

- (f) What do you mean by software documentation ?
Explain. 2
- (g) What is software evolution ? Explain. 2
- (h) What do you mean by validation and
verification ? 2

UNIT - I

2. (a) What is Software Engineering ? What are the
essential characteristics and challenges of
software engineering ? Explain. 8
- (b) What do you understand by project scheduling ?
Also enumerate the activities involved in project
scheduling. 8
3. (a) What do you understand by Software Process
Models ? Compare waterfall model and spiral
model of Software Development. 8
- (b) Explain elaborately the various strategies and
steps involved in risk management. 8

UNIT - II

4. (a) What is Software Requirements Engineering ?
Discuss the various requirements engineering
processes in detail. 8
- (b) What are software metrics ? Discuss the effect of
software metrics on software productivity. 8
5. (a) What is Software requirements ? Discuss different
types of requirements in detail. 8

- (b) What do you mean by Software Project
Estimation models ? Explain COCOMO model in
detail. 8

UNIT - III

6. (a) What is software design Process ? State its
relevance and also discuss the importance of
software design Process in software engineering. 8
- (b) What is Software Reliability ? How does it
contribute to software quality ? Explain. 8
7. (a) What is software testing ? How is testing
important in software life cycle ? Discuss the
objectives of software testing. 8
- (b) What is computer aided software engineering
(CASE) ? What are various types of CASE tools ?
Explain. 8

UNIT - IV

8. (a) What is Software Maintenance ? What is the
importance of Software Maintenance ? What are
various type of software maintenance ? Discuss in
detail. 8
- (b) What is Software Reuse ? Illustrate the reasons for
software reuse. Also discuss the benefits of
Software Reuse. 8

7. (a) (i) Convert the decimal number $(413.75)_{10}$ into binary number.
- (ii) Convert the binary number $(1001.1101)_2$ into decimal number.
- (b) Explain merge sort and sort these elements by using merge sort 14, 72, 20, 9, 16, 27, 19 in increasing order.

UNIT - IV

8. (a) Solve the recurrence relation subject to given initial conditions :
- $$a_n = 5a_{n-1} - 6a_{n-2}, n > 2, a_1 = 1.5, a_2 = 3$$
- (b) Using principle of mathematical induction, prove that :
- $$1 + 3 + 3^2 + 3^3 + \dots + 3^{n-1} = (3^n - 1)/2$$
9. (a) Find the g.c.d. of 190 and 34. Also find x and y , if g.c.d. $(190, 34) = 190x + 34y$.
- (b) Solve the congruences : $342x = 5 \pmod{13}$

Roll No.

97667
B.C.A. 2nd Semester
Examination - May, 2019

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

Paper : BCA-108

Time : Three Hours]

[Maximum Marks.: 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is compulsory. Attempt four questions by selecting one question from each Unit. All questions carry equal marks.

1. (a) Find the median of the following series :
 25 , 20 , 23 , 32 , 40 , 27 , 30 , 25 , 20 , 10 , 55 , 41
- (b) What do you mean by correlation ?
- (c) Explain the properties of algorithm.
- (d) What is directed graph ?