E(AS)/2118

Total No. of Questions – [4] Total No. of Printed Pages: 2

G.R. No.	

Paper Code - U127-101 (T2)

MARCH 2018 / IN - SEM (T2)

F. Y. B.TECH. (COMMON) (SEMESTER - II)

COURSE NAME : Engineering Mathematics-II

(2017 PATTERN)

Time : [1 Hour] [Max. Marks : 30]

Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q 1) a) Evaluate $\int_{-\pi/2}^{\pi/2} \cos^3\theta(1+\sin\theta)^2 d\theta$ [6]

b) Show that $\int_0^1 \frac{y^{m-1}+y^{n-1}}{(1+y)^{m+n}} dy = B(m,n)$ [6]

c) Evaluate $\int_0^\infty \frac{e^{-x}}{x}\left(1-e^{-ax}\right)dx$ [4]

OR

Q2) a) $U_n = \int_0^{\pi/4} \tan^n\theta d\theta$, then show that, $n(U_{n+1}+U_{n-1}) = 1$ and hence, find $\int_0^{\pi/4} \tan^6\theta d\theta$ [6]

b) Evaluate $\int_0^1 \frac{dx}{\sqrt{-\log x}}$ [6]

c) Prove that $\frac{d}{dx} erf(x) = \frac{2}{\sqrt{\pi}} e^{-x^2}$ [4]

Q3) a) Trace the curve $y^2(x^2-1)=x$ [6]

b) Trace the curve $r = a \sin 3\theta$ [4]

c) Find total length of the curve $x^{2/3}+y^{2/3}=a^{2/3}$ [4]

OR

Q4) a) Trace the curve $y^2(x-a)=x^2(2a-x)$ [6]

b) Trace the curve $x = a(t + \sin t)$ $y = a(1+\cos t)$ [4]

c) Find total length of the curve $r = a(1+\cos\theta)$ which lies outside the curve $r + a\cos\theta = 0$ [4]