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B.Tech. (Electronics & Communication Engg.)
3rd Semester G-Scheme

Examination, December–2024

ECONOMICS FOR ENGINEERS

Paper-HSMC-01-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in all, selecting **one** question from each unit. **Question No. 1 is compulsory.** All questions carry equal marks.*

1. (a) Define Micro Economics.

   (b) Define Marginal Cost.

   (c) What is Economic Problem?

   (d) Define Monopoly.

   (e) What is Law of Demand?

   (f) What is Globalization?

6×2.5=15

Unit-I

2. What is Economics? Explain the nature of Economic Problem also discuss the significance of production possibility curve. 15

3. Explain the term Demand. Discuss the nature and importance of Law of Demand. 15

Unit-II

4. What is Production? Explain various factors of production and their significance. 15

5. Discuss the Law of Production. Illustrate the various cost in short run and in long run. 15

Unit-III

6. Define Market and its characteristics. Differentiate between Perfect Competition, Monopoly, Monopolistic and Oligopoly. 15

7. What is Law of Supply? Explain the various factors that affect the supply of the product. 15

Unit-IV

8. What do you understand by Privatization? Explain its merits and demerits. 15

9. What are Commercial Banks? Explain various functions of commerical banks. 15

B.Tech. (CSE) 3rd Semester (G-Scheme)

Examination, December-2024

DATA STRUCTURES & ALGORITHMS

(w.e.f. March-2021)

Paper -PCC-CSE-203-G(A)

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt any **five** questions in total, selecting **one** question from each unit. **Question No. 1 is compulsory.** All questions carry equal marks.*

1. (a) What is the length of the path in a tree?

   (b) Why do we use Big O notation to compare algorithms?

   (c) What are the advantages of the array over a linked list?

   (d) Why Stack is a recursive data structure?

   (e) How do you test for empty Queues in 'C'?

   (f) How does bubble sort get its name?

   (g) Write applications of a doubly linked list.

   (h) What is the need for a header in the header-linked list?

(i) What do you mean by external and internal sorting?

(j) What is an almost complete binary tree?

(k) What is a balance factor in the AVL tree?

(l) What is the use of Kruskal's algorithm?

(m) What is visiting and traversing in a graph?

(n) What are the characteristics of an algorithm?

(o) How priority queues are represented in 'C'?

15×1=15

Unit-I

2. (a) Define Data Structure. Why do we need Data Structure? 7

(b) Differentiate between the following: 8

(i) Primitive Data Structure and Non-Primitive Data Structure.

(ii) Linear Data Structure and Non-Linear Data Structure.

(iii) Static Data Structure and Dynamic Data Structure.

(iv) Homogeneous Data Structure and Non-Homogeneous Data Structure.

3. (a) Recursive or iterative Binary Search: which one is more efficient and why? 7

(b) Write a program for Recursive Binary Search. 8

Unit-II

4. (a) Why and when Stack or Queue data structure should be used instead of Array or lists. 7

(b) Convert the following prefix expression into an infix expression by using Stack: 8

*– P/QR– /PST

5. (a) Define Priority Queues. What are the characteristics of Priority Queues? 6

(b) What are the implementation strategies for Priority Queues? Explain with a suitable example. 9

Unit-III

6. What are the advantages, disadvantages and applications of circular linked list? 15

7. What are the differences between B–tree and B+tree? Construct a Binary Search Tree for the following:

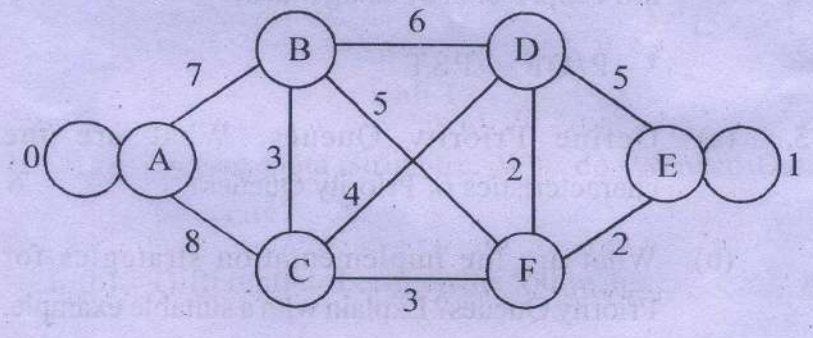
52, 17, 60, 5, 20, 58, 91, 3, 8, 37, 59, 24. 15

