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Principal
(Dr. FAREEDA HASANI)
St. Wilfred's P.G. College
Jaipur

ST. WILFRED'S PG COLLEGE

29/40

SESSION - 2012 - 2013

Name/Roll No. Saurabh Pareek Class B.Sc. II Section

Subject N.A (Maths) Paper Pre - University

Day Date Invigilator Signature

CO1 CO2 CO3 CO4 CO5 CO6 CO7

1	2	3	4	5	6	7	8	9	10	Total
4	4	4+4	2	04	04	3	–	–	–	29

Marks Obtained 29 Max Marks 40 Examiners Signature

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a. $\Delta^n \sin(ax+b) = ?$

$\because \Delta \sin(ax+b) = \sin(a(x+h)+b) - \sin(ax+b)$

$= \sin(ax+ah+b) - \sin(ax+b)$

and we know that

$\sin C - \sin D = 2\cos\left(\frac{C+D}{2}\right).\sin\left(\frac{C-D}{2}\right)$

so, $\Delta \sin(ax+b) = 2\cos\left(\frac{2ax+ah+2b}{2}\right)\sin\left(\frac{ah}{2}\right)$

$= 2\cos\left(ax+\frac{ah}{2}+b\right)\sin\left(\frac{ah}{2}\right)$

$= 2\sin\left(\frac{ah}{2}\right)\cos\left(ax+\frac{ah}{2}+b\right)$

$= 2\sin\left(\frac{ah}{2}\right)\sin\left(ax+\frac{ah}{2}+b+\frac{\pi}{2}\right)$

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and $\Delta^2 \sin(ax+b) = 2\sin\left(\frac{ah}{2}\right)\Delta\sin\left(ax + \frac{ah}{2} + b + \frac{\pi}{2}\right)$

$= 2\sin\left(\frac{ah}{2}\right)\left(\sin\left(a(x+h) + \frac{ah}{2} + b + \pi/2\right) - \sin\left(ax + \frac{ah}{2} + b + \pi/2\right)\right)$

$= 2\sin\left(\frac{ah}{2}\right)\left(\sin\left(ax + ah + \frac{ah}{2} + b + \pi/2\right) - \sin\left(ax + \frac{ah}{2} + b + \pi/2\right)\right.$

$= 2\sin\left(\frac{ah}{2}\right) \cdot 2\cos\left(\frac{2ax + 2b + \frac{2\pi}{2} + 2ah}{2}\right)\sin\left(\frac{ah}{2}\right)$

$= 2^2\left(\sin\left(\frac{ah}{2}\right)\right)^2 \cos\left(ax + b + \frac{\pi}{2} + ah\right)$

$= 2^2 \sin^2\left(\frac{ah}{2}\right) \sin\left(ax + b + \frac{\pi}{2} + \frac{\pi}{2} + ah\right)$

$= 2^2 \sin^2\left(\frac{ah}{2}\right) \sin\left(ax + \frac{2b}{2} + \frac{2\pi}{2} + ah\right)$

similarly for $\Delta^n(\sin(ax+b)) = 2^n \sin^n\left(\frac{ah}{2}\right) \sin\left(ax + \frac{2b}{2} + \frac{n\pi}{2} + ah\right)$

$$= \frac{1}{2}\left(\Delta + \Delta E^{-1}\right)$$

$$= \frac{1}{2}\left(\Delta + (E-1)E^{-1}\right) \qquad \because (\Delta = E-1)$$

$$= \frac{1}{2}\left(\Delta + 1 - E^{-1}\right)$$

$$= \frac{1}{2}\left(\Delta + \nabla\right) = R.H.S \qquad \because (\nabla = 1 - E^{-1})$$

so, $\mu\delta = \frac{1}{2}(\Delta + \nabla)$

2

H.P

b) $y_{20} = 49225$, $y_{25} = 48316$, $y_{30} = 47236$, $y_{35} = 45926$, $y_{40} = 4430$

we know that stirling formula is :-

$\therefore y_u = y_0 + {}^uC_1 \Delta f(0) + {}^uC_2 \Delta^2 f(0) + {}^{u+1}C_3 \Delta^3 f(-1) + {}^{u+1}C_4 \Delta^4 f(-2) + {}^{u+2}C_5 \Delta^5 f($

and $y_u = y_0 + {}^uC_1 \Delta f(-1) + {}^{u+1}C_2 \Delta^2 f(-1) + {}^{u+1}C_3 \Delta^3 f(-2) + {}^{u+2}C_4 \Delta^4 f(-2)$ — ①

