimate the missing term using interpolation:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 4 | | f(x) | 1 | -1 | … | -1 | | L2 | CO1 | 3 |
|  | (c) | Integrate numerically by using Simpson’s one third rule by taking 7 ordinates: | L3 | CO1 | 5 |
|  | (d) | From the following table, estimate the number of students who obtained marks between 50 & 55   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Marks | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | | No. of students | 15 | 26 | 33 | 35 | 21 | | L4 | CO1 | 5 |
|  | | | | | |
| 2. | (a) | In a biased coin, the probability of heads is twice that of tails. Out of 10 tosses of this coin, what is the probability of getting 5 heads. | L1 | CO2 | 2 |
|  | (b) | A random variable X has the following distribution:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | X=x | 1 | 2 | 4 | 5 | 7 | | p(x) | k | 2k | 2k2+k | k2+k | 3k2 |   Find the value of k. | L2 | CO2 | 3 |
|  | (c) | The sales per day in a shop is exponentially distributed with mean Rs.1000. The sales tax is to be levied at the rate of 12%. What is the probability that the sales tax will exceed Rs.140 on two consecutive days? | L4 | CO2 | 5 |
|  | (d) | In a normal distribution, 5% are under 25 and 80% are under 60. Find the mean and standard deviation of the distribution. | L3 | CO2 | 5 |
|  | | | | | |
| 3. | (a) | Write the expressions for and using forward interpolation formula at the point | L1 | CO1 | 2 |
|  | (b) | An experiment consists of counting the number of Alpha particles given off in a one second interval by one gram of radioactive substance. If earlier data shows that on an average 2.3 such Alpha particles are emitted per second, using Poisson distribution, find the probability that at most 1 Alpha particle will be emitted in a second. | L2 | CO2 | 3 |
|  | (c) | A random variable X is Gamma distributed with mean 8 and variance 32. Find the probability P(X>10). | L4 | CO2 | 5 |
|  | (d) | Find the interpolating polynomial for the given data and hence find f(4)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 5 | | f(x) | 1 | 11 | 49 | 233 | | L3 | CO1 | 5 |