THAKUR COLLEGE OF
ENGINEERING & TECHNOLOGY
(Approved by AICTE, Govt. of Maharashtra & Affiliated to University of Mumbai)
(Accredited by National Board of Accreditation, New Delhi)*
Shyamnarayan Thakur Marg, Thakur Village, Kandivali (East), Mumbai - 400 101.
Tel.: 6730 8000 / 8106 / 8107
Fax : 2846 1890
Email : tcet@thakureducation.org
Website : www.tcetmumbai.in • www.thakureducation.org
* Accredited Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology (w.e.f.: 16-09-2011 for 3 years)
ISO 9001 : 2008 Certified

Term Test II
Applied Mathematics II

YEAR / SEM: F.E. / II
BRANCH: COMMON

DATE : 16/04/2015
TIME : 9:45 am to 10:45am
MARKS: 20

Note: Attempt any five sub questions from Question no. 1 for 10 marks.

Q.1 (i)The value of $\int_0^1 \int_0^1 1\, dx\, dy$

(a) 0 (b) 1 (c) -1 (d) none

(ii) Euler's method is

(a) $y_n = y_{n-1} - hf(x_{n-1}, y_{n-1})$ (b) $y_n = y_{n-1} + hf(x_{n+1}, y_{n+1})$
(c) $y_n = y_{n-1} + hf(x_{n-1}, y_{n-1})$ (d) $y_n = y_{n+1} - hf(x_{n-1}, y_{n-1})$

(iii)The value of $\Gamma\left(-\frac{5}{2}\right)$ is

(a) $(-\frac{5}{2})!$ (b) $\frac{3}{4}\sqrt{\pi}$ (c) $\frac{-8}{15}\sqrt{\pi}$ (d) None

(iv) In Runge-Kuttaof fourth order k_3 is

(a) $k_3 = hf(x_0, y_0)$ (b) $k_3 = hf\left(x_0 + \frac{h}{2}, y_0 + \frac{k_1}{2}\right)$

(c) $k_3 = hf(x_0 + h, y_0 + k_3)$ (d) $k_3 = hf\left(x_0 + \frac{h}{2}, y_0 + \frac{k_2}{2}\right)$

(v) Duplication formula on beta function is

(a) $\Gamma(2n) = \frac{\sqrt{\pi}\ \Gamma(n)}{2^{2n-1}\ \Gamma(n+\frac{1}{2})}$ (b) $\Gamma(n+\frac{1}{2})\,\Gamma(n) = \frac{\sqrt{\pi}\ \Gamma(2n)}{2^{2n-1}}$ (c) $\Gamma(2n)\,\Gamma(n+\frac{1}{2}) = \frac{\sqrt{\pi}}{2^{2n-1}\,\Gamma(n)}$ (d) none

(vi) *For the definite integral* $\int_0^\infty \frac{e^{-ax} - e^{-bx}}{x} \sin mx\, dx$ *parameters are*

(a) a, b, x (b) a, b, m (c) a, b (d) None

Q.2 *Show that* $\int_0^\infty e^{-kx} x^{n-1}\, dx = \frac{\Gamma(n)}{k^n}$ **[5]**

OR

Q.2 Evaluate $\int_0^1 \int_0^{x^2} e^{\frac{y}{x}}\, dx\, dy$ **[5]**

Q.3 *Evaluate* $\int_0^\infty \left(\frac{t}{1+t^2}\right)^4 dt$ **[5]**

OR

Q.3 Using Taylor's Series Method solve $\frac{dy}{dx}$ = x+ ywith $x_0 = 0$, $y_0 = 1$ at x= 0.1 **[5]**

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