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Printed Pages : 4 **PHAR-125/PH-125**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 9925 Roll No.

B. Pharm.

(SEM. II) EXAMINATION, 2006-2007

ADVANCED MATHEMATICS

Time : 3 Hours] *[Total Marks : 80*

Note : *Answer all the questions. Internal choice is mentioned for each question.*

1 Attempt any **two** parts of the following : **8×2=16**

(a) Evaluate $\int \frac{dx}{x(x^3-1)}$.

(b) Evaluate $\int_1^2 \frac{[1+\log x]^4}{x} dx$.

(c) Solve : $\frac{dy}{dx} = \frac{2x+y+1}{2x+y+5}$.

2 Attempt any **two** parts of the following : **8×2=16**

(a) Solve : $(1+x)\frac{dy}{dx} - y = e^{3x}(1+x)^2$.

(b) Solve : $(x \log x)\frac{dy}{dx} + y = 2\log x$.

(c) Solve : $\frac{dy}{dx} = \frac{x^3 + y^3}{x^2 y}$.

3 Attempt any **two** parts of the following : **8×2=16**

(a) Solve : $\frac{d^2x}{dt^2} + \lambda\frac{dx}{dt} + \mu x = e^t$.

(b) Solve : $\frac{d^4x}{dt^4} + 2\frac{d^2x}{dt^2} + x = t^2 \cos t$,.

(c) Solve :

$$2\frac{dx}{dt} + \frac{dy}{dt} - 2x + 3y = 3e^t$$

$$3\frac{dx}{dt} + \frac{dy}{dt} + 2x + y = 4e^{2t}$$

4 Attempt any **two** parts of the following : **8×2=16**

(a) Define the standard deviation, mean deviation and root mean square deviation. Calculate the mean and standard deviation for the following :

Size of item	6	7	8	9	10	11	12
Frequency	3	6	9	13	8	5	4

(b) Define the Mean, Median and Mode. Calculate mean, median and mode for the following :

Mid value	15	20	25	30	35	40	45	50	55
Frequency	2	22	19	14	3	4	6	1	1

(c) Given below are the marks obtained by a batch of 20 students in a certain class test in statistics and mathematics

Role No. Students	1	2	3	4	5	6	7	8	9	10
Marks in Statistics	53	54	52	32	30	60	47	46	35	28
Marks in Math	58	55	25	32	26	85	44	80	33	72

Role No. Students	11	12	13	14	15	16	17	18	19	20
Marks in Statistics	25	42	33	48	72	51	45	33	65	72
Marks in Math	10	42	15	46	50	64	39	38	80	85

In which subject is the level of knowledge of students higher ?

5 Attempt any **two** parts of following : **8×2=16**

(a) Define the coefficient of skewness and kurtosis. Calculate coefficient of the skewness of the following :

Years Under	10	20	30	40	50	60
No. of Persons	15	32	51	78	97	109

(b) Define coefficient of correlation. Find the coefficient of correlation between the values X and Y

X	1	3	5	7	8	10
Y	8	12	15	17	18	20

(c) The probability that a boy will pass the examination is $\frac{3}{5}$ and that for a girl it is $\frac{2}{5}$. What is the probability that at least one of them passes the examination ?