Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **17MA1006** | **Duration :** | **3hrs** |
| **Sub. Name :** | **FOUNDATIONS OF MATHEMATICS**  **AND STATISTICS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Expand  in ascending powers of x. Find the coefficient of . State the condition on which the expansion is valid. | CO1 | 10 |
| b. | Sum the series: | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Sum the series: | CO1 | 10 |
| b. | Prove that | CO1 | 10 |
|  | | | | |
| 3. | a. | Differentiate with respect to given, | CO1 | 5 |
| b. | Differentiate with respect to  given, | CO1 | 5 |
| c. | Find maxima and minima of | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Evaluate | CO1 | 5 |
| b. | Evaluate | CO1 | 5 |
| c. | Evaluate  using Bernoulli’s integration. | CO1 | 5 |
| d. | Evaluate | CO1 | 5 |
|  | | | | |
| 5. | a. | Three guns are fired at a target with probabilities 0.7,0.8 and 0.9 respectively. Find the probability that (i) target is being hit (ii) exactly one hits the target (iii) none hits the target. | CO3 | 10 |
| b. | If P(A) = 0.35, P(B) = 0.75, P(A∪B) = 0.95 Find P() | CO3 | 5 |
| c. | Find the probability that (i) a leap year selected at random has 53 Sundays (ii) a non leap year selected at random has 53 Sundays. | CO3 | 5 |
| (OR) | | | | |
| 6. | a. | A and Balternativelythrow a pair of dice. Player A wins if he throws 6 before B throws 7. Player B wins if he throws 7 before A throws 6. If player A begins the game, find the probability of his winning the game. | CO3 | 10 |
| b. | A lot consists of 10 good articles, 4 with minor defects, 2 with major defects. Two articles are taken at random. Find the probability that  (i) both are good (ii) both have major defects (iii)both have minor defects (iv)exactly one is good (v) neither is good. | CO3 | 10 |
|  | | | | |
| 7. | a. | A machine manufacturing screws is known to produce 5% defectives. In a random sample of 15 screws, what is the probability using the binomial distribution that there are  (i) exactly 3 defectives (ii) at least 3 defectives (iii) almost 3 defectives | CO6 | 10 |
| b. | Fit a Poisson distribution and hence deduce theoretical frequencies.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 0 | 1 | 2 | 3 | 4 | | f(x) | 122 | 60 | 15 | 2 | 1 | | CO4 | 10 |
| (OR) | | | | |
| 8. | a. | In a test of 2000 electric bulbs, it was found that the life of a particular type was normally distributed with average life of 2040 hrs and standard deviation 60 hrs. Estimate the number of bulbs likely to burn for (i) more than 2150 hrs (ii) less than 1950 hrs (iii) more than 1920 hrs but than 2160 hrs. | CO6 | 10 |
| b. | In a city a sample of 1000 people was taken and out them 540 are vegetarians and the rest are non vegetarians. Can we say that both habits of eating are equally popular in the city at (i) 1% LOS (ii)5% LOS. | CO5 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | From the following data of two sample values, find if the sample variances are significantly different.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Sample I | 17 | 27 | 18 | 25 | 27 | 29 | 27 | 23 | 17 | | Sample II | 16 | 16 | 20 | 16 | 20 | 17 | 15 | 21 | ---- | | CO5 | 10 |
| b. | The following table gives a classification of a sample of 160 plants of their flower color and flatness of the leaf. Test whether the flower color is independent of flatness of the leaf.   |  |  |  | | --- | --- | --- | |  | Flat leaves | Curled leaves | | White flower | 99 | 36 | | Red flower | 20 | 5 | | CO5 | 10 |

ALL THE BEST