

This question paper contains 4 printed pages.

Your Roll No.

Sl. No. of Ques. Paper : 5230 H
Unique Paper Code : 235551
Name of Paper : Analysis
Name of Course : B.A. Programme
Semester : V
Duration : 3 hours
Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

There are three Sections. Each Section consists of 25 marks.

Attempt any two parts from each question in each Section.

Marks are indicated against each question.

SECTION I

1. (a) Define a bounded set, its supremum and infimum. Find the supremum and infimum of the following sets:

(i) $\left\{ \frac{1}{2}, \frac{1}{2^2}, \frac{1}{2^3}, \dots \right\}$

(ii) $\left\{ \frac{n}{n+1}; n = 1, 2, 3, \dots \right\}$

(iii) \mathbb{Z} , the set of integers. 6

- (b) Define open set and prove that the union of an arbitrary family of open sets is an open set. 6

Turn over

(c) Give an example of a set which has:

- (i) No limit point
- (ii) Unique limit point
- (iii) Infinite number of limit points.

6

2. (a) Show that the function f defined as:

$$f(x) = \begin{cases} (1+2x)^{\frac{1}{x}}, & \text{when } x \neq 0 \\ e^2, & \text{when } x = 0 \end{cases}$$

is continuous at $x = 0$.

6½

(b) Show that $f(x) = \frac{1}{x}$ is not uniformly continuous on

$[0, 1]$.

6½

(c) (i) Define neighbourhood.

(ii) Define closed set.

(iii) Give an example of a set whose derived set is void.

6½

SECTION II

3. (a) Show that $\lim_{n \rightarrow \infty} r^n = 0$ if $|r| < 1$.

6½

(b) If $\langle a_n \rangle$ and $\langle b_n \rangle$ be two sequences such that:

$$\lim_{n \rightarrow \infty} a_n = a, \lim_{n \rightarrow \infty} b_n = b, b_n \neq 0 \text{ and } b \neq 0$$

then show that:

$$\lim_{n \rightarrow \infty} \left(\frac{a_n}{b_n} \right) = \frac{\lim_{n \rightarrow \infty} a_n}{\lim_{n \rightarrow \infty} b_n} = \frac{a}{b}.$$

6½

(c) Prove that a monotone sequence is convergent iff it is bounded.

6½

4. (a) If $\sum_1^{\infty} u_n$ is a convergent series then show that

$\lim_{n \rightarrow \infty} u_n = 0$. Does the converse of this result hold? Justify your answer.

6

(b) State Raabe's test for convergence of the series $\sum_1^{\infty} u_n$ and hence test the convergence of the series:

$$\sum_1^{\infty} \frac{1.3.5 \dots (2n-1)}{2.4.6 \dots 2n} \cdot \frac{1}{n}.$$

6

(c) Test the absolute convergence of the following series:

$$(i) \sum_1^{\infty} \frac{(-1)^{n-1}}{n\sqrt{n}}$$

$$(ii) \sum_1^{\infty} \frac{\sin nx + \cos nx}{n^{3/2}}$$

$$(iii) \sum_1^{\infty} \frac{(-1)^{n-1}}{n}.$$

6

SECTION III

5. (a) Show that continuous function f defined on a closed and bounded interval $[a, b]$ is integrable.

6

(b) Test the convergence of the improper integral:

$$\int_0^{\infty} x^{n-1} e^{-x} dx.$$

6

(c) Define Gamma function and show that $\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$. 6

6. (a) Find the Fourier series of the function f defined as follows:

$$f(x) = \begin{cases} 1, & \text{for } -\pi < x \leq 0 \\ -2, & \text{for } 0 < x \leq \pi \end{cases} \quad 6\frac{1}{2}$$

(b) Show that $\sum_{n=1}^{\infty} \frac{(-1)^n x^{2n}}{n^p (1+x^{2n})}$ converges absolutely and uniformly for all real values of x if $p > 1$. $6\frac{1}{2}$

(c) (i) Find the radius of convergence of the power series:

$$\sum_{n=0}^{\infty} \frac{2^n}{n!} x^n.$$

(ii) Discuss the Riemann integrability of the function $f(x) = |x|$ on $[-1, 1]$. $6\frac{1}{2}$

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 391

H

Unique Paper Code : 290565

**Name of the Paper : CONFLICT RESOLUTION AND
PEACE BUILDING – I**

**Name of the Course : B.A. (Prog.) III Year
APPLICATION COURSE**

Semester : V

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions.
3. **All** questions carry equal marks.
4. Answers may be written either in English or Hindi; but the same medium should be used throughout the paper.

