

Roll No. _____

SVIS 300 A-2K14
B.Sc. VIth Semester Degree Examination
Physics
(Electronics, Astrophysics & Biophysics)
Paper - 6.2(viii)

Time :3 Hours

Maximum Marks : 80

Instructions to Candidates:-

Answer **all** the questions from section 'A', any **five** from section B, and any **four** from Section C.

Section - A

I. Answer the following in one or two sentences:

(15×1=15)

- 1) In a transistor $I_B = 70\mu A$, $I_C = 1.80mA$. Calculate current gain.
- 2) What is the unit of h_{22} ?
- 3) What is meant by digital signal?
- 4) Define negative feedback.
- 5) Define power gain of an amplifier in CE-mode.
- 6) Liquid Crystals are ----- compounds.
- 7) Define Amplitude modulation.
- 8) Write the truth table for NOT gate.
- 9) What is the principle on which optical fibre works?
- 10) State the principle of super heterodyne.
- 11) What is the value of Chandrasekhar limit?
- 12) What is nucleoside?
- 13) Mention any one use of Zodiacal constellation?
- 14) What is the function of ribosome?
- 15) Write the importance of chloroplast.

Section - B

II. Answer any five questions:

(5×5=25)

- 16) Explain with a neat diagram and working of phase shift oscillator.
- 17) Explain inverting op-Amp and derive an expression for voltage gain.

- 18) Define the terms luminosity and brightness of a star and obtain the relation between them.
- 19) Explain with a neat diagram, the I-V characteristics of FET.
- 20) Write a note on Demodulation.
- 21) Explain briefly Stellar properties.
- 22) Compare Inanimate and animate matter.

Section - C

III. Answer any **four** of the following: **(4×10=40)**

- 23) a. Explain the need for biasing of a transistor.
b. What are different methods of biasing?
c. What is d.c load line of a transistor? Explain with neat diagram, how a d.c load line can be drawn and operating point be located. **(2+2+6)**
- 24) a. Discuss transistor as Amplifier in CE-mode write its demerits.
b. What is feedback. Explain the concept of feedback in amplifier. **(7+3)**
- 25) a. Define bandwidth of a wave.
b. Derive an expression for power relation in amplitude modulated wave.
c. In a Wein bridge oscillator $R_1=R_2=240\text{Kn}$ and $C_1=C_2=270\text{pf}$. Determine frequency of oscillations. **(2+5+3)**
- 26) a. Define numerical aperture of a fibre.
b. Derive an expression for numerical aperture of an optical fibre.
c. A transistor supplies 8Kw power to the aerial when unmodulated. Determine the power radiated when modulated to 40%. **(2+5+3)**
- 27) a. Write a note on spectral classification of stars.
b. The apparent brightness of sun is 1400 w/m^2 and the sun is at a distance of $1.5 \times 10^{11} \text{ m}$ from the earth. Calculate its luminosity. **(7+3)**
- 28) a. Explain evolution of life.
b. Write a note on membrane potential. **(5+5)**