

PURBANCHAL UNIVERSITY

2022

Master of Computer Application (M. C. A.)/Third Semester /Final

Time: 03:00 hrs.

Full Marks: 80 /Pass Marks: 32

MCA215; E-Governance (Elective-II) (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.

$2 \times 16 = 32$

1. If you are hired as e-Governance Advisor for United Nations/Nepal, discuss your e-Governance plan and implementation strategies to achieve Sustainable Development Goals (SDG) that are set by United Nations/Nepal.
2. What is Public Private Partnership (PPP) in e-Governance? Discuss citizen-centric approach to e-Governance, with an application area.
3. Define digital signature. Discuss the working mechanism of digital signature and e-payment system.

Group B

$6 \times 8 = 48$

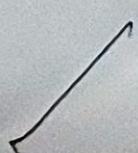
Answer SIX questions.

4. What is e-readiness in e-Governance? How do you measure e-readiness?
5. What is analysis of current reality? Discuss.
6. Explain e-procurement and emerging management uses for e-government.
7. How can Government Integrated Date Center (GIDC) play important role for e-Governance in Nepal?
8. "E-Governance has helped to reach the unreached". Explain the statement with reference to major undertakings in Nepal.
9. How do you mitigate challenges of e-Governance security?

Contd. ...

(2)

10. Why is citizen engagement important in developing e-Governance system?
11. Write short notes on any TWO: $2 \times 4 = 8$
- (a) Security for e-Government
 - (b) Interoperability
 - (c) BOOT



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MCA214: Marketing Management (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

$2 \times 16 = 32$

Answer TWO questions.

1. Discuss the various stages of new product development process by taking an example of compute set as a new product concept.
2. How would you apply your knowledge of segmentation , Targeting and Positioning (STP) for
 - Cold Coffee
 - Soft drinks
 - Slim tea
3. Discuss the main objectives of sales promotion. Explain some of the sales promotion methods directed at consumers which can be used by biscuit producer.

Group B

$6 \times 8 = 48$

Answer SIX questions.

4. Define the term Marketing. Explain the marketing mix.
5. Discuss the marketing strategies that may be used at the introductory and maturity stages of the product life cycle.
6. Define competitors. Highlight the importance of competitor analysis in marketing, develop an outline of competitors' analysis.
7. Explain various pricing strategies for new product with examples.
8. What steps are necessary for building customer value, satisfaction, and loyalty?

Contd. ...

(2)

9. What do you mean by consumer buyer behavior? Explain its decision making process.
10. Contrast between strategic and tactical marketing plan with examples. What are the different tools that a marketer may use to develop its marketing plan?
11. Discuss about the distribution channels. What do you understand by hybrid channel levels? Explain.



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MCA212: Design & Analysis of Algorithm (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.

$2 \times 16 = 32$

1. What is greedy method? Explain Kruskal's algorithm with an example in detail.
2. Explain matrix-chain multiplication problem and define it recursively. Trace the matrix-chain multiplication problem with example, and show your calculation explicitly.
3. What is divide and conquer algorithm? Trace the quick sort algorithm for the elements {3, 9, 4, 6, 2, 5, 1, 8}; write down its algorithm and analyze it.

Group B

Answer SIX questions.

$6 \times 8 = 48$

4. Define algorithm with its properties. Why we should study an algorithm?
5. What is stack and queue? Explain doubly linked list with an example.
6. What is dynamic programming? Explain 0/1 Knapsack problem.
7. Define back tracking? Explain backtracking with 8-queens problems.
8. What is Number theoretic algorithm? Discuss Chinese remainder theorem with example.
9. Explain P-class and NP-class. Discuss Cook's theorem with an example.

Contd. ...

(2)

11 Write short note on any TWO:

$2 \times 4 = 8$

- (a) Prim's algorithm.
- (b) Multistage graph.
- (c) RAM model.

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Time: 03:00 hrs.

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MCA211: Optimization Techniques (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.

$2 \times 16 = 32$

- What is an integer linear programming problem? Solve the following all-integer programming problem using Gomory's cutting plane method.

$$\text{Minimize } Z = -x_1 - x_2$$

$$\text{Subject to } 2x_1 + 5x_2 \leq 20$$

$$4x_1 + 3x_2 \leq 17$$

$$x_1, x_2 \geq 0, \text{ integers}$$

- ✓ 2(a) A small maintenance project consists of the following jobs whose precedence relationships is given below:

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration (days)	15	15	3	5	8	12	1	14	3	14

(a) Draw an arrow diagram representing the project?

(b) Find the total float for each activity.

(c) Find the critical path and the total project duration.

- ✓ 3. Using graphical method to solve the following linear programming problem.

$$\text{Minimize } Z = 3x_1 + 6x_2$$

$$\text{Subject to } -3x_1 + 3x_2 \leq 2$$

Contd. ...

