POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE

Name Himanshu Dixit Enrollment No. 21103262

Jaypee Institute of Information Technology, Noida
T2 Examination, Odd Semester 2022
B. Tech 3rd Semester

Course Title: Economics
Course Code: 15B11HS211

Maximum Time: 1 hr
Maximum Marks: 20

After pursuing this course the student will be able to:
CO1 Explain the basic micro and macroeconomic concepts.
CO2 Analyze the theories of demand, supply, elasticity and consumer choice in the market.
CO3 Analyze the theories of production, cost, profit and break even analysis.
CO4 Evaluate the different market structures and their implications for the behaviour of the firm.
CO5 Examine the various business forecasting methods.
CO6 Apply the basic of national income accounting and business cycles to Indian economy.

NOTE: Attempt all questions

Q1 Mr. Jacob purchases only two goods, Icecream (a) and Chocolates (b). He has an income of Rs.220 and price of a=Rs.12 and price of b=Rs.10. His utility function is: $U(a, b) = 6a^2+5b^2$. What bundles of a and b should he purchase to maximise his utility. **(CO2) (2 Marks)**

Q.2 A healthcare business researcher decided to develop a regression model in an attempt to predict the number of FTEs(Full time employees) of a hospital by the number of beds. She surveyed 7 hospitals and obtained the following data: **(CO5) (7 Marks)**

Number of beds	15	20	25	30	35	40	45
FTEs	25	35	50	65	80	100	110

a. Compute the regression line to predict the number of FTEs at a hospital.
b. Calculate Coefficient of Determination and interpret the results if $\Sigma(\hat{y} - \bar{y})^2$ is 6150.89
c. Verify if there exists a significant relationship between the number of FTEs and the number of beds at 1 % level of significance and interpret your decision if the critical t value is $t_{0.01, 5} = 4.032$

Q.3 Following is the Seasonal Demand for sales of electricity in (million of kilowatt –hours) in a Metro city from 2020-21. **(CO5) (3 Marks)**

Time period in Quarters	2020-I	2020-II	2020-III	2020-IV	2021-I	2021-II	2021-III	2021-IV
Demand for sales	14	18	15	17	15	20	16	19

If the trend line S_t=14.71+0.452t, calculate the seasonally adjusted forecast for 2022 Quarter I.

Q.4 Company A produces cotton fabrics using skilled(S) and unskilled labour(U).The production function for cotton fabrics is given by $Q = 300S+200U-0.2S^2-0.3U^2$.The wages of skilled and unskilled labours are $10 and $5 respectively. The company has hired 400 skilled and 100 unskilled labours. Evaluate the hiring and suggest the company about the number of skilled and unskilled labours. If the company has $5000 to spend on these two types of labours, calculate how many skilled and unskilled labours should be hired? **(CO3) (5 Marks)**

Q.5 Answer the following questions in brief: **(3 Marks)**

a. What happens to the budget line when money income and prices changes in the same proportion? (CO2)
b. At what level of variable input, the diminishing returns begin? (CO3)
c. When Exponential smoothing method should be used for forecasting? (CO5)

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Name...Himanshu...Dixit... Enrollment No.....21103262.....

Jaypee Institute of Information Technology, Noida
T-2 Examination, Odd Semester 2022
B. Tech. III Semester

Course Title: Electrical Science-2
Course Code: 15B11EC211

Maximum Time: 1 Hr.
Maximum Marks: 20

After pursuing the above mentioned course, the students will be able to:

CO1 Study and analyze the complete response of the first-order and second-order circuits with energy storage and/or non storage elements.
CO2 Understand two port network parameters and study operational amplifier, first and second order filters.
CO3 Study the properties of different types of semiconductors, pn junction diodes, zener diodes and analyze diode applications.
CO4 Study the characteristics, operation of bipolar junction transistor (BJT) and its biasing, stability aspects.

Note: All questions are compulsory.

