Reg. No. : | | | | | | | | | | |

Question Paper Code: 53001

B.E./B.Tech. DEGREE EXAMINATION, SEP 2020

Third Semester

Civil Engineering

15UMA321- Transforms and Partial Differential Equations

(Common to MECH, ECE, EEE, CHEM, AGRI, BME)

(Regulation 2015)

Duration: One hour Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any Six of the following Questions)

1. If f(x) is an odd function in $(-\pi,\pi)$,then the value of a_n is equal CO1- R

   (a) 3 (b) 2 (c) 1 (d) 0

2. The R.M.S value of f(x) = x in 0 < x < 1 is CO1- R

   (a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{4}}$ (d) $\frac{1}{\sqrt{5}}$

3. If F(s) = F{f(x)},then $F\{f(x-a)\}$ = CO2- R

   (a) e^{-isx} F(s) (b) s + a (c) s ─ a (d) e^{isa} F(s)

4. If F{f(x)} = f(s),then f(x) is said to be CO2- R

   (a) self reciprocal (b) multi reciprocal (c) mono reciprocal (d) nano reciprocal

5. The Z- transform of (3.4^n) = CO3- R

   (a) $\frac{3z}{z-4}$ (b) $\frac{3z}{z+4}$ (c) $\frac{z}{z-4}$ (d) $\frac{3}{z-4}$

6. Let CO3- R

Y(z) = $\frac{z}{(z-1)^2}$ .Then f(n) = ------,where Z{f(n)} = Y(z)

(a) 1 (b) n (c) n^2 (d) n^3

7. $\sum_{r=0}^{n} f(r)g(n-r) =$ CO3- R

(a) $f(n) * g(n)$ (b) $f(n)/g(n)$ $f(n) \cdot g(n)$ (d) $f(n) - g(n)$

8. A solution that contains as many arbitrary constants as there are independent variables is called as CO4- R

(a) singular integral (b) general integral (c) complete integral (d) particular integral

9. The complete integral of p – q = 0 is given by CO4- R

(a) a = b + 2 (b) a = b + 1 (c) a = b (d) a = b − 1

10. Form the p.d.e by eliminating the function from z = ax + by + f(xy) CO4- R

(a) px − qy = xy (b) px − qy = − xy (c) px − qy = 0 (d) px − qy = x − y

PART – B (3 x 8 = 24 Marks)

(Answer any Three of the following Questions

11. Find the complex form of Fourier series for the function $f(x)=e^{-x}$ in -1< x < 1. CO1-App (8)

12. Find the sine and cosine transform of e^{-ax} , a > 0. Hence, Evaluate $\int_0^\infty \frac{x^2}{(x^2+a^2)^2}dx$ and $\int_0^\infty \frac{dx}{(x^2+a^2)(x^2+b^2)}$. CO2 -App (8)

13. Find $Z^{-1}\left(\frac{z(z^2-z+2)}{(z+1)(z-1)^2}\right)$ by using method of partial fraction. CO3- App (8)

14. Solve $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ given $y_0 = y_1 = 0$, using Z- transform. CO3-App (8)

15. Solve x(y – z) p + y(z – x) q = z(x – y). CO4 -App (8)