$+ {}^{u+2}C_5 \Delta^5 f(-3)$ — ②

by adding ① and ②

$$2y_u = 2y_0 + {}^{u}C_1\left(\Delta f(0) + \Delta f(-1)\right) + \Delta^2 f(-1)\left({}^{u}C_2 + {}^{u+1}C_2\right)$$
$$+ {}^{u+1}C_3\left(\Delta^3 f(-1) + \Delta^3 f(-2)\right) + \Delta^4 f(-2)\left({}^{u+1}C_4 + {}^{u+2}C_4\right) - (3)$$

eqⁿ (3) divide by 2

we get, $y_u = y_0 + {}^{u}C_1\left(\frac{\Delta f(0) + \Delta f(-1)}{2}\right) + \Delta^2 f(-1)\left(\frac{u^2}{2}\right) + {}^{u+1}C_3\left(\frac{\Delta^3 f(-1) + \Delta^3 f(-2)}{2}\right)$

$$+ \Delta^4 f(-2)\left(\frac{u^2(u^2-1)}{4}\right) + \ldots \quad \text{— (4)}$$

eqⁿ (4) is stirling formula.

x	y	Δy	$\Delta^2 y$	$\Delta^3 y$	$\Delta^4 y$
20	49225				
		-909			
25	48316		-171		
		-1080		-59	
30	47236		-230		-21
	y_0 =	-1310		-80	
35	45926		-310		
		-1620			
40	44306				

o,

$$y_u = y_0 + {}^{u}C_1\left(\frac{\Delta f(0) + \Delta f(-1)}{2}\right) + \Delta^2 f(-1)\frac{u^2}{2} + {}^{u+1}C_3\left(\frac{\Delta^3 f(-1) + \Delta^3 f(-2)}{2}\right)$$
$$+ \Delta^4 f(-2)\left(\frac{u^2(u^2-1)}{4}\right) + \ldots$$

where $u = \frac{x - x_0}{h}$

$x = 28$
$x_0 = 30$
$h = 5$

$$u = \frac{28-30}{5} = \frac{-2}{5} = -0.4$$

$$= 47236 + {}^{-0.4}C_1\left(\frac{-1080 - 1310}{2}\right) + (-230) \times \frac{(-0.4)^2}{2} +$$
$$+ {}^{-0.4+1}C_3\left(\frac{-59 - 80}{2}\right) + (-2)\left(\frac{(-0.4)^2((-0.4)^2 - 1)}{4}\right) + \ldots$$

$$= 47236 - 0.4 \times \left(\frac{-1080 - 1310}{2}\right) + (-230) \times \frac{0.16}{2} + 0.6C_3\left(\frac{-59-80}{2}\right)$$
$$+ (-2)\left(\frac{0.16 \times (0.16-1)}{24}\right) \ldots$$

$= 4723$

$+ (\ldots$

$= 4723$

$= 476$

so,

(5)

at $x=1$

at $x=2$

at $x =$

32/75

ST. WILFRED'S PG COLLEGE

SESSION - 201 22 - 201 23

Name/Roll No. Gaatri kulshrestha Class BA-2nd yr. Section:

Subject General Psychology Paper Pre - university

Day Fri. day Date 31/2/2023 Invigilator Signature

CO1	CO2	CO3	CO4	CO5						
1	2	3	4	5	6	7	8	9	10	Total
12	1	5	11	3	0	—	—	—	—	32

Marks Obtained 32 Max Marks 75 Examiners Signature

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(1) - Psychology is the study of human behaviour and mental processes.

(2) Size constancy is result of cognitive scaling operations that enable us to perceive an object as having the same size when presented at different view distance.

(1) (7) - Learning is process of acquiring knowledge through experiences of clives

(5) - (1) Encoding, storage and retrival

(8) - Personality refers to enduring (1) Characteristics and behaviour that compose a person's unique adjustment to life including major habits, interest and drives

(9) - (1) Standford Binet Intelligence scale
Universal - Nonverbal Intelligence

11 (2) It involves human or mechnical observation of what people actually do or what events take place during their lives

14 (2) Classical conditioning theory states

that behaviours are learned by connecting a neutral stimuli with a positive one
- Given by Pavlov
- It is the type of learning that often unconsciously

16- Different behaviours to problem solving - (3)
i Lack of Motivation
ii Lack of knowledge
iii Lack of resource
iv- Cultural or social barries

Ans-18- Psychology as field of experimental study began in 1854 in Leipzig Germany.
i)- Structuralism: Developed by Wilhelm Wundt
ii)- It focuses on studying the structure or basic elements of mind (9)

ii - Functionalism - By William James it believed in studying functions and behaviour of mental processes and not structure of mind

iii Gestalt Psychology - It is founded by Max Wertheimier Kurt Kofka and Wolfgang Kohler, They believed in Holistic Approach

iv) Psychoanalyses - By Sigmund Freud he believed that behaviour is control and guided by unconscious processes.

Ans- Theories of emotion.

- James Lange theory -
proposed by William James

and Carl Lange. It suggest that physical changes in body happens first & then leads to experience of emotion

- The opponent process theory that states that the more person experience fear, the less fear will affect them

- Facial Feedback Hypothesis - This theory assumes that facial expressions provide feedback to brain.

10