

QP Code : 30557

(3 Hours)

[Total Marks : 80

- 1) Question No. 1 is compulsory.
- 2) Attempt any THREE of the remaining.
- 3) Figures to the right indicate full marks.

Q 1.A) If $\int_0^{\infty} e^{-2t} \sin(t + \alpha) \cos(t - \alpha) dt = \frac{1}{4}$, find α (5)

B) Find half range Fourier cosine series for $f(x) = x$, $0 < x < 2$ (5)

C) If $u(x,y)$ is a harmonic function then prove that $f(z) = u_x - iu_y$ is an analytic function. (5)

D) Prove that $\nabla f(r) = f'(r) \frac{r}{r}$ (5)

Q.2) A) If $v = e^x \sin y$, prove that v is a harmonic function. Also find the corresponding analytic function. (6)

B) Find Z-transform of $f(k) = b^k$, $k \geq 0$ (6)

C) Obtain Fourier series for $f(x) = \frac{3x^2 - 6x\pi + 2\pi^2}{12}$ in $(0, 2\pi)$,
where $f(x+2\pi) = f(x)$. Hence deduce that $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots$ (8)

Q.3) A) Find inverse Laplace of $\frac{(s+3)^2}{(s^2+6s+5)^2}$ using Convolution theorem (6)

B) Show that the set of functions $\{\sin x, \sin 3x, \sin 5x, \dots\}$ is orthogonal over $[0, \pi/2]$. Hence construct orthonormal set of functions (6)

C) Verify Green's theorem for $\int_C \frac{1}{y} dx + \frac{1}{x} dy$ where C is the boundary of region defined by $x = 1$, $x = 4$, $y = 1$ and $y = \sqrt{x}$ (8)

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Q.4) Find $Z\{k^2 a^{k-1} U(k-1)\}$ (6)

B) Show that the map of the real axis of the z -plane is a circle under the transformation $w = \frac{z}{z+i}$. Find its centre and the radius. (6)

C) Express the function $f(x) = \begin{cases} \sin x & |x| < \pi \\ 0 & |x| > \pi \end{cases}$ as Fourier sine Integral. (8)

Q.5) A) Using Gauss Divergence theorem evaluate $\iint_S \bar{N} \cdot \bar{F} ds$

where $\bar{F} = x^2 \mathbf{i} + z \mathbf{j} + yz \mathbf{k}$ and S is the cube bounded by $x=0, x=1, y=0, y=1, z=0, z=1$ (6)

B) Find inverse Z-transform of $F(z) = \frac{z}{(z-1)(z-2)}$, $|z| > 2$ (6)

C) Solve $(D^2+3D+2)y = e^{-2t} \sin t$, with $y(0)=0$ and $y'(0)=0$ (8)

Q.6) A) Find Fourier expansion of $f(x) = 4 - x^2$ in the interval $(0,2)$ (6)

B) A vector field is given by $\bar{F} = (x^2 + xy^2) \mathbf{i} + (y^2 + x^2y) \mathbf{j}$. Show that \bar{F} is irrotational and find its scalar potential. (6)

C) Find (i) $L^{-1}\left\{\tan^{-1}\left(\frac{s}{s}\right)\right\}$

(ii) $L^{-1}\left(\frac{e^{-ns}}{s^2-2s+2}\right)$ (8)



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QP Code : 30625

(3 Hours)

[Total Marks : 80

- N.B. : (1) Question No.1 is compulsory.
 (2) Out of remaining attempt any three.
 (3) Assume & mention suitable data wherever required.
 (4) Figures to right indicates full marks.

1. Solve any four :- 20
- (a) State the advantages of digital communication over analog communication. Justify each point.
- (b) Define the following terms.
 (i) Noise figure (ii) Noise temperature
 (iii) Noise bandwidth (iv) Noise voltage (v) Modulation.
- (c) Compare pulse code modulation and delta modulation.
- (d) Explain in short pre-emphasis and De-emphasis.
- (e) What is BPSK signal. Draw the BPSK signal for the following binary signal 10111010.
2. (a) Define signal to noise ratio. Explain the effect of cascade connection on a signal to noise ratio. An amplifier with 10dB noise figure and 4 dB power gain is cascaded with a second amplifier which has a 10dB power gain. What is overall noise figure and power gain. 10
- (b) State and prove the following properties of Fourier transform with example 10
 (i) Time shifting (ii) Convolution in time domain
3. (a) An amplitude modulated waveform has a form $x(t) = [10 (1 + 0.6 \cos 2000 \pi t + 0.4 \cos 4000 \pi t) \cos 20000 \pi t]$ 10
 (i) Sketch the amplitude spectrum of X(t).
 (ii) Find the power spectral of each spectral component including carrier
 (iii) Find the total power and sideband power
 (iv) What is the modulation index

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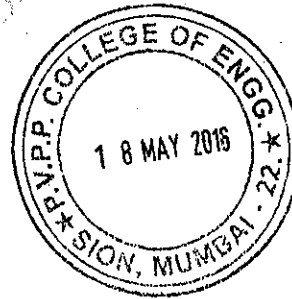
FW-Con. 10512-16.



QP Code : 30625

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- (b) What are the limitations of TRF receiver. Explain how these limitations are avoided using superheterodyne receiver. 10
4. (a) With the help of neat circuit diagram and phasor diagram explain the working of Foster Seelay discriminator. 10
- (b) What is multiplexing in communication system. Draw and explain in brief the transmitter and receiver of FDM. 10
5. (a) State and prove sampling theorem for low pass band limited signal. 10
- (b) Draw the block diagram of PWM generator. Explain the working giving waveforms at the output of each block. 10
6. (a) Explain slope overload error and hunting error in Delta modulation. Derive the condition to avoid slope overload distortion. 10
- (b) Explain the generation and detection of FSK signal. 10

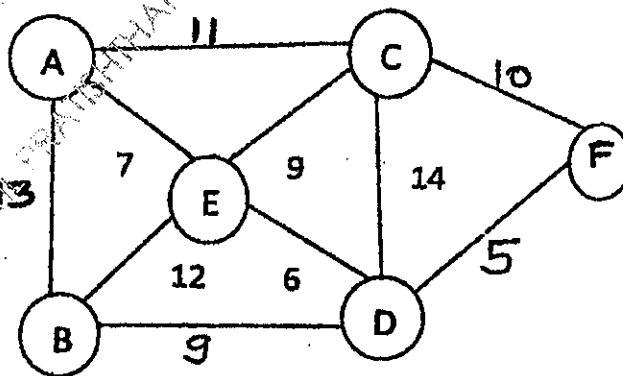


FW-Con. 10512-16.

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- N.B. :** (1) Question No.1 is compulsory.
 (2) Attempt four questions out of remaining.
 (3) Figures to the right indicate full marks.

1. (a) Distinguish between data type and data structure. 5
 (b) Explain Vector with atleast five methods. 5
 (c) What is Recursion? Give disadvantages of recursion. Write a program to implement Tower of Hanoi. 10
2. (a) Write a program to implement Queue using array. 10
 (b) Write an algorithm and explain with example Merge sort method. 10
3. (a) Write any pattern matching algorithm and explain with suitable example. 10
 (b) Implement a function to delete a node from Binary Search Tree. (Consider all possible Cases). 10
4. (a) Given an 'INFIX' expression, Write a program to convert it into its 'POSTFIX' form. 10
 (b) Write algorithm for Heap Sort explain ascending heap with suitable example. 10
5. (a) Compute the minimum spanning tree for the given graph using Kruskal's Algorithm. 10



- (b) Write a program to search an element in an array using Binary Search Technique. 10

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QP Code : 28763

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6. (a) What is Doubly Linked List? Write an algorithm to implement following operations with DLL : 10
(i) Insertion (All Cases)
(ii) Traverse (Forward and Backward)
- (b) Hash the following in a table size of 11. Use any two collision resolution techniques 99, 67, 41, 0, 17, 2, 98, 20, 27, 94, 56. 10
7. Write short notes on any four of the following with example 20
(a) Selection Sort
(b) Comparison of sorting algorithms
(c) B Trees
(d) Graph traversal techniques
(e) AVL Tree



GE-Con. 10962-16.

QP Code : 30720

(3 Hours)

[Total Marks : 80]

- N.B. : (1) Question No.1 is compulsory.
 (2) Attempt any three out of remaining questions.
 (3) Assume suitable data wherever required.
 (4) Draw appropriate waveforms wherever required.

1. Solve any five :

- | | | |
|-----|--|----|
| (a) | CE configuration is popular in amplifier circuits. Justify. | 4 |
| (b) | Explain the working of zener diode as voltage regulator. | 4 |
| (c) | State ideal and practical characteristics of Op-amp. | 4 |
| (d) | Add $(83)_{10}$ and $(34)_{10}$ in BCD. | 4 |
| (e) | Convert S-R flip-flop to D flip-flop. | 4 |
| (f) | Explain parallel i/p, serial o/p shift register. | 4 |
| 2. | (a) Explain in brief different biasing circuits of BJT. | 10 |
| | (b) Explain how Op-amp can be used as summing, scaling and averaging amplifier in inverting configuration. | 10 |
| 3. | (a) Design and implement one digit BCD adder using IC-7843. | 10 |
| | (b) Implement the following logic function using 4:1 mux
$f(A, B, C) = \pi M(0, 1, 3, 5, 7)$. | 5 |
| | (c) Explain the working of LCD. | 5 |
| 4 | (a) Design a 2-bit comparator using minimum number of gates. | 10 |
| | (b) Explain the working of Astable multivibrator using IC-555. | 10 |
| 5. | (a) Design a synchronous counter which goes through following states using J K flip-flop,
0 - 2 - 4 - 6 - 0 | 10 |
| | (b) With the help of neat diagram, explain the functioning of a 4-bit bidirectional shift register. | 10 |

FW-Con. 11494-16.



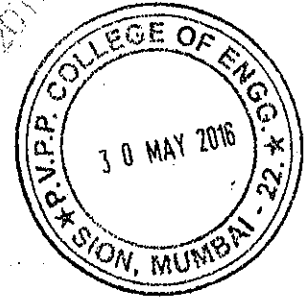
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QP Code : 30720

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6. Write short notes on the following :

- (a) VHDL program format
 - (b) Universal gates. Implement EX-OR gate using NAND gate
 - (c) Integrator using Op-amp
 - (d) Current mirror circuit
-



FW-Con. 11494-16.

QP Code : 30760

(3 Hours)

[Total Marks : 80

- N. B. :** (1) Question No.1 is compulsory.
 (2) Solve any **three** questions out of remaining **five** questions.
 (3) Assume suitable data if necessary.

1. (a) List all functional dependencies satisfied by the relation 5

X	Y	Z
X1	Y1	Z1
X1	Y2	Z1
X2	Y2	Z1
X2	Y2	Z1

- (b) Explain Generalization and Specialization. 5
 (c) Explain deadlock in brief. 5
 (d) Explain aggregate function with example 5
2. (a) Explain different data models with its advantages and disadvantages. 10
 (b) Draw E-R diagram for Car insurance company that has a set of customers. Each customer has one or more cars. Each car is zero or more accident records. 10
3. (a) Explain following terms 10
 (i) Primary key
 (ii) Group by clause
 (iii) Lock point
 (iv) Total participation
 (v) Data independence
 (b) What is view? How it is created and stored? 10
4. (a) What is JOIN? Explain different types of JOIN along with example. 10
 (b) Consider the following employee database 10
 Employee (emp_name,street,city,date_of_joining)
 Works (emp_name, company_name, salary)
 Company (company_name, city)
 Manages (emp_name,manager_name)

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Write SQL queries for following

- (i) Modify the database so that 'Deepa' lives in 'Pune'
- (ii) Give all employees of 'XYZ corporation' a 10% rise in salary
- (iii) List all employees who lives in the same city as heir company city
- (iv) Display all employees who joined in the month of 'March'
- (v) Find all employees who earn more than average salary of all employees of their company.