छात्रों के लिए निर्देश

1. इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए ।
2. किन्हीं चार प्रश्नों के उत्तर दीजिए ।
3. सभी प्रश्नों के अंक समान हैं ।
4. इस प्रश्न-पत्र का उत्तर अंग्रेजी या हिंदी किसी एक भाषा में दीजिए, लेकिन सभी उत्तरों का माध्यम एक ही होना चाहिए ।

P.T.O.

1. Define Peace building and suggest this approach for any Contemporary Conflict.
शांति निर्माण संकल्पना की व्याख्या कीजिए और किसी समकालीन विवाद के लिए एक शांतिनिर्माण पद्धति सुझाइए।
2. Discuss Multi Track Diplomacy model.
बहुमार्गीय कूटनीति मॉडल की चर्चा कीजिए।
3. Elaborate on the differences between conflict-resolution and conflict transformation.
विवाद समाधानीकरण समविवाद रूपांतरण में अंतर की व्याख्या कीजिए।
4. Discuss any two models of conflict using examples from south Asia.
दक्षिण एशिया से उदाहरण लेते हुए विवाद के किसी दो प्रतिरूप पर चर्चा कीजिए।
5. Critically discuss Johan Galtung's typology of violence.
जॉन गाल्टिंग के संघर्ष के प्रारूप वर्गीकरण की समीक्षा कीजिए।

6. What is the impact of Gandhian philosophy on conflict prevention and peace building?
गांधी दर्शन का विवाद-व्युत्पत्ति और शांति निर्माण पर क्या प्रभाव पड़ा?
7. What is peace-building? Discuss the model introduced by John Paul Lederach in this regard.
शांति निर्माण क्या है? इस संबंध में जॉन पॉल लीडरैच द्वारा डिजाइन किए मॉडल पर चर्चा करें।
8. 'Culture plays a salient role in the way a society perceives peace and conflict resolution'. Discuss briefly.
'संस्कृति, समाज में शांति और संघर्ष के प्रति समाज एक प्रमुख भूमिका निभाता है'। संक्षेप में चर्चा करें।
9. Write short notes of any two of the followings:
निम्नलिखित में से किन्हीं दो पर संक्षिप्त टिप्पणियां लिखिए:
(i) Adam Curle's conflict progression model
विवाद का मानचित्रण

(ii) Two models of conflict

विवाद के दो प्रतिरूप

(iii) "An Agenda for Peace" by Boutros Boutros-Ghali

बुतरस बुतरस घाली द्वारा "An Agenda for Peace" क्या है ?

(iv) Structural Violence by Galtung

संरचनात्मक हिंसा पर चर्चा कीजिए ।

This question paper contains 7 printed pages]

Roll No.

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S. No. of Question Paper : 8037

Unique Paper Code : 62347502

HC

Name of the Paper : Programming with Python

Name of the Course : B.A. Programme : Computer Application : DSE

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory.

Attempt any five of Question Nos. 2 to 8.

Parts of a question must be answered together.

1. (a) What will be the output of the following code segment ?

2

```
a=40
b=10
a=a^b
b=a^b
a=a^b
print(a,b)
```

(b) Give the output of the following code segment :

3

```
total=0
N=10
for i in range(1,N+1):
    if i %2==0:
        continue
    for j in range(1,i+1):
        total+=1
        if j == i/2.0:
            break
print total
```

P.T.O.