Q.1 [CO2] (a) Obtain the admittance (Y) parameters of the two port network shown in Fig. 1. **[4]**
(b) A two port network is described by the following set of current-voltage equations. $V_1 = I_1 + 2V_2$ & $I_2 = -2I_1 + 0.4\,V_2$, Find its transmission parameters (ABCD). **[2]**

Q.2 [CO2] (a) Determine the transfer function of the circuit shown in Fig. 2. What type of filter is it? **[2]**
(b) Design a first-order active low-pass filter with a DC gain 2 and corner frequency of 1 KHz. Also draw its circuit diagram. Assume capacitor value as 0.1μF. **[3]**

Q.3 [CO2] (a) Write the four characteristics of an Ideal Op-amp. **[2]**
(b) Find Vo for the following circuit shown in Fig. 3. **[2]**

Q.4 [CO3] (a) Define the mass action law with mathematical expression. **[1]**
(b) Calculate the probability that an energy state in the conduction band is occupied by an electron in silicon at T = 300 K. Also, calculate the thermal equilibrium electron concentration (n_o) for silicon at T = 300 K. Consider Fermi Energy is 0.25 eV below the conduction band and conduction band effective density of states (Nc) = 2.8×10^{19} cm^{-3} for silicon at T = 300 K. **[4]**

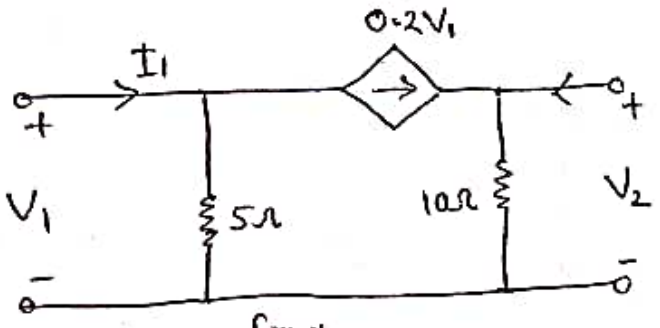

fig. 1

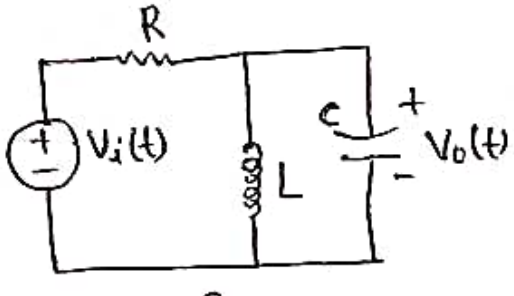

fig. 2

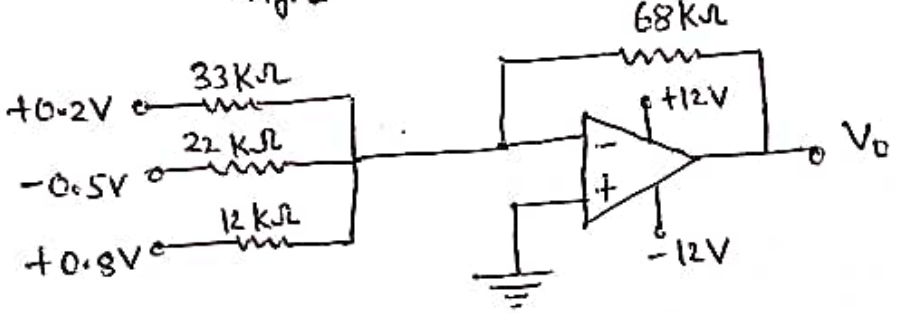

fig. 3

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Name..Himanshu Dixit.... Enrollment No.....21103262.....

Jaypee Institute of Information Technology, Noida
T-2 Examination, Odd Semester 2022
B. Tech. III Semester

Course Title: Database Systems and Web
Course Code: 15B11CI312

Maximum Time: 1 Hr.
Maximum Marks: 20

Note: Attempt All Questions

C212.1	Explain the basic concepts of Database Systems and Web components
C212.2	Model the real world systems using Entity Relationship Diagrams and convert the ER model into relational logical schema using various mapping algorithms
C212.3	Develop a simple web application with client and server side scripting using Javascript and PHP and connect with a relational database
C212.4	Make use of SQL commands and relational algebraic expressions for query processing
C212.5	Simplify database using normalization process based on identified keys and functional dependencies
C212.6	Solve the atomicity, consistency, isolation, durability, transaction and concurrency related issues of databases