Unit-IV

8. What are the steps of the heap sort algorithm? Sort the following list of unsorted numbers by using heap sort:

   85, 95, 10, 15, 20, 75, 55, 25. 15

9. How does Kruskal's algorithm work? Construct the Minimum Spanning Tree for the given graph using Kruskal's algorithm. 15



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B.Tech. (CSE) 3rd Semester (G-Scheme) Examination,

December–2024

PYTHON PROGRAMMING (w.e.f. March-2021)

Paper–PCC-CSE-207-G(A)

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in all, selecting **one** question from each unit. **Question No. 1 is compulsory**. All questions carry equal marks.*

1. (a) What are the different ways to sort the dictionaries in python ?

(b) Why python is called a strongly typed programming language ?

(c) What are mutable and immutable types in python ? Give an example of each.

(d) Differentiate between the terminal-based user interfaces and GUIs.

(e) What is time slicing ?

(f) Explain what a constructor does ? 6×2.5=15

Unit–I

2. (a) Write a python program to print the following star pattern : 8

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

(b) Write a python program to check whether the string is a palindrome ? 7

3. (a) Assume that the variable **data** refers to the string **"Python rocks !"**. 8

Use a string method perform the following tasks :

(i) Obtain a list of the words in the string.

(ii) Convert the string to uppercase.

(iii) Locate the position of the string **"rocks"**.

(iv) Replace the exclamation point with a question mark.

(b) Write a python program that reads a text file and changes the file by capitalizing each character of the file. 7

Unit–II

4. Define list data structure in python. Assume that the variable **data** refers to the list [18, 15, 20]. Write the expressions that perform the following tasks : 15

(a) Replace the value at position 0 in the **data** with that value's negation.

(b) Add the value 10 to the end of the **data**.

(c) Insert the value 22 at position 2 in the **data**.

(d) Remove the value at position 1 in the **data**.

(e) Add the values in the list **newData** to the end of **data**.

(f) Locate the index of the value 20 in the **data**.

(g) Sort the values in the **data**.

5. (a) Write the difference between lists and dictionaries in python. 7

(b) Write a python program to perform a binary search using recursion. 8

Unit–III

6. (a) Describe turtle operations in detail with the help of examples. 8

(b) Write a python program to draw a regular polygon using a turtle. 7

7. (a) Why does the blur function need to work with a copy of the original image ? 6

(b) Explain the python libraries used to create a graphical user interface. 9

Unit–IV

8. (a) What is a class variable ? When should the programmer define a class variable rather than an instance variable ? 4

(b) Describe how the arithmetic operators can be overloaded to work with a new class of numbers ? 4

(c) How is the lifetime of an object determined ? What happens to an object when it dies ? 4

(d) Explain what the __str__ method does and why it is a useful method to include in a class. 3

9. (a) What is the difference between a sleeping thread and a waiting thread ? 4

(b) What does a thread's run method do ? 4

(c) State two ways in which the readers and writers problem is different from the producer-consumer problem. 4

(d) What is a synchronization problem ? 3

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B.Tech. (CSE) 3rd Semester (G-Scheme) Examination,

December–2024

DATABASE MANAGEMENT SYSTEMS

Paper–PCC-CSE-201 G

Time allowed : 3 hours] *[Maximum marks : 75*

Note : ***Question No. 1 is compulsory.*** *Attempt* ***five*** *questions in total, selecting* ***one*** *question from each unit.*

1.	(a)	What is Data independence ?	2.5
	(b)	What is Data Abstraction ? Explain by taking suitable example.	2.5
	(c)	Define Armstrong's axioms.	2.5
	(d)	What is Hashing ?	2.5
	(e)	What is Object Relational Database ?	2.5
	(f)	Write short note on Web Database.	2.5

