KOII NO.

7 : Sage 1 10 'ON IRIOI]

EE6021

LI 'SD

B.Tech. VI Semester (Main/Back) Examination, April/May - 2017 Computer Sc. & Engg. 6CSIA Computer Networks

08 : 847aFM mumixaM 06 : 847aFM gaissea . 26

ruoH E : 3 Mours

6E6021

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

I - tinU

- A) What is Distance vector Routing? Explain count to Infinity problem and give its solution?
 (8)
- b) Explain Flooding and shortest path routing an describe how and when they are used in link state routing.

OB

- Mhat are the basic design issues of a Network layer? Also explain what are the services provided by the network layer to the transport layer? (8)
- b) Differentiate between the static and dynamic routing with their pros and cons.
 c) Give examples of some routing protocol used in both type of routing.

II - iinU

- 2. a) Explain the concept of fragmentation. Why fragmentation is done and how? (8)
- b) What do you understand by layering and protocol? Explain your answer using the Internet architecture.

OB

- Define Network address translation. How the outgoing and incoming packets are made to reach to its destination in the presence of a MAT bax? Explain. (8)
- (8) Explain the difference between IPV4 and IPV6.

2107/120939

(1)

- (8) over U.D.P rather than TCP and draw the format of UDP header. Describe why an application developer may choose to run its application (P ·£
- (q Write short note on :
- Addressing in Transport layer. (1
- Flow control and Buffering. (7)

OB

(91) protocol. Explain the working of Go-Back-N protocol and compare it with selective repeat 3.

VI - JinU

and acknowledgement number fields of TCP segment. Explain with example. (91) Explain the TCP connection management. What is the significance of sequence number .4

OB

- (9) Out (RTO). Explain the concept of Round Trip Time (RTT) and Retransmission Time (9 .1
- (9) Explain working of Transport layer in the Internet. (q
- (*) delay for single packet? over a fixed route. Explain delay components encountered in the end to end Consider sending a series of packets from sending host to receiving host ()

V - inU

(9) In electronic mail, what is MIME? () (*) What is URL and what are its components? Explain. (9 (9) What is Proxy server and how it is related to HTTP. (P .5

OB

- (8) (8) Compare SMTP with HTTP. .5 (P
- What is DNS? Explain how DNS works. (q

(7)

EE6021

(+++)



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1	. a	ı)	Explain and write an algorithm for greedy method of algorithm design. 10 activities along with their start and finish time as	(8)
			$S = \{A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8, A_9, A_{10}\}$	
			$S = \{1, 2, 3, 4, 7, 8, 9, 9, 11, 12\}$	
			$F = \{3, 5, 4, 7, 10, 9, 11, 13, 12, 14\}$	
			Compute a schedule where the largest number of activities take place.	10136
	1	b)	i) Solve the recurrence	(4×2)
		,	T(n) = T(n-1)+T(n-2)+1, when T=0	
			T(1) = 1	
			ii) if $f(n) = 100^{*}2^{n} + n^{3} + n$ show that $f(n) = O(2^{n})$	
			OR	
1	1.	a)	Determine the best case complexity of Merge sort algorithm.	(4)
		b)	Consider the following function	(4)
			int Sequential Search (int A[], int & x, int n)	
			Int i;	
			For (int i =0, i < n & & $a[i]!=x;i++$)	
			If $(i = n)$ return i;	
			Determine the average and worst case complexity of the function Sec	quential

Search.

c) Show all the steps of Strassen's matrix multiplication algorithm to multiply the following matrices.
 (8)

$$\mathbf{X} = \begin{bmatrix} 3 & 2 \\ 4 & 8 \end{bmatrix} \text{ and } \mathbf{Y} = \begin{bmatrix} 1 & 5 \\ 9 & 6 \end{bmatrix}$$

Unit - II

- a) Discuss Knapsack problem with respect to dynamic programming approach. Find optimal solution for given problem, w(weight set) = {5, 10, 15, 20} and size of knapsack is 8.
 - b) Discuss Dynamic programming solution to Longest common subsequence problem. Write an algorithm to compute an LCS of two given strings. (8)

OR

- a) Write an algorithm for solving n-queen problem. Trace it for N=6 using backtracking approach.
 (8)
 - b) Describe Travelling salesman problem. Show that a TSp can be solved using backtracking method in the exponential time.
 (8)

Unit - III

- a) Explain and write Knuth Morris Pratt algorithm for pattern matching and also comment on its running time.
 (8)
 - - i) How many shifts (both valid and invalid) will be made by the Naīve string matching algorithm?
 - ii) Provide the algorithm to compute the transition function for a string matching automation.
 - iii) Find out the state transition diagram for the automation to accept the pattern P given above.

OR

- a) Discuss Boyer moore pattern matching algorithm with appropriate example of good prefix and bad character.
 (8)
 - b) State the assignment problem and solve the following assignment problem using branch and bound for which cost matrix is given below. (8)

7 5 4 Cost = 2 - 61 3 9 8

6E6022

Unit - IV

E

B

D

(8)

		F	
	b) Write and explain ford Fulkerson algorithm	(8)
		OR	(0)
4.		$s + \frac{12/12}{11/14} v_{4}$	
	a)	Find Maximum flow in above network.	
	b)	Find the corresponding minimum cut and check that its capacity i that value of maximum flow found in a) part	(5) s same as
	c)	Compare Las vegas and Monte carlo algorithm approaches.	(5) (6)
5.	a)	Prove that circuit satisfiability problem belongs to the close ND	
	b)	Assuming 3 CNF satisfiability problem to be NP-complete, prov problem is also NP-complete.	(8) ve clique (8)
5	2)	OR	
э.	a)	Explain approximation algorithm for vertex cover.	(8)
	0)	Write short note on :	(8)
		• NP-completeness • Cook's theorem and its applic	ation
		*** *	

4. a) Give randomized algorithm for min cut of the following graph.

(A)

6E6022

(3)



Maximum Marks : 80 Min. Passing Marks : 26

[Contd....

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

 a) Differentiate between deterministic and non-deterministic finite automata. convert the following non-deterministic transition system into deterministic system.



Present state		Next state			
	a	= 0	a =	= 1	
	State	Output	State	Output	
$\rightarrow q_1$	q ₁	1	q ₂	0	
q ₂	q_4	1	q ₄	1	
q ₃	q ₂	1	q ₃	1	
q ₄	q ₃	0	q ₁	1	
		OF	2		

b) Construct a Moore machine equivalent to the Mealy machine M defined by the table given below : (6)

1. a) Construct a regular expression for the given below deterministic finite automata. (12)



b) Convert the following regular expression into an E–NFA
 R.E. = 00 (0+1)*

Unit-II

(4)

Sile.

- 2. a) Find a regular expression corresponding to each of the following subset of $\{0, 1\}$ (3×4=12)
 - i) The language of all strings containing at least two o's
 - ii) The language of all strings containing at most two o's
 - iii) The language of all strings ending with 1 and don't contain 00.
 - iv) The language of all strings in which both the number of o's and number of 1's are odd.

1

b) Construct a regular grammar for $L = \{a^m b^n | m, n \ge 1\}$

OR

- a) Construct a DFA (Deterministic finite Automata) set of all strings over {0, 1} whose length is divisible by 3.
 - b) Construct a finite automation recognizing L(G), where G is the Grammar.

 $S \rightarrow aS|bA$

 $A \rightarrow aA|a$

Unit-III

- 3. a) Construct a push Down Automata (PDA) for language (12) $L = \{a^{n} b^{n+m} a^{m} | n, m \ge 0\}$
 - b) Show that the grammar

 $S \rightarrow a|ab \ Sb|aAb$

 $A \rightarrow bS|aAAb$ is ambiguous

OR

- **3.** a) Write a short notes on chomsky normal forms. (4)
 - b) Construct a Grammar in Greiback Normal Form (GNF) equivalent to grammar (12)

 $S \rightarrow AB, A \rightarrow BS|b B \rightarrow SA|a$

Unit-IV

- 4. a) Given the Grammar S \rightarrow AB, A \rightarrow a, B \rightarrow C|b, C \rightarrow D, D \rightarrow E, E \rightarrow a find an equivalent grammar which is reduced and has no unit production. (10)
 - b) Consider the following production :

 $S \rightarrow aB|bA$

 $A \rightarrow aS|bAA|a B \rightarrow bS|a BB|b$

for string aaabbabbba, find left most and right most Derivation Trees.

OR

4. Construct a Turing machine for $L = \{a^n \ b \ c^n | n \ge 1\}$ (16)

Unit-V

- 5. a) Explain the model of Linear Bounded Automata (LBA). (6)
 - b) Find a context-free grammar for $L = \{a^n b^n c^n | n \ge 1\}$ (10)

6E6023

[Contd....

(4)

(4)

(4)

(6)

5. Write short notes on :

(4×4=16)

- a) Recursive and recursively enumerable language
- b) Chomsky Hierarchy of languages
- c) Variation of Turing machine
- d) Properties of context-free language



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

- 1. a) Explain various application areas of computer graphics. Differentiate beam penetration method of colored CRT with shadow mask method. (4+4=8)
 - b) What steps are required to plot a line whose slope in between 0° and 45° using Bresenham's method? Indicate the raster locations would be chosen by Bresenham's algorithm when scan converting a line from screen coordinate (20,10) to (30,18).

(**OR**)

- a) If a TV screen has 525 scan lines and an aspect ratio of 3:4 and if each pixel contains 12 bits of intensity information, how many bits are required for refresh rate 30 frames per second?
 (8)
 - b) Give the advantages and disadvantages of DDA line algorithm. Explain mid point circle algorithm. (2+6=8)

Unit-II

- a) Show rotation of a 2D Box represented by (5,5) to (10,15) with respect to (5,5) by 90° in anticlockwise direction. (8)
 - b) Explain flood fill algorithm. Differentiate it with Boundary fill algorithm.

(5+3=8)

(8)

(**OR**)

2. a) Explain Cohen Sutherland line algorithm.

6E6024/2017

b) Show that the composition of two rotations is additive by concatenating the matrix representation for R(θ₁), and R(θ₂) to obtain : (8) R(θ₁). R(θ₂) = R(θ₁+θ₂)

Unit-III

- 3. a) Explain the scan line method for displaying the visible surface of a given polyhedron. (8)
 - b) Differentiate B-splines with Bezier curves. Briefly describe B-spline curve.

(3+5=8)

 $(3 \times 3 = 9)$

(OR)

- a) What is hidden surface problem? Write and explain Z-buffer algorithm for visible surface detection. (2+6=8)
 - b) What is parametric representation of a curve? Explain Bezier curve in detail. (2+6=8)

Unit-IV

- a) Explain following terms :
 - i) Diffuse reflection
 - ii) Specular reflection
 - iii) Illumination model

b)	Explain phong shading. Compare it with Gouraud shading.	(4+3=7)
	(OR)	
a)	What is Ray Tracing? Explain Basic ray tracing algorithm.	(2+6=8)

b) Explain color model RGB. Compare it with HSV. (5+3=8)

Unit-V

5.	a)	Define Animation. Explain principles of animation briefly.	(2+6=8)
	b)	What is compression of data? Explain MPEG in detail.	(2+6=8)
		(OP)	

•	a)	Explain various presentation tools.	(8)
	b)	Explain Authority tools with their uses.	(8)

4.

