2023-24

B. TECH. (ODD SEMESTER) EXAMINATION

ATMOPHERIC CHEMISTRY

OPEN ELECTIVE (O.E.)

ACO-3080

Maximum Marks: 60 **Credits: 04** **Duration: Two Hours**

Answer all questions.
Assume suitable data if missing.
Notations and symbols used have their usual meaning.

Q.No.	Question	CO	M.M.
1(a)	Enlist the various layers of the atmosphere. Discuss the significance of stratosphere and also mention major chemical species present in each layer.	CO1	[6]
1(b)	What is temperature inversion? Give its classification and discuss about any one in detail.	CO1	[4]
1(c)	Define air pollution. Give the classification of air pollutants on the basis of origin and state of matter.	CO1	[5]
2(a)	Enlist the criteria pollutants? What are the sources, effects and control of emissions of carbon monoxide?	CO2	[4]
2(b)	Define particulate matter and describe the sources, effects and their significance.	CO2	[5]
2(c)	Write short notes on <u>any two</u> of the followings: (i) Cyclone Separator (ii) Venture scrubber (iii) Acid Rain	CO2	[3×2]
3(a)	What is air quality monitoring? Describe the difficulties encountered in sampling for air quality monitoring. Discuss Freeze out sampling and Absorption in liquids in detail.	CO3	[5]
3(b)	Write the chemical reactions for analysis of SO_2, O_3 and NH_3.	CO3	[6]
3(c)	Write short notes on <u>any one</u> of the followings: (i) Atomic Absorption Spectroscopy (ii) Volumetric and Gravimetric Analyses	CO3	[4]
4(a)	What is Global Warming (GW)? Mention any four sources and harmful effects of Global Warming.	CO4	[4]
4(b)	Describe the catalytic destruction of ozone with the help of chapman cycle. Write the various ozone depleting substances along with their depletion potential.	CO4	[6]
4(c)	Enumerate the various environmental agreements on climate change. Discuss about Vienna Convention or Montreal Protocol in detail.	CO4	[5]

2023-24
B.TECH. (AUTUMN SEMESTER) EXAMINATION
OPEN ELECTIVE (ALL BRANCHES)
NUMERICAL TECHNIQUES
AMO3510

Maximum Marks: 60 **Credits: 04** **Duration: Two Hours**

Answer all questions.
Programmable calculators are not allowed.
Write answers up to four decimals.

Q. No.	Question	M.M.
1 (a)	Use Doolittle's LU factorization method, to solve the following system of equations: $2x+y+4z=12$, $8x-3y+2z=20$, $4x+11y-z=33$. [CO-01]	[07]
	OR	
(a)'	Compute the spectral radius of the matrix A^{-1} where $A=\begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{bmatrix}$ [CO-01]	[07]
(b)	Compute singular value decomposition (SVD) of the matrix $\begin{bmatrix} 1 & 2 \\ 2 & 1 \\ 1 & 3 \end{bmatrix}$. [CO-01]	[08]
2(a)	(i) Calculate the nth divided difference of $\frac{1}{x}$, based on the arguments $x_1, x_2, x_3, \ldots\ldots\ldots, x_{n+1}$. [CO-2]	[4+3]
	(ii) Find the value of the uniform mesh size h that can be used to tabulate the function $f(x) = x^2 \ln x$ on [5, 10] using quadratic interpolation formula such that $\varepsilon = 1 \times 10^{-5}$.	

Contd.... 2.

OR

(a)' Obtain the rational approximation $R_{2,3}(x)$ for the function e^x. Also find the order of its approximation. [07]

(b) (i) Verify whether the function defined by [3+5]

$$f(x)=\begin{cases}-x^2-2x^3, & -1\le x\le 0\\ -x^2+2x^3, & 0\le x\le 1\end{cases}$$

is a cubic spline on [-1,1] or not.

(ii) Obtain a cubic spline fit for the data

x	1	2	3	4
f(x)	1	5	11	8

Under the conditions M(0) = 0 = M(4) and valid in the interval [3 ,4].

Hence obtain the estimate of $f(3.5)$ and $f'(3.5)$.

3(a) Obtain the least squares polynomial approximation of degree two for $f(x)=x^{3/2}$ on the interval [0, 1]. [07]

(b) For the function $f(x)=1+\frac{sin8\pi x}{2}$ on the interval [0,1]. determine L_1, L_2 *and* L_∞ norms with respect to weight function $w(x)=1$. [08]

OR

(b)' Obtain the Chebyshev polynomial approximation of degree 2 to the function $f(x)=x^3$ on the interval [0,1]. [08]

4(a) One has \$12000 to invest, and there are three different funds from which to choose. The municipal bond fund has a 7% return, the local bank's CDs have an 8% return, and the high-risk account has an expected 12% return. To minimize risk, one decides not to invest any more than \$2000 in the high risk account. For tax reasons, one need to spend at least three times as much in municipal bond as in the bank CDs. Assuming the year end yields are as expected. Formulate an LPP and use graphical method to determine the optimal investment amounts. [07]

Contd....3.

