PURBANCHAL UNIVERSITY
2023

B.E.(Computer)/Fourth Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BEG274CO: Discrete Structure *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.   8×10=80

1(a) Suppose there are 15 staffs in an office. Find the minimum number of staffs that can have their joining in the same month. 3

(b) How many ways can a committee of 3 faculty members and 2 students are selected from 7 faculty members and 8 students? 3

(c) Define universal quantifier and existential quantifier with example. 4

2(a) Prove that $(P \lor Q) \leftrightarrow (P \land Q)$ is logically equivalent to $(P \leftrightarrow Q)$. 4

(b) Define DNF and CNF-obtain the conjunctive normal form of $(\sim p \to r) \land (q \leftrightarrow p)$. 2+4

3(a) State whether the argument given is valid or not. If I graduate this semester, then I will have passed the math course. If I do not study math for 10 hours a week, then I will not pass math. If I study math for 10 hours a week, then I cannot play cricket.

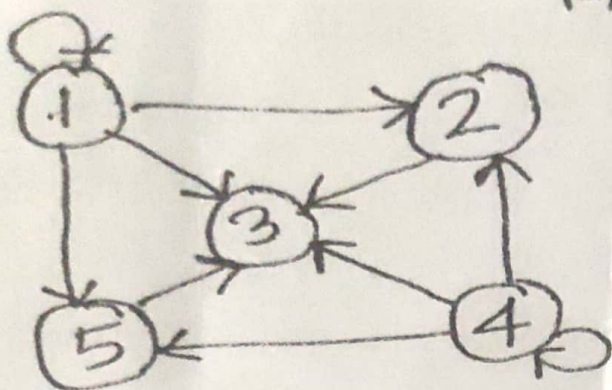If I play cricket, I will not graduate this semester. 7

(b) Prove by mathematical induction:

$$5+10+15+\ldots\ldots\ldots+5n = \frac{5n(n+1)}{2}.$$ 3

4(a) Determine whether the relation R whose diagraph is given is reflexive, irreflexive, symmetric, asymmetric, antisymmetric, or transitive. 6
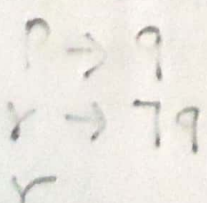
(b) Let A ={1, 2, 3, 4}   4

R = {(1,1), (1,2), (2,3), (2,4), (3,4), (4,1), (4,2)}

S={(3,1), (4,4), (2,3), (2,4), (1,1), (1,4)}.

Compute: (i) SoR   (ii) RoS

5(a) Using warshall algorithm, find all the transitive closure of the relation R={(1,2), (2,3), (3,3)} on the set A=(1,2,3).   7

(b) What do you mean by generating function? Give example.   3

6(a) Using generating function solve the recurrence relation

$a_{r+2} - 2a_{r-1} + a_r = 2'$ given that a_0=2 and a_1=1.

(b) Define walk path and circuit with example.   3

7(a) Define Regular graph and Complete graph with example.   5

(b) Determine whether the given graph has Hamiltonian circuit or path. If it has, find such path or circuit.   5
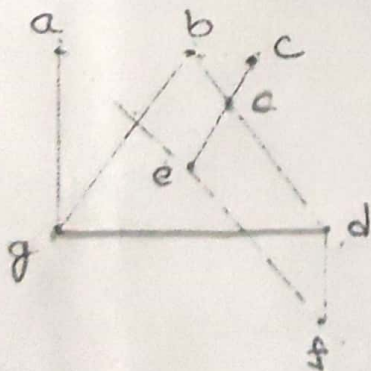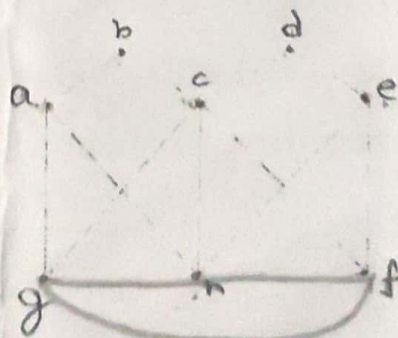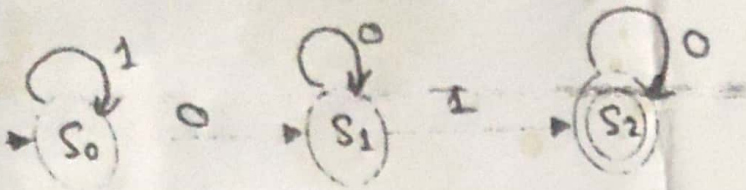