4.

5

Total No. of Pages : Z

6E6025

6E6025 B.Tech. VI Semester (Main/Back) Examination, April/May-2017 Computer Sc. & Engg. 6CS5A Embedded System Design

Time : 3 Hours

Roll No.

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable by assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit-I

1.	a)	Define embedded systems and also define the components of embedded system hardware. (8)
	b)	What are the requirements before designing an embedded system? (8)
		OR
1.	a)	What is the microcontroller and what is the use of microcontroller? (8)
	b)	Define an embedded system give specific feature of embedded system. In this context how is microcontroller different from a micro processor. (8)
		Unit-II
2.	a)	Explain scheduling of multiple tasking in real time by RTOS and define Interrupt handling. (8)
i a	b)	Explain benefits that an interrupt address table has over fixed and vectors interrupt methods. (8)
		OR
2.	a)	Explain different types of scheduling models. (8)
-2	b)	Explain Round Robin scheduling with suitable example? (8)

Unit-III

a) Explain the meaning of "No Blocking" and "No RTOS calls without fair warning" for intrrupt Routines in an RTOS Environment with examples. (8)

- b) Write short notes on :
 - i) TCB
 - ii) Market window

OR

3. Write short note on :

a) Fixed block Allocation

b) Preemptive Scheduling

- c) Mutex
- d) Pipe

3.

Unit-IV

4. Write short note on :

a) JTAG

b) QNX

c) Windows CE

d) Locator

OR

a) Explain the requirement of RTOS? What are the criteria to achieve it? (8)
b) Explain software Architecture of RTOS kernel. And also define types of RTOS

kernel.

Unit-V

5. Write short note on :

- a) CPU performing issue
- b) Data acquisition system
- c) Energy meter
- d) Debugging Techniques

OR

- 5. a) Explain pros and cos of leaving the debugging software in final embedded system firmware.
 (8)
 - b) What is the complex testing in Embedded system? And define the function of ICE.
 (8)

 (4×4)

(4×2)

 (4×4)

 (4×4)

(8)



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1.	• a)	Compare various test entry devices.	. *
	b)	How do ergonomics affect the interaction between man and machine?	Explain
			(6+10)
		OR	(9,10)
1.	a)	State what are the causes and effects of emotions	
	b)	Explain various in-	(8)
		Emplain various input-output channels.	(8)
		Unit - II	(0)
2.	a)	Explain :	
			(8)
		1) Process of design	•
		ii) Usability Engineering	
		iii) User Focus	
×	b)	Differentiate between local structure	
		setween local structure and global structure.	(8)
		OR	
2.	a)	What are the principles to support learnability?	
	b)	Emploi 1 a composition and additional for the support realizability?	(8)
		Explain low fidelity prototyping and high fidelity prototyping in details.	(8)
6E60)28/2(017	

Unit - III

3. Explain the requirements of user support system and approaches for the same. (16)

OR

 $(8 \times 2 = 16)$

- 3. Explain:
 - i) Evaluation through expert analysis
 - ii) Experimental evaluation.

Unit - IV

4. What is cognition? Explain cognitive architecture in detail. (16)

OR

4. Explain key stroke level models. Three state model and problem state model. (16)

Unit - V

5. Describe the main kind of social mechanism that are used by people to communicate and collaboration. (16)

OR

5. Explain knowledge based and ER based analysis Differentiate between both. (16)

	Roll No [Total No. of Pages : 2
58	6E6058
20	B.Tech. VI Semester (Main/Back) Examination, April/May - 2017
E	Electronics & Communication Engg.
9	6EC6.3A OPtical Fiber Communcation

Maximum Marks: 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable by assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- What is dispersion? Explain dispersion shifted & dispersion flattened optical 1. a) fiber cables? (8)
 - Discuss Absorption Losses in optical fiber, comparing and contrasting the **b**) intrinsic & extrinsic Absorption mechanisms. (4)
 - A 15 km optical fiber Link uses fiber with a loss of 1.5 dB/km. The fiber is c) jointed every kilometer with connectors, which give an attenuation of 0.8 dB each. Determine the minimum mean optical power, that must be Launched into the fiber in order to maintain a mean power Level of $0.3\mu w$ at the detector. (4)

OR

1.	a)	Define the Relative Refractive Index difference for an optical fiber & how it may be related to the Numerical Aperture?	show
	b)	Explain the fabrication of optical fiber by vapour phase method.	(8)
		Unit - II	(-)
2.	a)	Describe the following characteristics of LASER	(8)
8		i) Threshold current temperature dependence.	(-)
		ii) Reliability	
		iii) Noise	
		iv) Frequency chirp	
	b)	Describe the optical characteristics of LED with neat sketch?	(8)

6E6058/2017

- 2. a) Write short notes on Q-switching?
 - b) A Laser Contains a crystal Length 4cm with a Refractive Index of 1.78. The peak emission wavelength from the device is 0.55 μm. Determine the number of longitudinal modes & their frequency separation?
 (8)

Unit - III

- a) Explain the structure features & working principle of PIN photodiode.
 What is the functional significance of intrinsic Layer inserted in between the P&N Layer? (4+4=8)
 - b) What is difference between connector and splices? Explain different types of splices with neat diagram? (8)

OR

- a) Explain the structure & the working of APD with the help of suitable diagram.
 Write advantages & disadvantages of APD over PIN diode? (8)
 - b) Ga As has a band gap energy of 1.43 eV at a 300k. Determine the wavelength above which an intrinsic photo detector fabricated from this material will cease to operate.
 (8)

Unit - IV

- 4. a) Explain Laser based system for measurement of distance with neat diagram. (8)
 - b) Write a short notes on Holography?

OR

- 4. a) What is the working principle of OTDR? Explain the process of fault location Identification through OTDR infield? (8)
 - b) Explain the time domain technique for measurement of dispersion with neat diagram? (8)

Unit - V

- a) Write down the applications of optical fiber instrumentation in daily life? Also gives its advantages & draw backs with clarifications? (8)
 - b) Explain WDM & DWDM in optical fiber.

OR

- a) What is the need of optical Amplifier? Explain Fiber Raman Amplifier (FRA) with neat diagram?
 (8)
 - b) Write a short note on Active and Passive components used in optical fiber system? (8)

(2)

(8)

(8)

Roll No.

Y

1.

[Total No. of Pages :

6E3085

B.Tech. VI Semester (Back) Examination, April/May - 2017 Electronics & Communication Engg. 6EC1(O) Microwave Engg. - II

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

- a) Why ordinary diodes and transistors are useful in microwave detection and microwave applications? (4)
- b) How will you detect microwave signals? Explain different methods used for power measurement of low power (< 1 mw), and high power (> 10 mw). (8)
- c) The double minimum method is used to determine the VSWR and found separation between two adjacent null is 4cm. If twice minimum power points are at 2.5mm, determine the VSWR. (4)

(OR)

- 1. a) Explain the methods of impedance measurement with suitable diagrams. (10)
 - b) An unknown load terminates a 50Ω microwave line. The VSWR measured is 2.4 and the first minima is located at a distance 0.313λ from the load. Find the unknown load and reflection coefficient. (6)

Unit-II

2. a) A lossless dielectric filled parallel stripline has characteristic impedance of 50Ω and d = 3.0mm ($\varepsilon_0 = 8.85 \times 10^{-12}$ F/m, $\varepsilon_r = 6$), Calculate. (10)

- i) Required width of conductor strip
- ii) Stripline inductance
- iii) Stripline capacitance
- iv) Phase velocity
- b) What are slot lines and how do they differ from micro striplines.

(6)

(OR) ·

- a) Explain parallel striplines and thus distributed parameters, characteristics impedance and attenuation losses. (8)
 - b) A micro strip is designed with dielectric constant $\varepsilon_r = 5.23$. The microstrip has width 10 mils, thickness 2.8 mils and it is located at a height h = 7 mils. Find the effective dielectric constant and characteristic impedance. (8)

Unit-III

- 3. a) What are [ABCD] parameters? How can these be related to : (8)
 - i) Z and

ii) S-parameters

b) The scattering matrix of a two-port microwave network is given below: (8)

$$\mathbf{S} = \begin{bmatrix} 0.10 < 0^{\circ} & 0.90 < -45^{\circ} \\ 0.90 < 45^{\circ} & 0.3 < 0^{\circ} \end{bmatrix}$$

Find return loss if port 2 is terminated in short circuit

(**OR**)

- 3. a) What are signal flow graphs? How are they advantageous in microwave network analysis? (8)
 - b) The impedance matrix of a certain microwave circuit is $[Z] = \begin{bmatrix} 4 & 2 \\ 2 & 4 \end{bmatrix}$ determine the corresponding scattering matrix.

Unit-IV

- 4. a) What are charge coupled devices? Using suitable diagrams explain the working of burried CCD and CCD structures. (10)
 - b) Calculate the charge transfer efficiency of a 330 stage CCD, If the charge transfer loss is 0.01%. What fraction of charge pulse remains in packet when finally delivered to the memory circuit?
 (6)

(OR)

4. a) Write short notes on :

i) Tunnel diode

- ii) PIN as switch
- iii) PIN as modulator
- b) What is varactor? Draw a layout of a varactor and hence obtain the equivalent circuit.
 (7)

(9)

(8)

Unit-V

- 5. a) Draw all steps involved in the fabrication of MOSFET'S. Discuss the major difference between low frequency and MMIC fabrication. (10)
 - b) What are the characteristics of substrate material and conductor materials used for MMICs. (6)

(OR)

- 5. a) Outline the planar passive elements used in MMICs. (8)
 - b) What are the various process used to grow epitaxy layer on the substrate?

(8)





ł

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit-I

1. a) Explain in detail the functioning of databus, address bus and control bus.

b) Explain briefly the concept of 'bus' in microprocessor. Why multiplexing is done in 'bus'?
 (8)

OR

1. a) Define tri-state logic and explain the function of the following devices :

 $(4 \times 2 = 8)$

(8)

Maximum Marks : 80

Min. Passing Marks : 26

- i) Buffer
- ii) Decoder
- iii) Latches
- iv) Encoder
- b) Is it possible that an output and input port have the same 8-bit address? If yes how does the 8085 MPU differentiate between the ports? If No, why? (8)

Unit-II

a) Discuss the function of the following signals of 8085, INTR, *INTA* HOLD, HLDA and READY.
 (8)

2.

b) Explain the internal Architecture of 8085 with the help of block diagram. (8)

OR

		Explain the contents of accumulator to run SIM instruction.	(8)
	b)	Discuss RISC and CISC architecture.	(8)
		Unit-III	
3.	a)	Draw and explain the timing diagram of opcode fetch operation and M read operation.	emory (8)
	b)	What do you mean by Instruction set? Explain :	(8)
		i) Flag	(0)
		ii) Machine cycle	2 B) 13 B)
		iii) T-states	
		iv) Addressing mode	
		OR	
3.	a)	What do you mean by programming and debugging?	(8)
	b)	Explain the formats of 8 bit and 16 bit instruction.	(8)
		Unit-IV	

 Draw the interfacing diagram of 8257 DMA-controller with 8085 microprocessor and explain its operation. (16)

OR

- 4. a) What are the different operating modes of 8255?
 - b) What are I/O ports? What are programmable and non-programmable ports?