(b) Use simplex method, to solve the following LPP: (Co-04) [08]

Maximize $P = x_1 + 2x_2 + x_3$

Subject to $2x_1 + x_2 - x_3 \leq 2$; $2x_1 - x_2 + 5x_3 \leq 6$;

$4x_1 + x_2 + x_3 \leq 6$; $x_1, x_2, x_3 \geq 0$.

OR

(b)' Use simplex method, to solve the following LPP: (Co-04) [08]

Maximize $Z = 2x_1 + x_2 - 3x_3 + 5x_4$

Subject to $x_1 + 2x_2 - 2x_3 + 4x_4 \leq 40$; $2x_1 - x_2 + x_3 + 2x_4 \leq 8$;

$4x_1 - 2x_2 + x_3 - x_4 \leq 10$; $x_1, x_2, x_3, x_4 \geq 0$.

xxxxxxxxxxxxxxxxxx

Code No.: 6465

2023-2024
B. TECH. (ODD SEMESTER) EXAMINATION
OPEN ELECTIVE
NANOPHYSICS AND NANOTECHNOLOGY-I
APO3090

Maximum Marks: 60 **Credits: 04** **Duration: Two Hours**

Answer all questions.

1(a)	Discuss the concept of "time scale'' in understanding the dynamics of reactions and processes in nanostructures.	(CO1)	[7.5]
1(b)	Write notes on electrical and magnetic properties of the nanomaterials.	(CO1)	[7.5]
2(a)	Define excitons and explain single electron tunnelling in details.	(CO2)	[05]
2(b)	Classify nanomaterials according to their origin and dimensionality.	(CO2)	[04]
2(c)	Explain the formation of quantum dot by electron beam lithography with a suitable diagram.	(CO2)	[06]
	OR		
2(c')	Explain potential well confinement and Fermi gas delocalization for nanostructures.	(CO2)	[06]
3(a)	Define nanomagnets. What is the effect of bulk nanostructuring on the magnetic properties of the material?	(CO3)	[7.5]
3(b)	What are ferrofluids? Discuss any of its two applications.	(CO3)	[7.5]
4(a)	What is Graphene? Write historical overview of graphene discovery and discuss some of its applications.	(CO4)	[08]
4(b)	Describe two distinct methods for the synthesis of graphene by highlighting the key steps involved in each process.	(CO4)	[07]

2023-24
B.TECH AUTUMN (VII SEMESTER) EXAMINATION
FUNDAMENTALS OF ENTREPRENEURSHIP
EZH-3010

Maximum Marks: 60 **Duration: Two Hours**

Assume suitable data if missing
Answer all the questions in sequential order.

Q.No.		C.O	M.M
1(a)	Discuss the relevance of Entrepreneurship in the modern economy. Also, highlight the various characteristics of enterprising people, in the context of General Enterprising Tendency Test (GETT).	CO 1	[7.5]
1(b)	With the help of a detailed diagram, discuss the Start-Up development phases from an Idea to a Venture & Team to an Organization.	CO1	[7.5]
	OR		
1'(a)	What is "Start-Up India initiative"? Briefly highlight its various programs & schemes that are aimed at promoting Start-Ups across the country.	CO1	[7.5]
1'(b)	With the help of a diagram, identify the different states experienced by an individual in accordance with Csikszentmihalyi's model of Flow. Also, discuss its relevance for Start-Up founders/co-founders.	CO1	[7.5]
2(a)	With the help of a relevant example explain the concept of "Jobs to be Done".	CO2	[5]
2(b)	Why is Idea's Assessment/Validation critical after the Identification of problems by an entrepreneur? Also, focus attention on the factors to be considered during Idea Assessment/Validation.	CO2	[10]

contd....2.