(2)

$$4x_1 + 2x_2 \leq 4$$

$$-x_1 + 3x_2 \geq 1$$

$$x_1, x_2 \geq 0$$

Group B **$6 \times 8 = 48$** **Answer SIX questions.**

4. Solve the following linear programming problem using Big M method.

$$\text{Minimize } Z = \frac{15}{2}x_1 - 3x_2$$

Subject to the constraints

$$3x_1 - x_2 - x_3 \geq 3$$

$$x_1 - x_2 + x_3 \geq 2$$

$$x_1, x_2, x_3 \geq 0$$

5. What do you mean by Queuing system? Explain the various elements of Queuing system.
6. A marketing manager has five salesmen and five sales districts. Considering the capabilities of the salesmen and the nature of districts, the marketing manager estimates that sales per month (in hundreds rupees) for each salesman in each district would be as follows:

	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

Find the assignment to districts that will result in maximum sales.

7. What is transportation problem? Determine an initial basic feasible solution for following transportation problem by using North West Corner method.

Contd. ...

(3)

	D_1	D_2	D_3	supply
O_1	2	7	4	5
O_2	3	3	1	8
O_3	5	4	7	7
O_4	1	6	2	14
demand	7	9	18	34

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8. Write the dual of the following.

$$\text{Min. } Z = x_1 + x_2 + x_3$$

Subject to the constraints

$$x_1 - 3x_2 + 4x_3 = 5$$

$$x_1 - 2x_2 \leq 3$$

$$2x_2 - x_3 \geq 4$$

$$x_1, x_2 \geq 0, \quad x_3 \text{ is unrestricted}$$

9. Solve LPP by Dual Simplex Method.

$$\text{Min. } Z = 3x_1 + x_2$$

Subject to the constraints

$$x_1 + x_2 \geq 1$$

$$2x_1 + 3x_2 \geq 2$$

$$x_1, x_2 \geq 0$$

^

10. Solve the following LPP using the simplex method.

$$\text{Max. } Z = 3x_1 + 2x_2$$

Subject to the constraints

$$x_1 + x_2 \leq 4$$

$$x_1 - x_2 \leq 2$$

$$x_1, x_2 \geq 0$$

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**MCA213: Software Project Management**

*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.**

**$2 \times 16 = 32$**

1(a) What is project planning and what are its objectives? Explain. 6

(b) Given the following information: 5+5

| Activity | Duration (in weeks) | Predecessor(s) |
|----------|---------------------|----------------|
| A        | 2                   | -              |
| B        | 6                   | -              |
| C        | 4                   | -              |
| D        | 3                   | A              |
| E        | 5                   | C              |
| F        | 4                   | A              |
| G        | 2                   | B, D, E        |

(i) Draw the network diagram using CPM.

(ii) Determine the float of each activity, critical path, and project duration.

2(a) Define contract and contract management? Explain the types of contract. 2+6

(b) What is software quality management? Why is quality management necessary software project management? Explain. 2+6

3(a) In project scheduling, what do you mean by crashing? Consider the following information. 2+6+8

**Contd. ...**

| Activity | Predecessor(s) | Normal Time (in weeks) | Crash Time (in weeks) |
|----------|----------------|------------------------|-----------------------|
| A        | -              | 16                     | 8                     |
| B        | -              | 14                     | 9                     |
| C        | A              | 8                      | 6                     |
| D        | A              | 5                      | 4                     |
| E        | B              | 4                      | 2                     |
| F        | B              | 6                      | 4                     |
| G        | C              | 10                     | 7                     |
| H        | D, E           | 15                     | 10                    |

- (i) Construct the project network and determine the project duration.
- (ii) Determine the shortest project duration by crashing the project activities.

#### Group B

**Answer SIX questions.**

**$6 \times 8 = 48$**

- 4/ How does a software project differ from other traditional projects? What are the roles and responsibilities of a software project manager? Discuss who are the stakeholders of a software project.
- 5/ Calculate payback-period and return on investment (ROI) for the following three projects, and rank these projects in order of feasibility.

| Year | Project A | Project B | Project C |
|------|-----------|-----------|-----------|
| 0    | -70,000   | -110,000  | -80,000   |
| 1    | 20,000    | 20,000    | 15,000    |
| 2    | 45,000    | 30,000    | 15,000    |
| 3    | 10,000    | 30,000    | 35,000    |
| 4    | 20,000    | 40,000    | 30,000    |
| 5    | 5,000     | 50,000    | 10,000    |

6. What do you mean by resources in software project management? As a project manager, how do you allocate these resources? Explain.

Contd. ...

(3)

7. How do project managers monitor and control the progress of the project activities? What are the tools used? Explain with examples.
8. Why is training important in management of projects? Write the benefits of working in groups.
9. Explain the need of configuration management. Discuss configuration management responsibilities.
10. What is risk analysis? Explain evaluation of risk to schedule using Z-values.