(8)

(8)

Unit-V

5. Explain arithmetic instructions of 8051. Write an ALP in 8051 to add the contents of 9000 and 9001 address and store the result at address 9002. (16)

OR

6E3086

2.

a)

Explain the contants of

(2)

5. a) Explain with example of various addressing mode of 8051. (8)
b) Write short note on : (8)
i) Timer & interrupts

T

ii)

Special function registers



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Discuss the Lumped Element for MICs and MIMICs with proper diagram	. (8)
	b)	Discuss Impedance matching with Lumped (L-Networks) elements.	(8)
		OR	
1.	a)	Discuss single stub tuning in microstrip circuit using shunt stub.	(8)
	b)	Discuss single section quarter wave transformer.	(8)
		Unit - II	
2.	a)	Explain the following Detector Diodes with neat and clean diagram.	(8)
		i) Silicon Crystal Diode.	
2.		ii) Schottky Diode.	
	b)	Explain the equivalent circuit and characteristic of PIN Diode.	(8)
		OR	
2.	a)	Explain the Gunn Effect in Gunn Diode also explain two valley model in G diode with diagram.	Gunn (8)
	b)	Explain IMPATT Diode with its characteristics, negative Resistance, ou power and efficiency.	utput (8)

3.	a	 Explain the principle of operation of n-channel JFET with neat and cle diagram. 	ean		
	b	b) A sin-p-n bipolar transistor has the following Parameters	(8)		
		Collector current $Ic = 6mA$	(8)		
		Common emitter current gain factor $h = 120$			
×		Operational temperature $T = 300^{\circ}K$			
		Cross-sectional Area $W_{p} = 10^{-8} \text{ cm}^2$			
		Then compute :			
		i) a mutual conductance gm.			
		ii) The input conductance g and resistance R			
		iii) The electron diffusion coefficient D			
		iv) The Diffusion capacitance C_{n} .			
		OR			
3.	a)	Explain the Basic structure and principle of operation of MESEET			
	b)	Explain the single stage FET Amplifier in detail	<i>s)</i>		
		Unit - IV)		
4.	a)	Explain the bunching process. Derive the expression for the induced current in the catcher cavity for two cavity klystron			
	b)	Describe the construction of Reflex klystron and ownlain 1)		
		an oscillator?	S)		
	3	OR)		
4.	a)	Explain Mechanism of oscillations of Magnetrons oscillator? Also explain	n		
	b)	Voltage tunable magnetron. (8))		
	0)	A Frequency agile coaxial Magnetron has the following operation parameters. (8))		
		Fulse duration $\tau = 0.25, 0.50, 1.0 \ \mu sec.$			
		Duty cycle $Dc = 0.001$			
		Compute dl = 6 u dl			
		i) A aile and a sile a			
		i) Agile excursion			
		ii) Pulse to pulse frequency separation.	24		
a (e		iv) Time C N i			
	22	v) Time for N pulses.			
		v) Aglie Rate.			

6E6051

(2)

a) Describe the mechanism of velocity modulation in a two cavity Klystron and hence obtain an expression for the bunched beam current. Also find out condition for maximum power output.
 (8)

(8)

b) A two cavity klystron amplifier has the following

Parameter,

5.

 $R_0 = 40k\Omega$ $I_0 = 25mA$ f = 3 GHz,

 $V_0 = 1000$ V.

Gap spacing in both cavity d = 1 mm. Spacing between the two cavity L=4cm Effective shunt Impedance Excluding beam loading R&h = $30k\Omega$ determine.

- i) Input gap voltage to give max. voltage V_2 .
- ii) Voltage gain, neglecting the beam loading in output cavity.
- iii) Efficiency of Amplifier.
- iv) Beam loading conductance and Show that neglecting it was justified in the proceeding calculation.

OR

- 5. a) Explain the wave modes of helix type travelling wave tube and show that output Power gain of TWT is $AP = -9.54 + 47.3 \ \mu c \ dB$. (8)
 - b) Explain with a neat diagram how TWT is used as microwave amplifier. (8)

6E6051

	Roll No.	[Total No. of Pages :
70	6E6(052
EO	B.Tech. VI Semester (Main/Back) Examination, April/May - 201	
0	Electronics & Communication Engg.	
	6EC2A Micro	oprocessors

Maximum Marks : 80

Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1. Draw and explain the block diagram as well as pin diagram of 8085 microprocessor.

(16)

OR

1. State and explain the various types of addressing modes available in 8085. (16)

Unit - II

State and explain the conditional call and return instructions of 8085 along with suitable examples. (16)

OR

2. State the various data transfer instructions of 8085. Explain them with suitable examples. (16)

Unit - III

3. Explain the arithmetic operations related to memory counter and time delays. (16)

OR

3. Explain the 16 bit data operations and arithmetic instructions. (16)

Unit - IV

(16)

 $(8 \times 2 = 16)$

OR

4. State an explain the interrupts for serial I/O and data communication. (16)

. Unit - V

Explain the programmable peripheral devices, along with the pin and block diagram of 8255 PPI.
 (16)

OR

5. Write short notes on :

4.

- i) DMA controller.
- ii) Interval timer.

6E6052

(2)



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit-I

a) In the circuit shown in figure SCR is forced commutated by circuitry. Compute the minimum value of 'c' so that SCR does not get turned on due to reapplied dv/dt. The SCR has minimum charging Current of 5mA to turn it on and its junction capacitance is 25 pf.



b) Define latching and holding currents as applicable to an SCR. Show these currents on its static I-V characteristics. What are the necessary conditions for turning - on of an SCR?

OR

- a) Describe the switching characteristics of an IGBT. How does latch up occur in an IGBT? (8)
 - b) Discuss why PMOSFET has no reverse blocking voltage where as in an IGBT. (4)
 - c) An SCR has half cycle surge current rating of 3000A for 50Hz supply. Calculate its one cycle surge rating and I²t rating. (4)

Unit-II

- 2. a) A 3 phase bridge rectifier, using diodes delivers power to a load of $R = 10 \Omega$ at a dc voltage of 400V. Determine the ratings of the diodes and of the three phase delta star transformer. (10)
 - b) Describe the evaluation of three phase six pulse diode rectifier from 3 phase 3 pulse diode rectifier with appropriate circuits.
 (6)

OR

2. a) Describe a single phase current source inverter with L load. Write appropriate expression governing its performance and prove there from that total circuit

turn-off time for this inverter is given by $t_o = \left(1 + \frac{\pi}{2}\right)\sqrt{LC}$. (12)

b) Compare the voltage and current source inverters.

Unit-III

- 3. a) Describe flyback SMPS with relevant circuits and waveforms. Derive the various expressions for voltage and current involved. (12)
 - b) Briefly explain the principle of uninterrupted power supply.

OR

- 3. a) A step down/up chopper has input dc voltage of 660V. If the conduction time of thyristor is 120 µ sec. Compute the pulse width of load voltage. In case pulse width is increased three times its previous value, for constant frequency operation, calculate the new value of average output voltage.
 (8)
 - b) Draw the circuit diagrams and relevant waveforms for A,B,C,D,E choppers.

Unit-IV

- 4. a) The speed of a separately exited dc motor is controlled by a 3-φ semiconverters, 415V, 50Hz supply. The motor constants are L = 10 mH, resistance 0.9Ω, armature constant 1.5 rad/s (Nm/A). Calculate the speed of this motor at a torque of 50Nm, when the converter is fired at 45°. (8)
 - b) Describe how the speed of a separately excited dc motor is controlled through the use of two three phase full converter. (8)

OR

a) Describe how the speed of dc series motor can be controlled by means of a dc chopper.
 (8)

6E6053

:063

(4)

(4)

(8)

b) Describe the use of $3-\phi$ semiconverter for a speed control of dc series motor.

Unit-V

5. Write the short note on any three :

(6+5+5=16)

(8)

- i) Dielectric heating
- ii) Expression for induction heating losser
- iii) Variable reluctance stepper motors
- iv) Hybrid stepper motors
- v) Factors affecting induction heating and applications



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit-I

- 1. a) Explain the technique which is required to convert the analog signal to digital signal with proper block diagram. (8)
 - b) In a single integration Delta Modulation system, the voice signal is sampled at rate of 64 KHz. The maximum signal amplitude $A_{max} = 1$.
 - i) Determine the minimum value of the step size σ to avoid slope overload.
 - Determine the granular noise power N_o if the voice signal bandwidth is 3.5 KHz.
 - iii) Assuming that the voice signal is sinusoidal, determine S_0 and SNR.
 - iv) Assuming that the voice signal amplitude is uniformly distributed in the range (-1, 1), determine S_o and the SNR.

 (2×4)

(8)

OR

- 1. a) What is meant by slope overload distortion and granular noise in Delta modulation system? How it can be avoided? (4+4)
 - b) Write short note on T1 carrier system.

Unit-II

- 2. a) Consider the binary sequence 0100101, draw the waveforms for the following formats. (2×4)
 - i) Bipolar RZ
 - ii) Unipolar NRZ
 - iii) AMI RZ
 - iv) Manchester
 - b) A binary PCM wave is to be transmitted over a low pass channel with an absolute maximum bandwidth of 75 KHz. The bit duration is 10 micro seconds. Find a raised cosine spectrum that satisfies these requirements. (8)

OR

- a) Derive the Nyquist's criterion for distortion less base band binary transmission in the absence of noise. (8)
 - b) Describe the detection process of matched filter and its applications with suitable diagram. (8)

Unit-III

- 3. a) Explain and compare the BPSK and QPSK modulation techniques w.r.t. bandwidth requirement, probability of error and data rate and their advantages and disadvantages also. (4+4)
 - b) Explain the selection criteria for digital modulation techniques and applications for different modulation techniques. (8)

OR

- 3. a) Draw the signal space diagram for coherent binary PSK system. Derive the average probability of symbol error for coherent BPSK. (4+4)
 - b) What do you mean by union bound approximation? Explain with suitable diagram and justification. (4+4)

Unit-IV

- 4. a) For a continuous random variable x constrained to a peak magnitude M (-M< x <M). Show that the entropy is maximize when x is uniformly distributed in the range of (-M, M) and has zero probability density outside the range. Show that the maximum entropy is given by "log 2M". (8)
 - b) State and explain the Shannon's channel capacity theorem and its bound.

(6+2)

- 4. a) A television picture is composed of approximately 3,00,000 basic pixels. Each of theses elements can assume 10 distinguishable brightness levels with equal probability. Find the information content of a television picture frame.
 - b) For a noiseless channel, prove that H(X/Y) = 0.

(8) (8)

Unit-V

- a) A source emits six messages with probabilities 1/2, 1/4, 1/8, 1/16, 1/32, 1/32 respectively find the entropy of the source. Obtain the compact binary code and find the average length of the code word. Determine the redundancy and efficiency of the code. (4+4)
 - b) Describe performance comparison of coded and uncoded system. (4+4)

OR

- a) A DMS has an alphabet of eight letters x_i , i = 1, 2, 3...8 with probabilities 0.25, 0.20, 0.15, 0.12, 0.10, 0.08, 0.05 and 0.05.
 - i) Use the Huffman encoding procedure to determine a binary code for the source output.
 - ii) Determine the average number \overline{R} of binary digits per source letter.
 - iii) Determine the entropy of the source and compare it with R.

