Numerical Methods for Engineers [MAT2001 - 136]

Marks: 50 **Duration: 90 mins.**

1NM2001

Answer all the questions.

1) The viscosity of a certain kind of oil is experimentally measured at different temperatures as shown in table: (12)

Temperature in °C	110	130	160	190
viscosity of the oil	10.8	8.1	5.5	4.8

Using Lagrange's method, find the viscosity of this oil at 140°C.

2) Estimate the minimum weight of a bib taps when bore is 20 mm, from the following tabular information, using divided difference formula: (12)

Bore (in mm)	8	10	15	25	32	40	50
Weight of a bib taps (in kg)	0.25	0.3	0.4	1.25	1.7	2.15	3.65

3) A rocket is launched vertically upward from the ground. Its acceleration is registered during the first 80 seconds and is given in the following table: (12)

t (in sec)	0	10	20	30	40	50	60	70	80
a (in m/sec^2)	30	31.63	33.44	35.47	37.75	40.33	43.29	46.69	50.67

Find the velocity and the height of the rocket at $t = 80$ seconds.

4) An experiment provides the following result for the pressure and specific volume of some vapour. (14)

v	1	2	3	4	5
p	21	8	5	3.5	3

Find the rate of change of pressure with respect to volume when $v = 2$.

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