5. (a) Define Normalization? Explain 1NF, 2NF and 3NF with example 10
(b) Consider the SQL query given below. Draw initial query tree and transform this initial query tree using heuristic query optimization. 10

```
SELECT p.ticketno
FROM Flight as F, Passager as P, Crew as C
WHERE F.flightno=c.flightno AND
      F.Date= '06 -23-15' AND
      F.to= 'Mumbai' AND
      P.name=C.name
```

6. (a) Define transaction? Explain transaction state diagram and properties of transaction 10
(b) Explain Differed database modification and immediate data base modification and their difference in context of recovery. 10



Q.P. Code : 548901

(3 Hours)

[Total Marks : 100

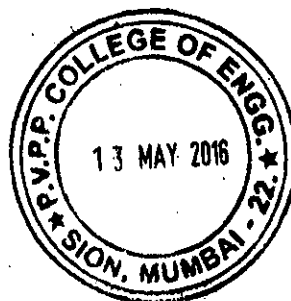
- N.B. :** (1) Q. No. 1 is compulsory.
 (2) Answer any **four** out of remaining **six** questions.
 (3) **Figures** to the right indicate **full marks**.
 (4) Use of **statistical tables** is **permitted**.
 (5) Write the **sub-questions** of main question collectively together.

1. (a) Using the Newton Raphason method find the root of $x^3 - 5x - 11 = 0$, 5
 (b) The means of two samples of sizes 1000 and 2000 respectively are 67.50 and 68.0 inches. Can the samples be regarded as drawn from the same population of standard deviation 2.5 inches? 5
 (c) The probability distribution of a r. v. X is, 5
- | | | | | | | | |
|----------|---|----|----|----|----|-----|-----|
| X | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| P(X = x) | k | 3k | 5k | 7k | 9k | 11k | 13k |
- Find k, $P(x < 4)$, $P(3 \leq x \leq 6)$, $P(3 < x \leq 5)$.
- (d) State true or false with reasoning: " $x + 3y = 5$ & $4x = -3y + 8$ are the lines of regration then correlation coefficient is 0.5" 5
2. (a) Random samples of 200 bolts manufactured by a machine A & 100 bolts manufactured by a machine B showed 19 & 5 defective bolts respectively. Is there any significant difference between the performances of the machines? 6
 (b) Solve the equations by Gauss - Seidel upto 4 iterations 6
 $4x + y + z = 5$, $x + 6y + 2z = 19$, $x + 2y + 5z = -10$.
 (c) Fit the Binomial Distribution to the following data, 8
- | | | | | | | | |
|-----|---|----|----|----|---|---|---|
| X : | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| f : | 5 | 18 | 28 | 12 | 7 | 6 | 4 |
3. (a) Investigate the association between the darkness of eye colour in father and son from the following data. 6

Colour of Son's eyes	Colour of father's eyes	
	Dark	Not dark
Dark	48	90
Not dark	80	782

- (b) The diameters of a can tops produced by a machine are normally distributed of 0.01 cms. At what mean diameter the machine be set so that not more than 5% of the can tops produced by the machine have diameters exceeding 3 cms? 6

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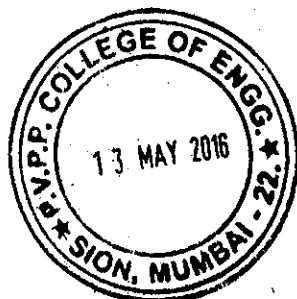


- (c) Evaluate $\int_0^1 \frac{1}{1+x^2}$ between suitable intervals and hence find an approximate value of π by using 1) Trapezoidal rule & 2) Simpson's 1/3rd rule. 8
4. (a) Determine all basic solutions to the following problem. 6
 Maximize $Z = X_1 - 2X_2 + 4X_3$
 subject to $X_1 + 2X_2 + 3X_3 = 7$
 $3X_1 + 4X_2 + 6X_3 = 15$.
- (b) Prove that $\left(\frac{\Delta^2}{E}\right)e^x \left[\frac{E(e^x)}{\Delta^2 e^x}\right] = e^x$, the interval of differencing being h . 6
8
- (c) fair coin is tossed 3 times. A person receives Rs. X^2 if he gets X heads. Find his expectation. (
5. (a) Using Lagrange's interpolation formula, find $f(4)$ from $f(1) = 3$, $f(2) = 12$, $f(5) = 12$, $f(10) = 2$, 6
 (b) Express into factorial polynomial the function $x^4 - 8x^3 + 18x^2 - 10x$, also find the function whose first difference is the given function. 6
 (c) If X_1 & X_2 are two independent r. v. with mean 30, 25 & variances 16, 12 and if $Y = 3X_1 - 2X_2$, find $P(60 \leq Y \leq 80)$ & $P(Y \leq 70)$. 8
6. (a) Find $f(4.4)$ from the following table 6

X	0	2	4	6	8	10	12
f(x)	12	7	6	7	13	32	77
- (b) Fit a Poisson distribution to the following data. 6

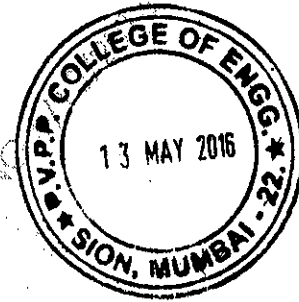
X:	0	1	2	3	4	5	6	7
F:	314	335	204	86	29	9	3	0
- (c) Calculate the first four raw & central moments for the following data: 8

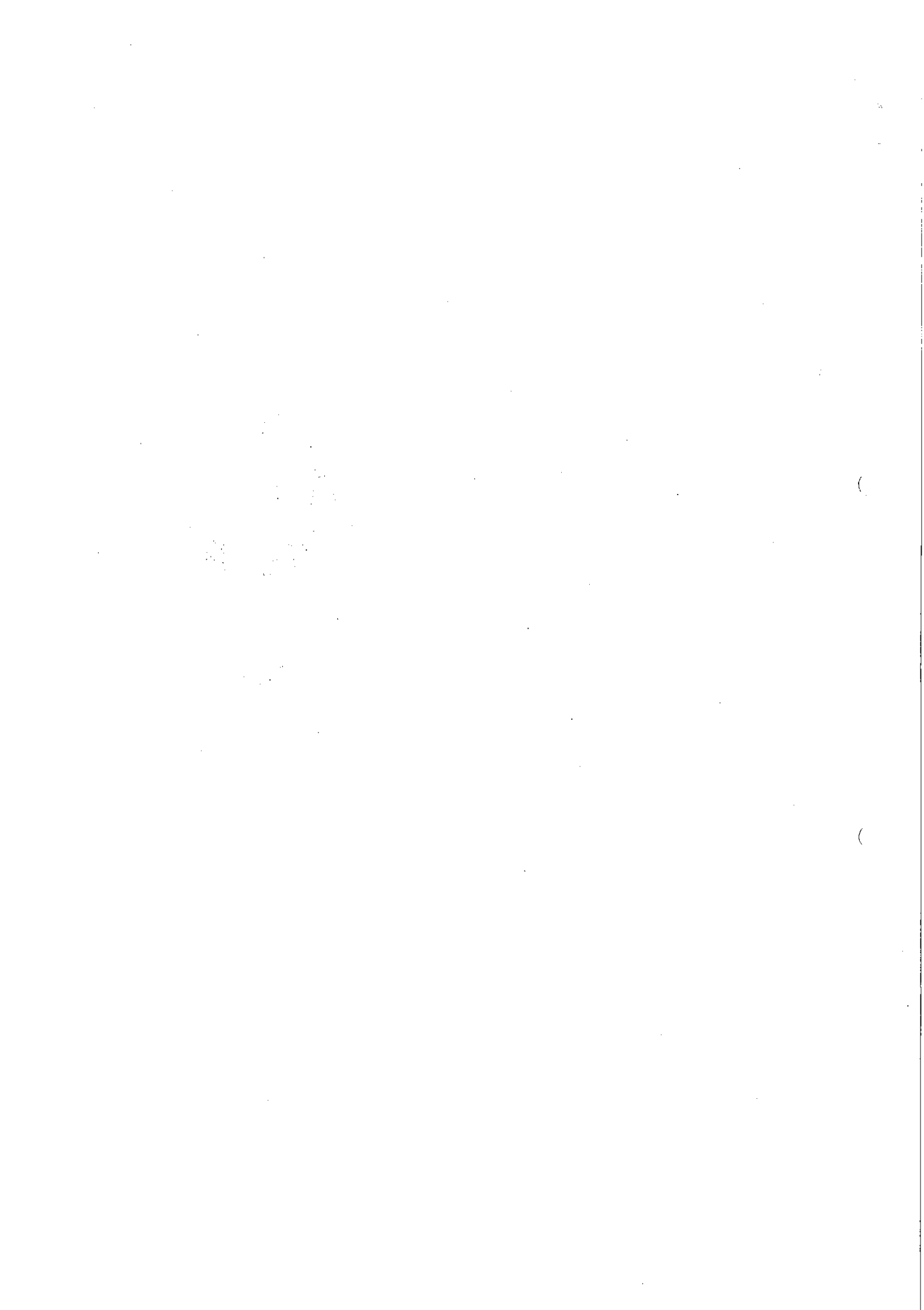
X	1	2	3	4	5	6	7	8	9
f	1	6	13	25	30	22	9	5	2



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7. (a) Given $6Y = 5X + 90$, $15X = 8Y + 130$, $\sigma_x^2 = 16$.
Find (i) \bar{x} & \bar{y} (ii) r and (iii) σ_y^2 . 6
- (b) The probability that a man aged 60 will live up to 70 is 0.65. What is the probability that out of 10 such men now at 60 at least 7 will live up to 70? 6
- (c) Solve the following L.P.P. by simplex method. 8
- Maximize $Z = 2X_1 - 3X_2 + X_3$
Subject to $3X_1 + 6X_2 + X_3 \leq 6$
 $4X_1 + 2X_2 + X_3 \leq 4$
 $X_1 - X_2 + X_3 \leq 0$
 $X_1, X_2, X_3 \geq 0$





(3 Hours)

[Total Marks : 80

- N.B. : (1) Question no. 1 is **compulsory**
 (2) Attempt **any three** questions from the remaining questions.
 (3) Total **four** questions need to be solved.

20

1. Answer any four

- (a) Compare slotted ALOHA and Pure ALOHA.
 (b) Explain selective repeat protocol.
 (c) Explain TCP timer
 (d) Compare Linux and windows operating system
 (e) Explain PSTN.

2. (a) What is OSI model? Give the functions and services of each layer. 10
 (b) Explain Guided Transmission media in detail. 10

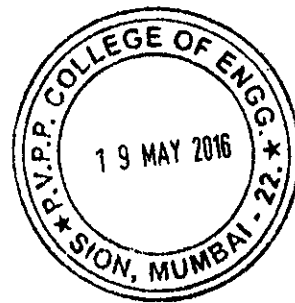
3. (a) What are the different types of routing algorithms? Explain shortest path routing algorithm in detail? 10
 (b) Explain (i) IP address (ii) Subnet Mask 6
 (c) An IPV₄ Packet has arrived with the first "8 bits" as shown : 0100 0010. The receiver discards? Why? 4

4. (a) Draw and explain TCP segment header. 10
 (b) Explain TCP Congestion Control. 10

5. (a) What is HDLC? Explain the frame formats of I-frame, U- frame and S-Frame? 10
 (b) Compare Connectionless and connection oriented services. 5
 (c) Explain Traditional Ethernet 5

6. Write short notes on following (any four) 20

- (i) Compare LAN, MAN, WAN
 (ii) BGP
 (iii) Explain CRC with example
 (iv) CDMA/CA
 (v) Bridges, Router, Switches.



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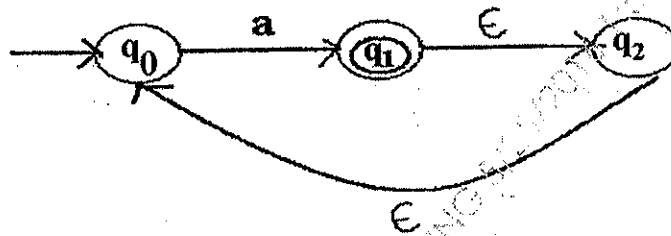


(3 Hours)

[Total Marks : 80]

- NB:** (1) Question no. 1 is compulsory.
 (2) Solve any Three questions from remaining questions.
 (3) Draw diagrams wherever necessary.

