

DEPARTMENT OF EXAMINATION SRI LANKA

EXAMINATION FOR THE AMATEUR RADIO OPERATORS' CERTIFICATE OF PROFICIENCY
ISSUED BY THE DIRECTOR GENERAL OF TELECOMMUNICATIONS OF SRI LANKAAPRIL 1993
(GENERAL CLASS)

Index No.

FUNDAMENTALS OF ELECTRICITY & RADIO COMMUNICATIONS*Two hours*Answer **all** questions on this paper itself.

A minimum of 50 marks is required for a pass.

Choose the correct answer and **underline it**.

1. Resistors of $12\ \Omega$, $15\ \Omega$ and $20\ \Omega$ are connected in parallel. What is the effective resistance?

- (a) $47\ \Omega$ (b) $30\ \Omega$ (c) $5\ \Omega$ (d) $10\ \Omega$

2. Capacitors of $8\ \mu\text{F}$, $4\ \mu\text{F}$ and $2\ \mu\text{F}$ are connected in Parallel. What is the effective Capacitance?

- (a) $1.14\ \mu\text{F}$ (b) $14\ \mu\text{F}$ (c) $14\ \text{F}$ (d) $1.5\ \mu\text{F}$

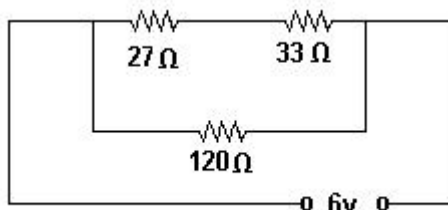
3. Two inductors of $10\ \mu\text{H}$ & $20\ \mu\text{H}$ are connected in series; two others of $30\ \mu\text{H}$ & $40\ \mu\text{H}$ are also connected in series. What is the equivalent inductance if these series combinations are connected in parallel?

- (a) $21\ \mu\text{H}$ (b) $23.8\ \mu\text{H}$ (c) $20\ \mu\text{H}$ (d) $100\ \mu\text{H}$

4. At what frequency do a capacitor of $100\ \text{pF}$ & an inductance of $100\ \mu\text{H}$ resonance?

- (a) $160\ \text{kHz}$ (b) $1.6\ \text{MHz}$ (c) $3.2\ \text{MHz}$ (d) $3.2\ \text{kHz}$

5.



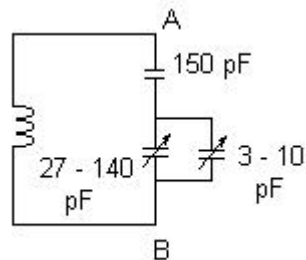
The current flow through the $27\ \Omega$ resistor has a value of

- (a) $27\ \text{mA}$ (b) $33\ \text{mA}$ (c) $60\ \text{mA}$ (d) $100\ \text{mA}$

6. The voltage across the $33\ \Omega$ resistor in the above question is

- (a) $0.6\ \text{V}$ (b) $1.2\ \text{V}$ (c) $3.3\ \text{V}$ (d) $4.5\ \text{V}$

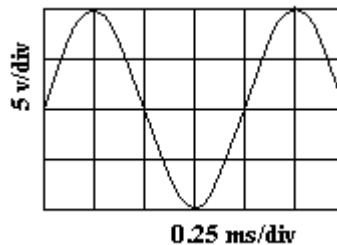
7. A loudspeaker speech coil has a resistance of 4Ω . If the voltage across it is 4 v, then the power in the speech coil is
 (a) 4 w (b) 3 w (c) 6 w (d) 9 w
8. A coil has a reactance of 1000Ω and a resistance of 10Ω . It's approximate impedance is
 (a) 990Ω (b) 1000Ω (c) 1100Ω (d) $10\text{ k}\Omega$
- 9.



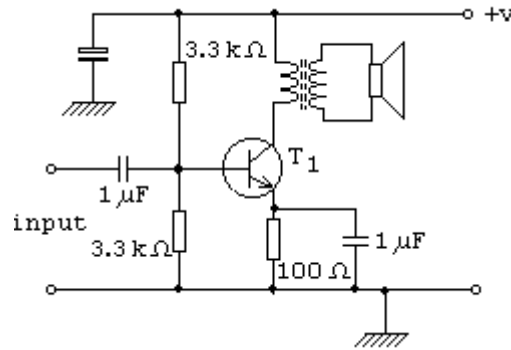
When the variable capacitor & the trimmer capacitor of a local oscillator tuned circuit are adjusted to their maximum values, the effective capacitance between points A & B will be

- (a) 50 pF (b) 75pF (c) 200pF (d) 300pF
10. The peak to peak value of a Sine-wave having an R.M.S voltage of 14.1V is approximately
 (a) 20 V (b) 28.2V (c) 40 V (d) 56.4 V
11. Which of the instruments below can measure the exact frequency of a component in a complex waveform?
 (a) a heterodyne wavemeter (b) a digital frequency counter
 (c) an absorption wavemeter (d) an oscilloscope waveform
12. Double sideband, suppressed carrier transmissions are
 (a) prohibited (b) permitted
 (c) allowed with written permission (d) allowed only on VHF frequencies
13. Interference is experienced in the 144 MHz band from some 432 MHz crystal controlled equipment . The basic oscillator is around 12 MHz. The most likely multiplication order is
 (a) $\times 2 \times 3 \times 3 \times 2$ (b) $\times 2 \times 2 \times 3 \times 3$
 (c) $\times 3 \times 3 \times 2 \times 2$ (d) $\times 3 \times 2 \times 3 \times 2$

14. Which type of mixer keeps unwanted outputs to a minimum ?
 (a) A balanced mixer (b) A product detector
 (c) Single transistor mixers (d) Single diode mixers
15. Having established contact on a calling frequency, it is a good practice to
 (a) stay on the same frequency
 (b) move to another frequency
 (c) invite others to join in on the same frequency
 (d) be objectionable to all others calling
16. The purpose of a terrestrial repeater is to
 (a) increase satellite coverage.
 (b) increase the range of mobile stations.
 (c) increase the range of fixed stations.
 (d) minimise contacts of pedestrian stations.
17. The band plans should be observed because
 (a) they are mandatory. (b) they are governed by International Regulations.
 (c) they try to aid operations. (d) they are only for novices.
18. The diagram represents a trace on an oscilloscope. What is the frequency of the displayed waveform ?
 (a) 1 kHz (b) 5 kHz (c) 10 kHz (d) 100 kHz



19. As the frequency rises, the reactance of an inductor,
 (a) stays constant (b) decreases (c) increases (d) none of these
20. A power gain of 4 is equivalent to
 (a) 3 dB (b) 6 dB (c) 10 dB (d) 16 dB
21. A reverse biased diode exhibits
 (a) no resistance (b) low resistance
 (c) high resistance (d) high inductance



22. The circuit shown is that of
 (a) an audio amplifier (b) an RF amplifier
 (c) a mixer (d) a BFO
23. The circuit in question No.22 would operate in class
 (a) A (b) AB (c) B (d) C
24. Integrated circuits that perform logic functions come under the general classification of
 (a) linear circuits (b) Amplifiers (c) mixers (d) digital circuits
