

B.TECH SEM – V (2007 COURSE) (PRODUCTION ENGG.) :
SUMMER - 2018
SUBJECT : DATABASE AND INFORMATION TECHNOLOGY

Day : **Thursday** S-2018-2687 Time : **10.00 AM TO 01.00 PM**
Date : **24/05/2018** Max. Marks : 80

N. B. :

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of remaining attempt **ANY TWO** questions from each section.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Answers to both sections should be written in the **SEPARATE** answer books.
 - 4) Draw neat and labelled diagram **WHEREVER** necessary.
 - 5) Assume suitable data, if necessary.
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SECTION - I

- Q. 1** a) Discuss the advantages and disadvantages of Data Base Management System (DBMS). (05)
- b) Explain: (05)
- i) Forward chain mechanism
 - ii) Backward chain mechanism
- c) Discuss the life cycle approach for knowledge base system development. (04)
- Q. 2** a) What is data independence? Explain types of data independence. (07)
- b) Explain in detail the three schema architecture of DBMS. (06)
- Q. 3** a) What do you understand by knowledge representation? Explain declarative knowledge and procedural knowledge. (07)
- b) Explain the methodology for building an expert system. (06)
- Q. 4** Describe the knowledge based system in process planning with the help of suitable examples using hierarchical process planning: (13)
- i) Input data
 - ii) Process planner
 - iii) Process plan

SECTION - II

- Q. 5** a) Explain the procedure of finding the solution of linear simultaneous equations by Gauss Jordan method. (05)
- b) Explain the significance of pivoting in direct methods. (05)
- c) Derive formula for Simpson's $1/8^{\text{th}}$ rule. (04)

P. T. O.

Q. 6 a) Use Newton Raphson method to find the root of the equation: **(07)**

$$x^3 - 3x - 5 = 0.$$

b) Solving the equation using Gauss elimination method: **(06)**

$$3x + 2y + 4z = 7$$

$$2x + y + z = 7$$

$$x + 3y + 5z = 2.$$

Q. 7 a) Derive an expression for linear regression of y on x. **(07)**

b) Use multiple linear regression $y = a_0 + a_1x_1 + a_2x_2$ to fit the data given **(06)**
below:

x1	x2	xy
0	0	5
2	1	10
2.5	2	9
1	3	0
4	6	3
7	2	27

Q. 8 a) Derive the formula for trapezoidal rule. **(07)**

b) Evaluate : **(06)**

$$I = \int_0^1 \sqrt{1-x^2} \cdot dx \text{ by Simpson's } 3/8^{\text{th}} \text{ rule by taking } h = 0.1.$$

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