3 (a)	What is "Customer Segmentation" & briefly highlight its relevance. Differentiate between the following segmentation techniques with the help of examples • Psychographic Segmentation • Benefit Segmentation	CO3	[7.5]
3(b)	Design a detailed Value Proposition Canvas; including the Fit, for a young Fin-Tech Stat-Up, that offers retail & institutional broking, commodities trading, mutual funds and bonds in online space to the end consumers.	CO3	[7.5]
	OR		
3'(a)	How is the Four-Action framework used by Low-Cost Airlines to re-segment the existing conventional Airline market	CO3	[7.5]
3'(b)	Design a detailed Value Proposition Canvas; including the Fit, for a young Start-Up, that provides consumers with on-demand, home-delivered access to a wide range of prescriptions, pharmaceuticals, comprehensive diagnostic test services and teleconsultations thereby serving their healthcare needs.	CO3	[7.5]
4(a)	What are Standard Business Models? Briefly explain the following with the help of relevant examples: • Peer to Peer Business Model • Razor and Blades Business Model • Subscription Business Model	CO4	[7.5]
4(b)	Explain how's the Blue Ocean Strategy different from the Red Ocean Strategy. Also, highlight the defining characteristics of the Blue Ocean Strategy.	CO4	[7.5]

2023-24

B. TECH. (AUTUMN SEMESTER) EXAMINATION

INTELLECTUAL PROPERTY RIGTHS FOR ENGINEERS

(OPEN ELECTIVE)

(EZH-3020)

Maximum Marks: 60 **Time: 2 hours**

Answer all the questions.

			M.M.
1.	(a)	What do you understand by the term Intellectual Property Rights (IPR)? Why basic awareness and understanding of Intellectual Property is essential for engineers, scientists, researchers and entrepreneurs? **(CO-1)**	(7.5)
	(b)	Write short notes on any three of the following: **(CO-1,2)** (i) Universal Copyright Convention, 1952. (ii) Paris Convention, 1883. (iii) Hague Agreement concerning the International Deposit of Industrial Designs,1925 (iv) Functions of WIPO	
2.	(a)	"Define Trade Secrets. How is it protected? Compare the advantages and disadvantages of Trade Secret Protection with respect to Patent protection **(CO-4)**	(7.5)
	(b)	Discuss the procedure from filing till the grant of Patents in India. **(CO-2)**	(7.5)
		OR	
2.	(a')	Explain in detail all non patentable inventions as provided under Section 3 & 4 of the Patent Act, 1970. Illustrate your Answer. **(CO-3)**	(7.5)
	(b')	Critically analyze the Draft Patent Amendment Rules 2023 with respect to changes brought in Pre Grant Opposition. **(CO-4)**	(7.5)
3.	(a)	Define copyright. Dwell on the doctrine of fair use with respect to limitation and exceptions in Copyright Law. **(CO-1,3)**	(7.5)
	(b)	Define Geographical Indication of Goods (GI)? How are Geographical Indications relevant to business? What are the conditions for the registration of GI under the G.I. Act, 1999. **(CO-3)**	(7.5)
4.	(a)	Explain the procedure for the registration of Semiconductor Integrated Layout Design and also state the rights conferred by registration. **(CO-3)**	(7.5)
	(b)	Discuss the Design Amendment Rules 2021 with a focus on changes with respect to StartUps and Locarno Classification. **(CO-1)**	(7.5)

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2023-24

B. TECH. (AUTUMN SEMESTER) EXAMINATION

PATENT LAW FOR ENGINEERS

(OPEN ELECTIVE)

(EZH-3030)

Maximum Marks: 60 **Time: 2 hours**

Answer all the questions.

			M.M.
1.	(a)	"Intellectual Property is all about the products of the human mind. IP is everywhere." Critically analyze the statement? **(CO-1)**	(7.5)
	(b)	Explain Patents. What rights does it provide and how it is useful to an individual, society and business. **(CO-1,2)**	(7.5)
		OR	
1`.	(a')	Write Short Notes on the following: **(CO-4)**	
		(i) Product Patent and process patent	(2.5)
		(ii) Differentiate between Invention & Patent	(2.5)
		(iii) Paris Convention, 1883	(2.5)
	(b')	Elucidate the concept & nature of Patents. How far Patent is different from monopoly and proprietary Rights. Also elucidate the rights and obligations of Patentee. **(CO-2)**	(7.5)
2.	(a)	Enumerate those categories of inventions which are non patentable. Illustrate your answer with regard to every category. Also discuss in detail Section-3(d) of the Patents Act, 1970. **(CO-4)**	(7.5)
	(b)	The fundamental principle of Patent Law in India is that a patent is always granted for an invention, which is novel, new, non-obvious and useful. Inventive step without novelty is myth. Explain the requirement of Inventive Step and its essentials as per law. **(CO-2)**	(7.5)
3.	(a)	"The standards for meeting patentability criteria under The Patents Act 1970 are emphasized to reward the contributors of an invention. Among these criteria, novelty is a vital and absolute condition for patentability". In light of this, explain the concept of Novelty in reference to India.". [redacted]. **(CO-3)**	(7.5)
	(b)	"Explain Provisional Specifications and Complete specifications. Explain the difference between the two." **(CO-4)**	(7.5)
4.	(a)	Explain in detail procedure for the filing and grant of Patent as per The Patents Act, 1970 and The Patent Rules 2002. **(CO-1,3)**	(7.5)
	(b)	Critically analyze the Draft Patent Amendment Rules 2023 with respect to changes brought in Pre Grant Opposition. **(CO-3)**	(7.5)

2023-24
B.TECH. (AUTUMN SEMESTER) EXAMINATION
CIVIL ENGINEERING
OPEN ELECTIVE
DISASTER MANAGEMENT
CEO 4710

Maximum Marks: 60 **Credits: 04** **Duration: Two Hours**

Answer all the questions.
Assume suitable data if missing.
Notations used have their usual meaning.