(4+2+2)

(4+4)

- b) For (7,4) cyclic code and $G(x) = 1+X^2 + X^3$ Determine :
 - i) Let data word 1010 find corresponding code word.
 - ii) Code word is 100101-find data word.

6E6054

5.



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Semilogarithmic paper

Unit - I

1. a) Explain following terminologies in relation to control system :-

(4×2)

- i) Open loop control system
- ii) Controller
- iii) Feedback control system
- iv) Disturbance

b) Simplify the following block diagram to calculate the transfer function $\frac{C(s)}{R(s)}$.(4) $R(s) + G_1 + G_2 + G_3 - C(s)$ $H_1 + G_2 + G_3 - C(s)$ $H_2 - C(s)$ $H_3 + G_3 - C(s)$ $H_2 - C(s)$ $H_3 - C(s)$ $H_2 - C(s)$ $H_3 - C(s)$ $H_3 - C(s)$

c) Calculate the transfer function of the following SFG using Mason's formula. (4)



6E6055/2017

OR

- 1. a) Define the following in relation to control system :
 - i) Servomechanism iii) Regulatory systems
 - ii) Electromechanical systems iv) Transfer function.
 - b) Draw the electrical analog of the following mechanical system using. (2×4)
 - i) Force-voltage Analogy ii) Force-o

Force-current Analogy

 (4×2)





2. a) Derive the response of a second order Underdamped system given by $\frac{C(S)}{R(S)} = \frac{W_n^2}{s^2 + 2\xi W_n s + W_n^2};$ for unit step input. (10)

b) Briefly explain the concept of stable, unstable and marginally stable system. (6)

OR

2. a) Define peak time, settling time and maximum overshoot and also calculate them for a unity feedback system whose forward transfer function is given by

$$G(s) = \frac{25}{s(s+6)}.$$
 (1.5×6)

b) Consider a sixth order system with the characteristics equation given by : (7) $S^6 + 2S^5 + 8S^4 + 12S^3 + 20S^2 + 16S + 16 = 0.$

Comment on the Location of roots of this system.
Unit - III

- Sketch the root Locus plot of the transfer function given by $G(s)H(s) = \frac{K(s+1)}{s(s-3)}$. 3. Showing all the salient points and also explain all the rules associated. (16)
 - OR

3. Explain following terms in relation to control system.

- Polar plot i)
- Mapping ii)
- Nyquist stability Criteria iii)
- Effect of adding pole & zero on Root locus. iv)

Unit - IV

Construct the Bode plot for the given open loop transfer function with unity feedback 4.

$$G(s) = \frac{1}{s(1+0.2s)(1+0.02s)}$$
(1)

OR

4.

Define the following terms with respect to frequency response analysis: (3×2) a)

Gain Margin i)

Phase Margin ii)

iii) Nicholas Chart

Derive any two frequency domain specifications. b)

Unit - V

Determine the transfer function of the system whose state model is given by (8) 5. a)

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$
$$y = \begin{bmatrix} 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

b) Convert $\frac{8}{(s+1)(s+2)}$ into state model.

(8)

OR

Write short note on : 5.

- a) Compensator
- State Model c)

- b) Controllability
- Canonical Representation. d)

6E6055

** (3)

 (4×4)

(5×2)

 (4×4)

6)



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

1. a) Define the following for Gaussian distribution of data :

(8)

- i) Precision index
- ii) probable error
- iii) Standard deviation of mean
- iv) Standard deviation of standard deviation
- b) Define the limiting (guarantee) errors. Derive the expression for relative limiting error. (8)

(OR)

- 1. a) Define Gaussian error curves and probable error. (8)
 - b) Describe various types of errors and explain combination of errors. (8)

Unit-II

- a) Derive the expression for the gauge factor of strain gauges. Give the constructional details of a strain gauge. (8)
 - b) Explain the construction and working principle of seismic accelerators with suitable examples.
 (8)

[Contd....

- a) What are different selection criteria for proper transducer? Explain the input, output and transfer characteristics of a transducer. (8)
 - b) Explain the construction and principle of working of a Linear Voltage Differential Transformer (LVDT). Explain how the magnitude and direction of the displacement of core of an LVDT is detected. (8)

Unit-III

- 3. Explain the working principle of function generator along with a block diagram. a) Discuss the general features of a function generator. (8)
 - b) Explain the construction and working of frequency to voltage converters along with a suitable diagram. (8)

(OR)

3. a) Explain the circuit diagram of instrumentation amplifier and also discuss the applications, merits and demerits. (8)

b) Write short notes on :

> Shielding i)

2.

ii) Grounding

iii) Sample and hold circuit

Unit-IV

4. Explain the industrial metering and various types of industrial tariffs. (8) a)

Discuss the constructional details of a single phase induction type energy b) meter. Discuss the different errors and their compensation in single phase energy meter. (8)

(OR)

4. a) Write short notes on :

> i) Ratiometer type frequency meter

ii) Saturable core type frequency meter

b) Define power factor. Explain causes of low power factor and methods of improvement of power factor. Explain the method of measurement of power factor. (8)

(8)

105

(8)

Unit-V

- 5. Write short notes on any two :
 - a) Capacitive voltage transformer
 - b) Transient performance of CT.
 - c) Wilson compensation method for reduction of error in CT
 - d) Protection circuit of CT
 - e) Major sources of errors in CT



Instructions to Candidates:

Maximum Marks : 80 Min. Passing Marks : 26

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

This

· a) E	xplain f.	omi-j	
b) p	-plain functional charac	teristics of a role	
0) De	etine zone of protection		am
1. 18 20 21	1 ••••••••••••	, primary and back up protection	(8)
1. a) Wh	at are one	OR Protection.	(8)
b) Exp	lain steady state ratio a	ners? Discuss transient errors availab nd phase angle errors in PTc	le in CT. (8)
2. Discuss th	e following paramet	Unit-II	(8)
a) Instar	a pur diffeters	for over current relays -	
b) Defin	ite time		(16)
c) Invers	e time		
d) Time a	nd current Grading		5 SA 16
2. Give brief de	escription of	OR	
	r ston of over curren	nt protective scheme	
6E3111/2017		schemes for a feeder.	(16)
	*.		

(1)

Unit-III

3.	a)	Differentiate between differential and percentage differential protection.	(8)
	b)	Discuss unbalanced stator currents.	(8)
		OR	
3.	a)	Explain the mechanism of Rotor protection against excitation and prime m failure.	10uer (10)
	b)	Define field earth fault.	(6)
		Unit-IV	
4.	a)	What is Buchholz relay. Discuss its working with suitable diagram.	(8)
	b)	What do you mean by percentage differential protection.	(8)
		OR	
4.	Dis	cuss the following parameters for Bubar protection-	(16)
	a)	High impedance relay scheme	
	b)	Frame leakage protection	
		Unit-V	
5.	a)	Explain the working of induction cup type reactance and mho relays.	(8)
1.15	b)	List out the faults and abnormal operating conditions for induction mote	or.
			(8)
	(R. 5)	OR	8

5. Discuss the construction, operating principle and characteristics of an electromagnetic impedance relay. List out the effects of arc resistance. (16)

TTT

.

	Roll No.	[Total No. of Pages : 2
3	6E3113	in the cashe mow L again in
I	B.Tech. VI Semester (Back) Examin	ation, April/May-2017
E	Electrical & Electronics	Engg.
9	6EX5(O) Data Structur	es in C
	EE,EX	

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

 Dei	ine and explain following no	otations for complexity :	(16)
a)	Big oh		
b)	Omega		
c)	Theta		
Als	o discuss their significance		

(OR)

1.	write C code to create nodes of singly, doubly and circular link lists.	(16)
	Unit-II	
2.	What is sparse matrices? How it can be represented as an array. Also c different forms of a sparse matrix	discuss

(**OR**)

2.	Write a 'C' program to check whether the string is palindrome or not.	(16)

Unit-III

a)	What is stack data structure. Explain its applications.	(6)
----	---	-----

b) Write an Algorithm for infix to prefix conversion using stack. (10)

(OR)

3. Write a 'C' program for decimal to binary conversion using stack. (16)

6E3113/2017

3.

(1)

[Contd....

Unit-IV

4.	a)	Create an AVL search tree from given set of values :	(8)
		H, I, J, B, A , E, C, F, D, G, K, L	(8)
	b)	Create a Binary search tree by inserting following numbers ·	(8)
		40, 25, 70, 22, 35, 60, 80, 90, 10, 30	(8)
		(OR)	
4.	Wr	ite a program to implement Binary search Tree and pre order travers	al in 'C'.
			(16)
		Unit-V	
5.	a)	Write and explain kruskal's algorithm (Minimum spanning tree).	
	b)	Write and explain prim's Algorithm (Minimum spanning tree).	(2×8)
		(OR)	· ,
5.	a)	Sort following numbers using insertion sort Algorithm	(9)
		13, 4, 18, 25, 10, 16	(0)
	b)	Explain quick sort with the help of suitable example.	(8)



4



1.

1.

0)

Maximum Marks: 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit-I

<i>a)</i>	Determine the domain of following function :	(4)
	$f(x) = \sqrt{4x - 8}$	3 4
b)	Show that the vectors are linearly dependent	(4)
	$\alpha_1 = [2, 3], \alpha_2 = [1, 1], \text{ and } \alpha_3 = [4, 5]$	(.)
c)	Explain in brief about time invariant system.	(4)
d)	Write a short note on linear and a still	. (4)
	and non linear system.	(4)
	OR	
a)	Show that the vectors $x_1 = (1, -1, -2, -4), x_2 = (2, 3, -1, -1), x_3 = (3, -4), x_4 = (6, 3, 0, -7)$ are linearly dependent. Also, for $1 - 1, x_3 = (3, -1, -1), x_4 = (3, -1, -1), x_5 = (3, -$	1, 3, -2),

endent. Also find relationship among them. (4)

b) Find the domain of function
$$f(x) = \frac{\sqrt{-x}}{(x-3)(x+5)}$$
. (4)

Write a short note on Relaxedness and causality of a system. c) (4) Define domain and range of function with suitable examples. d)

6E6071/2017

[Contd....

(4)

Unit-II

2. Construct the state model for a system characterized by the differential a) equation. (8)

$$\ddot{y}'' + 5\ddot{y}' + 7\dot{y}\,9\,y = 8u$$

Express the following transfer function (Tf) in a state model b)

$$\frac{y(s)}{u(s)} = \frac{1}{s^3 + 6s^2 + 11s + 6}.$$
(8)

OR

Find the state model for following transfer function (Tf): 2. a) (8)

$$\frac{y(s)}{u(s)} = \frac{1}{(s+1)} \frac{1}{(s+2)} \frac{1}{(s+3)}$$

b) Construct the state model in Jordan's canonical form for a system whose transfer function (Tf) is given by $\frac{y(s)}{u(s)} = \frac{10}{(s+1)^2(s+2)}$. (8)

Unit-III

- Derive the ackermann's formula for the evaluation of state feedback gain. (8) 3. a)
 - Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & -6 \\ 2 & -2 & 3 \end{bmatrix}$. (8) b)

OR

- A system characterized by the transfer function $\frac{y(s)}{u(s)} = \frac{2}{s^3 + 6s^2 + 11s + 6}$. Test 3. a) the controllability and absorbability of the system. (8) (8)
 - b) Consider the state equation :

$$\begin{bmatrix} \dot{x}_1(t) \\ \dot{x}_2(t) \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

Obtain the state transition matrix.

