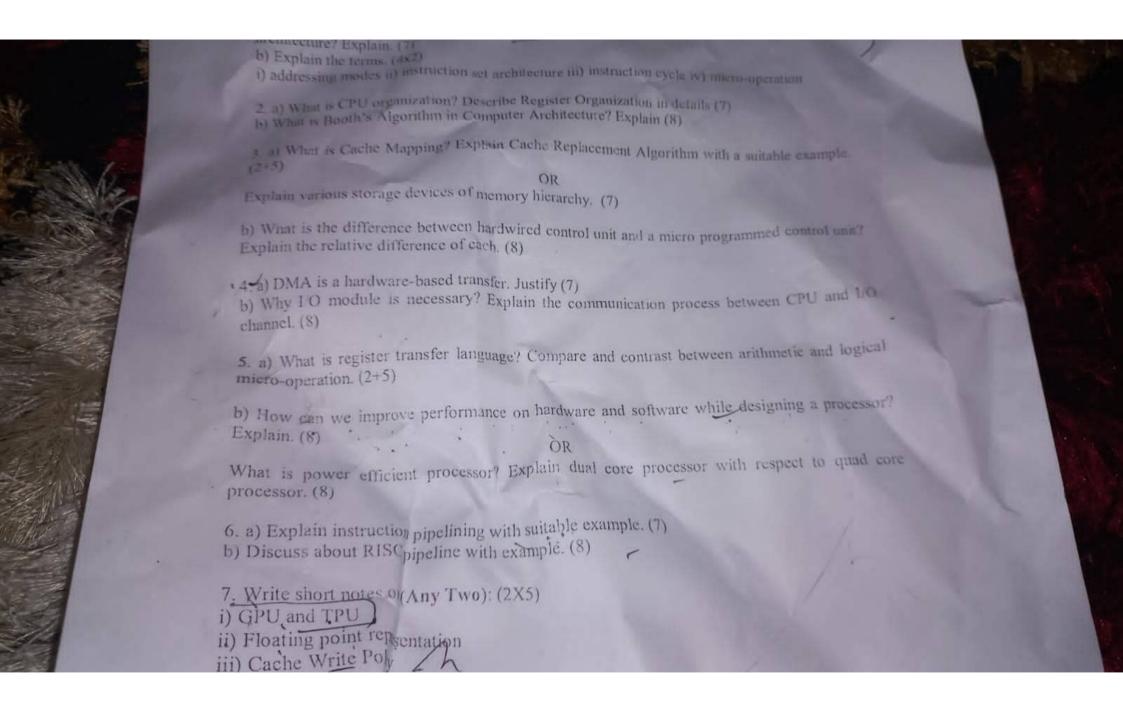




Computer Architecture, Spring 2024 Total marks: 100, Pass marks: 45 BoCE IV semester Attempt all the questions. 1. a) What are the advantages of the Harvard architecture in relation to the Von Neumann architecture? Explain. (7) b) Explain the terms. (4x2) i) addressing modes ii) instruction set architecture iii) instruction cycle iv) micro-operation 2. a) What is CPU organization? Describe Register Organization in details (7) b) What is Booth's Algorithm in Computer Architecture? Explain (8) 3. a) What is Cache Mapping? Explain Cache Replacement Algorithm with a suitable example. (2+5)OR Explain various storage devices of memory hierarchy. (7) b) What is the difference between hardwired control unit and a micro programmed control unit? Explain the relative difference of each. (8)



POKHARA UNIVERSITY FACULTY OF SCINCE AND TECHNOLOGY SCHOOL OF ENGINEERING

Exam	Final Interna	d Examinati	on 2024
Level	B.E.	FM	100
Program	Computer	PM	45
Year/ Part	HI/I	Time	3 Hrs