Q.No.	Question	CO	M.M.
1 (a)	Discuss in detail Global warming and its effect on environment	CO 1	07
(b)	Describe the basis of identification and classification of Anthropogenic disasters.	CO 1	08
2 (a)	Describe briefly the structure of earth and mentioning the important layers with its salient features.	CO 1	04
2 (b)	Distinguish between any three of the following (i) Magnitude and Intensity of earthquake (ii) Epicentral distance and hypo central distance (iii) M – discontinuity and crust (iv) Damping coefficient and Damping ratio	CO 2	06
2 (c)	Derive the relation for logarithmic decrement for a freely vibrated body. For a system with damping ratio 5%, determine the number of free vibration cycles required to reduce displacement amplitude by 80% of the initial amplitude, if the initial velocity is zero.	CO 4	05

OR

Contd....2.

2' (a) I. Prove that maximum dynamic amplification obtained when $\eta = \sqrt{1-2\zeta^2}$ Where η = frequency ratio and ζ = damping ratio. CO 4 05

II. The largest earthquake ever measured in Chile in 1960 and was 18 times more intense than San-Francisco Earthquake in 1960 (M=8.3). What did earthquake in Chile measured on Richter Scale.

2'(b) Differentiate between any three of the following: CO 4 06

I. Nominal mix and design mix

II. Plain bar, Tor bar and TMT bar

III. Curing and efflorescence

IV. Cube test and cylinder test

2'.(c) What are the possible damages to RCC buildings in earthquake prone areas? Explain with neat sketches CO 1, 4 04

3 (a) A 500-ha watershed has the land use/ cover and corresponding runoff coefficient as given below: CO 2 08

Land use/cover	Area (ha)	Runoff coefficient
Forest	250	0.10
Pasture	50	0.11
Cultivated land	200	0.30

The maximum length of travel of water in the watershed is about 3000 m and the elevation difference between the highest and outlet points of the watershed is 25 m. The maximum intensity duration frequency relationship of the watershed is given by:

$$i = \frac{6.3T^{0.15}}{(D+0.5)^{0.95}}$$

Where, i is in cm/h, T return period in years, D is duration of rainfall in hours. Estimate the (i) 25 year peak runoff from the watershed.

3.(b) Discuss various types of flood walls and levees. CO3 07

OR

3'.(b) What do you understand by flood plain zoning? Explain the steps involved in flood plain zoning. CO3 07

4 (a) Give a short account of "Disaster Management Cycle". Highlight the role of engineering in general and of your own branch in particular in disaster management. CO 3,4 07

4.(b) What are International and National Strategies and Organizations for disaster reduction. CO 3, 4 08

Code-6531

2023-24

DEPARTMENT OF CIVIL ENGINEERING

B.Tech. VII Semester Examination

Project Management CEO-4750 (Open Elective)

Maximum Marks:60 **Duration: Two Hours**

Note: (i) Answer ALL Questions

(ii) Answer to any part of the question should begin from FRESH page

(iii) All parts of a question should be attempted in one sequence within one copy

(iv) All questions carry equal marks

(v) Assume any data if not given

			MM	CO
Q. 1	(a)	Define and discuss various phases of project in detail with examples	(6)	CO1
	(b)	Discuss inherent nature of a project in detail with examples	(6)	CO1
	(c)	Discuss the concept of Ceiling Limit	(3)	CO1
Q.2	(a)	Explain the following concepts, used as in, statistical analysis of a set of data. Also mention suitability of use, of each concept, along with nature of data and phenomenon under study with example (i) Arithmetic Mean (iii) Harmonic Mean (v) Variance (ii) Geometric Mean (iv) Range (vi) Deviation	(6)	CO 2
	(b)	In Figure -1, Normal Time in weeks, of a PERT Network for a Technology Development Project, have been given. Determine the Critical Path and normal Project Completion Time having probability of 50 percent	(9)	CO 2
Q.3	(a)	Discuss in detail the process of establishing Need Definition in context of purchasing with example and applications	(6)	CO 3
	(b)	Write a brief account on broad classification of Specification with example and applications	(9)	CO 3

contd...2.