Unit-IV

(2×8=16)

4. Find the z transform of following function :

i) $x(n) = (-1)^n u(n)$

ii) $x(n) = (1/4)^n u[-n+3]$

4.	Define and prove initial and final value theorem.		(16)
	8	Unit-V	
5.	a)	Write a short note on modeling of sample-hold circuits.	(8)
	b)	Write a short note on stability in z-plane.	(8)
		OR	
5.	a)	Write a short note on digital PID controllers.	(8)
	b)	Write a short note on adaptive control system.	(8)

[Total No. of Pages :



Time : 3 Hours

Maximum Marks: 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Define Townsend's first and	second	ionization	coefficients.	Explain
		Townsend's criteria for a spark.				(8)

Explain clearly suspended particle mechanism of liquid break down. b) (8)

OR

- What are treeing and Tracking? Explain clearly the two processes in solid 1. a) dielectrics. (8)
 - b) Discuss the application of gases in Power System.

Unit - II

2.	a)	Explain the steps of	generation of high D.C. Voltage in detail	. (8)
----	----	----------------------	---	-------

b) Discuss about the Mark's multistage impulse generator. (8)

OR

2.	a)	Explain the different schemes	for cascade	connection	of transformer	for
		producing very high voltage.			8 	(8)

Write short note on Klydonograph. b)

[Contd....

(8)

(8)

Unit - III

- 3. a) Discuss about high voltage schering bridge. What are its applications. (10)
 - b) What is partial discharge? Compare between wide band and narrow band partial discharge. (6)

OR

3. a) Explain the method by which resistivity of a dielectric can be measured. (8)

b) Write short notes on

i) Dielectric constant ii) Loss factor

Unit - IV

- 4. a) Explain the simpson's theory of charge accumulation in thunder clouds. Describe the mechanism of lightning strokes. (10)
 - b) Explain refraction of travelling wave at T junction.

OR

- 4. a) What are the mechanisms by which lightning strokes develop and induce over voltage on over head power lines. (10)
 - b) Explain the terms attenuation and distortion of travelling waves propagating on overhead lines. (6)

Unit - V

- 5. a) Explain insulation coordination problem. Describe the basic impulse insulation levels.
 (8)
 - b) Describe the volt time curves construction and purpose by drawing neat diagram and mentioning all specifications of curve in diagram. (8)

OR

5. Explain Various types of lightning arrestors in detail.

(16)

(8)

(6)

	Roll No [Total No. of Pages : 3
2	6E6073
	B.Tech. VI Semester (Main/Back) Examination, April/May - 2017
9	Elect. Engg
HO	6EX3A Switchgear & Protection
	EE,EX

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

- 1. a) Classify relay according to their construction, application and principle of operation and time of operation. (10)
 - b) Write a short note on "Phase splitting type amplitude comparator". (6)

(OR)

- 1. a) Explain the Hall effect devices. How can they be used as phase comparator?
 - b) Name of the coincidence circuit type phase comparator. Explain direct phase comparison techniques. (8)

Unit-II

a) A 3-φ, 15 MVA, 11KV star connected generator is protected by the current balancing system of protection. If the ratio of CT is 1200/5, the minimum operating current of the relay is 0.7A and the neutral point earthing resistance is 5.5Ω. Calculate the percentage of each phase of state winding which is unprotected against earth faults when the machine is operating at normal voltage.

6E6073/2017

[Contd....

(8)

b) Discuss all the factors on which protective gear for transformer depends and also discuss differential protection for it. (8)

(OR)

- a) Derive torque equation for reactance relay with construction diagram and operating characteristic. (8)
 - b) Write a short note on choice between impedance, reactance and MHO relay. (8)

Unit-III

- 3. a) Discuss about carrier assisted and carrier block scheme of distance protection. (10)
 - b) Write a short note on power swings.

(OR)

- a) What do you understand by out of step blocking? Discuss the operating principle of an out of step bloching relay.
 (8)
 - b) Draw and explain the circuit connection of three MHO units used at a particular location for three zones of protection. (8)

Unit-IV

- 4. a) Explain Arc interruption theories.
 - b) In a short circuit test on a circuit breaker, the following data was obtained on a frequency transient. (8)
 - i) Time to reach the peak restriking voltage, 55 μs .
 - ii) The peak restriking voltage, 100 KV. Calculate the
 - a) Natural frequency of the circuit
 - b) Average rate of rise of restriking voltage

(OR)

- 4. a) Discuss Air circuit breaker construction and working principle. (8)
 - b) Derive the expression for resistance to be connected across the breaker contacts and calculate the same for given data. L = 4.5H, $C = 0.02 \mu f$. (8)

6E6073

(2)

(8)

(6)

Unit-V

- a) Write a short note on air blast circuit breaker.
 - b) Write a short note on construction and advantage of vacuum circuit breaker. (8)

(8)

(6)

(OR)

- a) Write a note on selection of circuit breaker and discuss the advantages of SF₆ circuit breaker. (10)
 - b) Write a short note on rating of circuit breaker.

T.

5.



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- 1. a) Explain the operation of single phase AC voltage controller with R load. What changes will takeplace in output voltage? (8)
 - b) Analyse the output waveform of a single phase a.c. regulator (Converter) into various harmonics with fourier series and find the expression for the magnitude of nth harmonic, E_{nm} and its phase ϕ_n . (8)

OR

- a) What are the steps involved in determining the output voltage waveforms of three phase bidirectional controllers. (8)
 - b) What is the control range of the delay angle for single phase unidirectional controller. (8)

Unit - II

- a) Draw and explain the control circuit block diagram for a cycloconverter with non circulating current.
 (8)
 - b) What is a load commutated cycloconverter? How does it differ from line commutated cycloconverter? (8)

[Contd....

- a) Discuss why a 3\$\ophi\$ to 1\$\ophi\$ cycloconverter requires positive and negative group phase controlled converters. Under what conditions, the group works as inverter or rectifier.
 - b) What are the advantages and disadvantages of a cycloconverter? (8)

Unit - III

- a) Explain 120° mode of operation of V.S.I. Compare V.S.I. and C.S.I. with respect to their merits and demerits.
 (8)
 - b) Discuss the method of harmonic reduction in inverters by PWM. (8)

OR

- 3. a) What is the need for controlling the output at the output terminals of an inverter? Also, Discuss briefly and compare the various methods employed for the control of output voltage of inverters.
 (8)
 - b) A 3φ bridge inverter is operated in 180° conduction mode. Draw the output line voltage waveform and obtain fourier series for the line voltage. (8)

Unit - IV

- a) What are the advantages and disadvantages of resonant inverters with bidirectional switches.
 (8)
 - b) What are the methods for voltage control of series resonant inverters. (8)

OR

- **4.** a) What is class E resonant inverter.
 - b) What are the advantages and limitations of zcs and zvs converters. (8)

(8)

1 . . .

Unit - V

- 5. a) Discuss the comparative analysis of flyback and forward converter in detail. (8)
 - b) What is conditioning of power factor? Discuss multistage converter used for conditioning of power factor. (8)

OR

5. a) What are the elements of SMPS ? Discuss its advantages and disadvantages. (8)

(8)

b) Discuss the operation of bidirectional AC power supplies.

**



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit-I

- 1. a) Define smart grid. Differentiate between conventional grid and smart grid.
 - b) Explain the concept of Resilient and self-healing grid.

OR

- 1. a) Describe the opportunities and challenges relate to smart grid.
 - b) What are the major points which are the forced drivers for demanding smart grid?

Unit-II

- 2. a) What is smart substation? Explain the classification of smart substation.
 - b) Explain Energy management system in detail.

OR

- 2. a) Explain the principle and operation of phase shifting transformer.
 - b) Describe volt/VAR control in smart grid.

Unit-III

- **3.** a) Explain how smart meter can be play an important role to make a system smart.
 - b) What are the protocols and benefits of Advanced Metering Infrastructure (AMI)?

[Contd....

OR

- 3. a) What is phasor measurement unit? Explain its features and applications of PMU in power system.
 - b) Give the brief description of Intelligent Electronic Devices (IED).

Unit-IV

- 4. a) Describe the power quality issues of grid connected renewable energy resources.
 - b) Explain ElectroMagnetic Compatibility (EMC). What is the importance of voltage quality to achieve EMC?

OR

- 4. a) Illustrate power quality monitoring concept and also explain monitoring considerations.
 - b) Explain the concept of power quality conditioners related to smart grid.

Unit-V

- 5. a) Explain in detail about the cyber security for smart grid.
 - b) Describe IP based protocols.

OR

5. Write a short note on :

a) Cloud computing

b) LAN and WAN

	Roll No [Total No. of Pages : 3
18	6E7018
2	B.Tech. VI Semester (Main & Back) Examination, April/May - 2017
È	Mechanical Engineering.
9	6ME6.3A Maintenance Management

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

- a) What is the meaning of Maintenance Management? How it is essential in case of Plant & Machinery? (8)
 - b) Define the meaning of TQM. Describe various elements for implementation of TQM.
 (8)

(OR)

- 1. a) What is standardization? Also describe ISO 9000.
 - b) If annual requirement of an item is 1000 units. Cost of each unit is Rs.30, ordering cost Rs.10 per order, Carrying cost 20%, calculate EOQ. (10)
 - i) If supplier sales in lots of 25. Which nearest multiple of EOQ is recommended to buy.
 - ii) If supplier offer discount of 2% on min lot size 250. Whether to buy or not?
 - iii) Supplier offer following

Order less than 100 - price per unit Rs.30

Order between 100 & 199 - price per unit Rs. 29.75

Order more than 200 - price per unit Rs. 29.60

6E7018 /2017

[Contd....

(6)

Unit-II

2.	a)	What are the important points in administration of maintenance. Explain th Briefly.	em (8)	1
	b)	What is maintenance strategy? Describe different types of maintenance strate	gy. (8)	
		(OR)		
2.	a)	Differentiate between planned maintenance and unplanned maintenance.	(8)	
	b)	Draw & Describe organization chart of maintenance department.	(8)	
		Unit-III		
3.	a)	What is Tribology? Define its role in maintenance.	(6)	
	b)	What is the use of lubrication in Maintenance? Define Types of lubricat Mechanisms.	ion (6)	
	c)	Write a short note on seals and packings.	(4)	
		(OR)		
3.	a)	What is fault analysis? Describe different methods of fault analysis.	(8)	
	b)	What are the main causes of degradation of lubricants.	(8)	
		Unit-IV		
4.	a)	Write short note on	(6)	
		i) Machine Health Monitoring		
ia.		ii) Condition monitoring		
	b)	Give the advantages and disadvantages of condition monitoring.	(4)	
	c)	Explain in detail, various health monitoring techniques.	(6)	
		(OR)		
4.	a)	Explain about Signal processing technique and its terms.	(8)	
	b)	Discuss about 'Data Base Design' and explain the phases of Data Base Des	ign. (8)	

Unit-V

	a)	Define RAM and explain importance of reliability and explai affecting RAM.	n which factors (10)			
	b)	Explain Application of failure mode and effects analysis.	(6)			
		(OR)				
	a)	Write short note on				
		i) Reliability of repairable and non repairable system.				
10		ii) Improvement in Reliability.				
		iii) Utilization factor.				

b) The MTBF of plastic injection moulding machine is 300 hrs. If 100 machines of the same make, same life are working for the least 100 hrs. How many machines should have failed during this time? (7)

5

5



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Explain the various methods of finding the frictional power of an IC engine and discuss the relative merits. (8)
 - b) The air flow to a four cylinder four stroke petrol engine is measured by mean of 7.5 cm diameter sharp edged orifice, cd = 0.6, during a test on the engine the following data were recorded : (8)

Bore = 11 cm, stroke = 13 cm

Engine speed = 2250 rev/min

Brake power = 36 kw

Fuel consumption = 10.5 kg/hr

CV of fuel = 42,000 kJ/kg

Pressure drop across the orifice = 4.1 cm of water atmospheric temp & pressure = 15° C & 1.013 bar

- Calculate: 1) Brake Thermal efficiency
 - 2) Brake mean effective pressure.
 - 3) Volumetric efficiency based on free air conditions.

