Total No. of Questions – [ ] Total No. of Printed Pages 02

G.R. No.	

Paper Code - U127-101 (RE-F & FS)

JUNE 2018/1 RE-EXAM.

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

COURSE NAME: Engineering Mathematics II

COURSE CODE: ES12171

(2017 PATTERN)

Time: **[2 Hours]** [Max. Marks: **50**]

(*) Instructions to candidates:
1) **Answer Q.1 OR Q.2, Q.3 OR Q.4 and Q.5**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data whereever required**

Q.1) a) Find the equation of sphere on the join of the points (2,-3,1); (1,-2,-1)as its diameter. 6

b) Obtain the equation of the right circular cone, which passes through the point (2, 1,3) with vertex is at (1,1,2)and axis parallel to the line $\frac{x-2}{2}=\frac{y-1}{-4}=\frac{z+2}{3}$. 6

c) Find the equation of right circular cylinder whose guiding curve is $x^2+y^2+z^2=9, x-y+z=3$ 4

OR

Q.2) a) Find the equation of circle which is section to the sphere $x^2+y^2+z^2+6y-6z-21=0$ and having center at (2,-1,3). 6

b) Obtain the equation of the right circular cone, with vertex is at (1,-1,2)and axis parallel to the line $\frac{x-1}{2}=\frac{y+1}{1}=\frac{z-2}{-2}$ and semi vertical angle 45^0 .6

c) Find the equation of right circular cylinder whose axis is the line $\frac{x-2}{2}=\frac{y-3}{1}=\frac{z+1}{1}$ and radius is 5. 4

Q.3) a) Express the following integral $\int_{0}^{4}\int_{y/4}^{1} e^{x^2}\,dx\,dy$ 6

b) Evaluate $\int_0^1\int_0^{\sqrt{1-x^2}}\int_0^{\sqrt{1-x^2-y^2}} \frac{dz\,dx\,dy}{\sqrt{1-x^2-y^2-z^2}}$ 4

c) Find the total area of astroide $x^{2/3}+y^{2/3}=a^{2/3}$ 4

OR

Q.4) a) Evaluate $\int_0^1 dx\int_1^\infty e^{-y}y^x \log y\,dy$ 6

b) Evaluate $\int_0^1 dx \int_0^{\sqrt{1-x^2}} e^{x^2+y^2}\, dy$ 4

c) Find the volume cut off by $x^2+y^2=z^2$ *from sphere* $x^2+y^2+z^2=a^2$ 4

Q.5) Attempt following questions:[20 marks] 20

1 Find order and degree of the differential equation $\left(\frac{d^3y}{dx^3}\right)^2+\left(\frac{dy}{dx}\right)^4+y=0$. 2

2 Find I.F. of the D.E. $\frac{dy}{dx}+2xy=x^2$. 2

3 Find orthogonal trajectory for the family of y = mx 2

4 What is amplitude of the first harmonic of Fourier series

5 Using DUIS rule find $\frac{d}{dx}\left(\int_x^{x^2} e^{-t^2}\, dt\right)$ 2

6 If $f(x)= a^2 - x^2$ in $0 < x < a$ then find value of a_0 in Fourier series 2

7 Evaluate $\int_0^{\infty} e^{-x}\sqrt{x}\,dx$. 2

8 Evaluate $I=\int_0^{2\pi} \sin^4 x\,dx$ 2

9 Find asymptotes of the curve $y^2(x-a)=x^2(2a-x)$. 2

10 Evaluate $\int_0^{\pi/2} \sqrt{\tan x}\,dx$. 2

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