(c) Give the output in each case :

3

(i) `print(1.0 + 2)`

(ii) `print(1.0 + float(2))`

(iii) `s = "goodmorning"`
`c = set(s)`
`print ("After converting string to set : ")`
`print (c)`
`c = list(s)`
`print ("After converting string to list :")`
`print (c)`

(d) What will be the output on execution of the following code segment ?

4

(i) `class test:`
`def __init__(self):`
`self.variable = 'hello'`
`self.Change(self.variable)`
`def Change(self, var):`
`var = 'namaste'`
`obj=test()`
`print(obj.variable)`

(ii) `def moo(x):`
`x[0] = ['name']`
`x[1] = ['rate']`
`return id(x)`

`q = ['name', 'rate']`
`print(id(q) == moo(q))`

(e) Define a function called `minSum`, which takes as an argument a list of lists of numbers
`list1 = [[2, 3, 2, 2], [1, 6, 2, 4], [4, 4, 1, 6]]` and calculates the sum of the values in each of the lists and returns the smallest such sum. [For example, if the argument was `[[1, 4, 0, 2], [2, 5, 1, 3], [3, 6, 2, 4]]` the sums would be 9, 13, and 15, so the value returned should be 9.]

8

- (f) Write a function that finds the sum of the following series for n terms. 3

$1 + 1/3.0 + 1/5.0 + \dots$

- (g) What is the output of the following sequence of statements : 2

```
list = ['a', 'b', 'c', 'd', 'e', 'f']
list[1:3] = ['x', 'y']
print list
```

2. (a) Write a python function maximum3 (n1, n2, n3) to find maximum of three numbers. 5

- (b) Write a python function to count the number of vowels in a string. 5

3. (a) Write a python function for sorting a list L1 = [6, 23, 4, 72, 9, 79] using bubble sort. 5

- (b) For each of the following, indicate whether it is a valid python identifier : 3

(i) N1

(ii) N_1

(iii) N.1

(iv) N-1

(v) RateOfIncrease

(vi) 2Good2BeTrue

- (c) Write the output produced by following code segment : 2

```
x = 3
if 2 > x :
    print 'First'
else :
    print 'Second'
    if 2 > x :
        print 'Third'
    print 'Fourth'
print 'Fifth'
```

4. (a) Evaluate the following expressions :

5

- (i) $15 \ \& \ 22$
- (ii) $15 \ | \ 22$
- (iii) $-15 \ \& \ 22$
- (iv) $-15 \ | \ 22$
- (v) ~ 15
- (vi) `print(4.00/(2.0+2.0))`
- (vii) $X = 2 + 9 * ((3 * 12) - 8) / 10$
- (viii) `float(4+int(2.39)%2)`
- (ix) $2^{**}(3^{**}2)$
- (x) $(2^{**}3)^{**}2$

(b) What is the output of the following code segment ?

5

```
(i) class Name:
    def __init__(self, firstName, mi, lastName):
        self.firstName = firstName
        self.mi = mi
        self.lastName = lastName
firstName = "Sita"
name = Name(firstName, 'F', "Smith")
firstName = "Geeta"
name.lastName = "Mita"
print(name.firstName, name.lastName)
```

(ii) What is the value of sum after the following code has been executed ?

```
sum = 0
for i in range(0, 18, 3):
    if i%6 == 0 :
        sum = sum + i
print(sum)
```

5. (a) An outline for a Student class is defined as follows :

5

```
class Student(object) :  
def __init__(self, name, regNum, postGrad) :  
self.name = name  
self.regNum = regNum  
self.postGrad = postGrad  
def showStudent(self) :
```

You should assume that the name is a string, the registration number is an integer and the postGrad attribute is a boolean value indicating whether the student is a post-graduate. Provide a complete body for the method showStudent which should display on one line the name, registration number and postgraduate status of the student applied as an argument in the following format.

Name: Ajay Kumar; Reg Number: 12345; Postgrad: no

- (b) Give the output for the following code segment :

2

```
a = [1, 2, 3]  
b = a[:]  
print b
```

- (c) What will be the output on execution of the following code ?