- 1 (a) What is the complement of the language accepted by the NFA shown below? 2
 Assume $S = \{a\}$ and ϵ is the empty string.



- (b) Definition of a language L with alphabet $\{a\}$ is given as following 2
 $\{a^{nk} \mid k > 0, \text{ and } n \text{ is a positive integer constant}\}$
 What is the minimum number of states needed in a DFA to recognize L ?
- (c) What is Multi-Tape Turing Machine? 3
- (d) Design Mealy Machine to convert each occurrence of substring 1000 by 1001. 7
- (e) State that whether a following Language is Regular or not. 3
 1) $L = \{WW^R \mid |W|=2 \text{ over } \Sigma = \{a,b\}\}$ 3
 2) $L = \{WW^R \mid W \in (a,b)^*\}$ 3
- 2 (a) Give formal definition of a Turing Machine. 5
 (b) Write a regular expression for the following languages, over $\Sigma = \{a,b\}$. 10
1. Seventh symbol from right must be a .
 2. Every second character is b .
 3. Exactly one ab .
- (c) Explain Chomsky Hierarchy. 5



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- 3 (a) Construct a TM for accepting Even palindromes. 10
 (b) Design PDA For recognizing $L = \{a^n b^{2n+1} \mid n \geq 1\}$ 10
- 4 (a) Convert the following grammar to Chomsky Normal Form. Show all the relevant 10 steps briefly.
 $S \rightarrow bA \mid aB$
 $A \rightarrow bAA \mid aS \mid a$
 $B \rightarrow aBB \mid bS \mid b$
- (b) Give the technical strategy to convert CFG to GNF. 10
 Convert the following grammar to GNF.
- $$S \rightarrow AA \mid a$$
- $$A \rightarrow SS \mid b$$
- 5 (a) Enumerate the differences between finite automata and non-deterministic 8 automata?
 (b) Construct NFA, DFA for the regular Expression $R = ab(a+b)^+abb$. Obtain minimized 7 DFA.
 (c) Give formal definition of a Push Down Automata (PDA). 5
- 6 Write short notes on:- (Any Two) 20
 (a) Unsolvability problems
 (b) Recursive and Recursively enumerable languages.
 (c) Simplification of CFG.



Q.P. Code : 549802

(3 Hours)

[Total Marks : 80

- N.B. : (1) Question No .1 is **compulsory**.
(2) Solve any **three** questions out of remaining **five** questions.
(3) Assume suitable data if necessary.

1. Solve any **four** out of **five** :- 20
- (a) Explain the types of microinstruction formats.
 - (b) Draw and explain the flowchart of Add and Shift method of integer multiplication.
 - (c) What the functions of following registers ?
(i) Z (ii) SP (iii) MAR (iv) MDR (v) Y
 - (d) Compare SRAM and DRAM.
 - (e) With the help of diagram, explain Von-Neumann architecture.
2. (a) Multiply (-9) and (4) using Booth's algorithm. 10
(b) Explain different addressing modes with example. 10
3. (a) Express $(28.75)_{10}$ in the IEEE 754 single and double precision standard of floating point representation. 10
(b) Explain design of control unit w.r.t. microprogrammed and hardwired approach. 10
4. a) Explain different mapping techniques of Cache memory. 10
b) Explain Flynn's classification in detail. 10
5. a) Draw and explain six stage instruction pipeline and the various hazards. 10
b) What is the need of DMA? Explain its various techniques of data transfer. 10
6. a) Find out page hit and miss for the following string using FIFO, LRU and OPTIMAL page replacement policies considering a frame size of three. 2, 3, 3, 1, 5, 2, 4, 5, 3, 2, 5, 2. 10
b) Divide 15 by 4 using restoring division algorithm. 10



Q.P. Code : 549902

(3 Hours)

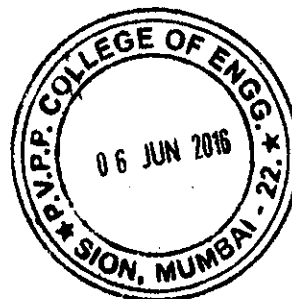
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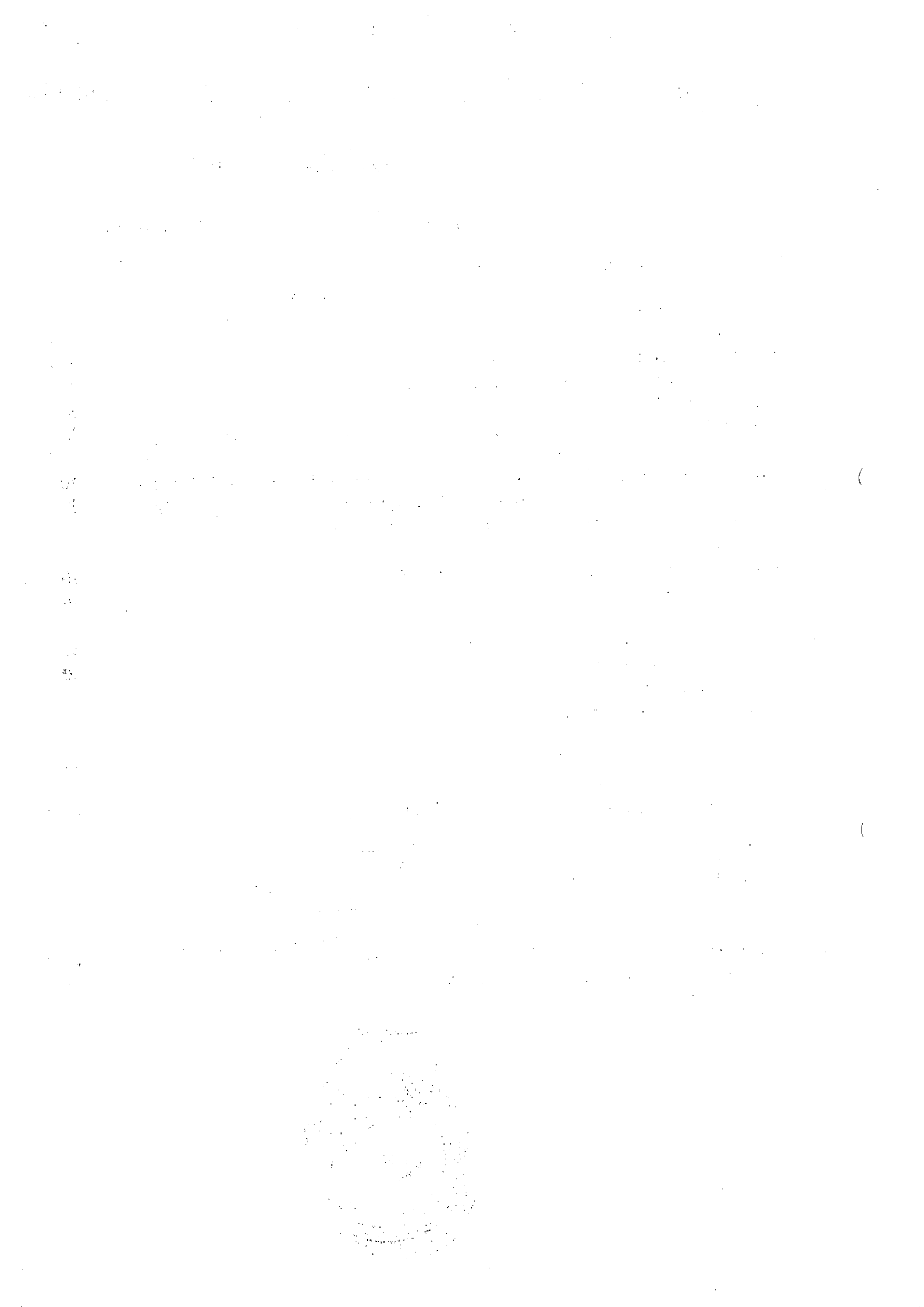
- N.B. :** (1) Question No. 1 is compulsory.
(2) Solve any **three** questions out of remaining questions.
(3) Assume suitable data if required.

1. (a) Explain Cross Browser Compatibility. 5
(b) Write a JavaScript code to change a background color using buttons. 5
(c) Explain PHP string functions. 5
(d) Explain all methods of session tracking in ASP.NET. 5
2. (a) What is CSS? Explain the ways by which CSS is included in the web page. 10
(b) Write HTML code which includes table, Hyperlink, character formatting, ordered and unordered list to display your resume. 10
3. (a) Write a PHP Program to insert a record into MYSQL database. 10
(b) Explain XML, XSL and XPATH with Example. 10
4. (a) Explain Built in objects in JavaScript. 10
(b) Differentiate following. 10
i) GET and POST
ii) JSP and SERVLET
5. (a) Explain JDBC drivers. 10
(b) Explain Servlet Life Cycle. 5
(c) Write HTML code to draw table given below: 5

Items		Price
Shirt	Trouser	Rs.1000/-
Rs. 400/-	Rs. 600/-	

6. (a) What is JQUERY? Illustrate the use of JQUERY for FORM validation. 10
(b) Explain life cycle of ASP.NET application. 10





QP Code : 30802

(3 Hours)

[Total: 80 marks]

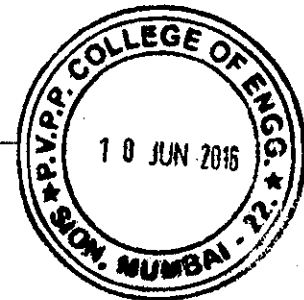
- Note: 1. Question no.1 is compulsory
 2. Answer three questions out of remaining five questions
 3. Figures to right indicate marks
 4. Answers of same questions to be grouped and written

1. a) write a note on convolution code. [4]
 b) State Fermat's little theorem and its applications [4]
 c) Define entropy and explain types of entropy [4]
 d) Explain cyclic codes. [4]
 e) What is compression. List different compression algorithm. [4]
2. a) Name the source coding technique used in the following types of files and Classify them as lossy or lossless. [10]
 i).Zip ii).jpg iii).mpg iv).bmp v).gif
 b) For(7,4) cyclic code, find out the generator matrix if $G(D)=1+D+D^3$ [10]
- 3 a) Explain Diffie-Hellman algorithm. Which attack is it vulnerable to? [10]
 b) Construct Huffman code for the given symbols $\{x_1, x_2, \dots, x_8\}$ with probabilities $P(x) = \{0.07, 0.08, 0.04, 0.26, 0.14, 0.09, 0.07, 0.25\}$
 Find coding efficiency. [10]
4. a) Explain LZW compression with example. [10]
 b) State Chinese Remainder theorem. Using it solve for X.

$$X \equiv 1 \pmod{2}$$

$$X \equiv 2 \pmod{3}$$

$$X \equiv 2 \pmod{5}$$
 [10]
- 5 a) what do you mean by symmetric key cryptography? Explain DES in detail. [10]
 b) Define i)Hamming weight ii)Hamming Distance iii)Syndrome
 iv)Linear code properties v)Code Efficiency [10]
6. Write short notes on [20]
 a) RSA
 b) RLE
 c) Security Goals
 d) Digital signature.



FW-Con.12473-16.

17/05/2016

QP Code : 31109

(2½ Hours)

[Total Marks : 80

N.B. : (1) Question 1 is compulsory.

(2) Attempt any three questions from the remaining questions.

(3) Assume suitable data wherever applicable.

(4) Draw figures wherever applicable.