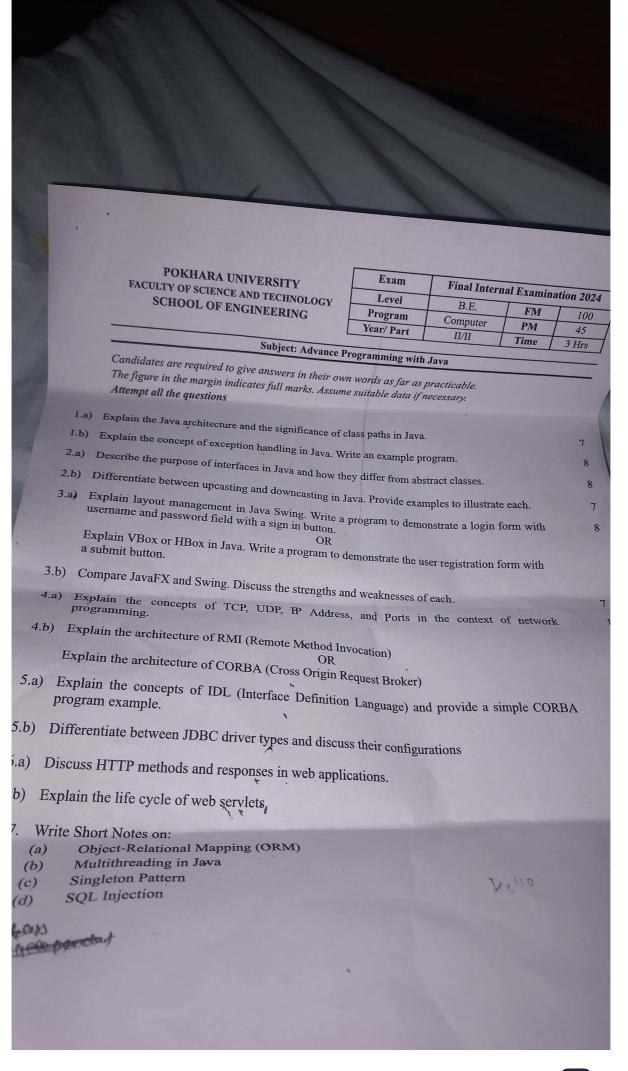
Subject: Theory of Computation

Candidates are required to give answers in their own words as far as practicable. The figure in the margin indicates full marks, Assume suitable data if necessary. Attempt all the questions.

1.	a) Define DFA. Design a DFA that accepts a set of string such that every string ends in 010 over alphabet {0,1}.	7
	b) Define regular expression. Construct a finite automata equivalent to the following regular expression. (a + a (b+aa) * b)* a (b + aa)* a	0
		8
2.	 a) State the pumping lemma for regular set. Show that L = {0'1' i>0 } is not regular. 	8
	b) Convert the following CFG into Chomsky Normal Form. S →Sbb aabb Aa Bb A →Aa a B →Bb b E	7
3.	a) Define Context Free Grammar. Check whether the given grammar S-aB ab,	7
	A→aAB a, B→AB b is ambiguous or not. b) Design a PDA for the language L={a*b*e***, where m & n>=1}.	8
4.	a) "TM is stronger than PDA and FA" Explain this statement with their suitable	7
1	block diagram. b) State the pumping lemma for context free language. Prove that L={a*, n is prime number is not context free language}.	8
5.	a) Explain the possible extensions of basic model of Turing Machine.	8
	b) Convert the following CFG to equivalent PDA. S→0S1 00 11	7
6.	a) Write about Church Turing thesis and universal Turing machine.	5
	b) Differentiate between Recursive and Recursively enumerable languages.	5
	c) Define computational complexity theory. Define class P and class NP	5
74	Write short notes on: (Any two) a) Halting problem b) Properties of regular language c) Tractable and Intractable Problems	2×5

*** Best of Luck ***





POKHARA UNIVERSITY SCHOOL OF ENGINEERING

Exam	Final Internal	Examination	2081
Level	Bachelor	FM	
Programme	DUXE	1951	45
Year Part	IV	Time	1 hen

Subject: Numerical Methods

Candidates are required to give answers in their own words as far as practicable. The figure in the margin indicates full marks

Attempt all the questions

- 1 a) Find a root of an equation x² 3 = 0 using Bisection method, correct up-to 3 decimal places. (7)
 - b) What are the limitations of NR method? Using NR method, find the root of equation $x^3 x 1 = 0$ correct up-to 4 decimal places. (8)
- 2 a) Find solution when x=302 using Newton's Divided Difference Interpolation formula
 (8)

×	f(x)
300	2.4771
304	2.4829
305	2,4843
307	2 4871

b) Fit a least square line for the following data

XX 1 2 3 4 5	Parit is sente	Separate Separate	and the same of			
vv 2 5 3 8 7	XX	1	2	3	4	5
	YY	2	5	3	8	7

3 a) Show mathematical difference between trapezoidal rule and Simpson's 1/3 rule. Find solution using Trapezoidal rule and Simpson 1/3 rule. (4+4)

Х	1.4	16	1.8	2	2.2
y	4.0552	4.953	6.0436	7.3891	9.025

- b) $F(x) = 0.2 + 25x 200x^2 + 675x^3 900x^4 + 400x^5$, find $\int_0^b f(x) dx$, a = 0, b = 0.8 by Romberg's Integration. (7)
- 4 a) Find largest eigenvalue and corresponding eigenvector using power method for the matrix A if

-- Best of luck --

50

$$10x + y + z = 12$$

 $x + 10y - z = 10$

$$x - 2y + 10z = 9$$

- 5 a) Find y (0.2) for y'=(x-y)/2, y (0) = 1, with step length 0.1 using Runge -Kutta 4th order. (7)
 - b) Solve using shooting method:

$$y'' + xy' - xy = 2x$$

with boundary conditions $y(0) = 1$, $y(2) = 8$. (8)

- 6 a) When u(0, t) = 0, u(4, t) = 0 and with initial condition u(x, 0) = x(4 x) up-to t = 6. Solve $u_{xx} = 2u_t$ assuming $\Delta x = h = 1$.
- b) Solve the equation $\Delta^2 U = -10(x^2+y^2+10)$ over square with sides x=0=y, x=3=y with U=0 on the boundary and mesh length = 1
- 7 Write short notes (any two)

(5+5)

(8)

- a) III Conditioned system
- b) Numerical method vs Analytical Method
- c) Errors in numerical calculations
- d) Matrix and its properties