E 2601 (Pages : 3) Reg. No.....

Name.....

B.Sc. DEGREE (CBCSS) EXAMINATION, NOVEMBER 2021

First Semester

Vocational Course—ELECTRONIC APPLICATIONS

(For Applied Electronics of B.Sc. Physics—Model II)

[2013 to 2016 Admissions]

Time : Three Hours Maximum : 60 Marks

Candidates can use Clark's tables and scientific non-programmable calculators.

Part A (Very Short Answer Questions)

Answer **all** *questions.*
Each question carries 1 *mark.*
Choose the most appropriate alternative.

1. For an ideal inductor in an ac circuit, the current through the inductor :
   (a) is in phase with the induced e.m.f.
   (b) leads the induced e.m.f. by 90°.
   (c) leads the induced e.m.f. by an angle less than 90°.
   (d) lags the induced e.m.f. by an angle less than 90°.
2. Thermistors are semiconductor devices which have a very high ——— temperature coefficient of resistance.
   (a) negative. (b) positive.
   (c) either negative or positive. (d) none of the above.
3. A series RLC circuit is connected to an ac generator. When the generator frequency varies, the average power is :
   (a) minimum when $X_C = X_L$.
   (b) maximum when $|X_L - X_C| = R$.
   (c) equal to $I_{rms}^2 R$ only at the resonant frequency.
   (d) equal to $I_{rms}^2 R$ at all frequencies.
4. LVDT is ——— type displacement transducer.
   (a) Conduction. (b) Convection.
   (c) Radiation. (d) Induction.

Turn over

5. The input and output voltages have almost equal amplitude in :
   (a) Miller sweep generator circuit.
   (b) Bootstrap sweep generator circuit.
   (c) Constant current charging circuit.
   (d) UJT relaxation oscillator circuit.
6. The Q value is :
   (a) $\frac{1}{R}$. (b) $\frac{1}{L}$.
   (c) $\frac{1}{X_L}$. (d) $\frac{X_L}{R}$.
7. The rpm of CD is :
   (a) 100. (b) 200.
   (c) 800. (d) 1000.
8. In a TV receiver current-time base signal is applied to :
   (a) RF section. (b) Mixer section.
   (c) Audio section. (d) Yoke.

$(8 \times 1 = 8)$

Part B (Brief Answer Questions)

Answer any **six** *questions.*
Each question carries 2 marks.

9. How distortion is measured ? Explain.
10. Define SWR ? How it is measured ?
11. Define and explain selectivity of series RLC circuit with its frequency response characteristcs.
12. What are Lissajous figures ? What are its uses ?
13. Differentiate between an audio generator, RF generator and a function generator.
14. "Time-base generators are also called sweep circuits." Give reasons.
15. Draw the circut of current time base generator.
16. Differentiate between Father disc and Master disc.
17. Explain the working principle of phototransistor.
18. Differentiate between Variable density method and Variable area method of sound recording of films.

$(6 \times 2 = 12)$

Part C (Problems/Descriptive Questions)

Answer any **four** *questions.*
Each question carries 4 *marks.*

19. An RLC circuit is assembled with R = 2.5 Ω, L = 220 mH, C = 470 pF. At what frequency, the circuit will allow maximum current through it ?
20. Calculate the resolution of a 4½ digit DVM. How could 12.35 V be displayed on such 10 V range ? How would 0.1234 V be displayed on 1V and 10 V ranges ?
21. With waveforms and circuit diagram, explain the generation of sweep using UJT switch.
22. An LVDT has an output of 4V rms when the displacement is 0.25 μm. Calculate its sensitivity.
23. Explain recording of sound on a disc using Laser beam.
24. Explain the features of different types of PCB.

(4 × 4 = 16)

Part D (Essay Questions)

Answer any **two** *questions.*
Each question carries 12 *marks.*

25. With a block diagram, explain the function of each block of a dual trace CRO. Also explain the function of each electrode in it.
26. Explain the principle of linear sweep generation. With circuit and waveforms, explain how linear sweep voltage is generated using Miller sweep circuit.
27. Explain, with necessary diagrams, the constructional details and working of LVDT, taking a case of displacement measurement.
28. With necessary diagrams, explain different methods of optical recording of sound of films. Compare and contrast them.

(2 × 12 = 24)