OR

Q.3'	(a)	In what ways industrial purchasing is different from house hold Purchasing, discuss in detail	(7)	CO 3
	(b)	Explain the various discounts given in purchasing	(8)	CO 3
Q.4	(a)	Discuss the concept of wage and its types in detail with example and applications	(8)	CO 4
	(b)	Explain in detail the need for human resource development	(7)	CO 4

OR

Q.4`	(a)	Discuss in detail various factors which determine the wage fixation	(7)	CO 4
	(b)	Write short notes on any **Two** of the following	(8)	CO 4

(i) Dualism in Labour Market (ii) Multiskilling

(iii) Job Selection (iv) Job Satisfaction

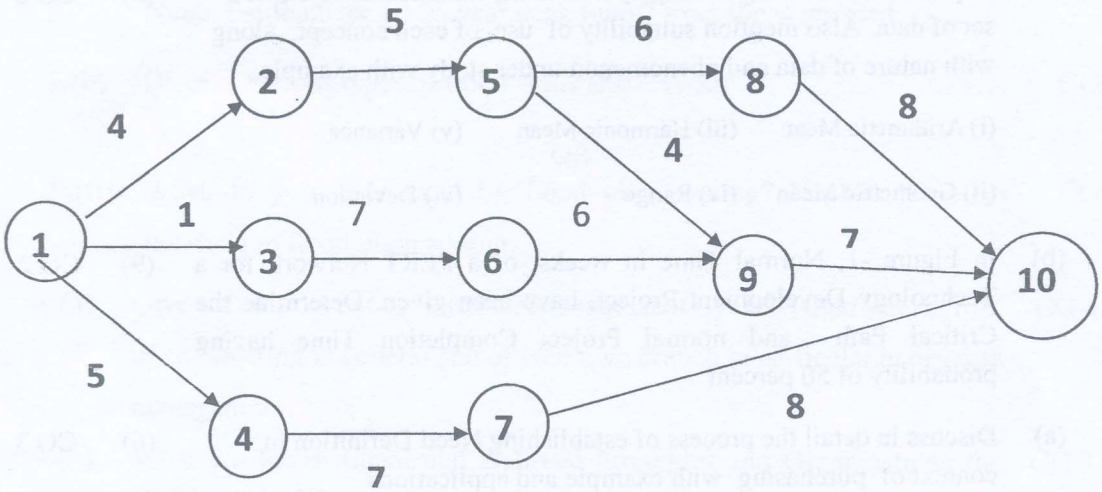

Fig-1

2023-24

B. TECH. (AUTUMN VII, SEMESTER) EXAMINATION

(OPEN ELECTIVE)

(ELECTRICAL/ MECHANICAL/ CIVIL/ ELECTRONICS/ COMPUTER / CHEMICAL / PETRO-CHEMICAL / ARCH. ENGG.)

MATLAB FOR SCIENTISTS AND ENGINEERS

CHO4260

Maximum Marks: 60 **Credits: 04** **Duration: Two Hours**

Answer all the questions.
Assume suitable data if missing.
Notations used have their usual meaning.

1(a) Explain the following with appropriate examples:

- 'format rat'
- 'cosd'
- 'clear all'
- 'full'
- 'sparse'

[CO-1] [10]

OR

1(a') A vector a=[1 5 7] is typed on the command prompt then what shall be the output of the following statements:

a) a(2,4) = 3

b) output of (a) , the statement a(1:2,3)=eye(2) is executed

c) the lattest value of a the statement a(1:2,3)=eye(2,1) is executed [CO-1] [10]

d) the lattest value of a the statement a(1:2,3:4)=eye(2) is executed

e) the lattest value of a the statement a(1:2,3:4)= [ ] is executed

1(b) Explain the different ways the help can be obtained from MATLAB. [CO-1] [5]

2 The permeability of air through a thin soap film varies with temperature as $k_p = \alpha\sqrt{T}e^{\frac{-E}{RT}}$, where k_p is the permeability (m/s), α is a constant ($ms^{-1} K^{-0.5}$), T is absolute temperature in K, E is activation energy for hole formation (J mol^{-1}), and R is universal gas constant (8.314 J mol^{-1} K^{-1}).

Contd....2.

