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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May– 2017**

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| **Code :** | **15MA3017** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATHEMATICS FOR COMPETITIVE EXAMINATIONS** | **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. | A and B entered into a partnership investing Rs. 16,000 and Rs. 12,000 respectively. After 3 months, A withdraw Rs. 5,000 while B invested Rs. 5,000 more. After 3 more months C joins the business with a capital of Rs. 21,000. Find the share of B exceeds that of C, out of a total profit of Rs. 26,400 after one year. | CO1 | 8 |
| b. | A basket contains 10 apples & 20 oranges out of which 3 apples and 5 oranges are defective. If we choose 2 fruits at random, what is the probability that either both are oranges or both are non-defective? | CO1 | 8 |
| c. | In how many different ways can the letters of the word ‘SOFTWARE’ be arranged in such a way that the vowels always come together? | CO4 | 4 |
| (OR) | | | | |
| 2. | a. | The ratio of the father’s age to his son’s age is 7:3. The product of ages is 756. Find the ratio of their ages after 6 years. | CO4 | 8 |
| b. | The average weight of 6 men decreases by 3kg when one of them weighing 80kg is replaced by a new man. Find the weight of the new man. | CO1 | 8 |
| c. | Subtracting 40% of a number from the number, we get the result as 30. Find the number. | CO1 | 4 |
| 3. | a. | In a factory 80% of the workers are males, 20% out of these are undergraduates and remaining post graduates. In ladies, 25% are undergraduates and remaining post graduates. If the total number of lady workers in the factory is 600, then what is the number of post graduates in the factory? | CO2 | 8 |
|  | b. | Find the least number which when divided by 18, 27 and 36 leaves the remainder 5, 14 and 23 respectively. | CO2 | 8 |
|  | c. | If 6 men working 8 hours a day earn Rs.840 per week, then 9 men working 6 hours a day will earn how much per week? | CO4 | 4 |
| (OR) | | | | |
| 4. | a. | The ratio of the students in three classes is 2:3:5. If 40 students were increased in each class then the ratio becomes 4:5:7. What was the total number of students in the three classes before the increase? | CO4 | 8 |
|  | b. | Three pipes A, B and C can fill the tank in 6 hours. After working together for 2 hours, C is closed and A & B fills the remaining part in 7 hours. Find the number of hours taken by C alone to fill the tank. | CO1 | 8 |
|  | c. | Find the smallest fraction which when added to  gives the whole number. | CO2 | 4 |
| 5. | a. | A salesman sold two pipes at Rs. 15 each. If his profit on one was 25% and the loss on the other was 25%, what was the loss/profit for him? | CO2 | 8 |
|  | b. | A classroom has equal number of boys and girls. 8 Girls left to play Kho-Kho, leaving twice as many boys as girls in the classroom. What was the total number of boys and girls present initially? | CO2 | 8 |
|  | c. | Find the least 4 digit number which is perfect square. | CO2 | 4 |
| (OR) | | | | |
| 6. | a. | A can do a piece of work in 80 days. He works at it for 10 days and then B alone finish the remaining work in 42 days. In how many days together could complete the work? | CO1 | 8 |
|  | b. | The difference between compound interest and simple interest earned at the end of the second year on the sum of the money at 10% per annum is Rs. 20. Find the sum. | CO1 | 8 |
|  | c. | A man has some hens and cows. If the number of heads be 48 and the number of feet equals 140 then find the number of hens and cows. | CO1 | 4 |
| 7. | a. | Two trains of equal length are running on parallel lines in the same direction at 46 km/hr and 36 km/hr. The faster train passes the slower train in 36 seconds. Find the length of each train. | CO2 | 8 |
|  | b. | Find the day of the week on 18th July, 1776. | CO2 | 8 |
|  | c. | The sides of the rectangular field of 726m2 are in the ratio of 3:2. Find the sides. | CO2 | 4 |
| (OR) | | | | |
| 8. | a. | The current of the stream runs at 1 km/hour. A motor boat goes 35 km upstream and back again to the starting point in 12 hours. Find the speed of the motor boat in still water. | CO2 | 8 |
|  | b. | From a point A due north of the tower, the elevation of the top of the tower is 60º. From the point B due south, the elevation is 45 º . If AB = 100 meters, then find the height of the tower. | CO1 | 8 |
|  | c. | Find the angle between the minute hand and the hour hand of the clock when the time is 6:40. | CO4 | 4 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Study the following table and answer the questions based on it.  Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years**.**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Year | Item of Expenditure | | | | | | Salary | Fuel and Transport | Bonus | Interest on Loans | Taxes | | 1998 | 288 | 98 | 3.00 | 23.4 | 83 | | 1999 | 342 | 112 | 2.52 | 32.5 | 108 | | 2000 | 324 | 101 | 3.84 | 41.6 | 74 | | 2001 | 336 | 133 | 3.68 | 36.4 | 88 | | 2002 | 420 | 142 | 3.96 | 49.4 | 98 |  1. What is the average amount of interest per year which the company had to pay during this period? 2. The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period? 3. The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period? 4. What is the total expenditure of the company over these items during the year 2000? 5. What is the ratio between the total expenditure on Taxes for all the years and the total expenditure on Fuel and Transport for all the years respectively? | CO3 | 10 |
|  | b. | What is the digit in the unit place of the number represented by (1795−4358) | CO2 | 5 |
|  | c. | If  then find the value of . | CO4 | 5 |