Hall Ticket Number :										

R-14

Code: 4G245

II B.Tech. II Semester Supplementary Examinations August 2021

Electrical Technology

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. The impedance parameters of a two port network are Z_{11} =6 Ω; Z_{12} = Z_{21} =3 Ω; Z_{22}=4 Ω. Compute the Y parameters and ABCD parameters and write the Describing equations.

OR

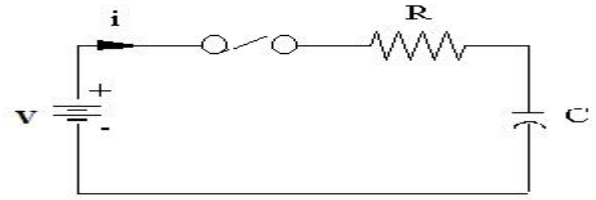
2. Obtain the Conditions for Reciprocity & Symmetry for Z and Y parameters.

UNIT–II

3. Explain about transient response of series RL circuit using Laplace Transform Approach

OR

4. A series RC circuit with R=10 Ω and C= 0.1F has a constant voltage V=20 V applied at t=0 as below .Determine the current I the voltage across the resistor and capacitor



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UNIT–III

5. Design constant k high pass filter with characteristic impedance of 600 ohms and to pass frequency above 20kHz.

OR

6. Relate the characteristics of pass band and stop band filters, explain them.

UNIT–IV

7. a) Write the applications of different types of DC motors?
   b) Draw and explain magnetization and load characteristics of DC shunt generator?

OR

8. A 4 pole lap connected DC machine has a flux per pole of 0.05weber .There are 384 conductors rotating with a speed of 800 rpm in the armature, calculate the EMF in the armature.

UNIT–V

9. Explain the Constructional details of transformer with necessary figures.

OR

10. Explain how the efficiency of a transformer may be estimated from open circuit and short circuit tests.

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Hall Ticket Number :										

R-14

Code: 4G344

II B.Tech. II Semester Supplementary Examinations August 2021

Field Theory and Transmission Lines

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) Define co-ordinate system? Explain different types of co-ordinate systems. 10M
   b) Write a short note on following: i) Stoke's theorem ii) Divergence theorem. 4M

OR

2. a) Define Electric potential? Derive the expression for Electric potential. 7M
   b) Determine the Divergence and curl vector field as $T=10r \sin_2\theta\ 2\cos\Phi$. 7M

UNIT–II

3. a) Write and explain different kinds of current density's with suitable diagrams and expressions. 7M
   b) In a cylindrical conductor of radius 2mm,the current density varies with distance from the axis according to $J= 10^3\ e^{-400r} A/m^2$. Find the total current I. 7M

OR

4. a) Derive the expressions for resistance of conductor with uniform cross section 7M
   b) If $J=1/r^3\ (2\cos\theta a_r + \sin\theta\ a\theta)\ A/m^{2,\ c}$alculate the current passing through
      i) A hemispherical shell of radius 20cm,$0<\theta<\pi/2$, $0<\Phi<2\pi$
      ii) A spherical shell of radius 10cm 7M

UNIT–III

5. a) Derive the force equation due to current element. 7M
   b) Write Maxwell's equations for static EM fields. 7M

OR

6. State and prove Biot savart's law ,using Biot savart's law derive an expression for magnetic field strength H due to a finite &Infinite filamentary conductor carrying a current I and placed along Z-axis at appoint P on Y–axis .hence deduce the magnetic field strength for the length of the conductor extending from $-\infty+\infty$. 14M

UNIT–IV

7. a) Define the wave? List out the different medias and Give the properties of different medias. Write the E&H equations in those medias. 7M
   b) A uniform plane wave propagating in medium has $E= 2\ e^{-\alpha z} \sin(10^8 t - \beta z)\ a_y$ V/m. If the medium is characterized by $\epsilon_r=1$, $\mu_r = 20$ and $\sigma=3$ S/m. Find α , β and H. 7M

OR

8. a) Derive the relation between E& H in a uniform plane wave. find the value of intrinsic impedance of free space . 7M
   b) In free space $H= 0.1\cos(2x10^8 - \beta_z)\ a_{y\ A/m,}$ calculate i) β, λ and T ii) the time t_1 takes by the wave to travel a distance of $\lambda/8$. 7M

UNIT–V

9. a) Define transmission line? And explain different types of transmission line with neat sketches. 8M
   b) Discuss about infinite line concept. 6M

OR

10. a) Derive the expression for the input impedance of a transmission line of length. 7M
    b) A loss less line of 300Ω is terminated by a load of $Z_{R.}$ if the VSWR at 200MHZ is 4.48,and the first V_{min} is located at 6 cm from the load .calculate the reflection coefficient and Z_R 7M

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Hall Ticket Number :										

R-14

Code: 4GC41

II B.Tech. II Semester Supplementary Examinations August 2021

Mathematics-III

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) Symmetry of Beta function B(m, n)=B(n, m) 7M

   b) Evaluate $\int_0^1 \frac{x^2}{\sqrt{1-x^5}}dx$ in terms of B function 7M

OR

2. a) Find real and imaginary parts $\cot z$ 7M

   b) Find all the roots of $\sin z = 2$ 7M

UNIT–II

3. Determine P such that the function $f(z)=\frac{1}{2}\log\left(x^2+y^2\right)+i\,Tan^{-1}\left(\frac{px}{y}\right)$ be an analytic function 14M

OR

4. Find an analytic function whose real part is $e^{-x}\left[x\sin y - y\cos y\right]$ 14M

UNIT–III

5. Evaluate $\int_c \left(y^2+2xy\right)dx+\left(x^2-2xy\right)dy$ where c is the boundary of the region by $y=x^2$ *and* $x=y^2$ 14M

OR

6. Expand $Log\, z$ by Taylor's series about z=1. 14M

UNIT–IV

7. a) Find the poles and Residues at each pole $\frac{ze^z}{(z-1)^3}$ 7M

   b) Use Residue theorem to find the number of zeros of the polynomial $z^{10}-6z^7+3z^3+1$ if $|z|<1$ 7M

OR

8. Evaluate $\int_c \frac{e^{2z}}{(z-1)(z-2)}dz$ where c is the circle $|z|=3$ 14M

UNIT–V

9. Find the bilinear Transformation which maps the point (-1, 0, 1) into the points (0, i, 3i). 14M

OR

10. Find the image of the region in the z-plane between the lines y=0 and $y=\frac{®}{2}$ under the Transformation $w=e^z$. 14M

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