3

```
l=[]  
def convert(b):  
    if(b==0):  
        return l  
    dig=b%2  
    l.append(dig)  
    convert(b//2)  
convert(6)  
l.reverse()  
for i in l:  
    print(i),
```

6. (a) In each case, give the output on execution of the code segment :

4

(i)

```
a = [1, 2, 3]  
b = a  
b[0] = 5  
print a
```



```
(ii) a = [1, 2]
      b = [a, 3]
      c=b[:]
      a[0]=7
      b[1] = 8
      print c
```

(b) (i) What is the value of sum after the following code has been executed ? 2+4

```
i = 0
sum = 0
while i < 9:
    if i%4 == 0:
        sum = sum + i
    i = i + 2
print sum
```

(ii) Rewrite the code fragment from part (i) using a for loop without using any break statements and without introducing any more variables.

7. (a) Write the output that will be produced on execution of the following code segments : 5

```
def test(i,j):
    if(i==0):

        return j
    else:
        return test(i-1,i+j)
print(test(3,6))
```

(b) Write the output of the following string functions on the given string :

5

```
s='abcdefxyyzyxzyxzyy'
1. print(s.islower())
2. print(s.count('xy'))
3. print(s.replace('xy','pq'))
4. print(s.find('cd'))
5. print(s.split('x'))
```

8. (a) Illustrate the operation of the sequential search on the following list when the search is made for the number 18. 5

L1: {6, 23, 5, 78, 11, 80, 18, 100}

Also give linear search algorithm.

- (b) Rewrite the following segments using while loop. 5

(i) `total = 0`
`for count in range(1, 21):`
 `total += count`
`print total`

(ii) `import math`
`total = 0`
`for count in range(1, 11, 3):`
 `total += math.pow(count, 2)`
`print total`

This question paper contains 4 printed pages]

Roll No.

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S. No. of Question Paper : 8078

Unique Paper Code : 62357502

HC

Name of the Paper : Differential Equations

Name of the Course : B.A. (Prog.) DSE : Mathematics

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *all* questions by selecting any *two* parts from each question.

1. (a) Solve the initial value problem : 6

$$(ye^x + 2e^x + y^2) dx + (e^x + 2xy) dy = 0; y(0) = 6.$$

(b) Solve : $(x^2 + y^2 + x)dx + xydy = 0$. 6

(c) Solve : $(x - 2y + 5)dx - (2x + y - 1)dy = 0$. 6

2. (a) Solve : $\frac{d^3y}{dx^3} + 2\frac{d^2y}{dx^2} + \frac{dy}{dx} = e^{2x} + x^2 + x$ 6.5

(b) Solve : $x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 5y = x^2 \sin \ln x$. 6.5

(c) Consider the differential equation :

$$\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 4y = 0. \quad 6.5$$

P.T.O.

- (i) Show that each of the functions e^x , e^{4x} and $2e^x - 3e^{4x}$ is a solution. Also show that e^x and $2e^x - 3e^{4x}$ are linearly independent.

(ii) Write the general solution.

3. (a) Using the method of variation of parameters, solve :

$$\frac{d^2y}{dx^2} + y = \sec^2 x. \quad 6.5$$

- (b) Using the method of undetermined coefficients to find the general solution of the differential equation :

$$\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = 2x^2 + e^x + 2xe^x + 4e^{3x}. \quad 6.5$$

- (c) Given that $y = e^x$ is a solution of the differential equation :

$$x\frac{d^2y}{dx^2} - (2x-1)\frac{dy}{dx} + (x-1)y = 0 \quad 6.5$$

Find a linearly independent solution by reducing the order and write the general solution.

