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 – Nov/Dec– 2017**

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| **Code :** | **15MA3017** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATHEMATICS FOR COMPETITIVE EXAMINATION** | **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, B and C enter into partnership. A initially invests Rs. 25 lakhs and adds another Rs.10 lakhs after one year. B initially invests Rs. 35 lakhs and withdraws Rs.10 lakhs after 2 years and C invests Rs.30 lakhs. In what ratio should the profit be divided at the end of 3 years? | CO1 | 8 |
| b. | A basket contains 10 apples and 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 between the ages of P and Q four years ago was 5:6. If the total of their ages at present is 52 years, what is the ratio of their present ages? | 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. | If  then evaluate . | CO1 | 4 |
| 3. | a. | The population of a city increased by 1% in one year, but if it had been 100 less than the present population, then it would have been 1% less. Find the population of the city. | CO2 | 8 |
|  | b. | What is the greatest number which when divides 5970 and 5260 leaves 7 and 9 as remainder 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. | In a class the number of boys and the number of girls are in the ratio 4 : 5 respectively. If 10 more boys joined then ratio of the number of boys and girls become 6 : 5 respectively. How many girls are there in the class? | CO4 | 8 |
|  | b. | Two pipes A and B can fill a tank in 36 mins and 45 mins respectively. A third pipe can empty the tank in 30 mins. First A and B are opened. After 7 mins, C is also opened. In how much time, the tank will be full? | CO1 | 8 |
|  | c. | What is the value of i. ii. | CO2 | 4 |
| 5. | a. | A man purchases 5 horses and 10 cows for Rs. 10000. He sells the horses at 15 % profit and the cows at 10 % loss. Thus, he gets Rs. 375 as profit. Find the cost of one cow. | CO2 | 8 |
|  | b. | If and , then what is the value of ? | CO2 | 8 |
|  | c. | What is the greatest four digit perfect square number? | CO2 | 4 |
| (OR) | | | | |
| 6. | a. | A, B and C can do a piece of work in 24 days, 30 days and 40 days respectively. They began the work together but C left 4 days before the completion of the work. In how many days was the work completed? | CO1 | 8 |
|  | b. | There is 80% increase in an amount in 8 years at simple interest. What will be the compound interest of Rs. 14,000 after 3 years at the same rate? | CO1 | 8 |
|  | c. | A room has equal number of men and women. Eight women left the room, leaving twice as many men as women in the room. What was the total number of men and women present in the room initially? | CO1 | 4 |
| 7. | a. | A train moves past a post and a platform 264metre long in 8 seconds and 20 seconds respectively. What is the speed of the train? | CO2 | 8 |
|  | b. | Two vessels A and B contain spirit and water in the ratio 5 : 2 and 7 : 6 respectively. Find the ratio in which these mixtures be mixed to obtain a new mixture in vessel C containing spirit and water in the ratio 8 : 5 ? | CO2 | 8 |
|  | c. | Find the day of the week on 1st January, 2012. | CO2 | 4 |
| (OR) | | | | |
| 8. | a. | In covering a distance of 30 km, Arun takes 2 hours more than Anil. If Arun doubles his speed, then he would take 1 hour less than Anil. What is Arun's speed? | CO2 | 8 |
|  | b. | The angle of elevation of the top of a lighthouse 60 m high, from two points on the ground on its opposite sides are 45° and 60°. What is the distance between these two points? | CO1 | 8 |
|  | c. | At what time between 4 o'clock and 5 o'clock, will the hand of clock be at right angles? | CO4 | 4 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Study the following table chart and answer the questions based on it. Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Year | Salary | Fueland  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. Total expenditure on all these items in 1998 was approximately what percent of the total expenditure in 2002? 4. Calculate the total expenditure of the company over these items during the year 2000 from the table chart given 5. 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 is approximately? | CO3 | 10 |
|  | b. | When a number N is divided successively by 3 and 5, the remainder obtained are 1 and 2 respectively. What is the remainder when N is divided by 15? | CO2 | 5 |
|  | c. | Which of the following are prime numbers?  (i) 337 (ii) 391 | CO4 | 5 |

ALL THE BEST