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

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**End Semester Examination – Nov/Dec – 2018**

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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. | Find the least number which when divided by 5, 6, 7, 8 and leaves remainder 3, but when divided by 9, leaves no remainder? | CO2 | 8 |
| b. | In a class, 30% of the students offered English, 20% offered Hindi and 10% offered both. If a student is selected at random, what is the probability that he has offered English or Hindi? | CO4 | 8 |
| c. | How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated? | CO4 | 4 |
| (OR) | | | | |
| 2. | a. | The students in three classes are in the ratio of 2 : 3 : 4. If 40 students are added in each class, the ratio becomes 4 : 5 : 6. Find the total number of students in all the three classes. | CO4 | 8 |
| b. | Murugan, Prasanna and Arun invested Rs.8000, Rs.4000 and Rs.8000 respectively in a business. Arun left after six months. If after eight months, there was a gain of Rs.4005, then what will be the share of Prasanna? | CO2 | 8 |
| c. | If , then find the value of x. | CO2 | 4 |
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| 3. | a. | A student has to obtain 33% of the total marks to pass. He got 125 marks and failed by 40 marks. Find the maximum mark. | CO2 | 8 |
| b. | A grocer has a sale of Rs. 6435, Rs. 6927, Rs. 6855, Rs. 7230 and Rs. 6562 for 5 consecutive months. How much sale must he have in the sixth month so that he gets an average sale of Rs. 6500? | CO4 | 8 |
| c. | Simplify: | CO2 | 4 |
| (OR) | | | | |
| 4. | a. | A person’s present age is two-fifth of the age of his mother. After 8 years, he will be one-half of the age of his mother. How old is the mother at present? | CO4 | 8 |
| b. | A man bought a horse and a carriage for Rs.3000. He sold the horse at a gain of 20% and the carriage at a loss of 10%, thereby gaining 2% on the whole. Find the cost of the horse. | CO2 | 8 |
| c. | Find the square root of | CO1 | 4 |
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| 5. | a. | A lent Rs. 5000 to B for 2 years and Rs. 3000 to C for 4 years on simple interest at the same rate of interest and received Rs. 2200 in all from both of them as interest. Calculate the rate of interest per annum? | CO4 | 8 |
| b. | A and B can do job in 8 days. B and C can do same job in 12 days. A, B and C together can do same job in 6 days. In how many days A and C together can complete a job? | CO2 | 8 |
| c. | At what time, in minutes, between 3 o’clock and 4 o’clock, both the needles will coincide each other? | CO2 | 4 |
| (OR) | | | | |
| 6. | a. | Two pipes A and B can fill a cistern in 15 hours and 10 hours respectively. A tap C can empty the full cistern in 30 hours. All the three taps were open for 2 hours, when it was remembered that the emptying tap had been left open, it was then closed. How many hours more would it take for the cistern to be filled? | CO4 | 8 |
| b. | One quality of wheat at Rs.9.30 per kg is mixed with another quality at a certain rate in the ratio 8 : 7. If the mixture so formed be worth Rs.10 per kg, what is the rate per kg of the second quality of wheat? | CO2 | 8 |
| c. | The area of a rectangle is 460 square metres. If the length is 15% more than the breadth, what is the breadth of the rectangular field? | CO1 | 4 |
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| 7. | a. | A train passes two persons walking in the same direction at the rate of 2 kmph and 3 kmph completely in 10 and 12 seconds respectively. Find the length of the train? | CO1 | 8 |
| b. | A truck covers a distance of 550 meters in 1 minute whereas a bus covers a distance of 33 km in 45 minutes. Find the ratio of their speed. | CO1 | 8 |
| c. | What was the day of the week on 28th May 2006? | CO2 | 4 |
| (OR) | | | | |
| 8. | a. | A boat running downstream covers a distance of 16 km in 2 hours while for covering the same distance upstream, it takes 4 hours. What is the speed of the boat in still water? | CO4 | 8 |
| b. | A vertical tower stands on ground and is surmounted by a vertical flagpole of height 18 m. At a point on the ground, the angle of elevation of the bottom and the top of the flagpole are 30° and 60° respectively. What is the height of the tower? | CO2 | 8 |
| c. | Find x in the interval, where attained maximum value. | CO1 | 4 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | The exports of a commodity ( in crores of rupees) for 2000 to 2006 is given in the line graph.   1. What is the percentage increase of exports in 2006 compared to 2000? 2. What is the average exports in the seven years? 3. What is the ratio of maximum exports in any year to the average of seven years? 4. What is the ratio of minimum exports to the average? 5. How does the percent ratio of annual value to the average value change over the years? | CO3 | 10 |
|  | b. | What is the unit digit in | CO2 | 5 |
| c. | On dividing a number by 357, we get 39 as remainder. On dividing the same number by 17, what will be the remainder? | CO2 | 5 |

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