4. (a) Solve : $\frac{dx}{x(y^2-z^2)} = \frac{dy}{y(z^2-x^2)} = \frac{dz}{z(x^2-y^2)}$. 6

- (b) Solve : $y^2(y+z)dx + xz(x+z)dy + xy(x+y)dz = 0$. 6

- (c) Solve :

$$\frac{dx}{dt} + 4x + 3y = t,$$

$$\frac{dy}{dt} + 2x + 5y = e^t.$$

5. (a) Find the general solution of the differential equation

$$(y+z)p + (z+x)q = x+y. \quad 6.5$$

- (b) Find the complete integral of the differential equation

$$(p^2 + q^2)x = pz. \quad 6.5$$

- (c) (i) Classify the partial differential equation as elliptic, parabolic or hyperbolic :

$$u_{xx} + (1+x^2)^2 u_{yy} = x^2. \quad 2.5$$

- (ii) Eliminate the parameters a and b from the following equation to find the corresponding partial differential equation :

$$ax^2 + by^2 + z^2 = 1. \quad 4$$

6. (a) Find the complete integral of the equation :

$$p^2 z^2 + q^2 = 1. \quad 6$$

- (b) Eliminate the arbitrary function f from the equation

$$z = f\left(\frac{x}{y}\right) \text{ to find the corresponding partial differential equation.} \quad 6$$

- (c) Find the general solution of the partial differential equation :

$$yzp + xzq = x + y. \quad 6$$

This question paper contains 4 printed pages.

Your Roll No.

Sl. No. of Ques. Paper: 5215

H

Unique Paper Code : 234553

Name of Paper : Internet Technologies – I

Name of Course : B.A. (Prog.)

Semester : V

Duration : 3 hours

Maximum Marks : 45

***(Write your Roll No. on the top immediately
on receipt of this question paper.)***

Question No. 1 is compulsory.

Attempt any three questions from Q. Nos. 2 to 6.

1. (a) What are Empty tags in HTML? Name any two. 2
- (b) Write HTML code to open a link in a new browser window. 2
- (c) What are the uses of “onblur” and “onfocus” events? 2
- (d) Which HTML tag is used to specify footer for a document or section? 1
- (e) Explain the logical operators in JavaScript with example. 3
- (f) Write HTML statement to accept Password from the user. 3
- (g) Write HTML code to insert an image in the background. 1

P. T. O.

- (h) Differentiate between Subscript text and Superscript text with example.

2. (a) Write HTML code:

Frames	
Menu	Logo
Introduction Courses Facilities Faculty	Target window for menu links

(b) Create an HTML form:

User Input Form

Personal Particular

Name: _____

Password: _____

Gender: ☐ Male ☐ Female

Age: < 1 year old

Languages

☐ Java ☐ C/C++ ☐ C#

Instruction

Enter your instruction here...

3. (a) Create a table in HTML as given below:

X	Y	Z	
A	B	D	E
		F	G

(b) Explain any two data types in JavaScript.

4. (a) Give the output of the following:

- (i) Math.max(100, 120, 50, 29, -80, -40);
- (ii) Math.pow(6, 3);
- (iii) Math.floor(14.9);
- (iv) var txt = "UNIVERSITY OF DELHI";
var sln = txt.length;

(b) Write a program in JavaScript to find the factorial of a number.

5. Write the HTML code to generate a Web Page in the format given below:


- Consider the following while writing the HTML code:
- (i) Title of the page should be "Hospitality Industry"
 - (ii) Background colour of the page should be "Silver", Link colour should be "Maroon", visited link colour should be "Red".
 - (iii) Picture used in the page is the file "beach.jpg"
 - (iv) Table should have a border of width 2.

(v) Use the concept of nested lists for creating the list given in the web page with specified bullets.

(vi) Pages linked to:

- Front Office as "front.html"
- Food & Beverages as "food.html"

Hospitality Industry	
<p>One of the industries which is on the path of rapid growth is the hospitality industry.</p>	
<p>Hotels are broadly classified as:</p>	
Hotels	Resorts
Business Hotels	Beach resorts
Liocuro Hotels	Hill resorts
Budget Hotels	Heritage resorts



Departments in a Hotel

1. Front Office
 - Reservations
 - Reception
 - Guest relations
2. Food and Beverages
 - Room Service
 - Coffee Shop
 - Restaurant

For all further enquires : [Contact us](#)

6. (a) Differentiate between While and Do While loop in JavaScript. 4
- (b) Explain "With" in JavaScript with example. 2
- (c) What is external Style Sheet? How to link it with HTML page? 4