Unit–I

2. What is Database system ? Explain its architecture, its advantages and disadvantages in detail. 15

3. Write short note on the following : 2×7.5=15

   (i) Entity Relationship Model

   (ii) Network Model

Unit–II

4. What are Normal forms ? Explain the different Normal Forms in details with the help of example. 15

5. What is Query Processing ? How we optimize a query ? Explain its algorithms. 15

Unit–III

6. What is B-Tree ? How we insert and delete elements in a B-Tree ? 15

7. What is Concurrency Control ? Describe Multi-version and optimistic Concurrency Control schemes in detail. by taking suitable example. 15

Unit–IV

8. Write short note on the following : 2×7.5=15

   (a) Data Security

   (b) Intrusion Detection

9. Define data warehousing. Explain data warehouse architecture and characteristics in detail. 15

B.Tech. (CSE) 3rd Semester (G-Scheme)

Examination, December-2024

DIGITAL ELECTRONICS

Paper -PCC-CSE-205-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt any* ***five*** *questions in all, selecting* ***one*** *question from each Unit.* ***Question No. 1 is compulsory.*** *All questions carry equal marks.*

1. (a) What do you mean by digital signal?

(b) Define various applications of flip-flop.

(c) What do you mean by multiplexer?

(d) Define ROM.

(e) Differentiate between Latch and flip flop.

(f) Define Quantization. 6×2.5=15

Unit-I

2. (a) State and explain Universal property of gates. 10

   (b) Convert $(ABC43)_{16}$ into $()_8$ 2

   (c) Convert $(4634)_8$ into $()_2$ 2

   (d) Convert $(264)_{10}$ into $()_8$ 1

3. Explain various Error detecting and correcting codes in detail. 15

Unit-II

4. Realize a function with the help of NAND gates:

   $F(A,B,C,D) = \sum(0,2,3,9,12,15) + d(1,4,6)$ 15

5. Write short note on: 15

   (a) De-Multiplexer

   (b) Priority encoder

Unit-III

6. Explain the working of J-K flip flop with truth table. 15

7. Differentiate between synchronous and asynchronous counter. 15

Unit-IV

8. Explain various types of digital to analog converters in detail. 15

9. Explain the following: 15

   (a) FPGA

   (b) CPLD

B.Tech. 3rd Semester (CSE) (G-Scheme) Examination,

December–2024

MATHEMATICS–III

Paper–BSC-Math-203-G

(Multivariable Calculus and Differential Equations)

Time allowed : 3 hours] *[Maximum marks : 75*

Note : ***Question No. 1 is compulsory****. Attempt total* ***five*** *questions with selecting* ***one*** *question from each section. All questions carry equal marks.*

1. (a) State Euler's Theorem for Homogeneous function.

   (b) Write the conditions for maxima and minima of the function $f(x, y)$.

   (c) If $u = e^{xyz}$, then find $\dfrac{\partial^3 u}{\partial x\, \partial y\, \partial z}$.

   (d) What is the I.F. for the equation of the form ?

   (i) $x^a y^b (my\, dx + nx\, dy) + x^c y^d (py\, dx + qx\, dy) = 0$

   (ii) $f_1(xy)\, y\, dx + f_2(xy)\, x\, dy = 0$

   (e) Solve : $\dfrac{d^2y}{dx} + y = 0$

(f) Find the Orthogonal trajectories of $y^2 = 4ax$.

Section–A

2. (a) If $u = \sin^{-1}\left(\frac{x+y}{\sqrt{x}-\sqrt{y}}\right)$

then prove that

$$x^2\frac{\partial^2 u}{\partial x^2} + y^2\frac{\partial^2 u}{\partial y^2} + 2xy\frac{\partial^2 u}{\partial x\,\partial y} = \frac{-\cos 2u \sin u}{4\cos^3 u}$$

(b) Discuss the maxima and minima of

$$\sin x + \sin y + \sin(x+y)$$

3. (a) If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, show that

$$\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 u = -9(x+y+z)^{-2}$$

(b) State and prove Euler's theorem on homogeneous functions and use it to find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$ where u is given by $u = \log\left(\frac{x^3+y^3}{x-y}\right)$.

Section–B

4. (a) Evaluate by changing the order of integration

$$\int_0^1 \int_x^{\sqrt{2-x^2}} \frac{x\,dy\,dx}{\sqrt{x^2+y^2}}$$

(b) Find the double integration, the area lying inside the circle $r = a\sin\theta$ and outside the cardiod $r = a(1 - \cos\theta)$.