Q1. [C212.4] Given in Shoppers_help database schemas:
Shop (Shop_id, S_name, Location, Rating)
Provides (Shop_id, Item_id, Price)
Items (Item_id, tag, I_name, Description)
Solve following queries using relational algebra expression

(a) Find the name of the shops that can provide item having tag "Dry Mango" and located at " Noida"
(b) Find the names of the shop that can only provide items having tag "Black Pepper".
(c) Find the ids of the shops located in "Kanpur" and can provide every item.
(d) Consider two tables T1 and T2 shown below, write the result of the following operation [6 Marks]

$T1 \bowtie_{(T1.M=T2.Q \text{ AND } T1.O=T2.S)} T2$

M	N	O
12	a	7
17	b	10
27	a	8

Q	R	S
12	b	8
27	c	5
12	b	7

Q2. [C212.3] Consider the Shoppers_help database in Q1, Design a webpage using PHP which takes input of Shop table as text boxes. Create a button named "Query". Following queries should be performed on clicking "Query" button

(a) Insert a tuple in Shop Table.
(b) Update the location of shop_id "5" to "Delhi".
(c) Display all the tuples of Shop table on web page. [5 Marks]

Q3. [C212.5] Consider the set of FD's F = {A→C, AB→C, C →DI, CD→I, EC→AB, EI →C}
Find the minimal cover. [4 Marks]

Q4. [C212.5] Given is the library database schemas:
Book (Title, Author, Catalog_no, Publisher, Year, Price)
Collection (Title, Author, Catalog_no)

The relation follows the following set of three functional dependencies:
{Title, Author}→Catalog_no, Catalog_no →{Title, Author, Publisher, Year}
{Publisher, Title, Year}→Price
Answer Following questions

(a) Find out the candidate keys of the library database.
(b) What is the highest normal form for the Book and Collection Relation schemas?
(c) Convert the schemas into higher normal form from the existing normal form of the schema. [5 Marks]

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE

Name JHOAT17 KUMAR Enrollment No. 21033121

Jaypee Institute of Information Technology, Noida
T2 Examination, Odd Semester 2022
B. Tech 3rd Semester

Course Title: Economics **Maximum Time: 1 hr**
Course Code: 15B11HS211 **Maximum Marks: 20**

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Name Himanshu Enrollment 21103262

Jaypee Institute of Information Technology, Noida
T2 Examination, 2022
B. Tech. ODD Semester

Course Title : Data Structures
Course Code : 15B11CI311

Maximum Time : 1 Hr.
Maximum Marks : 20

C210.1 Explain abstract data types, memory allocation schemes, and need of linear and non-linear data structures
C210.2 Apply and implement various linear data structures, like array, linked list, stack, and queue in different problems and applications
C210.3 Analyze the performance of various sorting and searching techniques
C210.4 Demonstrate and implement various operations like search, traverse, insertion, deletion, *etc.* on different non-linear data structures
C210.5 Apply appropriate data structure to design an efficient solution for given and identified problem

Q1. [C210.3] (a) What should be efficient data structure to represent a hash table with direct chaining collision resolution technique? Give the description of suggested data structure.[Marks 2]

(b) Given the two hash functions, h1(k) = k mod 23 and h2(k) = 1 + k mod 19. Assume the table size is 23. Find the address returned by double hashing after 2nd collision for the key = 90. [Marks 3]

Q2. [C210.4] Preorder Threaded binary tree by definition means for every node whose right child is non-existent(NULL), then make this node's right pointer point to the pre-order successor of this node. Write pseudo code to convert a given Binary Tree to Preorder Threaded Binary Tree. [Marks 4]

Q3. [C210.5] A survey conduction team intends to use tree data structure for storing and searching the collected data. The team requires efficient insertion and search with minimum number of rotations as well as guaranteed logarithmic worst-case costs for these two operations.

(a) Suggest a tree data structure with justification. [Marks 2]
(b) Insert the following elements in a tree suggested by you in 3a. [Marks 4]
2, 1, 4, 5, 9, 3, 6, 7

Q4. [C210.4] Derive the expression to compute the maximum no of keys a B tree can hold in terms of order/degree and height of the tree. Consider an initially empty B-Tree of order 5/Degree 3. Insert the following elements into the B-Tree:

5, 3, 21, 9, 1, 13, 2, 7, 10, 12, 4, 8. [Marks 2+3 = 5]