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RAN-1903000202030092**F.Y.B.Sc. (Sem. II) Examination April - 2023****Electronics : Paper II - Network analysis and Filters****Time: 2 Hours]****[Total Marks: 50****सूचना : / Instructions**

(१)

नीचे दशविले निशानीवाणी विगतो उत्तरवली पर अवश्य लपववी.
Fill up strictly the details of signs on your answer book

Name of the Examination:

F.Y.B.Sc. (Sem. II)

Name of the Subject :

Electronics : Paper II - Network analysis and Filters

Subject Code No.: 1903000202030092

Seat No.:

Student's Signature

- (2) Figure on the right indicates full marks.
- (3) All symbols and abbreviations have their usual meaning.
- (4) Non-programmable calculators are allowed.
- (5) Q. I is compulsory.
- (6) Assume data if necessary.

QI**Answer in brief****4 × 2**

1. Find the rms value of a sinusoidal function.
2. Define Laplace transform and its applications
3. How will you define bandwidth of a resonant circuit?
4. Draw phasor diagram in case of pure inductor

QII

A Find Laplace transform of a second order derivative

07**QII**B Write the inverse Laplace transforms of $\frac{1}{s}$ and $\frac{1}{(s-a)}$ **07****OR****QII**

A Find inverse Laplace transform

07

$$F(s) = S + 1 / (S^2 + 16S + 60)$$

QII

B Solve the following differential equation using Laplace transform

07

$$d^2x/dt^2 + 18dx/dt + 80x = 8.$$

$$\text{given } dx/dt = 2 \text{ at } t = 0$$

$$\text{and } x(0) = 1.$$

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QIII A Discuss the Sinusoidal steady state response of series R-L circuit. **08**

QIII B Add the following two sinusoids using phasor method **06**
 $i_1(t) = 10\sqrt{2} \sin\omega t$ and $i_2(t) = 20\sqrt{2}\sin(\omega t + 60)$.

OR

QIII A Discuss series resonance and find expression for resonant frequency. **08**

QIII B Prove that the voltages E_L and E_C in a series resonant circuit are equal in **06**
magnitude and opposite in sign.

QIV A Get the expression for instantaneous value of power and average power. **08**

QIV B A 60Hz sinusoidal voltage $v = 141 \sin\omega t$ is applied to a series R-L circuit. **06**
 $R = 3\Omega$ and $L = 0.0106H$. Compute the effective value of the steady
state current and the relative phase angle. Write the expression for the
instantaneous current.

OR

QIV A Discuss high pass filter using passive components. **07**

QIV B Define Pass band, stop band and cut off frequency of filter. **07**

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