- a) Explain the effect of Air fuel ratio on Co, HC No_x emission from petrol engine.
 (8)
 - b) Explain the automative pollution control system.

Unit - II

(8)

 $(3 \times 3 = 9)$

- 2. a) Describe the phenomenon of detonation & discuss different factors affecting detonation in SI engine. (10)
 - b) Explain the need of additives in the fuels. What are the effects of various additives in engine fuels? (6)

OR

- a) What are the basic requirement of good SI Engine combustion chamber? What are the advantages of overhead combustion chamber over side valve combustion chamber.
 - b) "Factors which increase detonation in SI Engines, tend to reduce knocking in CI engines". Discuss the validity of the statement. (8)

Unit - III

- 3. a) What are basic requirements of spark ignition system? Describe working of spark ignition system used in a four cylinder petrol engine. (8)
 - b) Why injection system is better than carburetion system? Compare both the system with neat diagram. (8)

OR

- 3. a) Explain Transistorized Coil Ignition (TCI) system with neat sketches. (7)
 - b) Write short note on following :
 - i) MPFI system
 - ii) Firing order
 - iii) Fuel pump

Unit - IV

- 4. a) Explain thermodynamic cycle of supercharging with neat sketch. (8)
 - b) What do you understand by scavenging? Explain various scavenging process in brief. (8)

a) A racing car SI engine is to be converted for a passenger car. What changes will have to be made as regard (8)

- i) Valve timing
- ii) Valve lift

4.

- iii) Ignition timing
- iv) A/F ratio supplied, 150 NM, 250 NM, 450mm², 50mm, 420rpm, 217 NM, 2.95 kg/hr, 44000 kJ/kg, 0.068 log/sec, 45 K 4.1868 KJ/kg K.
- b) Why cooling of IC engine is essential? What are the effects of under cooling and over cooling of an engine? (8)

Unit - V

- a) What are the effect, of variable compression ratio on power output thermal load. Specific fuel consumption and engine noise? (8)
 - b) Draw a neat line diagram of a diesel power plant showing all the system with brief description.
 (8)

OR

5. Write short note on following :-

 $(4 \times 4 = 16)$

- a) Free piston engine
- b) Effect of compression ratio on power output.
- c) Dual fuel engine.
- d) Rotary engine

**

Total No. of Pages 3

6E3051

B.Tech. VI Semester (Back) Examination, April/May-2017 6ME3(O) - Manufacturing Science & Technology

Time : 3 Hours

Roll No.

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-1

- a) What are the essential characteristics in the proper design of Jigs & Fixtures?
 (8)
 - b) Discuss various principles of clamping and explain any two clamping elements. (8)

OR

- a) What are the functions of Jigs & Fixtures? What is the Six Points Location Principle? (8)
 - b) Write short notes on following:
 - i) Milling Fixtures
 - ii) Jig Bushes.

Unit-2

- a) Explain Electric-Discharge Machining process in brief. What are the voltages, amperes and temperatures involved? What are the advantages and disadvantages of EDM process.
 (8)
 - b) Explain "Abrasive Jet Machining" process. Discuss its advantages, limitations and applications. (8)

OR

a) Explain "Laser Beam Machining". Discuss its advantages, limitations and applications.
 (8)

 $(2 \times 4 = 8)$

b) What is the principle of Electron Beam Machining? Discuss the process of EBM with neat sketch as well as its advantages and limitations. (8)

Unit-3

- a) Explain "Three-Wire Method" of measurement of effective diameter of screw threads. What do you mean by "Best Size Wires"? (8)
 - b) What are the various elements of surface roughness? Explain any one method of measurement of surface roughness. (8)

 $(2 \times 4 = 8)$

OR

- 3. a) Explain with neat sketch:
 - i) Gear tooth-vernier caliper.
 - ii) Optical Flat.
 - b) Differentiate between a comparator and a measuring instrument. Explain the working principle and applications of a pneumatic comparator. (8)

Unit-4

- 4. a) Explain geometry of a single point cutting tool and explain functions of various tool angles.
 (8)
 - b) A mild steel tubing of 50 mm outside diameter is turned on a lathe with a cutting speed of 20 m.p.m. with a tool having tool rake angle of 35°. The tool is given a feed of 0.10 mm/rev. and it is found with dynamo meter the cutting force = 250 kg and feed force = 100 kg. length of continuous chip in one revolution = 80 mm. Calculate the coefficient of friction, shear plane angle, velocity of chip along tool face and chip thickness. (8)

- a) Make a brief summary of relationship between various angles and forces as per merchant's analysis of metal cutting.
 (8)
 - b) A surface 80 × 160 mm² is rough machined using a face milling cutter of 150 mm diameter having 10 teeth. The cutter center is offset by 15 mm from the

line of symmetry of work piece. Estimate the time to rough machine the surface if the feed per tooth 0.25 and cutting speed 20 m/min. With 5 mm approach and 5 mm over travel what is the single pass feed time? Also find the time to rough and finish machine the work if cutter is symmetric. (8)

Unit-5

5. a) Write short notes on followings:

i) Design of a lathe bed.

ii) Anti friction guideways.

b) What is the purpose of guide ways? What are the principle requirements of guide ways.
 (8)

OR

- **5.** a) Explain the different types of slide ways with the help of neat sketch. (8)
 - b) Write short notes on following:

 $(2 \times 4 = 8)$

i) Materials used for lathe bed.

ii) Lathe bed sections.

6E3051

 $(2 \times 4 = 8)$

1 - 1000 - 1000



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Show that when a jet of water impinges on a series of curved vanes, maximum efficiency is obtained when the vane is semicircular in section and the velocity of the vane is half that of the jet. (7)
 - b) A jet of water of 75mm diameter with a velocity of 20m/sec strikes a flat smooth plate. Determine the thrust on the plate, if the plate is moving in the same direction as the jet with a velocity of 5m/s. Also find the work done per second on the plate and the efficiency of the jet. (9)

- a) Obtain an expression for unit speed, unit discharge and unit power for a turbine.
 (6)
 - b) A Pelton wheel is revolving at a speed of 190 rpm and develops 5150.25 KW when working under a head of 220m with an overall efficiency of 80%. Determine unit speed, unit discharge and unit power. The speed ratio for the turbine is given as 0.47. Find the speed, discharge and power when this turbine is working under a head of 140 m.

Unit - II

2. a) Describe briefly the functions of various main components of Pelton turbine. (7)

(9)

b) Design a Pelton wheel with the following data Shaft power = 11772 kW, Head = 380 m, Speed = 750 rpm, Overall efficiency 86%, D/d = 6, Cv = 0.985, $\phi = 0.45$

Determine D, d and no of jets.

OR

- 2. a) What is Governing? Explain the methods of Governing of impulse turbine. (8)
 - b) A Pelton wheel is having a mean bucket diameter of 1 m and is running at 1000 rpm. The net head on the Pelton wheel is 700m. If the jet deflection angle is 165° and discharge through nozzle is 0.1 m³/s, find : (8)
 - i) Power available at the nozzle, and
 - ii) Hydraulic efficiency of the turbine.

Unit - III

- a) A Kaplan turbine runner is to be designed to develop 7357.5 kW shaft power. The net available head is 5.5 m. Assume the speed ratio is 2.09 and flow ratio is 0.68, and the overall efficiency is 60%. The diameter of the boss is1/3rd of the diameter of the runner. Find the diameter of the runner and its speed. (8)
 - b) A water turbine has a velocity of 6m/s at the entrance to the draft tube and a velocity of 1.2m/s at the exit. For friction losses of 0.1m and tail water 5m below the entrance to the draft tube, find the pressure head at the entrance. (8)

- 3. a) An inward flow reaction turbine has external and internal diameters as 1m and 0.5m respectively. The velocity of flow through the runner is constant and is equal to 1.5m/s. Determine
 (8)
 - i) Discharge through the runner, and
 - ii) Width of the turbine at outlet if the width of the turbine at inlet = 200mm.
 - b) What do you understand by the characteristic curves of a turbine? Explain the important types of characteristics curves.
 (8)

Unit - IV

- a) Obtain an expression for the saving in work done against friction without air vessel and with air vessel in a single acting reciprocating pump. (8)
 - b) A double acting reciprocating pump, running at 50rpm, delivers 8.4 liters/s of water. The dia of piston is 150 mm and stroke length 300 mm. The static head of the pump is 25m. The suction pipe is 5m long and 100 mm in diameter. Find the percentage slip and power required to run the pump. Also calculate the acceleration head at the beginning of the suction stroke.

OR

- a) Differentiate between a hydraulic ram and a centrifugal pump. Obtain an expression for the efficiencies of the hydraulic ram.
 (8)
 - b) How does a torque converter differ from a fluid coupling? Explain the working principle of torque converter with the help of neat sketch. (8)

Unit - V

- a) What are the various components of hydroelectric power station? Explain with the help of neat & clean diagrams and layout. (8)
 - b) What do you mean by hydrological cycle and hydrographs? Explain in detail. (8)

- 5. a) What are the different parameters for selection of site for hydroelectric power plant? Explain. (6)
 - b) Write a short note for present scenario of hydro-power in India. (10)



T R	Coll No [Total No. of F	ages : 3
5	6E3054	
	B.Tech. VI Semester (Back) Examination, April/May-201'	7
3	Mechanical Engineering	
5	6ME6(O) Numerical Methods and Applied Statistics	2.5

Maximum Marks : 80 Min. Passing Marks : 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

- 1. Probability distribution table
- 2. t-distribution, F-distribution Normal distribution

Unit-I

- 1. a) Apply Newton Rephson method to solve the equation $2(x-3) = \log_{10} x$ correct to three decimal places. (8)
 - b) Using the method of false-position, find the root of equation $xe^{x}-2=0$. (8)

OR

- 1. a) Find all the roots of the equation $x^4 3x + 1 = 0$ by using Graeffe's methods.(8)
 - b) Find the roots of the equation $x^3 9x + 1 = 0$ between x = 2 and x = 4 by the using bisection method. (8)

Unit-II

2. a) Solve the system of equations : x+y+z=1, 4x+3y-z=6, 3x+5y+3z=4 by using partition methods. (8)

b) Use Bessel formula to find y_{25} from the following data $y_{20} = 24$, $y_{24} = 32$, $y_{28} = 35$, $y_{32} = 40$. (8) 2. a) Using Lagrange's formula; find the value of f(5) from the following table: (8)

b) Compute the largest eigen value and the corresponding eigen vector of the following matrix (8)

$$\mathbf{A} = \begin{bmatrix} 3 & 1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 3 \end{bmatrix}$$

Unit-III

- 3. a) Use Simpson's $\frac{1}{3}$ and '3/8' rule to Evaluate the following $\int_0^1 \frac{dx}{1+x^2}$ Hence determine the value of π in each case. (8)
 - b) Use Picard's method to solve $\frac{dy}{dx} = 1 + xy$ with $x_0 = 2, y_0 = 0$. (8)

OR

- 3. a) Evaluate the following integral by using Gauss-three point quadrature rule $\int_{0}^{1} \frac{dx}{1+x}.$ (8)
 - b) Use Milne's p–c method to obtain y(0.4) by solving $\frac{dy}{dx} = 2e^x y$ Given that

y(0)=2, y(0.1)=2.01, y(0.2)=2.04, y(0.3)=2.09.

