

**Goa Vidyaprasarak Mandal's  
Gopal Govind Poy Raiturcar College of Commerce and Economics  
Farmagudi, Ponda-Goa.**

**B.C.A. (Semester - II) Supplementary Examination – May/June 2015**

**OPERATING SYSTEM CONCEPTS**

**Duration : 2 hours**

**Marks : 50**

**Instructions :** A.) All the questions are compulsory.  
B.) Draw neat diagrams with pencil wherever required.

- I. 1. State whether the following statements are True or False. (1mk x 5 = 5 mks)
- a) In Time-sharing systems processor time is shared among multiple users.
  - b) Unsafe state is a state that may allow deadlock.
  - c) Network File System is not a common distributed file-sharing method.
  - d) A program is a collection of segments.
  - e) Virus dropper fails to insert virus onto the system.
2. Answer the following. (1mk x 5 = 5 mks)
- a) What is a Processor ?
  - b) What is an Operating System ?
  - c) What is Mutual Exclusion ?
  - d) What is a Trojan Horse ?
  - e) What is Public Key ?
- II. 1. Explain the Page Table. (2 mks)
2. Explain the major services of an Operating System. (3 mks)
3. Explain the LRU Page Replacement with an example. (5 mks)

- III. 1. Explain the goals of System Protection. (2 mks)  
2. Explain the Internal Fragmentation and the External Fragmentation. (3 mks)  
3. Explain the Process State with the diagram. (5 mks)
- IV. 1. Explain the Push Migration and the Pull Migration. (2 mks)  
2. Explain that the many-to-one model maps many user-level threads to one kernel thread. (3 mks)  
3. Explain the First-cum-First-Serve scheduling with an example. (5 mks)
- V. 1. Explain the File Access methods. (2 mks)  
2. Explain the Resource Management in the Web based Operating Systems. (3 mks)  
3. Explain the Synchronization in the Distributed Operating Systems. (5 mks)

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 GOPAL GOVIND POY RAITURCAR COLLEGE OF COMMERCE & ECONOMICS  
 PONDA-GOA  
 B.C.A. (SEMESTER-II) SUPPLEMENTARY EXAMINATION, MAY/JUNE 2015  
 DISCRETE MATHEMATICS

Duration:2hrs

Max. Mark :50

**INSTRUCTIONS:**

- 1) All questions are compulsory
- 2) Figures to the right indicate full marks

Q.1) Answer the following

- i) Draw the truth table for  $p \vee q$  (1)
- ii) The logic symbol for OR gate is ..... (1)
- iii) Convert  $(1111001)_2$  to decimal form (2)
- iv) If  $p$  and  $q$  are two statements with truth values T and F respectively, then the truth value of  $p \leftrightarrow q$  is ..... (2)
- v) Write the middle term in the expansion of  $(a/2 - 1/a^2)^{10}$  (2)
- vi) Convert  $(25.125)_{10}$  to its equivalent binary form (2)

Q.2.a) Let '=' be the relation 'is equal to' show that it is an equivalence relation (5)

- b) If  $X$  is the universal set and  $A$  and  $B$  are two sets then draw a Venn diagram for (3)
- i)  $A' \cup B'$  ii)  $A \cap B$  iii)  $(A \cap B)'$  (2)
- c) Give an example of a relation that is reflexive but neither symmetric nor transitive (2)

OR

- Q.2.x) If  $X = \{a, b, c, d\}$ ,  $A = \{c, d\}$ ,  $B = \{a, b, c\}$ ,  $C = \{a, d\}$  (5)
- find i)  $A \cup (B \cap C)$  ii)  $A \cap (B \cup C)$  iii)  $A' \cup (B \cup C)$  iv)  $A \cup B \cup C$
- y) If  $A = \{m, n\}$ ,  $B = \{1, 2, 3\}$  then find i)  $A \times B$  ii)  $B \times A$  (3)
- z) Let  $A = \{1, 2, 3\}$  and a relation on  $A$  be  $R = \{(1, 1), (1, 2), (2, 3), (2, 2), (3, 3)\}$ . (2)

Prove that the relation  $R$  is reflexive but it is neither symmetric nor transitive.

