

Name :

Roll No. :

Invigilator's Signature :

**CS/M.Tech(ECE)/SEM-1/MCE-104/2010-11
2010-11**

**ADVANCED MICROWAVE COMMUNICATION
ENGINEERING**

Time Allotted : 3 Hours

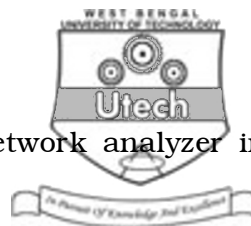
Full Marks : 70

The figures in the margin indicate full marks.

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

GROUP – A

1. Answer any *seven* of the following : $7 \times 2 = 14$
- i) Write the name and frequency range of different microwave frequency band.
 - ii) How is negative resistance occurred ? What are the applications of negative resistance ?
 - iii) Write the full name of TRAPATT and IMPATT. What is the main drawback of IMPATT ?
 - iv) What are the advantages of solid state microwave device over microwave vacuum tubes ?
 - v) Write the differences of the E-plane and H-plane Tee.



- vi) What are the functions of Vector Network analyzer in microwave measurement ?
- vii) What are the different modes occurred at GUNN oscillation ?
- viii) What do you mean by LOS at microwave communication ? What is fading occurred at this communication system ?
- ix) Write down two applications of microstrip patch antenna and two applications of parabolic reflector antenna.
- x) What do you mean by frequency independent antenna ? Give an example of frequency independent antenna.

GROUP – B

Answer any *four* of the following. $4 \times 14 = 56$

2. What are the different methods used to design microwave filter ? Briefly discuss the image parameter method to design microwave filter. What is $k-\beta$ diagram ?

$2 + 10 + 2$

3. What do you mean by bulk device ? What is tunnel diode ? Briefly discuss about the tunnel effect occurring at tunnel diode and explain the negative resistance occurred by tunnel diode.

$2 + 2 + 10$



4. What is the basic difference between a coupler and a power divider ? What is two hole directional coupler ? Briefly discuss about different types of directional coupler.

2 + 2 + 10

5. What is avalanche transit time device ? What is SDR and DDR IMPATT diode ? Briefly discuss the operation of a SDR IMPATT diode.

2 + 2 + 10

6. Write down Babinet principle. What are log periodic and log spiral antenna ? Briefly discuss the operation of a log periodic antenna with a neat diagram.

2 + 2 + 10

7. What are the advantages and disadvantages of a microstrip antenna ? What is flare angle of a horn antenna ? With a neat diagram explain the operation of antenna array.

2 + 2 + 10

8. Derive the expression of Friis transmission formula. What is fading effect occurred at microwave frequency ? Briefly discuss about the duct propagation.

2 + 2 + 10

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