5. (a) By Double integration, show that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $\frac{16}{3}a^2$.

(b) Evaluate $\int_1^e \int_0^{\log y} \int_1^{e^x} \log z\,dz\,dx\,dy$.

Section–C

6. (a) Solve the equation

$$\left[y\left(1+\frac{1}{x}\right) + \cos y\right]dx + (x + \log x - x\sin y)\,dy = 0$$

(b) Solve $\cos x\frac{dy}{dx} + \sin xy = \sqrt{y\sec x}$

7. (a) The equation of electromotive force in terms of current I for an electrical circuit having resistance R and a condenser of capacity C, in series is $E = Ri + \int \frac{i}{c} dt$. Find the current I at any time t, when $E = E_0 \sin wt$.

(b) A body originally at 80°C cools down at 60°C in 20 minutes, the temperature of the air being 40°C. What will be the temperature of the body after 40 minutes from the original ?

Section–D

8. (a) Solve the equation

$$(D^3 + 2D^2 + D)\, y = x^2 e^{2x} + \sin^2 x.$$

(b) Solve $\frac{d^2y}{dx^2} + y = \sec x$ by variation of parameters.

9. (a) Solve the equation

$$(1+x)^2 \frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + y = 4 \cos \log (1+x)$$

(b) Solve the simultaneous equation $\frac{dx}{dt} + 5x - 2y = t$;

$\frac{dy}{dt} + 2x + y = 0$ given that $x = y = 0$, when $t = 0$.

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B.Tech. 3rd Semester (Civil Engg.) G-Scheme

Examination, November-2023

ECONOMICS FOR ENGINEERS

Paper–HSMC-01-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in all, selecting **one** question from each unit. **Question no. 1 is compulsory**. All questions carries equal marks.*

1. Write short notes in 40-50 words : 6×2.5=15

(i) Law of Demand

(ii) Factors of Production

(iii) Types of Costs

(iv) Features of Monopoly Market

(v) Supply

(vi) Merits of Privatization

Unit-I

2. What do you mean by Demand ? Explain law of demand in detail. 15

3. Define Economics. What is the most acceptable Definition of Economics in your point of view ? 15

Unit-II

4. Explain the following : 3×5=15
   (a) Opportuniy cost
   (b) Marginal cost
   (c) Total cost

5. Define Production. Explain in detail the law of variable proportions. 15

Unit-III

6. What is Perfect Competition Market ? Explain various features of perfect competition market . 15

7. Define Supply. Explain role of demand and supply in price determination. 15

Unit-IV

8. What do you mean by Privatization ? Explain its merits and demerits. 15

9. Write a detailed note on Globalisation of Indian economy. Also explain its merits and demerits. 15

B.Tech. (CSE) 3rd Semester (G-Scheme)
Examination, November-2023
DATA STRUCTURES AND ALGORITHMS
Paper - PCC-CSE-203-G(A)
(w.e.f. March-2021)

Time allowed : 3 hours] *[Maximum marks : 75*

Note : ***Question No. 1 is compulsory.*** *Attempt* ***five*** *questions in total, selecting* ***one*** *question from each unit.*

1. (a) Define the term Data Structure. 2.5
   (b) What is Searching ? 2.5
   (c) What is Circular queue ? 2.5
   (d) What is Tree data structure ? Differentiate between Tree and Graph. 2.5
   (e) Describe the term Hashing. 2.5
   (f) What is Spanning Tree ? Explain by taking suitable example. 2.5

Unit–I

2. What is Linear Search ? How Binary Search is better than the Linear Search ? Explain by taking suitable examples. 15

3. What is an Algorithm ? Explain its performance analysis (Space and Time complexity) with example. 15

Unit-II

4. (a) Describe various applications of stack data structure. 10

   (b) Convert the following infix expression into prefix and postfix : $((A + B) - C^* (D / E)) + F$ 5

5. What is Priority Queue ? Explain its standard operations. 15

Unit-III

6. What is linked list ? Write algorithms for several operations : Traversing, Searching, Insertion into, Deletion from linked list. 15

