

## NEET ALTERNATING CURRENT — RESONANCE AND QUALITY FACTOR — PYQS

Max. Marks: 32

Questions: 8

### Section A (MCQ) — 8 questions

**Q.1** An ac circuit contains a resistance of  $1\text{ k}\Omega$ , a capacitor of  $0.1\text{ }\mu\text{F}$  and an inductor of  $1\text{ mH}$  connected in series. The resonance frequency of the circuit is approximately : [NEET (UG) 2026]

- (1)  $15.9\text{ kHz}$  (2)  $20.7\text{ kHz}$   
 (3)  $10.1\text{ kHz}$  (4)  $13.5\text{ kHz}$

 Scan or tap for the  
full solution


**Q.2** In a series LCR circuit, the inductance  $L$  is  $10\text{ mH}$ , capacitance  $C$  is  $1\text{ }\mu\text{F}$  and resistance  $R$  is  $100\text{ }\Omega$ . The frequency at which resonance occurs is :-

[NEET (UG) 2023]

- (1)  $15.9\text{ kHz}$  (2)  $1.59\text{ rad/s}$   
 (3)  $1.59\text{ kHz}$  (4)  $15.9\text{ rad/s}$

 Scan or tap for the  
full solution


**Q.3** A series LCR circuit with inductance  $10\text{ H}$ , capacitance  $10\text{ }\mu\text{F}$ , resistance  $50\text{ }\Omega$  is connected to an ac source of voltage,  $V = 200\sin(100t)$  volt. If the resonant frequency of the LCR circuit is  $\nu_0$  and the frequency of the ac source is  $\nu$ , then

[NEET (UG) 2022]

- (1)  $\nu_0 = \nu = 50\text{ Hz}$   
 (2)  $\nu_0 = \nu = \frac{50}{\pi}\text{ Hz}$   
 (3)  $\nu_0 = \frac{50}{\pi}\text{ Hz}$ ,  $\nu = 50\text{ Hz}$   
 (4)  $\nu = 100\text{ Hz}$ ,  $\nu_0 = \frac{100}{\pi}\text{ Hz}$

 Scan or tap for the  
full solution


**Q.4** A series LCR circuit containing  $5.0\text{ H}$  inductor,  $80\text{ }\mu\text{F}$  capacitor and  $40\text{ }\Omega$  resistor is connected to  $230\text{ V}$  variable frequency ac source. The angular frequencies of the source at which power transferred to the circuit is half the power at the resonant angular frequency are likely to be :

[NEET (UG) 2021]

- (1)  $42\text{ rad/s}$  and  $58\text{ rad/s}$  (2)  $25\text{ rad/s}$  and  $75\text{ rad/s}$   
 (3)  $50\text{ rad/s}$  and  $25\text{ rad/s}$  (4)  $46\text{ rad/s}$  and  $54\text{ rad/s}$

 Scan or tap for the  
full solution

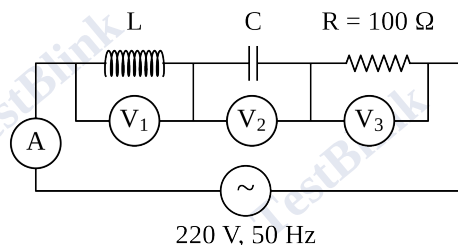

**Q.5** Which of the following combinations should be selected for better tuning of an L-C-R circuit used for communication? [NEET 2016 (Phase 2)]

- (1)  $R = 20\text{ }\Omega$ ,  $L = 1.5\text{ H}$ ,  $C = 35\text{ }\mu\text{F}$   
 (2)  $R = 25\text{ }\Omega$ ,  $L = 2.5\text{ H}$ ,  $C = 45\text{ }\mu\text{F}$   
 (3)  $R = 15\text{ }\Omega$ ,  $L = 3.5\text{ H}$ ,  $C = 30\text{ }\mu\text{F}$   
 (4)  $R = 25\text{ }\Omega$ ,  $L = 1.5\text{ H}$ ,  $C = 45\text{ }\mu\text{F}$

 Scan or tap for the  
full solution


**Q.6** In the given circuit the readings of voltmeters  $V_1$  and  $V_2$  are  $300\text{ volts}$  each. The readings of the voltmeter  $V_3$  and ammeter  $A$  are respectively

[AIPMT 2010 (Prelims)]



- (1)  $150\text{ V}$ ,  $2.2\text{ A}$  (2)  $220\text{ V}$ ,  $2.2\text{ A}$   
 (3)  $220\text{ V}$ ,  $2.0\text{ A}$  (4)  $100\text{ V}$ ,  $2.0\text{ A}$

 Scan or tap for the  
full solution


**Q.7** What is the value of inductance  $L$  for which the current is maximum in a series LCR circuit with  $C = 10\text{ }\mu\text{F}$  and  $\omega = 1000\text{ s}^{-1}$ ? [AIPMT 2007]

- (1)  $1\text{ mH}$   
 (2) cannot be calculated unless  $R$  is known  
 (3)  $10\text{ mH}$   
 (4)  $100\text{ mH}$

 Scan or tap for the  
full solution


**Q.8** The value of quality factor is [AIPMT 2001]

- (1)  $\frac{\omega L}{R}$  (2)  $\frac{1}{\omega RC}$  (3)  $\sqrt{LC}$  (4)  $L/R$

 Scan or tap for the  
full solution


**ANSWER KEY**

|              |      |   |   |   |   |   |   |
|--------------|------|---|---|---|---|---|---|
| <b>Ques.</b> | 1    | 2 | 3 | 4 | 5 | 6 | 7 |
| <b>Ans.</b>  | 1    | 3 | 2 | 4 | 3 | 2 | 4 |
| <b>Ques.</b> | 8    |   |   |   |   |   |   |
| <b>Ans.</b>  | 1, 2 |   |   |   |   |   |   |