- Q.3.a) Of the total number of 200 students appearing in an exam, 140 passed in maths and 100 passed statistics. If 50 of them failed in both maths and statistics find the number of students who have passed in both. (4)
- b) If  $f(x) = 2x$  and  $g(x) = 4x + 1$  find  $f(g(x))$  &  $g(f(x))$  (4)
- c) Find the total number of selections of 8 objects out of 10 objects (2)

OR

- Q.3.x) Find the number of arrangements of the letters of the word COMMITTEE. (2)
- y) If  $g(y) = x^2$  then find  $g(g(y))$  (3)
- z) In a recent survey of 5000 people, it was found that 2800 read the Navhind Times and 2300 read Gomantak while 400 read both the papers. How many read neither Navhind Times nor Gomantak (5)
- Q.4.a) Verify whether  $p \vee [\neg(p \rightarrow q)]$  is a contradiction, tautology or contingency (3)
- b) Write a short note on AND gate (2)
- c) By principle of mathematical induction prove that (5)

$$p(n) : 1 + 3 + 6 + \dots + n(n+1)/2 = n(n+1)(n+2)/6$$

OR

Q.4.x) By principle of mathematical induction prove that (5)

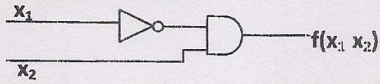
$$p(n) : (n+1)^2 + (n+2)^2 + (n+3)^2 + \dots + (2n)^2 = n(2n+1)(7n+1)/6$$

y) Explain NOT gate by giving symbol and truth table (2)

z) Verify whether  $\sim(pvq) \leftrightarrow (p \rightarrow \sim q)$  is a contradiction, tautology or contingency (3)

Q.5.a) Find the output for the given inputs of the following circuit diagram: (5)

Inputs  $x_1=0$  &  $x_2=0$

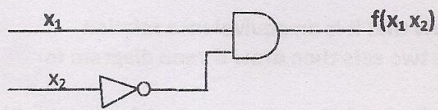


b) Write a short note on finite state machine (5)

OR

Q.5.x) ) Find the output for the given inputs of the following circuit diagram: (5)

Inputs  $x_1=0$  &  $x_2=0$



y) Write a short note on various types of grammars (5)

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B.C.A. (SEMESTER - II) EXAMINATION, MAY/JUNE 2015  
COST ACCOUNTING

Duration: 2 hrs

Marks: 50

INSTRUCTIONS: 1) All questions are compulsory.  
2) Use of calculator is allowed.

Q. 1. A) Match the following:- (5)

**Column A**

- 1) Variable cost
- 2) Inventory valuation
- 3) Storekeepers salary
- 4) Payroll department
- 5) Abnormal gain

**Column B**

- a) Factory overheads
- b) Actual loss < Normal loss
- c) Wage sheet
- d) Weighted average method
- e) Actual loss > Normal loss
- f) Changes with the output

B) Answer in one line. (5)

- 1) Define fixed cost.
- 2) What is works cost?
- 3) What is normal loss?
- 4) What is job order costing?
- 5) Define Break-even point.

Q. 2. A) Menino & company furnishes you the following cost data for the year ended 31<sup>st</sup> December 2014. (10)

Particulars	Amount (₹)	Particulars	Amount (₹)
Factory lighting	5000	Factory manager's salary	24000
Carriage inward	1500	Carriage outward	2500
Office stationary	1250	Depreciation on office machinery	900
Motive power	19000	Depreciation on factory machinery	14500

Foreman salary	12000	Indirect wages	4500
Opening stock of raw materials	225500	Closing stock of raw materials	105000
Other office overheads	2900	Packaging expenses	2000
Purchases	139000	Direct expenses	25000
Sales manager's salary	27000	Gas, water, fuel (factory)	3500
Delivery van charges	1200	Direct wages	75000

You are requested to prepare a cost sheet for the year ended 31<sup>st</sup> Dec 2014, assuming that the percentage of profit is 25% on total cost.

OR

- Q. 2.B.i) Explain the following
- Elements of cost. (3)
  - Total cost (2)
- B.ii) What is a cost sheet? Explain in detail the purposes of a cost sheet. (5)
- Q. 3.A) Pallavi productions provides you the following information regarding their purchases and issues of materials during the month of March 2015. (10)

<u>2015</u>		<u>Units</u>	<u>Price(₹)</u>
1 <sup>st</sup> March	Purchased	150	2.00
2 <sup>nd</sup> March	Purchased	70	2.20
4 <sup>th</sup> March	purchased	190	2.25
6 <sup>th</sup> March	Issued	210	---
8 <sup>th</sup> March	Purchased	20	2.20
12 <sup>th</sup> March	Issued	80	--
15 <sup>th</sup> March	Purchased	200	2.40
25 <sup>th</sup> March	Issued	240	--
26 <sup>th</sup> March	Purchased	120	2.30
28 <sup>th</sup> March	Issued	130	---

Ascertain the quantity of closing stock as on 31<sup>st</sup> March 2015 and state its value using LIFO method of inventory valuation.