7. (a) Explain various applications of Binary Tree. 7.5

   (b) Describe B+ Tree in detail. 7.5

Unit–IV

8. What is Sorting ? Explain Heap sort with complexity by taking suitable example. 15

9. Write Kruskal's Algorithm for finding Minimum Cost Spanning Tree. 15

B.Tech. (CSE) 3rd Semester (G-Scheme)

Examination, November–2023

PYTHON PROGRAMMING

Paper–PCC-CSE-207-G(A)

(w.e.f. March-2021)

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in all, selecting **one** question from each unit. **Question No. 1 is compulsory.***

1. Write short note on following : 15

(i) Python

(ii) String

(iii) List

(iv) Object

(v) RGB Scheme

(vi) Image

Unit–I

2. (i) How do you run a shell script in Python. 7.5

(ii) Describe the different data types in Python. 7.5

3. Describe the following : 15

(i) Subscript operator

(ii) Types of Text files in Python

Unit–II

4. (i) Describe Literals and its types in detail.

   (ii) How do you search a list in Python ? 15

5. How do you traverse through a Dictionary object in Python ? 15

Unit–III

6. Explain the following : 15

   (i) Turtle Punction

   (ii) Image Processing in Python

7. Define GUI. Also describe the best GUI for Python. 15

Unit–IV

8. Explain the following : 15

   (i) Inheitance

   (ii) Data Modeling

9. Describe the following : 15

   (i) Sleeping Threads

   (ii) Abstract classes

B.Tech. 3rd Semester (CSE) G- Scheme

Examination, November-2023

DATABASE MANAGEMENT SYSTEM

Paper–PCC-CSE-201-G

Time allowed : 3 hours] *[Maximum marks : 75*

*Note : Attempt **five** questions in all. **Question no. 1 is compulsory**. Attempt **four** more questions, selecting exactly **one** question from each unit. All questions carries equal marks.*

1. (a) Discuss Data Independence in detail. 6×2.5=15

   (b) Differentiate between Tuple and Attributes with example.

   (c) Discuss hashing in detail.

   (d) Define Data mining.

   (e) Define integrity constraints.

   (f) Explain Database Recovery in detail.

Unit-I

2. Explain the types of data models in detail with suitable examples. 15

3. Write short note on : 15

   (a) DDL (b) Data Abstraction

Unit-II

4. What is Normal form ? Explain the various types of Normal forms in detail. 15

5. Write short note on : 2×7.5=15

   (a) Lossless Design

   (b) SQL Server

Unit-III

6. Explain Multi-version and optimistic concurrency control schemes in detail. 15

7. Write short note on : 15

   (a) B-Trees

   (b) ACID property

Unit-IV

8. What is database security ? Explain the various models used for database security. 15

9. Write short note on : 15

   (a) Web databases

   (b) Intrusion detection

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B.Tech. (CSE) 3rd Semester (G-Scheme)

Examination, November-2023

DIGITAL ELECTRONICS

Paper - PCC-CSE-205-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempts five questions in all.* ***Question no. 1 is compulsory.*** *Attempt* ***four*** *more questions selecting at least* ***one*** *question from each Unit. All questions carry equal marks.*

1. (a) What do you mean by digital signal?

   (b) Define various applications of shift register.

   (c) What do you mean by demultiplexer?

   (d) Define RAM.

   (e) Define CAM.

   (f) Define Comparator. $6 \times 2\frac{1}{2} = 15$

Unit-I

2. (a) Convert $(734)_8$ into $()_{16}$ 15

   (b) Convert $(AB43)_{16}$ into $()_8$

   (c) Convert $(4634)_{16}$ into $()_{10}$

   (d) Convert $(264)_{10}$ into $()_2$

   (e) Convert $(11101)_2$ into $()_{10}$

3. Explain various Error detecting and correcting code in detail. 15

Unit-II

4. Realize a function with the help of NAND gates:

   $F(A, B, C, D) = \Sigma (0, 2, 3, 4, 6, 15) + d (1, 9, 12)$ 15

5. Write short note on: 15

   (a) Multiplexer

   (b) Priority encoder

Unit-III

6. Explain the working of S-R flip flop with truth table. 15

7. Explain different types of shift registers. 15

Unit-IV

8. Explain various types of analog to digital converters in detail. 15

9. Explain the following: 15

   (a) PLA

   (b) CPLD

B.Tech. 3rd Semester (CSE) (G-Scheme)

Examination, November-2023

MATHEMATICS-III

Paper - BSC-Math-203-G

(Multivariable Calculus ad Differential Equations)

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt any **five** questions in all, selecting **one** question from each Unit. **Question no.1 is compulsory**. All questions carry equal marks.*

1. (a) If $f(x,y)=\frac{xy^2}{x^2+y^4},(x,y)\neq(0,0)$.