1. (a) Differentiate between Raster scan display and Random scan display. 5
 (b) Prove that two successive rotation transformations are additive 5
 (c) Show that the transformation matrix for a reflection about a line $y = x$ is equivalent to reflection to x-axis followed by counter clockwise rotation of 90° . 5
 (d) Explain 3D trackers & enumerate some important trackers characteristics 5
2. (a) Specify highlights and drawbacks of Bezier curve. Construct the Bezier curve of order three with control points $P_1(0,0), P_2(1,3), P_3(4,2)$ and $P_4(2,1)$. Generate at least five points on the curve. 10
 (b) Write DDA Line drawing Algorithm. Compare DDA with Bresenham's Line drawing Algorithm. Calculate the pixel co-ordinates of line Abusing DDA Algorithm where $A=(0,0)$ and $B=(4,6)$. 10
3. (a) Let ABCD be the rectangular window with A (20,20), B(90,20), C(90,70) and D(20,70). Find region codes for endpoints and use Cohen Sutherland algorithm to clip the lines $P_1 P_2$ with $P_1 (10,30), P_2 (80,90)$ 10
 (b) With respect to 3D transformations, describe the steps to be-carried out when an object is to be rotated about an arbitrary axis. Specify all the required matrices. State your assumptions clearly. 10
4. (a) Explain Flood Fill Algorithm for 4 connected and 8 connected. What are its advantage over Boundary Fill Algorithm 10
 (b) Explain an algorithm which uses parametric equation of line clipping. Using same algorithm find the line segment A(10, 10) and B(70,40) after it is clipped against the window of two vertices (20,20) and (40,50). 10

FW-Con. 10276-16.



TURN OVER

QP Code : 31109

2

5. (a) Consider a triangle ABC whose coordinates are A (1 0, 20) B (30, 40) and 8 C (50, 20). Perform the following transformations (Specify the matrices that are used) **10**
- (i) Translate the given triangle by 3 units in X direction and -2 units in Y direction.
 - (ii) Rotate the given triangle by 30.
 - (iii) Reflect the given triangle about $X = Y$
 - (iv) Scale the given triangle uniformly by 2 units.
- (b) What is the significance of modeling in virtual reality? Explain any modeling technique used in virtual reality. **10**
6. Write a short note on (Any five):
- (a) Homogeneous Coordinates. **5**
 - (b) Text Clipping. **5**
 - (c) fractals **5**
 - (d) B- spline curve **5**
 - (e) Morphing and warping. **5**



FW-Con. 10276-16.

QP Code : 31152

(3 Hours)

[Total Marks: 80

- N.B.:** (1) Question No. 1 is compulsory.
 (2) Solve any three questions out of remaining five.
 (3) Figures to right indicate full marks.
 (4) Assume suitable data where necessary.

- | | | |
|--------|--|----|
| 1. (a) | Describe the features of ARM 7 processor. | 5 |
| (b) | What is embedded systems and explain SoC in detail. | 5 |
| (c) | Compare SJMP, AJMP and LJMP instruction of 8051 microcontroller. | 5 |
| (d) | 8051 microcontroller with XTAL frequency = 11.0592 MHz, find the TH1 value needed to have the following baud rates (i) 9600 (ii) 2400 (iii) 1200 | 5 |
| 2. (a) | Explain addressing modes of ARM 7 processor. | 10 |
| (b) | Explain the Timer/Counter modes of 8051 microcontroller. | 10 |
| 3. (a) | Explain in detail ARM 7 pipelining. | 10 |
| (b) | Explain various serial modes of 8051 microcontroller | 10 |
| 4. (a) | Explain priority inversion problem in Embedded system. How does it is resolved? | 10 |
| (b) | Write an assembly language program for 8051 microcontroller to arrange block of ten numbers in ascending order. | 10 |
| 5. (a) | Write an assembly language to generate square wave of 2 KHz at pin P1.1 using 8051. Assume 8051 operating frequency 12 MHz. | 10 |
| (b) | Explain CPSR register of ARM 7 processor. | 10 |
| 6. (a) | Explain detailed programmer's model of ARM 7. | 10 |
| (b) | Explain automated meter reading system in detail. | 10 |

FW-Con.10942-16.



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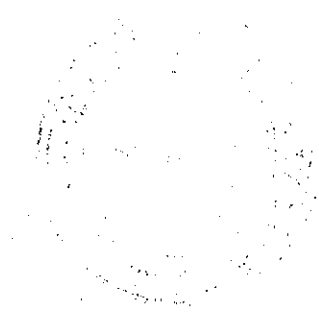
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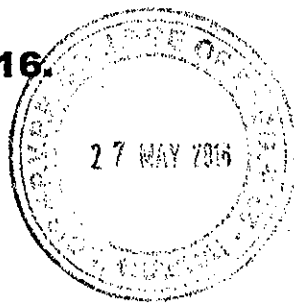


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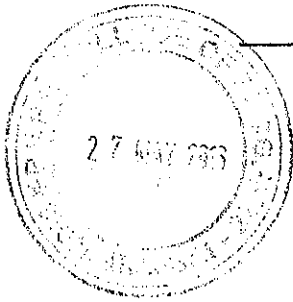
Marks: 80

- N.B. : 1. Question no. 1 is compulsory.
2. Solve any Three questions out of remaining Five questions.

- Q-1 a) What is referential integrity? Explain with suitable example. 5
b) Explain in short Object Query Language (OQL). 5
c) Explain in short dynamic SQL. 5
d) List the different types of transparencies in distributed databases and explain any one in detail. 5
- Q-2 a) Differentiate between
i. Data Warehouse Modeling Vs Operational Database Modeling. 5
ii. OLTP vs OLAP 5
b) Explain Dynamic Multilevel Indexes Using B-Trees or B⁺-Trees. 10
- Q-3 a) What are the different types of SQL injection attacks? What risks are associated with it? Explain any one attack in detail. 10
b) Consider the following database that has to be distributed: 10
- PROJ (PNO, PNAME, BUDGET)
PAY (TITLE, SALARY)
EMP (ENO, ENAME, TITLE)
ASG (ENO, PNO, RESPONSIBILITY, DURATION)
1. Show 2 examples of horizontal fragmentation.
2. Show 1 example of derived fragmentation.
3. Show 1 example of vertical fragmentation.
- Q-4 a) Explain with suitable example object identity, object structure and type constructors in OODB's. 10
b) Explain with suitable example "Star Schema". 10
- Q-5 a) Explain ECA model with suitable example. 10



- b) Explain Discretionary Access Control based on Granting and Revoking Privileges 10
- Q-6 a) Explain in short the concurrency control in distributed databases. 10
- d) Explain ETL phase in creating a data warehouse 10



Extra (15)

(05)

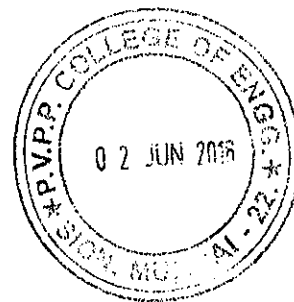
QP Code : 31234

(3 Hours)

[Total Marks : 80

- N. B. : (1) Question No. 1 is compulsory.
 (2) Attempt any three questions from remaining questions.
 (3) Draw suitable diagram wherever necessary.
 (4) Assume suitable data, if necessary.

1. Attempt all four sub questions.
 - (a) Explain features of Linux 5
 - (b) Describe Swap partition in Linux 5
 - (c) Explain permissions on directory 5
 - (d) Describe 'AndroidManifest.xml' file components 5
2. (a) What is data persistency in Android 10
 (b) Which are major components associated with Android application 10
3. (a) What is an Activity ? How is it created? 10
 (b) Explain concept of vi editor and give commands to move a cursor around, to insert text, to delete text, to cut & paste text, and to save & quit files. 10
4. (a) Explain concept of 'Links' and its types? 10
 (b) Explain command line editors 'sed' & 'gawk' with example 10
5. (a) Discuss significance of given files- /etc/passwd, /etc/shadow, /etc/group 10
 (b) Explain with examples given commands- chmod, chown, chgrp 10
6. (a) Explain following networking command-
 snetstat, ping, host, traceroute, route 10
 (b) Write short note on - process management in Linux 10



QP Code : 31643

TIME 3 hours

MARKS 80

Note

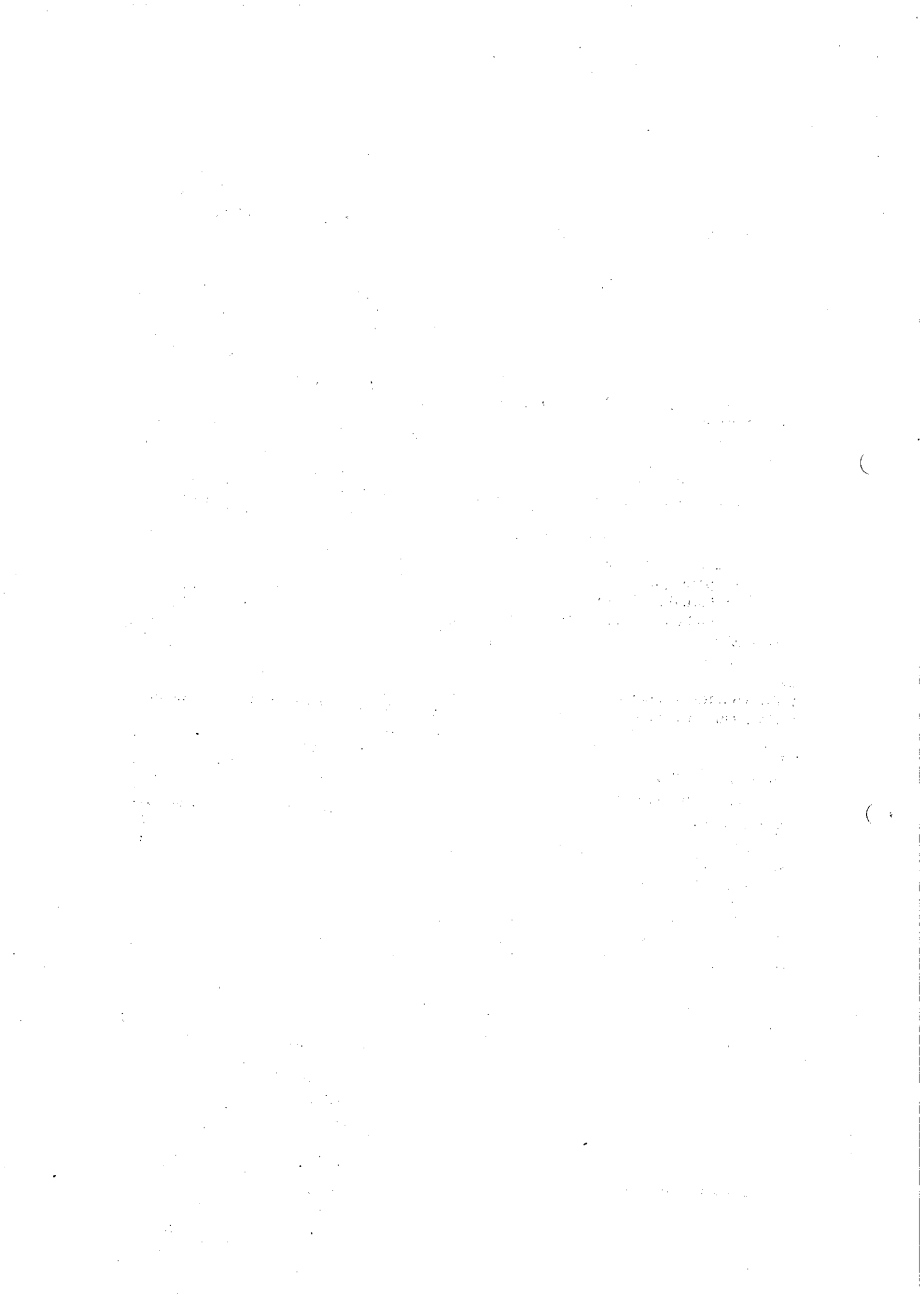
Q1 is compulsory

Attempt any three questions from the remaining Questions

- Q1** **20**
- a) What are the different levels of Capability Maturity Model (CMM)?
 - b) Compare agile and traditional Software Development models.
 - c) What are the different probable Origins of changes that are requested for software?
 - d) With suitable examples, explain the differences between 'known risks' and predictable risks'.
- Q2**
- a. Explain waterfall model give its advantage and disadvantages. 10
 - b. List evolutionary models and explain any one in detail 10
- Q3**
- a) Draw the DFD up to Level 2 for a Restaurant Management System which has food ordering, food delivering, invoice creation, and payments subsystems. 10
 - b) Prepare a sample risk table and explain the RMMM plan for the same. 10
- Q4**
- a. What are different requirements engineering tasks? Why identifying software requirements is difficult 10
 - b. Explain software design concepts 10
- Q5** Write note on (any two) 20
- i Component Based Development
 - ii Software Reliability measurements
 - iii Deployment-Level design elements
 - iv SQA activities
- Q6**
- a. What are different attributes of software quality? 10
 - b. Identify any two risks for your exam. Perform risk assessment and prepare the RMMM plan. 10

FW-Con.8166-16.





