III Semester M.C.A. Degree Examination, January 2017
(CBCS Scheme)
COMPUTER SCIENCE
MCA – 307 : SC : Quantitative Teaching and Research Aptitude

Time : 3 Hours
Max. Marks : 70

Instruction : Answer 5 questions from Part – A and answer 4 questions from Part – B.

SECTION – A

Answer any five questions. Each carries six marks. (5×6=30)

1. A bag contains 4 white and 6 red balls. Two draws of one ball each are made without replacement. What is the probability that one is red and other white?

2. A and B can do a piece of work in 12 days, B and C in 15 days, C and A in 20 days. How long would each take separately to do the same work?

3. The ratio of Rita’s age to the age of her mother is 3 : 11. The difference of their ages in 24 years. What will be the ratio of their ages after 3 years?

4. A train passes by a stationary man standing on the platform in 7 seconds and passes by the platform completely in 28 seconds. If the length of the platform is 330 meters, what is the length of the train?

5. The angle of elevation of the top of a tower at a point on the ground is 30 degree. On walking 24 m towards the tower, the angle of elevation becomes 60 degree. Find the height of the tower.

6. Discuss the factors affecting teaching.

7. What are the steps involved in Research?

8. What is distance education? Discuss advantages of distance education.
SECTION - B

Answer any four questions. Each carries ten marks. (4×10=40)

9. a) If 10th June 2001 is Saturday, then what day of week is 10th June 2004?  

b) Two taps A and B can fill a cistern in 12 and 16 minutes respectively. Both taps are opened together, but 4 minutes before the cistern is full, A is closed. How much time will the cistern take to fill?  

10. a) A car travels a distance of 170 km in 2 hours partly at a speed of 100 km/h and partly at 50 km/h. Find the time it travels at a speed of 100 km/h.  

b) The average weight of 15 students in a class increases by 1.5 kg when one of the students weighing 40 kg is replaced by a new student. Find the weight of the new student.  

11. a) A man rows, 10 km upstream and back again to the starting point in 55 min. If the speed of the stream is 2 km/h, find the speed of rowing in still water.  

b) A teak tree was planted three years ago. The rate of its growth is 30% per annum. If at present, the height of the tree is 670 cm, what was its height when it was planted?  

12. a) The annual income of Ram and Shyam are in the ratio of 5 : 7 and their expenditure is in the ratio of 2 : 3. If at the end of the year both save Rs. 1,000 each, find Ram’s annual income.  

b) A machine is sold for Rs. 5,060 at a gain of 10%. What would have been the gain or loss percentage if it had been sold for Rs. 4,370?  

13. a) Write short notes on:  
   i) Seminar  
   ii) Conference  

b) What is research aptitude? State its characteristics.  

14. What are the requirements of good teaching? Discuss the characteristics of a good teacher and students.
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SECTION – A

Answer any five questions. Each carries six marks. (5x6=30)

1. A train starts full of passengers. At the first station, it drops one-third of the passengers and takes 280 more. At the second station, it drops one-half of the new total and takes 12 more. On arriving at the third station, it is found to have 248 passengers. Find the number of passengers in the beginning.

2. Abhay's age after six years will be three-seventh of his father's age. Ten years ago, the ratio of their ages was 1 : 5. What is Abhay's father's age at present?

3. How many words can be formed from the letters of the word “EXTRA”, so that the vowels are never together?

4. A dealer sold three-fourth of his articles at a gain of 20% and the remaining at cost price. Find the gain earned by him in the whole transaction.

5. A and B undertake to do a piece of work for Rs. 600. A alone can do it in 6 days while B alone can do it in 8 days. With the help of C, they finish it in 3 days. Find the share of each.

6. Discuss the various types of research and their features.

7. Explain the different types of communication.

8. Differentiate between formal education and distance education in India.

P.T.O.
SECTION – B

Answer any four questions. Each carries ten marks. (4×10=40)

9. a) Two dice are thrown together. What is the probability that the sum of the numbers on the two faces is divisible by 4 or 6?

b) Simplify \( \log \frac{75}{16} - 2 \log \frac{5}{9} + \log \frac{32}{243} \).

10. a) A train is 150 m long is running with a speed of 68 kmph. In what time will it pass a man who is running at 8 kmph in the same direction in which the train is going?

b) A man takes 3 hours 45 minutes to row a boat 15 km down stream of a river and 2 hours 30 minutes to cover a distance of 5 km upstream. Find the speed of the river in current in km/hr.

11. a) Ajay borrowed some money at the rate of 6% p.a. for the first two years, at the rate of 9% p.a. for the next three years and at the rate of 14% p.a. for the period beyond five years. If he pays a total interest of Rs. 11,400 at the end of nine years, how much money did he borrow?

b) Two pipes A and B can fill a tank in 36 hours and 45 hours respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank?

12. a) What was the day of the week on 16th July, 1776?

b) Of the three numbers, second is twice the first and is also thrice the third. If the average of the three numbers is 44, find the largest number.


14. a) Explain governance policy and administration of higher education system in India.

b) Define the following terms:
   i) article
   ii) workshop.