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R-15

Code: 5P2B12

M.C.A. I Semester Supplementary Examinations January 2018

Computer Programming

Max. Marks: 60

Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1. a) Discuss about different programming language paradigms. 6M
- b) Differentiate between Algorithm, Flow chart and Pseudo code. Write a flow chart to find the greatest of four numbers. 6M

OR

- 2. a) Explain about different data types used in C language. 8M
- b) Differentiate between while and do-while loops and explain with an example. 4M

UNIT-II

- 3. a) Explain about different categories of functions. Explain with an example. 8M
- b) Explain malloc() memory function with suitable example. 4M

OR

- 4. a) Different between structure and union. Explain with suitable example. 6M
- b) Write a program to print the content of file in reverse order using fseek() function. 6M

UNIT-III

- 5. a) What is inline function? Explain with suitable example. 6M
- b) Explain the structure of a C++ program. 6M

OR

- 6. a) Explain the concept of copy constructor with an example. 6M
- b) Demonstrate New and Delete Operators. 6M

UNIT-IV

- 7. a) Explain about Operator Overloading with suitable example. 6M
- b) Differentiate between Function Template and Class Template. 6M

OR

- 8. a) Define Abstract Class in C++. Explain with an example. 6M
- b) How can we implement multiple inheritance in C++? Explain with an example. 6M

UNIT-V

- 9. a) Explain about C++ stream classes hierarchy. 6M
- b) Discuss about manipulators in C++ 6M

OR

- 10. a) Explain about various File Operations. 6M
- b) Explain the rules for Handling Exceptions. 6M

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Code: 5P2C13

M.C.A. I Semester Supplementary Examinations January 2018

Probability and Statistics

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. a) State and prove the addition theorem of Probability 5M
- b) The probabilities of A, B, C to become managers of a factory are $\frac{1}{2}, \frac{3}{10}, \frac{1}{5}$ respectively. The probabilities that the bonus scheme will be introduced if they become managers are 0.02, 0.03, and 0.04. Determine the probability that A, B, C to become managers if the Bonus Scheme is introduced. 7M

OR

2. a) From a lot of 10 items containing 3 defectives, a sample of 4 items is drawn at random without replacement. Let the random variable X denotes the number of defectives in the sample, find
- Probability distribution of X.
 - $P(X \leq 2)$ and $P(X \geq 2)$. 6M
- b) A random variable X has the probability density function
- $$f(x) = \begin{cases} mx(1-x), & \text{if } 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$$
- Evaluate the constant m
 - Find the mean and variance of X. 6M

UNIT-II

3. a) Find the mean and variance of the Uniform distribution. 6M
- b) The marks obtained in an examination are found to be normally distributed. If 15% of the students get more than 60 marks and 40% of the students get less than 30 marks, find the mean and standard deviation of the marks. 6M

OR

4. a) Find the mean and variance of the Poison distribution. 6M
- b) Let a committee has 77 members, find the probability of having more female members than male members given that the probability of having a male or female member is equal. 6M

UNIT-III

5. A population consists of 5 numbers 3, 6, 9, 15, 27. Consider all possible samples of size 3 which can be drawn from this population. Find
- Population mean.
 - Population standard deviation.
 - Mean of the sampling distribution of means.
 - Standard deviation of the sampling distribution of means. 12M

OR

6. a) Explain point estimation and interval estimation in detail. 6M
- b) In a random sample of 160 workers exposed to a certain amount of radiation, 30 workers severely affected. Construct a 99% confidence interval for the corresponding true percentage. 6M

UNIT-IV

7. a) A die is thrown 256 times. An even digit turns up 156 times. Can we say that die is unbiased? 8M
b) Explain Type-I and Type-II errors. 4M

OR

8. A manufacturer claimed that at least 95% of the equipment which she supplied to a factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 185 were faulty. Test her claim at a significance level of 0.05. 12M

UNIT-V

9. a) Explain the characteristics of an M/M/1 model briefly. 6M
b) A person repairing watches finds that the time spent on a watch has an exponential distribution with mean 20 minutes. If the watches are repaired in the order in which they arrive and their arrival is approximately poisson distributed with an average of 15 per 8-hour day. What is the repairman's expected idle time each day? 6M

OR

10. Customers arrive at the ration shop in poisson fashion with an average of a customer every 10 minutes. If the service time is 5 minutes, then find
i. Average number of customers in the system
ii. Average waiting time.
iii. Average length of waiting line. 12M