(3 Hours)

[Total Marks : 80

- N.B. :**
- (1) Question 1 is **Compulsory**.
 - (2) Attempt any **3** questions out of the rest
 - (3) Figure to the right indicate **full** marks.
 - (4) All question carry **equal** marks.

1. Attempt the following: 20
 - (a) Explain implementation of sequential consistency with non replicating migrating blocks strategy.
 - (b) Which .Net component makes .NET platform and language independent? Explain how it works.
 - (c) Explain Parameter passing Semantics in RPC.
 - (d) Compare Bully election algorithm with Ring based election algorithm.

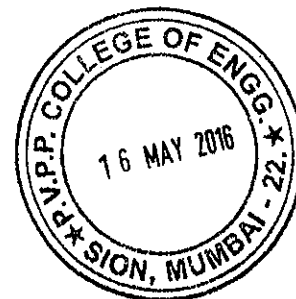
2. (a) Name four different distributed deadlock detection algorithms. Explain probe-based distributed deadlock detection algorithm (CMH) with example. 10
(b) Explain RPC Communication Protocol 10

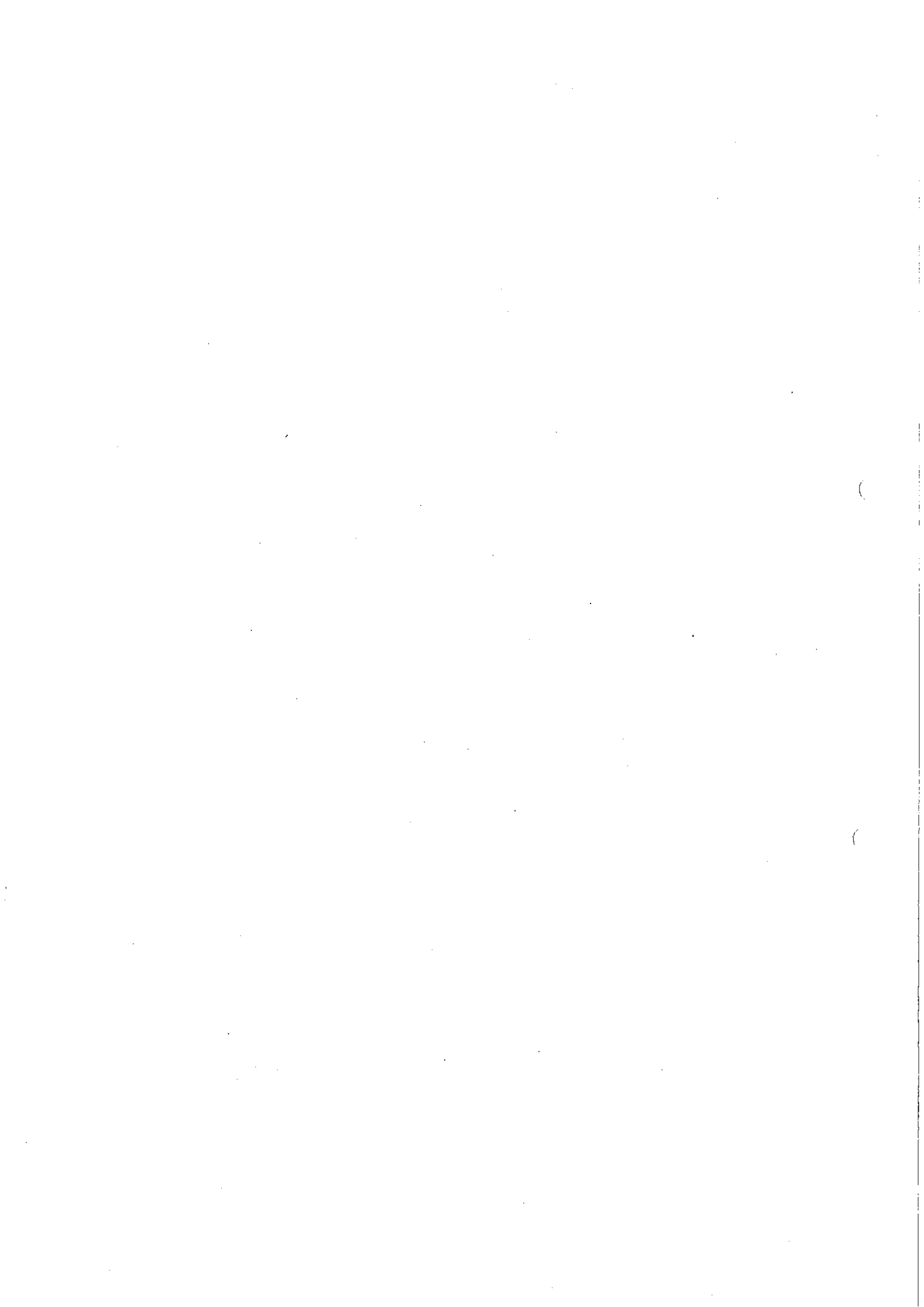
3. (a) Define Happened-Before relationship. Explain implementation of logical clocks with an example 10
(b) Describe .NET architecture with neat labeled diagram 10

4. (a) Explain migration in heterogeneous system. 10
(b) Explain desirable features of a good message passing system. 10

5. (a) Explain with respect to EJB -Roles in EJB and types of Beans 10
(b) Explain various distributed computing models. 10

- 6 Write notes on following : 20
 - (a) RMI Execution
 - (b) Components of EJB framework
 - (c) Message Buffering in IPC
 - (d) SOA lifecycle

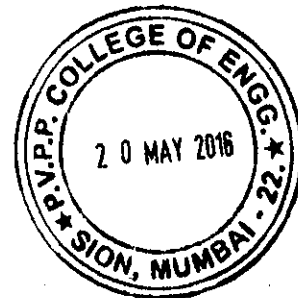


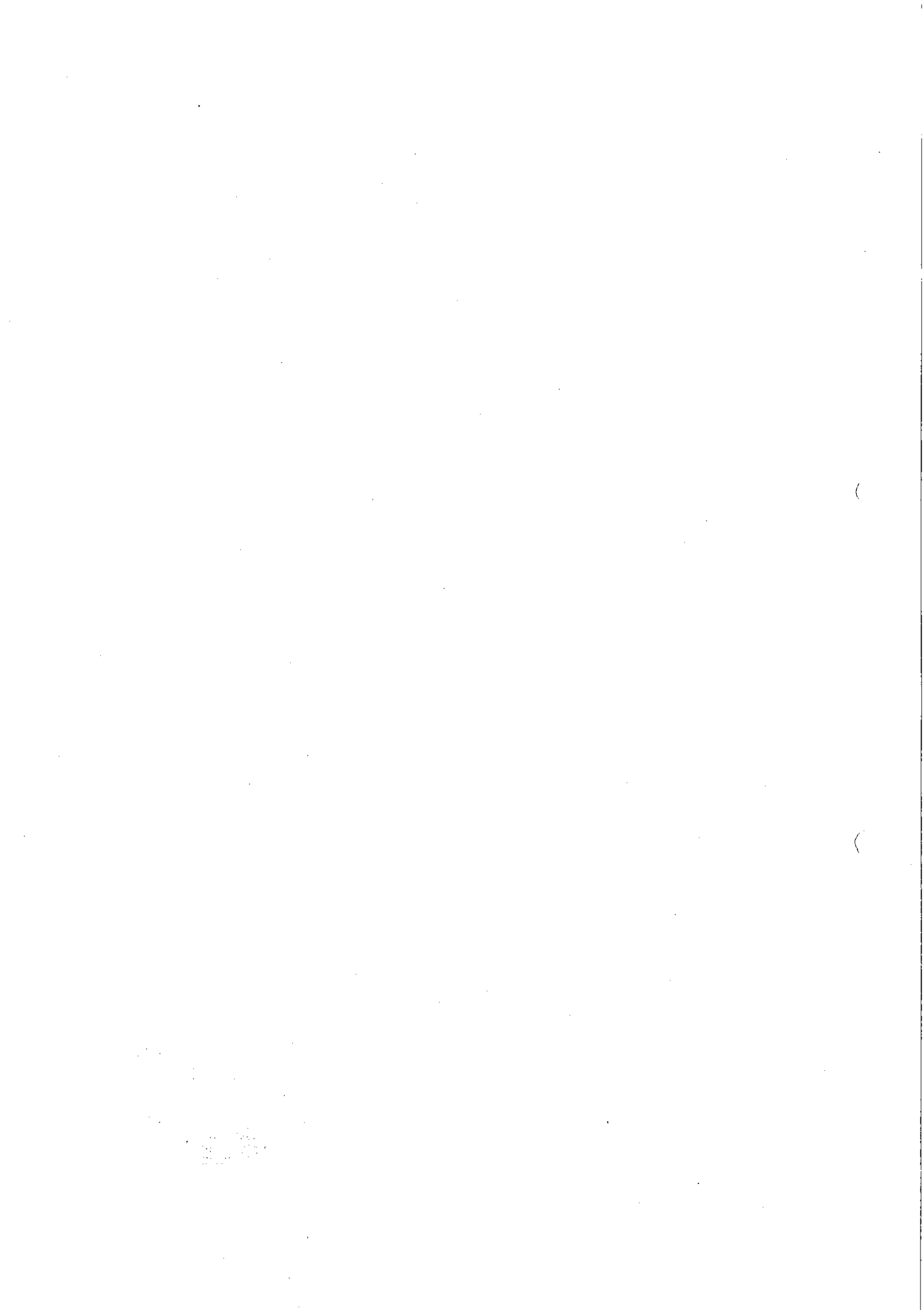


N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any **THREE** Questions out of remaining **FIVE** questions.

1. (a) For an online shopping system identify vulnerability, threat and attack. 5
- (b) What is IP spoofing? How does it lead to Denial of service attack? 5
- (c) What are the different modes of authenticating a user? 5
- (d) What are the different phases of a virus? How does a virus propagate? 5
2. (a) Differentiate between :- 10
 - (i) Access control list and capability list
 - (ii) Firewall and IDS.
- (b) Explain RSA algorithm for public key encryption. Given modulus $N = 143$ and public key $= 7$, find the values of p , q , $\phi(n)$, and private key d . Can we choose value of $e=5$? Justify. 10
3. (a) What is session hijacking? How does it occur? Give two ways to prevent a session hijack. 10
- (b) How is single sign on achieved in Kerberos protocol? What is the concept of a ticket in this protocol? 10
4. (a) Compare the different types of firewalls that can be used to secure a network. 10
- (b) List the different protocols of SSL and explain the working in detail. 10
5. (a) What are the different approaches to software reverse engineering? 10
- (b) What are the file system vulnerabilities for a Linux system? 10
6. Write short notes on (**any four**) : 20
 - (a) Secure email
 - (b) Multi level access control
 - (c) Digital Right Management
 - (d) Non-malicious programming errors
 - (e) Federated Identity Management





TE/Sem VI/CBSGS/DMBE/IT

26/05/2016

Q.P. Code : 595002

(3 Hours)

[Total Marks : 80

- N.B. : (1) Q1 is compulsory.
(2) Attempt any three from the remaining.
(3) Assume suitable data.

1. (a) Define "Data Mining". Enumerate five example applications that can benefit by using Data Mining. 5
- (b) What is Data Preprocessing? Explain the different methods for the Data Cleansing phase. 5
- (c) What is hierarchical clustering? Explain any two techniques for finding distance between the clusters in hierarchical clustering. 5
- (d) Explain the concept of a decision support system with the help of an example application. 5
2. (a) Partition the given data into 4 bins using Equi-depth binning method and perform smoothing according to the following methods. 10
Smoothing by bin mean
Smoothing by bin median
Smoothing by bin boundaries
- Data: 11,13,13,15,15,16,19,20,20,20,21,21,22,23,24,30,40,45,45, 45, 71, 72, 73, 75
- (b) For the same set of data points in question 2. (a) 10
(a) Find Mean, Median and Mode.
(b) Show a boxplot of the data. Clearly indicating the five- number summary.