Fig.1

Fig.2

$a -g -h -f-e -$

$q -g -f -h -e$

$d -c -b -h$

$g-f-e-d-c-h-a-b$

8(a) A DFA is defined by a transition diagram as shown below.   6

(3)

(i) Find is states

(ii) Find is input symbol

(iii) Find its mutual state

(iv) Find its accepting state

(v) Find S (s1,1)

(vi) Write its state table

(b) Describe the following sets by regular expression.   4

(i) The set of all string over {0,1} beginning with 0 and ending with 1.

(ii) The set of all string over {a,b} beginning and ending with a.

(iii) The set of strings of two or more symbols followed by three or more 0's.

(iv) Any number of a's followed by any number of b's followed by any number of c's.

9. Write short notes on any TWO: 2×5=10

(a) Transport network

(b) Recurrence relation

(c) Predicate logic

PURBANCHAL UNIVERSITY
2023

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BEG276CO: Database Management System *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer EIGHT questions.   8×10=80

1. Define 1NF, 2NF, 3NF and BCNF with examples.   10

2(a) Describe encryption method with example. What is SQL injection?   4+1

(b) Write and explain all SQL injection methods.   5

3(a) What is DBMS? Explain 3-schema architecture of database. 1+4

(b) Compare file system and database system with appropriate example.   5

4. What is a statistical database? Discuss the problem of statistical database security. Explain mandatory assess control.   2+3+5

5. Write SQL statements for following:

Student (Enrno, name, courseId, emailId, Phone)

Course (courseId, course_nm, duration)

(i) Add a column city in student table.

(ii) Find out list of students who have enrolled in "computer" course.

(iii) List name of all courses with their duration.

(iv) List name of all students start with "a".

(v) List email Id and phone of all Computer engineering students.   10

6. What is need of lock in DBMS? Explain shared lock and exclusive lock with the help of example.   10

7. Define query cost. Describe query processing in detail.   2+8

8. Explain Database Backup and Recovery from Catastrophic Failures.

8

9. What is filing? Explain hash collision techniques with example. 2+8

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PURBANCHAL UNIVERSITY
2023

B.E. (Computer)/Fourth Semester/Final

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BEG232EC: Communication Systems *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks.

Answer EIGHT questions.   **8×10=80**

1(a) What is noise? Describe different types of noise encountered in communication system.   6

(b) What do you mean by modulation? Why it is needed?   4

2(a) Explain any one method for the generation of DSB-AM signal.   5

(b) What is envelope detector? Explain working of envelope detector. 5

3(a) An AM voltage is represented by the expression $V=5[1+0.6Cos(6280t)]Sin(2\pi 10^4 t)$ Volts. What are minimum & maximum amplitude of AM wave? What frequency components are contained in the modulated wave & what is amplitude of each component?   5

(b) Point out the major merits of SSB-SC signal over conventional AM signal.   5

4(a) When the modulating frequency in an FM system is 400Hz & the modulating voltage is 2.4V, the modulation index is 60. Calculate the maximum deviation. What is the modulation index when modulating frequency is reduced to 250 Hz & the modulating voltage is simultaneously raised to 3.2V.   5

(b) Explain about detection method fo FM using PLL.   5

5(a) Define Carson's rule & its special cases.   5

(b) What are Armstrong method of generation of FM.   6

6. What do you mean by companding? Why companding is done in PCM system? Explain PCM system in detail with this reference. 10

7(a) Explain FDM technique in telephony.   6

(b) List out the advantages of optical fibres cables.   4

8(a) Describe cellular mobile communication based on GSM system
architecture.   5