How E and α can be determined using following command/functions of the MATLAB

'regress', 'nlinfit', 'polyfit' and '\'

k_p (m s^{-1})	$1*10^{-3}$	$1.5*10^{-3}$	$2.15*10^{-3}$
T (K)	294	303	313

[CO-2] [15]

OR

2' The A as given below is the coefficients matrix of the linear equations

$$A = \begin{bmatrix} 3 & 4 & 15 & 1 \\ 5 & 6 & 7 & 2 \\ 7 & 8 & 9 & 3 \\ 11 & 10 & 2 & 6 \end{bmatrix}$$

And constant vector B is [2.3; 3; 4.9; 10] how you will solve the equations with the help of the following commands? [CO-2] [15]

'inv', '\', '/ ', 'solve'

3 If the transfer function of the two processes are given as under:

$$\frac{5}{s+2}, \frac{1}{5s+1}$$

Are connected in series and parallel forms what shall be the outputs? Write the appropriate instructions on the command prompt to carry out the same. If the series connection are subjected to step input what shall be the appropriate commands. Write also the command for feedback connection. [CO-3] [15]

OR

4 Write the location in which following block is located in simulink block library.

'step', 'sum', 'integrator', 'gain', 'transfer function'

In what situation these can be used and how its property can be edited? [CO-4] [15]

2023-24
B. TECH. (AUTUMN SEMESTER) EXAMINATION
OPEN ELECTIVE
SELECTED TOPICS IN COMPUTER ENGINEERING I
COO4460

Maximum Marks: 60 **Credits: 04** **Duration: Two Hours**

Answer allquestions.
Assume suitable data if missing.
Notationsand symbols used have their usual meaning.

Q.No.	Question	CO	MM
1(a)	List the strengths and weaknesses (in terms of access, delete, insert operations) of the following data structures: Linked List, Stack, Queue, Binary Tree	(CO1)	[08]
1(b)	Define Big-Oh, Big-Omega, Big-Theta and Little Oh notations. Arrange the following time complexities in decreasing order: $O(log(n!)), O(nlogn), O(n^{3/2}), O(2^{logn}), O(n^{logn})$ Also, compute the time complexity of the relation $T(n) = 13n^2-7$	(CO1)	[07]
2(a)	Describe Merge Sort Algorithm. Sort the given array of numbers using Merge Sort: 9, 39, 45, 81, 18, 27, 72, 90	(CO2)	[08]
	OR		
2(a')	Distinguish between input restricted queue and output restricted queue. Write algorithms to perform insertion and deletion operations in circular queue using arrays.	(CO2)	[08]
2(b)	Write an algorithm to evaluate the postfix expression using stack. Also, use stack to evaluate the given expression: 623+-382/+*2+3+ Show all steps involved.	(CO2)	[07]

contd....2

3(a)	Distinguish between circular queue and circular linked list. Write a pseudo code to insert a node after a given node in a Doubly Linked List. Given the node in the list is:
	struct node
	{
	struct node *next;
	int data;
	struct node*prev;
	};
		(CO3)	[08]

	OR		
3(a')	Write an algorithm to find the height of a binary tree. Create a tree from the given traversals (Show all steps): Inorder: E A C K F H D B G Preorder: F A E K C D H G B For the tree so obtained, write the post order traversal.	(CO3)	[08]
3(b)	Differentiate between Heap and Binary Search Tree. Mention the best case time complexity of Heap Sort. Consider the given marks obtained by students in a class. 53, 23, 35, 68, 27, 15, 48,45,81,55 Create a heap that helps in finding lowest marks of students. Show the steps involved. Also, show the final heap, after the removal of two lowest marks.	(CO3)	[07]
4(a)	Consider the following set of processes, with the length of the CPU burst given in milliseconds: Process Burst Time Priority P1 2 2 P2 1 1 P3 8 4 P4 4 2 P5 5 3 The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all	(CO4)	[08]

Contd....3.

	at time 0. Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: First Come First Serve, Shortest Job First(SJF), nonpreemptive priority (a larger priority number implies a higher priority), and Round Robin(quantum = 2). Also, determine the turnaround time of process P2 in all cases.		
	OR		
4(a')	Write a short note on the services provided by the operating system. What is the difference between process and program? With the help of a suitable diagram, describe different process states.	(CO4)	[08]
4(b)	Define page fault. Consider the following page reference string: 7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2, 3, 0 ,1 Assuming demand paging with three frames, how many page faults would occur for LRU and FIFO replacement algorithms?	(CO5)	[07]

2023-24
B.TECH AUTUMN (VII SEMESTER) EXAMINATION
FUNDAMENTALS OF ENTREPRENEURSHIP
EZH-3010

Maximum Marks: 60 **Duration: Two Hours**

Assume suitable data if missing
Answer all the questions in sequential order.

Q.No.		C.O	M.M
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1(b)	With the help of a detailed diagram, discuss the Start-Up development phases from an Idea to a Venture & Team to an Organization.	CO1	[7.5]
	OR		
1'(a)	What is "Start-Up India initiative"? Briefly highlight its various programs & schemes that are aimed at promoting Start-Ups across the country.	CO1	[7.5]
1'(b)	With the help of a diagram, identify the different states experienced by an individual in accordance with Csikszentmihalyi's model of Flow. Also, discuss its relevance for Start-Up founders/co-founders.	CO1	[7.5]
2(a)	With the help of a relevant example explain the concept of "Jobs to be Done".	CO2	[5]
2(b)	Why is Idea's Assessment/Validation critical after the Identification of problems by an entrepreneur? Also, focus attention on the factors to be considered during Idea Assessment/Validation.	CO2	[10]

contd....2.