Unit-IV

4. a) Calculate the first four moments about the mean for the following distribution:

(8)

(8)

(8)

- x: 6 7 8 9 10 11 12 y: 3 6 9 13 8 5 4
- b) Derive mean and variance for Normal distribution.

OR

4. a) Calculate Rank correlation coefficient for the following data: (8)

x 81 78 73 73 69 68 62 58 y 10 12 18 18 18 22 20 24 b) Six dice are thrown 729 times. How many time do you expect at least three dice to show a 5 or 6. (8)

Unit-V

5. a) If ' θ ' is the acute angle between the two regression lines in case of two variable

x and y show that $\tan \theta = \left(\frac{1-r^2}{r}\right) \frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2}$. Where $r, \sigma_x \sigma_y$ have their usual

meanings. Explain the significance of the formula when r = 0 and $r = \pm 1.(8)$

b) Test made on the breaking strength of 10 pieces of a metal give the following results 578, 572, 570, 568, 572, 570, 572, 596, 570 and 584 kg. Test if the mean breaking strength of the wire can be assumed as 577 kg.
(8)

OR

5. a)

x	1	5	3	2	1	1	7	3
y	6	1	0	0	1	2	1	5

i) Fit the two regression lines.

With the help of the following data:

ii) Calculate karl pearson coefficient.

iii) Find explained and unexplained variation.

b) Two random samples give the following data :

Samplenumber	Size	Mean	Varience
1	8	9.6	1.2
2	11	16.5	2.5

Perform t - text to establish whether two samples have been drawn from the same normal population or not.

(8)

(8)


Maximum Marks : 80 Min. Passing Marks : 26

(6)

[Contd..

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

- 1. a) Explain modified goodman diagram for bending stresses.
 - b) A cantilever beam made of cord drawn steel 40C8 ($S_{ut} = 600$ N/mm² and $S_{yt} = 380$ N/mm²) as shown in fig. The force P acting at the free end varies from 50N to + 150N. The expected Reliability is 90% and factor of safety is 2. Notch sensitivity at fillet is 0.9. Determine diameter of beam at the fillet cross section. (10)



- a) What is endurance strength? Draw S-N diagram, What are the factors that affect endurance strength. (8)
 - b) The section of a steel shaft is shown in fig



The shaft is machined by a turning process. The section x-x is subjected to a constant bending moment of 500kN-m, the shaft material has $S_{ut} = 500$ MN/m² & $S_{yt} = 350$ MN/m² and endurance limit in bending for 7.5mm diameter specimen of 210 MN/m². Notch sensitivity is 0.8. Expected reliability is 90%. Determine life of shaft. Theoretical stress concentration factor can be taken from tabulated values. (8)

r/d	0.025	0.05	0.1
k,	2.6	2.05	1.66

Unit-II

- 2. a) Explain Buckling of connecting rod. also prove for connecting rod cross section that $3.2 I_{yy} = I_{xx}$. (6)
 - b) Design a connecting rod for a high speed I.C engine using following data.

Cylinder bore = 125mm, length of connecting rod = 300mm

Max. gas pressure = 3.5 MPa, length of stroke = 125mm

Mass of reciprocating parts = 1.6kg, engine speed = 2200 rpm

Assume suitable data and state the assumptions you made.

(OR)

The cylinder of a four stroke diesel engine has the following specification : Brake power 7.5 kW, Speed = 1400rpm, Indicated mean eff. pr. = 0.35MPa $\eta_{\text{mech}} = 80\%$, Max. gas pr. = 3.5 MPa. The cylinder liner and head are made of grey cast Iron FG 260 (S_{ut} = 260N/mm² and μ = 0.25) the stude are made of plain carbon steel 40C8 ($S_{yt} = 380N/mm^2$). Factor of safety for all parts is 6. Calculate :

Bore and length of cylinder liner i)

Thickness of cylinder liner ii)

Thickness of cylinder head iii)

Size, number and pitch of studs iv)

Design a cost iron piston for a single acting four stroke diesel engine with the b) following data.

Cylinder bore = 300mm, length of stroke = 450mm, speed = 300rpm.

IMEP = 0.85MPa, Max. gas pr. = 5MPa, fuel consumption = 0.3kg/BP/hr.

Higher calorific value of fuel = 44000 kJ/kg.

Assume suitable data and state the assumptions.

Unit-III

Explain spring design against fluctuating load also draw fatigue diagram for a) 3. spring.

[Contd

(8)

6E7011

a)

2.

(3)

Sec.

(10)

b) A railway wagon moving at a velocity of 1.5m/s is brought to rest by a bumper consisting of two helical springs arranged in parallel. The mass of wagon is 1500kg. The springs are compressed by 150mm is bringing the Wagon to rest. The spring index can be taken as 6. The springs are made of oil hardened and tempered Steel wire with Sut = 1250 N/mm² and modulus of rigidity = 81370N/mm². The permissible shear stress for spring wire can be taken as 50% of Sut. Design spring and calculate. (10)

i) Wire diameter

- ii) Mean coil diameter
- iii) Number of active coils
- iv) Total number of coils
- v) Solid length
- vi) Free length

vii) Pitch of coil

viii) Required spring rate

ix) Actual spring rate

(OR)

3. a) Prove that for Belt drive -

$$\frac{P_1 - mv^2}{P_2 - mv^2} = e^{\mu\theta}$$

Where P_1 and P_2 are tension in tight and slack side

 $\mu \rightarrow \text{coefficient of friction}$

6E7011

(8)

1079

$\theta \rightarrow$ Angle of lap

 $m \rightarrow \text{mass per meter of belt}$

b) It is required to design a V-Belt drive to connect a 7.5kW, 1440 rpm induction motor to a fan, running at approximately 480rpm, for a service of 24h/day. Space available for a center distance is about 1m.

Unit-IV

• a) Derive lewis equation for Beam strength of gear.

b) It is required to design a pair of spur gear with 20° full depth involute teeth consisting of 20 teeth pinion meshing with 50 tooth gear. The pinion shaft is connected to a 22.5kW, 1450rpm electric motor. The starting torque of motor can be taken as 150% of rated torque. The material for pinion is plain carbon steel Fe410 (S_{ut} = 410N/mm²). While gear made of grey cast iron FG200 (S_{ut} = 200N/mm²). Factor of safety = 1.5, design of gear based on Lewis equation & using velocity factor to account for dynamic load. (10)

(OR)

- **4.** a) Explain following :
 - i) Herring bone-gear
 - ii) Wear strength of helical gear
 - b) A pair of parallel helical gears consisting of a 20teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720rpm. The normal pr. angle is 20°. While helix angle is 25°. The face width is 40mm and the normal module is 4mm. The pinion as well as gear made of 40C8 ($S_{ut} = 600$ N/mm²). and heat treated to surface hardness of 300BHN. The service factor and factor of safety are 1.5 and 2 respectively. Assume velocity factor account for dynamic load and calculate power transmitting capacity of gears. (8)

Unit-V

5. a) Write short note on Mounting of Bearings.

6E7011

[Contd....

(6)

(8)

(6)

b) A transmission shaft rotating at 720rpm and transmitting power from the pulley p to the spur gear G as shown in fig. the Belt tensions and gear tooth forces are as follows $P_1 = 498N$, $P_2 = 166N$, $P_t = 497N$, $P_r = 181N$. The weight of the pulley is 100N. The diameter of shaft at Bearing $B_1 \& B_2$ is 10mm & 20mm respectively. The load factor is 2.5and the expected life for 90% of Bearing is 8000 hrs. Select single row deep groove ball bearings at $B_1 \& B_2$. (10)



(OR)

(8)

- 5. a) Derive Petroff's equation for sliding contact Bearings.
 - b) The following data is given for a 360° Hydrodynamic bearings.

radial load = 10kN

Viscosity of Lub. = 30 mPa–S

Journal speed = 1440 rpm

Unit Bearing pr. = 1000 kPa

Clearance ratio (r/c) = 800

Assuming that the total heat generated in the bearing is carried by the total oil flow in the bearing calculate - (8)

i) Dimensions of bearings

6E7011

- ii) Coeff. of friction
- iii) Power lost in friction
- iv) Total oil flow
- v) Side leakage and
- vi) Temperature rise

* * * *



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit-I

- a) Why newer machining methods are also known as unconventional machining method? Elaborate your answer. (8)
 - b) Classify modern machining processes and show mechanism of metal removal, energy source of various modern machining processes. (8)

OR

- 1. a) Explain the abrasive action in Abrasive Flow Machining (AFM) process. (8)
 - b) Describe briefly Magnetic Abrasive Finishing (MAF) process for finishing internal surface of hollow cylindrical surface/workpiece. (8)

Unit-II

- a) What is abrasive slurry in ultra sonic Machining (USM)? State clearly the functions of liquid medium in USM.
 (8)
 - b) Explain how Amplitudes and frequency of vibrations effect the material removal rate (MRR) of USM. (8)

OR

- a) Discuss the effect of stand off distance (SOD) on material removal rate (MRR) in abrasive jet machining (AJM). Also discuss the parameters of nozzle design for AJM.
 (8)
 - b) What is the principle of water jet machining (WJM). Explain the role of pump and nozzle in WJM. (8)

Unit-III

3.	a)	Elaborate the mechanism of metal removal in EDM process. (8
	b)	Briefly describe the Generators in EDM process. (8
		OR
3.	a)	How electron beam in generated in Electron Beam Machining (EBM) process State the role of magnetic deflection coil with suitable sketch. (8)
	b)	What is plasma torch in Plasma Arch Machining (PAM) process? Discuss the generation of plasma in PAM. (8)
		Unit-IV
4.	a) _	Explain the role of Tool-work gap in Electro Chemical Machining (ECM) with neat sketch.
	b)	Briefly discuss the electrochemical machining of iron using sodium chloride as electrolyte stating the chemical processes. (8)
		OR
4.	a)	What are the important factors for designing the tool in ECM process. Explain with proper diagram. (8)
	b)	Describe the working principle of Electro Chemical Grinding (ECG) process. (8)
		Unit-V
5.	a)	Briefly explain Micro drilling and Micro milling. (8)
	b)	What are benefits & special features of Nano machining. (8)
		OR
5.	a)	Discuss with proper sketches the evaluation of subsurface damages in Nano and Micro machining. (8)
	b)	Write short notes on (8)

Write short notes on

(8)

i) Nano scale cutting

ii) Micro turning

(2)

-	Roll No [Total No. of Pages : 2
13	6E7013 D.T. L. M. Surveyter (Mein/Back) Examination April/May-2017
170	B. Tech. VI Semester (Main/Back) Examination, April May 2017 Mechanical Engineering
6H	6ME3A Mechatronics
	ME,PI

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

1.	a)) What is 'Mechatronics'? Explain the components of a mechatronic s		
		×		(8)
	b)	Describe in detail MEMS.		(0)

OR

1.	a)	What is control system? Give the comparison between 'Open-loop 'Closed-loop' control systems.	
	b)	Explain in detail the scope and importance of mechatronic system.	(8)

Unit-II

2.	a)	Give classification of sensors and transducers. List main characteristics of generally used transducers. (8)
	b)	Write a short note on Hydraulic and pneumatic actuators. (8)
		OR
2.	a)	List various types of temperature sensors. Give the comparison between RTD and thermocouple. (8)

b) Write a short note on electrical and mechanical actuators. (8)

[Contd....