Show that $\underset{(x,y)\to(0,0)}{Lt} f(x,y)$ does not exist.

(b) If $u=e^{xyz}$, prove that

$$\frac{\partial^3 u}{\partial x\partial y\partial z}=(1+3xyz+x^2y^2z^2)e^{xyz}.$$

(c) Evaluate $\iint xy\,dxdy$ over the positive quadrant of the circle $x^2+y^2=a^2$.

(d) Solve:

$$(2xy+y-\tan y)\,dx+(x^2-x\tan^2 y+\sec^2 y)\,dy=0.$$

(e) Solve: $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} - 5y = 0$.

(f) Solve the equation $\frac{d^2y}{dx^2} + 4y = \tan 2x$ by the method of variation of parameters. 6×2.5=15

Unit-I

2. (a) Find the value of n, so that the equation $V = r^n(3\cos^2\theta - 1)$ satisfies the relation

$$\frac{\partial}{\partial r}\left(r^2\frac{\partial V}{\partial r}\right) + \frac{1}{\sin\theta}\frac{\partial}{\partial\theta}\left(\sin\theta\frac{\partial V}{\partial\theta}\right) = 0.$$

(b) If $u = \tan^{-1}\left(\frac{y^2}{x}\right)$, prove that,

$$x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x\partial y} + y^2\frac{\partial^2 u}{\partial y^2} = -\sin 2u\sin^2 u.$$

2×7.5 = 15

3. (a) Examine for minimum and maximum values:

$\sin x + \sin y + \sin(x+y)$.

(b) Divide 24 into three parts such that the continued product of the first, square of the second and the cube of the third may be maximum. 2×7.5 = 15

Unit-II

4. (a) Evaluate $\int_0^1\int_{x^2}^{2-x} xy\,dydx$ by changing the order of integration.

(b) Evaluate $\iiint z(x^2+y^2+z^2)\,dxdydz$, through the volume of the cylinder $x^2+y^2=a^2$ intercepted by the planes $z=0$ and $z=h$. 2×7.5 = 15

5. (a) Show, by double integration, that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $\frac{16}{3}a^2$.

(b) Evaluate $\int_0^1\int_0^{x^2}\int_0^{x+y}(x-2y+z)\,dzdydx$.

2×7.5 = 15

Unit-III

6. (a) Solve $(x^2+1)\frac{dy}{dx} + 4xy = \frac{1}{x^2+1}$.

(b) Solve $(3x^2y^4+2xy)dx + (2x^3y^3 - x^2)dy = 0$.

2×7.5 = 15

7. (a) If the air is maintained at 30°C and the temperature of the body cools from 80°C to 60° C in 12 minutes, find the temperature of the body after 24 minutes.

(b) Find the orthogonal trajectory of the family of the curve $r^2 = a^2\cos 2\theta$. 2×7.5 = 15

Unit-IV

8. (a) Solve: $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$.

(b) Solve: $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} - 3y = x^2 \log x$.

$2 \times 7.5 = 15$

9. (a) Solve the simultaneous equations:

$\frac{dx}{dt} + y = \sin t, \frac{dy}{dt} + x = \cos t$; given that $x(0) = 2, y(0) = 0$.

(b) An e.m.f. E sin pt is applied at t = 0 to a circuit containing a capacitance C and inductance L. The current i satisfies the equation $L\frac{di}{dt} + \frac{1}{C}\int i\,dt = E\sin pt$. If $p^2 \frac{1}{LC}$ and initially the current i and the charge q are zero, show that the current at time t is $\frac{Et}{2L}\sin pt$, where $i = \frac{dq}{dt}$. $2 \times 7.5 = 15$