3 (a)	What is "Customer Segmentation" & briefly highlight its relevance. Differentiate between the following segmentation techniques with the help of examples • Psychographic Segmentation • Benefit Segmentation	CO3	[7.5]
3(b)	Design a detailed Value Proposition Canvas; including the Fit, for a young Fin-Tech Stat-Up, that offers retail & institutional broking, commodities trading, mutual funds and bonds in online space to the end consumers.	CO3	[7.5]
	OR		
3'(a)	How is the Four-Action framework used by Low-Cost Airlines to re-segment the existing conventional Airline market	CO3	[7.5]
3'(b)	Design a detailed Value Proposition Canvas; including the Fit, for a young Start-Up, that provides consumers with on-demand, home-delivered access to a wide range of prescriptions, pharmaceuticals, comprehensive diagnostic test services and teleconsultations thereby serving their healthcare needs.	CO3	[7.5]
4(a)	What are Standard Business Models? Briefly explain the following with the help of relevant examples: • Peer to Peer Business Model • Razor and Blades Business Model • Subscription Business Model	CO4	[7.5]
4(b)	Explain how's the Blue Ocean Strategy different from the Red Ocean Strategy. Also, highlight the defining characteristics of the Blue Ocean Strategy.	CO4	[7.5]

2023-24

B.TECH./B.ARCH. (AUTUMN SEMESTER) EXAMINATION

(OPEN ELECTIVE)

AIR POLLUTION TECHNOLOGY

(MEO4250/ME425)

Maximum Marks: 60 **Credits: 04** **Duration: Two Hours**

Answer all the questions.
Assume suitable data if missing.

Q.No.	Question	COs	M.M.
1(a)	(i) To find the limiting reactant for oxidant synthesis in PINDEX scheme of calculation, the lower of the two pollutant concentrations ($\mu mol/m^3$) is selected. These pollutants are ….. and ……	CO1	[3]
	(ii) The dominant component responsible for radiative heating and cooling in upper layers of troposphere is (A) CO_2 (B) H_2O (C) O_3 (D) CO		
	(iii) The AQI value for a city is given as 320. The air quality of this city falls in the category of (A) Very poor (B) Poor (C) Moderate (D) Satisfactory		
1(b)	(i) What do you understand by Advective Inversion?	CO1	[2+2]
	(ii) Briefly describe the three complexity levels of Urban Modeling for Pollutants Dispersion.		
1(c)	Describe the Pollution cycle and explain various exchanges and interactions between Air-Water-Land.	CO1	[8]
	OR		
1(c')	Define "Lapse rate". What are the atmospheric stability conditions? With the help of proper diagrams, describe the Plume behaviour as a function of atmospheric stability conditions.	CO1	[8]
2(a)	(i) The hydrogenation and polymerization mechanisms are involved in the formation of (A) Carbon monoxide (B) Soot (C) Ozone (D) Unburned hydrocarbons	CO2	[3]
	(ii) The rate of oxidation of CO to CO_2 is ..... than/to CO formation rate. (A) Lower (B) Higher (C) Equal (D) Initially higher		

contd....2.

(iii) Comparatively, the HC emission from SI engines is .....than/to the CI engines.

(A) Lower (B) Higher (C) Similar (D) Almost negligible

2(b) (i) List out methods used for the abatement of NOx pollution from combustion systems. CO2 [2+2]

(ii) How does BS-VI differ from BS-IV emission standards for automobiles?

2(c) What are the major pollutants emitted from combustion systems? Describe formation mechanism, effects and means of reduction of sulphur oxides. CO2 [8]

OR

2(c') What are the causes of Unburned Hydrocarbon emission in the exhaust of SI engines? CO2 [8]

3(a) (i) The most commonly used solid adsorbents for gaseous pollutant sampling are ..... and..... CO3 [3]

(ii) Materials generally used for sampling probes are .....and.....

(iii) In chemiluminescence technique to detect NOx concentration

(A) NO_2 reacts with O_3 (B) NO reacts with O_2 (C) NO_2 reacts with O_2 (D) NO reacts with O_3

3(b) (i) What is the purpose of Air Quality Monitoring and how is it done? CO3 [2+2]

(ii) Why a gaseous sample is conditioned and diluted before analysis?

