



RAN - 1903000202030092 - CS

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F. Y. B. Sc. (Sem. - II) Examination April - 2023

Electronics : Paper - II

Network Analysis and Filters

Time: 2 Hours]

[Total Marks: 50

सूचना : / Instructions

(1)

नीचे दृशविले निशानीवाणी विगतो उत्तरवही पर अवश्य लभवी.
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-CS

Seat No.:

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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.1 is compulsory.
- (6) Assume data if necessary.

Q. I. Answer in brief.

4 × 2

1. Draw phasor diagram in case of pure inductor
2. Find Laplace transform of a ramp function
3. What is Q factor
4. Define cut off frequency of filter

Q. II. A. Find Laplace transform of exponential function.

07

Q. II. B. Find the Laplace Transform of $f(t) = t^2 - 7 + \cos 2t$

07

OR

Q. II. A. Find the inverse Laplace Transform of $F(S) = \frac{(3s + 1)}{s^2 - 2s - 3}$

07

**Q. II. B. Solve the following differential equation using Laplace transform
 $y'' + 5y' + 6y = 0, y(0) = 0, y'(0) = 1$**

07

RAN-1903000202030092-CS]

[1]

[P.T.O.]

P1913-CS

- Q. III. A.** Discuss the Sinusoidal response of series R-L circuit. **08**
- Q. III. B.** A sinusoidal current having an effective value of $10 \angle 0^\circ$ amperes is added to another sinusoidal current of effective value $20 \angle 60^\circ$ amperes. Find the effective value of the resultant current. **06**

OR

- Q. III. A.** Discuss Parallel resonance and find expression for resonant frequency. **08**
- Q. III. B.** Prove that the voltages E_L and E_C in a series resonant circuit are equal in magnitude and opposite in sign. **06**
- Q. IV. A.** Find the rms value of a sinusoidal function. If $v(t) = V_m \sin \omega t$ represents the potential difference across a resistor and $i(t) = I_m \sin(\omega t - \theta)$ denote the corresponding current flowing through it, then find the expression for the instantaneous power in it. **08**
- Q. IV. B.** Discuss the Sinusoidal steady state response of a pure capacitor. **06**

OR

- Q. IV. A.** Discuss low pass filter using passive components. **07**
- Q. IV. B.** Define Pass band, stop band and cut off frequency of filter. **07**
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