2709N563

Candidate's Seat No :_____

M.Sc Sem.-4 (Rep) Examination

510

Physics

September-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Instructions:

1. Attempt all questions.
2. Q-5 is compulsory to attempt.

Q.1 (A) Describe how the atmosphere influences space-based remote sensing of earth's surface features. [07]

(B) What exactly do you mean by spectral signatures in Remote Sensing? Explain in detail the spectral signatures of plants, water bodies, and soil using a sketch. [07]

OR

Q.1 (A) Describe the two most frequent scanning techniques for remote sensing. Mention the advantages and disadvantages. How does IFOV differ from FOV? [07]

(B) Discuss the following four remote sensing system resolutions in brief. Mention many aspects that have an impact on these intentions. [07]

Q.2 (A) Describe various elements of image interpretation. [07]

(B) What is meant by spatial frequency? With help of examples discuss spatial frequency filtering. [07]

OR

Q.2 (A) Briefly describe the followings : [07]

(a) Atmospheric correction of Remote sensing data

(b) Supervised classification

(c) Pixel by pixel scanning

(B) What is meant by image enhancement? Mention common techniques used for image enhancement. Describe in detail about histogram equalization technique. [07]

Q.3 (A) Discuss about the factors on which the choice of intermediate frequency depends. Draw and discuss the circuit of IF amplifier of a super heterodyne AM receiver. [07]

(B) Derive the expression for signal to noise ratio for FM receiver at the reference and at the output. [07]

OR

Q.3 (A) Draw the block diagram of superheterodyne FM receiver. Compare the differences and similarities between AM and FM superheterodyne receiver. [07]

(B) Describe the general process of frequency changing in a super heterodyne receiver. What are some of the devises that can be used as frequency changers? Why must some of them be separately excited? [07]

Q.4 (A) Explain in detail, "**PULSE** radar system". [07]

(B) Explain in detail, "**FMCW radar**". [07]

OR

Q.4 (A) Explain in detail, "**radar BEACON**". [07]

(B) Explain in detail, "**Conical switching**". [07]

Q.5 Answer in brief **Any Seven** questions from the following: (Each question is of **two** marks). [14]

(i) What do you mean by atmospheric window?

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(ii) What is the sensor used in Indian CARTOSAT satellite? Write its disadvantages.
(iii) Write advantage of hyperspectral sensors compared to multispectral sensors.
(iv) After min-max stretching of a scene having DN values ranging from 50 to 200, using a 8-bit display system, what will be range of output DN value?
(v) Give the basic concept of panchromatic (PAN) sensors.
(vi) Name any two Indian low earth orbit satellites used for remote sensing.
(vii) In superheterodyne FM receiver, the AGC is taken from Amplitude Limiter circuit. (TRUE or FALSE).
(viii) Define automatic gain control (AGC). What is need of AGC?
(ix) What is rejection ratio?
(x) How the bright-spot did appears at any point on the PPI screen for indication of target?
(xi) What is the reason behind the frequency of the radar cannot be increased far too much, in order to increase the range of the radar system?
(xii) What are the improvements required for better A-scope display presentation?

***** PAPER ENDS*****