3(c) Explain with the help of line diagram, the Gas Filter Correlation (GFC) CO Analyzer. What advantages it has over the conventional NDIR analyzer?. CO3 [8]

OR

3(c') Explain the stack sampling technique to collect the accurate and representative sample. How would you select the traverse points in circular and rectangular stacks. CO3 [8]

4(a) (i) The collector surface of an Electrostatic Precipitator is CO4 [3]

(A) positively charged (B) negatively charged (C) reversibly charged

(D) Uncharged

(ii) In a single bed unit of adsorber, the polluted air stream enters at the

(A) bottom of the bed (B) top of the bed (C) middle of the bed (D) centre of the bed

(iii) Steam injection is provided in Flares to control the formation of

(A) Sulphur oxides (B) Carbon dioxide (C) Smoke (D) Hydrocarbons

4(b) (i) Discuss the advantages and disadvantages of Fabric filters. CO4 [2+2]

(ii) What are the two general approaches which can be adopted to control particulate pollution?

Contd....3.

4(c) Name the techniques commonly employed to remove particulates from polluted gas streams. Describe Cyclone separator in detail. CO4 [8]

OR

4(c') Show the arrangement of various components and the working principle of a Regenerative Afterburner. CO4 [8]

A stream of 5 m^3/s of polluted air at 350 °C is to be treated in an afterburner fuelled with methane having LCV of 50 MJ/kg. The exit temperature is 750 °C, with exit velocity in the reaction chamber at 7 m/s. The required residence time is 0.4 seconds. There will be a total heat loss of 10% of the heat liberated in the chamber. Determine suitable dimensions of the chamber and the A/F required.

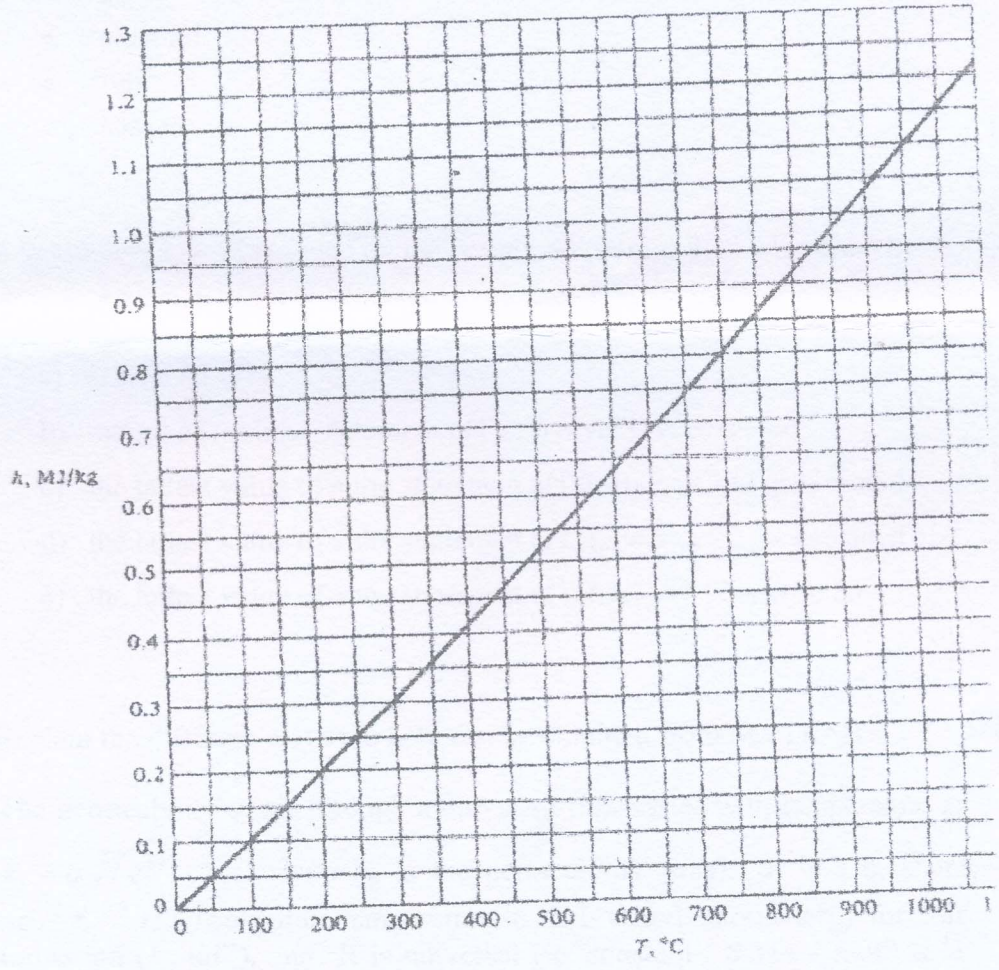

FIGURE 13-3
Specific enthalpy of air as a function of temperature. Datum temperature is 0°C.