Unit-III

- a) Discuss in detail the role of controls in mechatronic system. What do you mean by digital control system.
 (8)
 - b) Explain in detail the digital signal processing. What are the operations used in digital signal processing? (8)

OR

- a) Explain an artificial neural network with suitable examples. List the major advantages of neural network.
 (8)
 - b) What is adaptive control system? Also explain the fuzzy systems. (8)

Unit-IV

- 4. a) What is the necessity of 'Signal conditioning'? Explain briefly the processes usually adopted in signal conditioning. (8)
 - b) Write down the performance specifications and common applications of digital to analog converters. (8)

OR

- 4. a) What is 'Data acquisition system'? Explain single channel data acquisition system with a neat block diagram. (8)
 - b) What is data logger? Explain the computer based instrumentation system. (8)

Unit-V

- 5. a) Explain the design of an elevator system with neat block diagram. (8)
 - b) Discuss the design and working of an aeroplane.

OR

- 5. a) Discuss the design of a tank fluid level control system with neat sketch. (8)
 - b) Write a short note on CNC lathe, describing its working and control methods.

(8)

(8)



Maximum Marks : 80 Min. Passing Marks : 26

[Contd....

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly.) Units of quantities used/calculated must be stated clearly.

Unit-I

- a) Enlist the major noise sources in industrial environment. What control measures can be adopted for noise control at the source? (8)
 - b) What do you understand by sound pressure dependent human response? Derive the relationship between sound power level and sound intensity level. (8)

OR

- 1. a) For the complex numbers $z_1 = (1 + 2i)$ and $z_2 = (3 4i)$, find the ratio z_1/z_2 and express the result in the form of Ae^{iθ}. (8)
 - b) Find the sum of the two harmonic motions $x_1(t) = 5 \cos (3t + 1)$ and $x_2(t) = 10 \cos (3t + 2)$ using trignometric relations. (8)

Unit-II

- a) A spring-mass system k₁, m₁ has a natural frequency 'f₁'. Calculate the value of k₂, another spring which when connected to k₁ in series decreases the frequency by 20%.
 - b) A circular cylinder of mass 4kg and radius 12cm is connected by a spring of stiffness 6000 N/m as shown in figure. It is free to roll on horizontal rough surface without slipping, determine the natural frequency.
 (8)



a) A vibrating system is defined by the following parameters : m = 3kg, k = 100 N/m and c = 3 N-sec/m. Determine (8)

i) the damping ratio

ii) the natural frequency of damped vibration

iii) logarithmic decrement

iv) the number of cycles after which the original amplitude is reduced to 20 percent.

b) A body of mass m = 1kg, lies on a dry horizontal plane and is connected by spring to a rigid support. The body is displaced from the unstressed position by an amount equal to 0.25 m with the tension of 50 N in the spring for this new position. How many complete cycles of motion will be performed after being released from this position. How much time it will take to perform this motion if the coefficient of friction is 0.25? (8)

Unit-III

3. a) Derive the relation for force transmissibility and draw a neat plot of the force transmissibility ratio with frequency ratio for different values of damping. (8)

b) A 70 kg machine is mounted on a springs of stiffness $k = 14 \times 10^5$ N/m with an assumed damping factor of $\zeta = 0.20$. A 2kg piston within the machine has a reciprocating motion with a stroke of 0.08m and a speed of 2700 rpm. Assuming the motion of the piston to be harmonic, calculate the amplitude of vibration of the machine and the vibratory force transmitted to the foundation.

(8)

OR

- a) A 100 kg machine is mounted at the midspan of a 2.0 m long simply supported beam of elastic modulus E = 200 × 10° N/m² and cross section moment of inertia I = 2×10⁻⁶ m⁴. This system during an experiment was subjected to a harmonic excitation magnitude 2000 N at different excitation frequency. The largest steady-state amplitude recorded during experiment was 2.4 mm. Determine the damping ratio of the system.
 - b) A spring man damper system is subjected to a harmonic force. The amplitude is found to be 20 mm at resonance and 10 mm at a frequency 0.75 times the resonant frequency. Find the damping ratio of the system.

3.

(2)

2.

Unit-IV

- a) With the help of suitable mathematical derivation explain the principle of undamped dynamic vibration absorber. (8)
- b) Determine the natural frequencies and mode shaper of the system shown in figure. (8)



Comment on the rigid body mode obtained.

OR

- a) Derive the mathematical relationship between the deflection of the geometric centre and the eccentricity with other system parameter for a single rotor shaft with damping.
 (8)
 - b) A rotor has a mass of 10 kg mounted midway on a 24 mm diameter horizontal shaft supported at the ends by two bearings which are 1m apart. The shaft rotates at 2400 rpm. If the centre of mass m of the rotor is 0.12mm away from geometric centre of the rotar due to certain manufacturing defects, find the amplitude of the steady state vibration and dynamic force transmitted to the bearing. Take $E = 200 \text{ GN/m}^2$. (8)

Unit-V

5. a) Find the lowest natural frequency of the system shown in figure using dunkerley's method. (8)



Take $E = 2 \times 10^{11}$ N/m² and cross section moment of inertia of the beam $I = 4 \times 10^{-7}$ m.

4.

4.

b) Draw the free body diagram of each of the mass shown in the following many degrees of freedom system shown in figure. Derive the governing differential equation of motion using Newton's law of motion. Arrange thus obtained equation in matrix form.



OR

 Derive the governing equation of motion for the torsional vibration of a shaft. Obtain the frequency equation and mode shape for the shaft fixed at one end while free at the other end. (16)



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1) Steam table & Mollier chart

2) Property table

Unit-I

- 1. a) List the advantages and disadvantages of fire-tube and water-tube Boilers.(8)
 - b) What is circulation? Differentiate between natural and forced circulation boiler.

(**OR**)

1.	a)	What are the function of steam drum?	(4)

- b) Write short note on :
 - i) Economizers.
 - ii) Pre heater
 - iii) Steam super heater

Unit-II

2. a) Discuss following :

- i) Steady flow energy equation in nozzles.
- ii) Momentum equation for the flow through steam nozzle.
- b) A convergent Divergent nozzle expands steam from 14 bar and 300°c to 6 bar. If the flow rate is 1 kg/s. Find the throat and exit area. What should be the coefficient of velocity if the exit velocity is 550m/s? (10)

6E7015 /2017

[Contd....

(3+3=6)

(8)

(4+4+4=12)

(**OR**)

2.	a)	Explain the physical significance of chocked flow. Discuss about the flow through convergent divergent nozzle. (8)
	b)	Explain the term nozzle and diffuser efficiency. Mention the types of nozzle you know. (8)
		Unit-III
3.	a)	What is the principle of operation of steam turbine. (6)
	b)	Give the classification of steam Turbines. (10)

(OR)

3.	a)	What do you mean by throttle governing in steam Turbine?	(6)
----	----	--	-----

b) The data pertaining to an impluse turbine is as follow : (10)

Blade speed, 300 m/s; isentropic enthalpy drop, 450 kJ/kg; Nozzle efficiency, 0.9; Nozzle angle 20°; blade velocity coefficient, 0.85; blade exit angle, 25°.

Calculate for a mass flow 1Kg/s

- i) The inlet angle of moving blade
- ii) Axial thrust
- iii) Driving force and power

Unit-IV

- 4. a) Explain stage velocity and force diagram for a impulse-reaction turbine with neat sketch.
 - b) What is the condition of maximum gross stage efficiency in parson's reaction turbine?
 (8)

(d

(OR)

4. a) Discuss the saving in Heat Rate from regenerative heating.

(4)

- b) Dry and saturated steam enters a steam turbine at 40bar and exhausts at 0.07 bar. It is planned to use a regenerative feed heating system employing three heaters.(12)
 - i) Design suitable extraction points and estimate the mass of steam taken by the heater per kg of feed.

(2)

ii) Find efficiency of the regenerative cycle.

Unit-V

- 5. a) Explain with neat sketch reheat-regenerative feed heating cycle. Also draw T-s & h-s diagram.
 (8)
 - b) Steam is supplied to a turbine at a pressure of 32 bar and a temperature of 410°C. If the steam is reheated at 5.5 bar to a temperature of 395°C and then expands isentropically to a pressure of 0.08 bar. What is the dryness fraction at the end of expansion and Thermal efficiency of the cycle? (8)

(OR)

- a) With the help of diagram explain Regenerative water extraction cycle. Derive expression for its efficiency.
 (8)
 - b) Draw neat sketch following :

(4+4=8)

- i) Pass out Turbine.
- ii) Binary Vapour cycle.

Roll No.

Total No. of Pages : 2

6E7017

B.Tech. VI Semester (Main & Back) Examination, April/May-2017 Mech. Engg.

6ME6.2A Design and Manufacture of Plastic Products

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

1. a) Ex	xplain about linear, branched and cross linked polymers.	(8)
-----------------	--	-----

- b) Explain (any two)
 - i) Elastomers
 - ii) Amorphous
 - iii) Fillers

OR

1. Differentiate between homopolymer and copolymer with suitable examples. (16)

Unit-II

2. Discuss the nominal wall thickness and normal ranges of wall thickness. (16)

OR

2. Explain the design issues involved in products made of plastics versus reinforced plastics with suitable examples. (16)

Unit-III

3.	a)	Explain the term with example of Rotational moulding.	8	(8)

b) Explain the polymer processing techniques.

6E7017/2017

[Contd....

(8)

 $(2 \times 4 = 8)$

3. Write short notes on the followings

(2×8=16)

(8)

- i) Injection moulding.
- ii) Blow moulding.

Unit-IV

4.	a)	Discuss the thermal welding methods.	(8)
	1	0	(-)

b) Discuss the Radio Frequency (RF) welding.

OR

4.	a)	Explain the Adhesive Bonding with examples.	(8)

b) Describe the difference between the electromagnetic welding and spin welding. (8)

Unit-V

5. Write a short note on following (any two) (2)	×8=16)
--	--------

- i) Drilling and Reaming.
- ii) Thread Tapping
- iii) Tuming

OR

5. Explain the process of vacuum metallizing and sputter plating. (16)