OR

- Q. 3.B.i) From the following information, you are required to calculate maximum level, minimum level and ordering level for material X and Y. (6)

	X	Y
Normal usage per week	150 units	200 units
Reordering quantity	900 units	1500 units
Maximum usage per week	225 units	250 units
Minimum usage per week	75 units	100 units
Reorder period (weeks)	12 to 18	6 to 12

- B.ii) Explain the following. (2)  
 a) EOQ (2)  
 b) Simple average method of inventory valuation. (2)

- Q. 4.A.i) Calculate the total earnings and the rate earned per hour of three workmen, under the halsey and rowan plan, the bonus under the halsey plan is 50% of time saved. (6)

Standard time 20 hrs,

Hourly rate of wages ₹ 4.00

Time taken by workman A: 16hrs

Time taken by workman B: 10 hrs

Time taken by workman C: 8 hrs

- A.ii) What is idle time? Explain various causes of idle time. (4)

OR

- Q. 4.B) Explain the following: (2 ½)  
 a) Role of Personnel Department (2 ½)  
 b) Taylor's Differential Piece Rate System (2 ½)  
 c) Overtime (2 ½)  
 d) Labour Turnover (2 ½)

- Q. 5.A) One product is obtained after it passes through three different processes. You are required to prepare process accounts from the following information.

	Process			
	Total ₹	I ₹	II ₹	III ₹
Materials	15084	5200	3960	5924
Direct wages	18000	4000	6000	8000
Production overheads	18000	---	---	---

1000 units @ ₹ 6 per unit were introduced in process I. Production overheads are to be distributed as 100 % on direct wages. (10)

Actual output	Units	Normal loss	Value of scrap per unit
Process I	950	5%	4
Process II	840	10%	8
Process III	750	15%	10

OR

Q.5.B) Sarvottam Pvt. Ltd. took a contract for construction of building for ₹ 12,00,000 on 1<sup>st</sup> January 2014. The following information is available. You are informed that it is the practice of the company to take credit for 60% of the profit earned on the contracts in progress.

Direct Material issued	3,25,000
Direct Labour	4,00,000
Plant installed at cost	2,50,000
Establishment charges	75,000
Direct expenses	1,00,000
Work certified by architect	10,50,000
Cost of work not certified	50,000
Value of plant as at 31/12/2014	2,00,000
Materials at site on 31/12/2014	25,000
Cash received from contractor	9,45,000

You are required to show the contract account as on 31/12/2014. (10)

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Duration: 2 Hrs

Marks: 50

Q.1. Define the following. (5\*2=10)

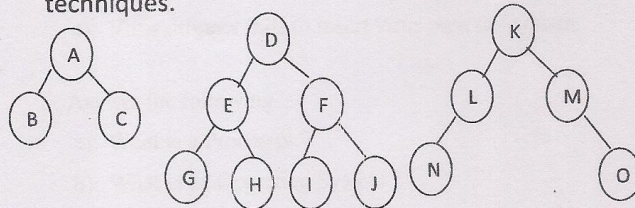
- i. Linked List.
- ii. Almost Complete Binary tree.
- iii. Leaf node.
- iv. Sorting.
- v. Queue.

Q.2.A. What is a pushdown list? (2)

Q.2.B. State and explain Primitive operations on Queues. (3)

Q.2.C. Write a C program to validate an expression for parenthesis using stack. (5)

Q.3.A. Convert the following forest into a Binary tree and state the traversal techniques. (2)



Q.3.B. Write C implementation for insertafter(p,x) of Linear Linked List. (3)

Q.3.C. Write an algorithm to concatenate 2 linked list. (5)

Q.4.A. What is O notation? (2)

Q.4.B. Discuss the efficiency of Bubble Sort. (3)

Q.4.C. Explain Heapsort. (5)

Q.5.A. Write C implementation for setleft(p,x). (2)

Q.5.B. Write an algorithm for right rotation on a tree. (3)

Q.5.C. Implement primitive operations of a graph. (5)

\*\*\*\*\*All the Best\*\*\*\*\*