(b) Describe NRZ,RZ & Manchester line coding system with
examples.   5

9. Write short note on any TWO: 4×5=10

(a) Modulation index for AM

(b) Block diagram of Analog communication system

(c) Stereo FM transmission

PURBANCHAL UNIVERSITY

2023

B.E. (Computer)/Fourth Semester/Final

Time: 01:30 hrs.   Full Marks: 40/Pass Marks: 16

BEG207SH: Applied Sociology (New Course)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Group A

Answer TWO questions.   2×10=20

1. Define sociology and show the relationship between sociology and engineering.

2. What is E-commerce? Discuss the role of e-commerce in the process of transformation?

3. What are the approaches of development? Point out the indicators of development.

Group B

Answer FOUR questions.   4×5=20

4. Define technology and discuss its importance and impact upon Nepalese society

5. What do you understand by state?

6. Define economy and discuss its types.

7. What is gender? Briefly explain the gender issues in Nepal.

8. "The history of population of Nepal is influence by migration" Discuss.

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PURBANCHAL UNIVERSITY
2023

B.E. (Computer)/Fourth Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BEG275CO: Free Open Source Programming *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Answer TEN questions.   **10×8=80**

1. Define FOSP. What is Propriety software? Define FOSs philosophy.   2+2+2+4

2. Explain commercial License versus Open source license. Explain the Types of licensing.   4+4

3. Compare HTTP and HTTPS. Explain how http is processed in www. Define web server and web browser.   2+4+2

4. Define cell padding and cell spacing attributes of a table tag with an example. Write html code for generating following output.   3+5

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal Assessment		Final		Total
			Theory Marks	Practical Marks	Theory Marks	Practical Marks	
3	1	3	20	50	80	-	150

5. Define CSS. Explain various way of including CSS in HTML with suitable examples.   2+6

6. Differentiate between java and JavaScript. Explain different types of dialog box provided in JavaScript with necessary diagrams.   4+4

7. Write a program to validate the empty field and email address using JavaScript. Write a PhP code to find the factorial number that user provide from the form.   4+4

8. How function is used in PHP. Write a suitable code to multiple two numbers by using function in PHP. Write a Program in PHP

to enter three numbers through textbox and display the greatest and lowest number in a web page. 2+2+4

9. Explain different types of array variables in PHP with suitable examples. Also explain different file handling modes in PHP. 4+4

10. Explain CRUD in mysql Write a PHP function for connecting and creating database with necessary parameter. Write a program using session variable. 4+2+2

11. Write short notes on any TWO: 2×4=8

(a) PHP framework

(b) DOM

(c) Cookies variable in PHP

PURBANCHAL UNIVERSITY
2023

B.E. (Computer/Elect. & Comm.)/Fourth Semester/*Final*

Time: 03:00 hrs.   Full Marks: 80 /Pass Marks: 32

BEG231EC: Microprocessor *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer FIVE questions.   5×16=80

1(a) "If a microprocessor is of 8 bits", what does it specify? Explain the flag register of 8085A microprocessor in brief.   8

(b) What is addressing mode? Explain the addressing modes of 8085A microprocessor.   8

2(a) Draw a block diagram of 8086 microprocessor. Explain about it general purpose registers and control flags.   4+4+2

(b) Draw a timing diagram of instruction MVI B, 01H Assume the instruction is in the location DFFFH.   6

3(a) Draw a block diagram of 8255 PPI and explain about its various mode of operation.   4+6

(b) What are assembler directives? Explain any four of them.   6

4(a) What is interrupt? Classify the interrupt on the basis of priority. Also write the interrupts of 8085 microprocessor on priority basis.   6

(b) Design a circuit to interface a 4KB ROM with microprocessor.   6

(c) Write ALP in 8085 to find 1's and 2's complement of a number.   4

5(a) What is the value of COUNT in the followings? Assume the crystal frequency as 4MHZ.   8

LXI B, COUNT   10T

LOOP: MOV A, B   4T

ORA C   4T

DCX B   6T

JNZ LOOP   10/7T

(b) Write ALP in 8086 to add two matrices.

8

6. Write short notes on any FOUR:

$4\times4=16$

(a) Memory devices

(b) Null modem connection

(c) Application of microprocessor

(d) Serial communication

(e) Intel 8088 microprocessor

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