[TURNOVER



3. (a) The table below shows a sample dataset of whether a customer responds to a survey or not. "Outcome" is the class label. Construct a Decision Tree Classifier for the dataset. For a new example (Rural, semidetached, low, No), what will be the predicted class label?

District	House Type	Income	Previous Customer	Outcome
Suburban	Detached	High	No	Nothing
Suburban	Detached	High	Yes	Nothing
Rural	Detached	High	No	Responded
Urban	Semi-detached	High	No	Responded
Urban	Semi-detached	Low	No	Responded
Urban	Semi-detached	Low	Yes	Nothing
Rural	Semi-detached	Low	Yes	Responded
Suburban	Terrace	High	No	Nothing
Suburban	Semi-detached	Low	No	Responded
Urban	Terrace	Low	No	Responded
Suburban	Terrace	Low	Yes	Responded
Rural	Terrace	High	Yes	Responded
Rural	Detached	Low	No	Responded
Urban	Terrace	High	Yes	Nothing

- (b) Briefly explain Bagging and Boosting of Classifiers

10



[TURNOVER

4. (a) Use the Apriori algorithm to identify the frequent item-sets in the following database. Then extract the strong association rules from these sets. 10

Min. Support = 30% Min. Confidence = 75%

TID	Items
01	A, B, D, E, F
02	B, C, E
04	A, B, D, E
04	A, B, C, E,
05	A, B, C, D, E, F
06	B, C, D
07	A, B, D, E

- (b) Explain multidimensional and multi level Association rules with examples. 10

5. (a) Use any hierarchical clustering algorithm to cluster the following 8 examples into 3 clusters : 10

A1= (2, 10), A2= (2, 5), A3= (8,4), A4 = (5, 8),
 A5= (7, 5), A6= (6, 4), A7= (1,2), A8= (4,9)

- (b) What is an outlier? Describe methods that can be used for outlier analysis. 10

6. (a) Consider the following case study: An International chain of hotels wants to analyze and improve its performance using several performance indicators -quality of room, service facilities, check in, breakfast, popular time of visits, duration of stay etc. 10

For this case study design a BI system, clearly explaining all steps from data collection to decision making.

- (b) Clearly explain the working of the DB_SCAN algorithm using appropriate diagrams. 10





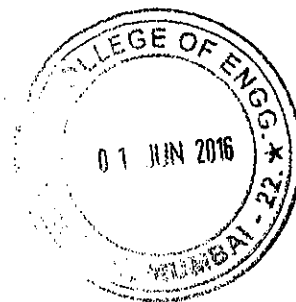
Q.P. Code : 595102

(3 Hours)

[Total Marks :80

- N.B. :** (1) Question 1 is compulsory.
(2) Attempt any three from remaining Questions.
(3) Assume suitable data wherever necessary.
(4) Figure indicates marks.

1. (A) Create a web page to show how you can apply the transformation effects so that the image rotates by 75 degree. Assume suitable parameters if required. 10
(B) Explain in detail Architecture of a simple Mashup on the web server. List out its advantages and disadvantages. 10
2. (A) Define Media Query ? Explain Media Query with an example. 10
(B) Discuss in detail Algorithm-Based Ranking System. 10
3. (A) Discuss the strengths and weaknesses of SWOT analysis. 10
(B) Discuss Fixed-width layouts and Fluid layouts with example. 10
4. (A) List and explain the audio and video file formats used in RWD. 10
(B) Explain in detail the different CSS3 style sheet with an example. 10
5. (A) Explain the different types of CSS3 selectors with an example. 10
(B) Explain in detail SEQ objectives. 10
6. (A) Explain in detail RUI implementation using AJAX with neat diagram. 10
(B) Define DOM. Explain in detail Node tree for HTML Document. Also explain the different levels of DOM. 10



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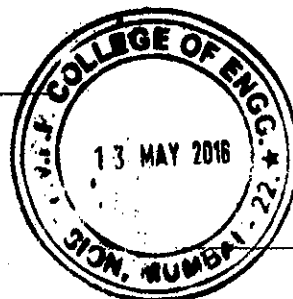
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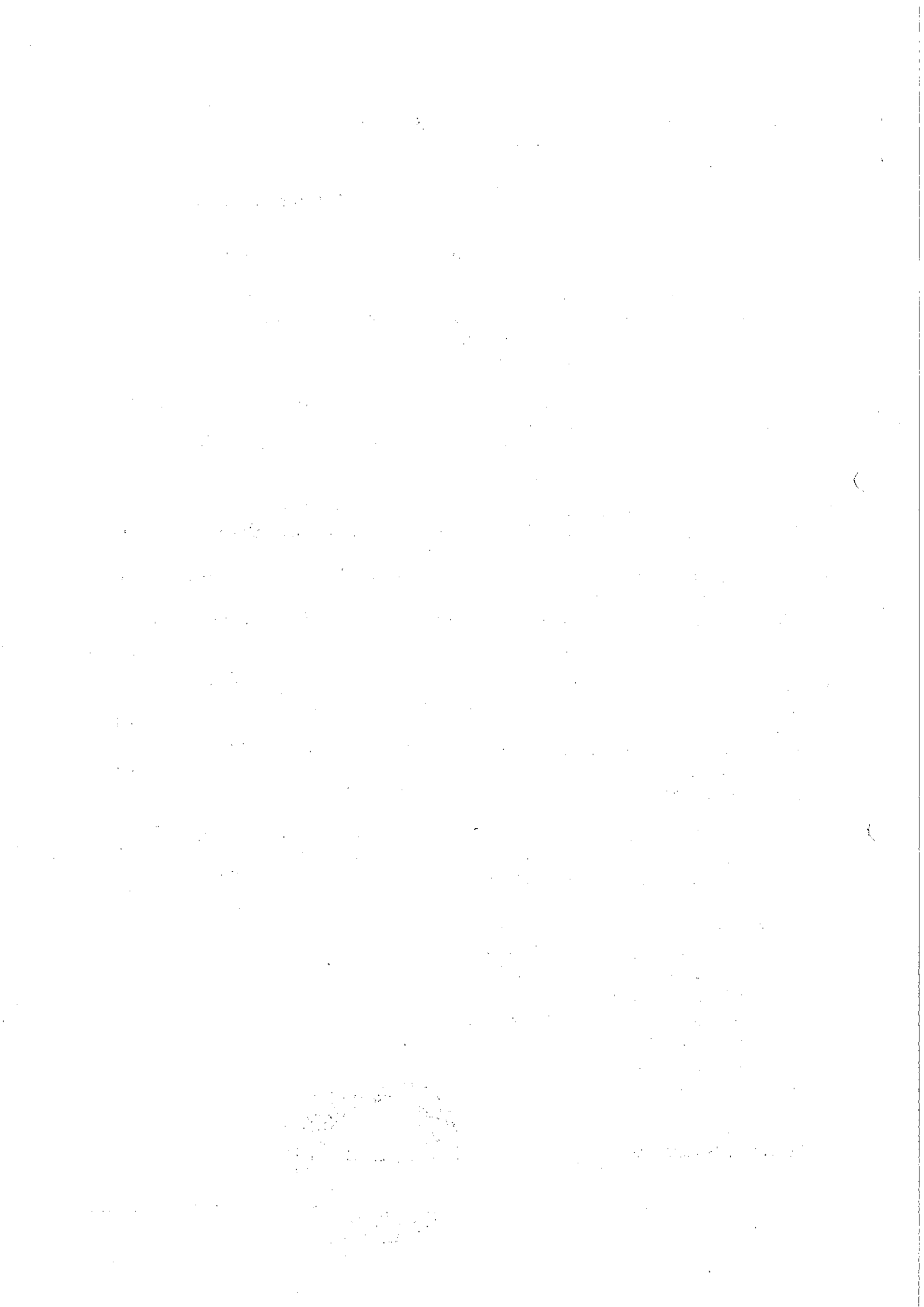
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QP Code : 29727**(3 Hours)****[Total Marks : 100**

- NB :-** (1) Question number 1 is compulsory.
(2) Students are required to solve any four questions out of the remaining six questions.
(3) Assume suitable data wherever necessary but justify the same.
(4) Figures to the right indicate full marks.

1. (a) What is multimedia? Explain the objects involved in Multimedia system and describe various applications. 10
(b) What is multimedia Authoring. Explain it with some useful editing and authoring tools. 10
2. (a) Explain the various file formats used in multimedia system. 10
(b) What is need of Adaptive Huffman coding and explain it with suitable example. 10
3. (a) Draw neat labeled diagram for Decoder and Encoder of H.261 and explain its working. 10
(b) With the help of block diagram explain baseline JPEG compression in detail. 10
4. (a) Explain object based Visual Coding and Video Stream in MPEG-4. 10
(b) Explain Hypermedia Messaging concept used in MMS in detail. 10
5. (a) Explain different architecture for Content Organization in multimedia database. 10
(b) Explain Similarity based retrieval in image databases 10
6. (a) Explain in details about MPEG-4 and also compare between MPEG-2 and MPEG-7. 10
(b) List and explain various Color models used in Image and Videos. 20
7. Write short notes on (Any Four)
(i) TV Trees in Text database
(ii) Descirptors in MPEG-7
(iii) MIDI file format
(iv) Midtreard Vs Midrise quantizer
(v) VRML
(vi) Audio Databases

GE-Con. 9922-16.

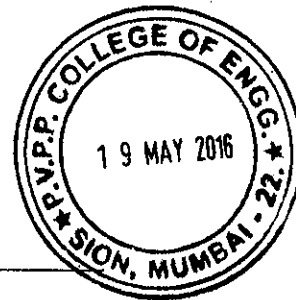


(3 Hours)

[Total Marks :80

N.B. : (1) Q. 1. is compulsory
(2) Attempt any three out of five.

1. (a) What are cloud deployment models? 5
(b) Explain benefits of virtualization? 5
(c) What saas maturity model? 5
(d) Explain different types of hypervisor with example. 5
2. (a) Explain Openstack Architecture in detail. 10
(b) Explain Xen architecture in detail. 10
3. (a) What are the features of Google file system? 10
(b) Explain cloud Data Security? 10
4. (a) What are techqines for the risk assessment and management for cloud? 10
(b) Explain AAA model for cloud? 10
5. (a) What is the impact of shared resources and Multi-Tenancy on cloud Applications? 10
(b) What are the fundamental requirements for cloud application architecture? 10
6. Write a note on:- 10
 - (a) Cloud Service Brokerage
 - (b) Mobile cloud Computing
 - (c) Amzon simple DB
 - (d) Modes of Eucalyptus



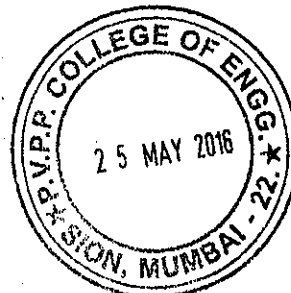


Revised Course
(3 Hours)

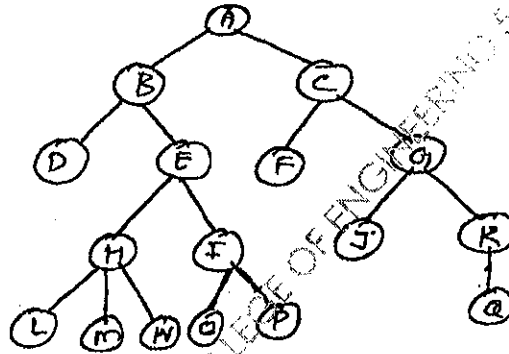
[Total Marks : 80

- N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of the remaining five questions.

