



WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2021

ELSADSE04T-ELECTRONICS (DSE3/4)

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

All symbols are of usual significance.

GROUP-A

1. Answer any **five** questions from the following: 2×5 = 10
- What is Delta Modulation?
 - What do you mean by dispersion in an Optical Fiber?
 - What is a graded index fiber?
 - What is the full form of IMEI?
 - What is “near and far” problem in CDMA band system?
 - What are the technical differences between CDMA 2000 and W-CDMA?
 - Write down the differences between geosynchronous and geostationary orbits.
 - “The up-link frequency is always lower than the down-link frequency in cellular operation.”-Justify the reason.

GROUP-B

Answer any **six** questions from the following

5×6 = 30

- (a) A glass optical fiber has a core refractive index of 1.5 and the cladding refractive index of 1.45, calculate- 3

 - the critical angle for core-cladding interface
 - the acceptance angle in air for the fiber
 - NA of the fiber.

(b) How does the photodiode differs from that of the phototransistor? 2
- (a) Given a sine wave of frequency f_m and amplitude A_m is applied to a delta modulator having step size Δ . Show that the slope overload distortion will occur if $A_m > \Delta/2\pi f_m T_s$, where T_s is the sampling period. 2

(b) Draw the block diagram of delta modulation transmitter and explain the function of each block. 3
- What are the different classes of fading that affect cellular communication systems? Explain. What is meant by Soft Hand-off? 3+2
- Draw a neat Block diagram of a Differential pulse-code modulation transmitter. 5
- Mention five applications of Adaptive Delta Modulation. 5

7. Which Frequency Bands are used in 3G and 4G Mobile Communication in India? $2\frac{1}{2} + 2\frac{1}{2}$
8. What do you mean by ARFCN? Mention ARFCN Codes for GSM900 & DCS1800 Bands. 1+2+2
9. With a neat diagram, explain frequency reuse in a mobile cell. 5
10. What do you mean by pseudo-random code (PRC) in CDMA? Explain with diagram assuming a voice data packet is 11011011, and the PRC is 1010111101011010. 5
- 11.(a) What are the differences between Active and Passive satellites? 3
- (b) Why the working life of a satellite is limited by the amount of fuel on-board it's thruster engine? 2

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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