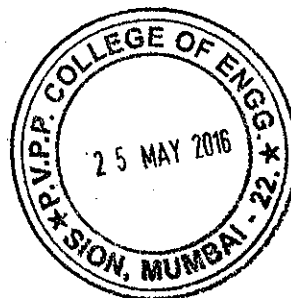
1. Attempt any five 20
- (a) Describe Bayes theorem.
 - (b) What are modus ponens ?
 - (c) Define Alpha & Beta value in game tree?
 - (d) Differentiate between propositional and predicate logic.
 - (e) Give Agent Task Environment of Image analysis.
 - (f) Explain in short what is Expert System Shell.
2. (a) Consider a knowledge base KB that contain following propositional logic 10
sentenced.
 $Q \Rightarrow P$
 $P \Rightarrow \neg a$
 $Q \vee \neg R$
- (i) Construct a truth table that shows the truth value of each sentence in KB and indicate the model in which KB is true.
 - (ii) Does KB entail R ? use definition of entailment to justify your answer.
 - (iii) Does KB $R \Rightarrow \neg P$ entail ? Extend the truth table and use the definition of entailment to justify your answer.
 - (iv) Does KB $Q \Rightarrow \neg R$ entail ? Extend the truth table and use the definition of entailment to justify your answer.
- (b) Explain simulated annealing with diagram. Where it is used ? 10
3. (a) Measure 1 liter water if available Jug sizes are 7 liters and 5 liters. 5
- (b) What is PEAS descriptor ? Explain PEAS descriptor for Taxi driver Agent. 5
- (c) You have two neighbour, John and Mary, who have promised to call you at work when they hear the alarm. John always calls when he hears the alarm, but sometimes confuses the telephone ringing with the alarm and calls then, too. Mary on other hand, likes rather loud music and some times misses the alarm altogether. Given the evidence of who has or has not called. We would like to estimate the probability of a burglary. Draw a Bayesian network for this domain with suitable probability table. 5



4. (a) Assume the following facts :- 10
- (i) It is a crime for an American to sell weapons to hostile nations.
 - (ii) The country Nano an enemy of America.
 - (iii) Nano has some missiles; all of its missiles were sold to try it by Colonel West. 10
 - (iv) Colonel West is an American
- Use resolution to answer the question "Colonel West is a Criminal."
- (b) Differentiate between Informed and unformed search techniques. Also give comparative analysis of various uninformed search techniques. 8
5. (a) Apply DFS algorithm on given tree write the sequence of nodes in which it is explored.



- (b) List down all types Agent Architecture. Explain utility based and learning agent. 5
- (c) What is Expert System explain its working with block Diagram. 7
6. Write Short notes on any Four. 20
- (a) Ontology
 - (b) Crypto Arithmetic Problem
 - (c) WUMBUS world Environment
 - (d) Partial order planner with STRIP representation
 - (e) Prolog.



Q.P. Code : 31604

(3 Hours)

[Total Marks : 80

- N.B. : (1) Question No. 1 Compulsory.
 (2) Attempt any three from the remaining.
 (3) Assume suitable data.

1. Develop a business plan based on the following guidelines to participate in *Green India/Go Green movement* announced by Indian Government. 20
 - i Identify the business model.
 - ii Develop the strategic plan based on Strategic Objectives, Strategic definition, Marketing plan, SCM and CRM plan etc.
 - iii Implementation should include few screenshots of websites demonstrating: Business model, Revenue model (s) used, CRM SCM activities, Marketing activities, Strategic objectives like mission, vision and objectives, Security concern, Payment mode etc.
 - iv. One example of use-case scenario.
 - v. Site structure diagram (blueprint) showing layout and relationship between pages.
 - vi. Organizational structure.
 - vii. Hardware and Software requirement.

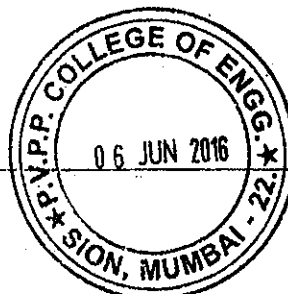
2. (a) Discuss any two tools to secure channel of communication in an e-commerce environment. 10
 (b) Discuss the CRM strategy to acquisition and retention of the customer worldwide for one e-commerce site based on B-C model. 10

3. (a) What is Smart card? Explain step by step by procedure of Payment by Smart card. 10
 (b) Explain with example the first three components of SOSTAC framework to promote the product. 10

4. Attempt any four.
 - (a) Comment on buy-side and sell-side SCM. 5
 - (b) Discuss how the combinations of revenue models can help us in generating more revenue. 5
 - (c) Discuss Technology & Infrastructure for E-Business 5
 - (d) What is E- Business? Give the mapping between conventional business & E- Business 5
 - (e) Explain difference between IT strategy and e-strategy? 5

TURN OVER

FW-Con.12194-16.



Q.P. Code : 31604

2

5. (a) Explain the role and support of E-Commerce in the following businesses 10
- i. Real estate business
 - ii. Insurance sector
 - iii. Jobs and employment sites
 - iv. Travel Suggest strategies for existing business to migrate to online business.
- (b) Suggest strategies for existing business to migrate to online business 10
6. Write a short note (Any 2)
- (a) Discuss 7s Strategic framework for change management. 10
 - (b) Comment on the drives, risks and impact of e-procurement. 10
 - (c) Describe various tools used for electronic marketing 10



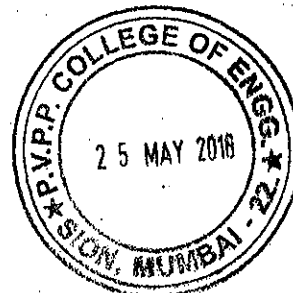
(3 Hours)

[Max marks 100]

1. Question No. 7 is compulsory
2. Answer any four out of remaining six questions.
3. Assume suitable data if necessary.

- | | | | |
|---|------------------------------|--|------|
| 1 | a) | Give different views of Software quality. | [10] |
| | b) | Explain how efficient test cases can be designed. | [10] |
| 2 | a) | Explain McCall's Quality factors and Criteria. | [10] |
| | b) | Draw and explain state transition diagram for a test case. | [10] |
| 3 | a) | Discuss advantages and disadvantages of random testing. | [10] |
| | b) | Discuss importance of DOS attack in acceptance testing. | [10] |
| 4 | a) | Discuss objectives and issues related with software testing. | [10] |
| | b) | Explain boundary value testing with a suitable example. | [10] |
| 5 | a) | Explain ISO 9126 Quality Characteristics. | [10] |
| | b) | Explain test execution strategy in detail. | [10] |
| 6 | a) | Discuss difference between verification and validation and their importance in maintaining software quality. | [10] |
| | b) | Draw and explain flow graph of binary search function. | [10] |
| 7 | Write short notes on any two | | [20] |
| | a) | Difference between failure, error, fault. | |
| | b) | Difference between UAT and BAT. | |
| | c) | Relative merits of Decision table and category partition based testing methodology. | |

GE-Con. 11245-16.



QP Code : 30102

Total marks 100

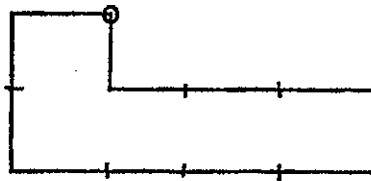
Duration 3 hours

N.B.: Q1 is compulsory.

Write any four questions out of remaining six.

Assume suitable data wherever necessary.

- Q1 (a) Explain fundamental of Digital Image Processing 05
 (b) What are different point processing techniques used for image enhancement 05
 (c) All image compression techniques are invertible 05
 (d) Every image has unique histogram 05
- Q2 (a) Show that 2D-DFT of an image can be computed by row and column passes with 1D-DFT algorithm. 10
 (b) Compute the convolution $y(n)=x(n)*h(n)$ of the following signal by tabular method 10
- i) $x(n)=\{1, 2, 4\}$ & $h(n)=\{1, 1, 1, 1\}$
 \uparrow \uparrow
- ii) $x(n)=\{1, 1, 0, 1, 1\}$ & $h(n)=\{1, -2, -3, 4\}$
- Q3 (a) Obtain the linear convolution of the following sequence 10
 $X(n)=\{1,1,0,1,1\}$ and $h(n)=\{1,-2,-3,4\}$
 (b) Obtain the circular convolution of the following sequence 10
 $X(n)=\{1,2,3,4\}$ and $h(n)=\{4,1,1,2\}$
- Q4 (a) Explain JPEG encoder along with different steps in encoding. 10
 (b) Define Chain Codes & Shape Number. Prove that Shape numbers are invariant to rotation and change in start point of the object. Consider following object. 10



- Q5 (a) What is Hough Transform? How It can be used for edge linking? Explain with the help of an example. 10
 (b) What is the importance of image segmentation in satellite images and biomedical images? 10

[TURN OVER

GE-Con. 12281-16.



Q6 (a) Find DFT of the image

10

0	1	2	1
1	2	3	2
2	3	4	3
1	2	3	2

(b) Grey level histogram of an image is given below, compute Histogram Equalization. Draw the histogram of input and output images

10

Grey level	0	1	2	3	4	5	6	7
No. of Pixels	790	1023	850	656	329	245	122	81

Q7 (a) Explain HIT and Miss Transform

10

(b) Explain Run length coding on bit planes

10



Extra

BE | SEM VIII | CBSGS | IT | STQA

12/5/16

QP Code : 720901

Library

(3 Hours)

[Total Marks :80

N.B. : (1) Question no. 1 is compulsory
(2) Attempt any three questions out of remaining five questions.

- 1. (a) With example explain Failure, Defect and Error 5
- (b) Explain STLC 5
- (c) Explain software quality metrics 5
- (d) Issues in Object Oriented Testing 5

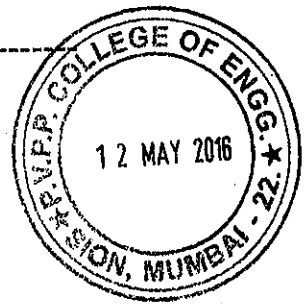
- 2. (a) What is Verification and Validation? What is it's need? 10
- (b) A program reads three numbers n1, n2, n3, in the range -100 to 100 and prints the smallest number. Design test cases for this program using equivalence class testing technique. 10

- 3. (a) Draw control flow graph and find cyclomatic complexity for the following PDL 10
if(c1 or c2 and c3) s1;
else s2;
while(c4) s3;
s4;
do s5; while (c5);
s6
- (b) Design test cases to find maximum of 4 nos. 10

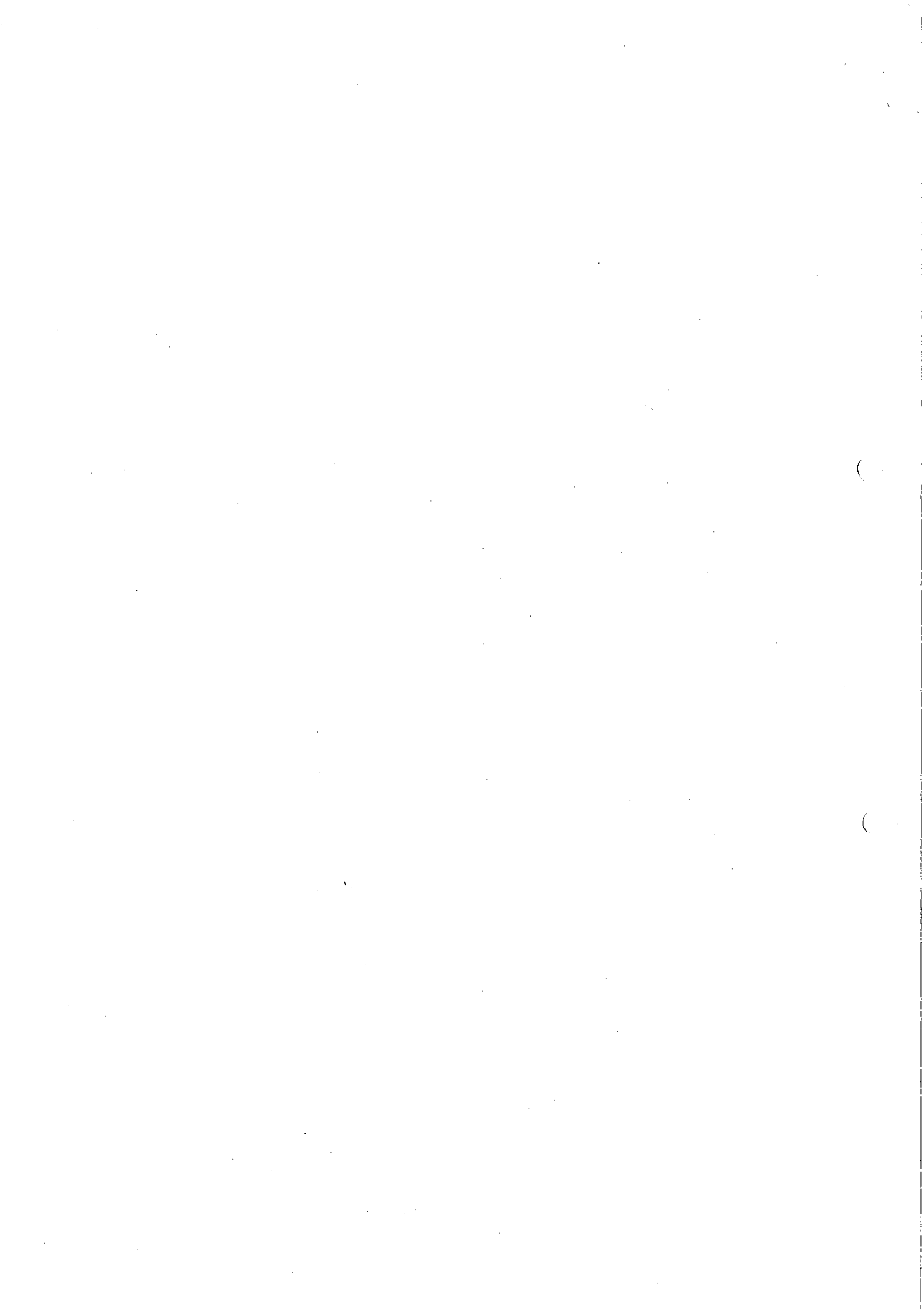
- 4. (a) Explain static Data Flow Testing with example 10
- (b) Explain different types of Incremental Integration Testing Methods 10

- 5. (a) Explain entry and exit criteria for Alpha and Beta Testing. How Alpha testing differs from Beta testing. 10
- (b) T contains 90 tests of which 20 are modification-revealing for P and P' and M selects 12 of these 20 tests, then calculate the inclusiveness of M relative to P, P', and T. 10

- 6. (a) Explain structure of Testing Group 5
- (b) Explain different size metrics 5
- (c) What is test suite? Why it grows. 5
- (d) Elaborate on SQA Models in brief 5



PADMAKESHU... MADAP... COLLEGE OF ENGG. & TECHNOLOGY



QP Code : 721201

(3 Hours)

[Total Marks : 80

- N.B. : (1) Question number 1 is **compulsory**.
Out of remaining question solve any **three**
- (2) Draw figures wherever necessary .
(3) Assume suitable data wherever necessary.
1. (a) Consider a disk I/O system in which an I/O request arrives at a rate of 100 I/O s per second. The disk service time is $R_s = 8\text{ms}$, Calculate the measures of disk performance **10**
 (a) Utilization of I/O controller (U)
 (b) Total response time (R)
 (c) Average Queue size
 (d) Total time spent by a request in the queue
 Considering the same disk I/O system and calculate the above measures of the disk performance if the disk service time is halved i.e. $R_s = 4\text{ms}$.
- (b) Explain ILM and its benefits. How ILM can be implemented as a strategy for hospital managementsystem. **10**
2. (a) Explain FC SAN topologies and FC protocol Stack **10**
 (b) Explain IP storage standards.
3. (a) Explain the Architecture and implementation related limitations of storage virtualization. **10**
 (b) Differentiate between symmetric and asymmetric storage virtualization and block level and file level storage virtualization. **10**
4. (a) What is Information Availability and Information unavailability? Explain BC planning life cycle. **10**
 (b) Explain Network data management protocol (NDMP). **10**
- 5 (a) Define Information system. List out the components of an information systems. **10**
 What is the difference between general purpose and specialized information systems?
 (b) Explain the Boolean based matching process in detail. **10**
6. Write short notes on: (Any four) **20**
 (a) Intelligent Storage system (b) Zoned bit recording
 (c) FC ports (d) Comparison of FC SAN, iSCSI, NAS.
 (e) Backup Operations
 (f) Document surrogates (g) Document term Matrices



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QP CODE : 633401

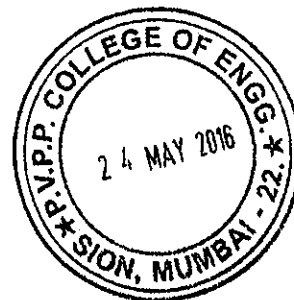
(Time: 3 Hours)

[Total Marks :100

Note:- 1) Question No. 1 is Compulsory.

2) Solve any four questions from remaining six questions.

- Q.1 (a) Explain Game design principles. (5)
(b) Explain Hardware abstraction. (5)
(c) What are the types of Research. (5)
(d) Explain Game development issues. (5)
- Q.2 (a) Explain phases of Game development (10)
(b) Which are the core groups involved in software factory, and how do they interact with each other. (10)
- Q.3 (a) Explain Architectural Styles (10)
(b) Explain the various game design patterns (10)
- Q.4. (a) Explain game deployment platforms. (10)
(b) Explain seven golden principles. (10)
- Q.5 (a) Explain Tokenization with example. (10)
(b) What is source control? What are the functions provided by source control. (10)
- Q.6 (a) Explain basic mouse interaction methods and user controls (10)
(b) Explain steps involved in Game Loop. (10)
- Q.7. Write short notes on: (any four) (20)
- (i) Direct Draw Objects
 - (ii) Sprites
 - (iii) Get Message
 - (iv) Resource file builders
 - (v) Scene Graph



(Time: 3 Hrs)

Marks: 80

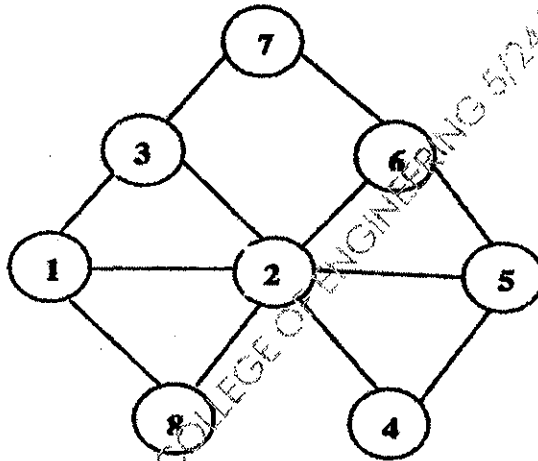
- N.B. : 1. Question no. 1 is compulsory.
2. Solve any Three questions out of remaining Five questions.

- Q-1 Write short Note on:**
- a) Big Data & its characteristics 5
- b) Distance Measures for Big Data 5
- c) The Map & Reduce Tasks 5
- d) Multistage Frequent Itemset Mining Algorithm 5
- Q-2**
- a) Explain HDFS architecture with diagram. 10
- b) Explain Column family store and Graph Store NoSQL architectural pattern with examples. 10
- Q-3**
- a) Explain Matrix-Vector multiplication algorithm by MapReduce? 10
- b) Explain Issues in Data stream query processing? 10
- Q-4**
- a) Explain 10
- 1) Bloom Filter with the help of an example
- 2) Steps of HITS algorithm
- b) Explain structure of web with suitable diagram? 10
- Q-5**
- a) Explain Park-Chen-Yu algorithm? How memory mapping is done in PCY? 10
- b) Explain CURE algorithm with initialization & completion phase? 10



[Turn Over

- Q-6**
- a) How recommendation is done based on properties of product? Explain with suitable example? 10
 - b) For following graph, show how the clique percolation method (CPM) find cliques. Explain with steps? 10



BE/ET/SEM VIII/ CBSG/ CSM

30/05/2016

QP Code :729100

(3 Hours)

[Total Marks: 80]

N.B. :

1. Question No. 1 is compulsory.
2. Out of remaining 5 questions, attempt any three questions.
3. Assume suitable data wherever required but justify the same.
4. All questions carry equal marks.
5. Answer to each new question to be started on a fresh page.
6. Figure to the right in brackets indicate full marks.
7. Use of statistical table is allowed.

1. (a) Briefly explain the steps in simulation study. (5)
(b) Compare random numbers and random variate. (5)
(c) Explain data collection and analysis in input modeling :- (5)
(d) State queue notation, queue discipline and queue behavior:- (5)
2. (a) Discuss various costs that are involved in inventory system. Explain the policy and goal of inventory system:- (10)
(b) Consider the following sequence of 5 numbers
0.15, 0.94, 0.05, 0.51, 0.29
Use the kolmogorov – Smirnov test to determine whether the Hypothesis of uniformity can be rejected. Given $\alpha=0.05$ and the critical value of $D=0.565$ (10)
3. (a) What is time-series input model? Explain AR(1) and EAR(1) model:- (10)
(b) Records pertaining to the monthly number of job-related injuries at an Underground coal mine were being studied by federal agency. The values for the past 100 months were as follows:-

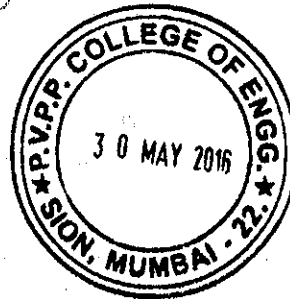
Injuries per month	0	1	2	3	4	5	6
Frequency of occurrence	35	40	13	6	4	1	1

Apply the chi-square test to these data to test the hypothesis that the underlying distribution is Poisson. Use the level of significance $\alpha=0.05$ (10)



[Turn Over

4. (a) A tool crib has exponential inter-arrival and service times and serves a very large group of mechanics . The mean time between arrivals is 4 minutes. It takes 3 minutes on the average for a tool-crib attendant to service a mechanic. The attendant is paid \$10 per hour and the mechanic is paid \$15 per hour. Would it be advisable to have a second tool-crib attendant? (10)
- (b) What do you understand by model verification and validation? How would you validate input-output transformation of a model? (10)
5. (a) Give the equation for steady state parameters of M/G/1 queue and derive M/M/1 From M/G/1:- (10)
- (b) Explain Inverse-Transform technique:- (10)
6. (a) Explain Manufacturing and Material handling system:- (10)
- (b) Explain Reliability System in detail:- (10)



30/05/2016

Duration 3 Hours

Total Marks 100

Note: i) Question No. 1 is compulsory.

ii) Attempt any four Questions from the remaining six Questions.

1. Answer any Four: 20
- What is triple constraint in IT project?
 - Define project. What is project management?
 - Define MOV and WBS
 - Compare various organizational structures
 - How can a system be a technical success but an organizational failure?
2. 10
- Explain ITPM in detail 10
 - Explain ethical leadership and ethical dilemmas.
3. 10
- Explain the project scope management plan 10
 - Distinguish resource loading from resource levelling. Why is levelling of resources preferred to large fluctuations?
4. 10
- Explain five practices of exemplary leadership. 10
 - Explain project risk management
5. 10
- What is outsourcing? Explain the project procurement management 10
 - Explain the project implementation methods
6. 10
- Explain the change management plan 10
 - What is meant by Communication Management? What are the strategies for an effective communication system? 10
7. 20
- Write notes
- Attributes of a project
 - Need of IT project management
 - Dealing with project conflict and resistance
 - Project integration management



1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial statements and for providing a clear audit trail. The records should be kept up-to-date and should be easily accessible to all relevant parties.

2. The second part of the document outlines the procedures for handling cash receipts and payments. It is important to ensure that all receipts are properly issued and that payments are made in a timely and accurate manner. The use of bank accounts and the regular reconciliation of the books are also discussed in detail.

3. The third part of the document covers the process of preparing the financial statements. This involves the consolidation of all the data from the various accounts and the preparation of the balance sheet, income statement, and cash flow statement. The accuracy and completeness of these statements are crucial for the success of the business.

4. The final part of the document discusses the importance of regular audits and the role of the auditor. It is essential to have an independent audit of the financial statements to ensure their reliability and to identify any potential areas of concern. The auditor's report provides valuable insights into the financial health of the business and is a key document for investors and other stakeholders.

5. In conclusion, the document emphasizes the need for a strong financial control system. By following the guidelines outlined in this document, businesses can ensure that their financial records are accurate, their cash flows are managed effectively, and their financial statements are reliable and transparent.