

G12404 ANTENNAS AND MICROWAVE ENGINEERING

MODEL QUESTION PAPER

Time : 3 Hours

Max.Marks: 100

Instructions:

1. **Group A** and **Group B** questions should be answered in the Main Answer book.
2. Answer any **TEN** questions in **Group A**. Each question carries two marks.
3. Answer **ALL** questions either **(a)** subdivision or **(b)** subdivision in **Group B**. Each question carries 14 marks.

Group – A**Marks: 10 x 3 = 30**

1. What is the Radiation resistance of an antenna it radiates a power of 120w and the current in it is 10amps.
2. Is antenna a transducer? Justify your answer.
3. How the EM wave radiation is done through the single wire?
4. How to analyze the regions of log-periodic antenna?
5. Calculate the λ and tilt angle of Rhombic antenna to operate at 20MHz if the elevation angle is 20° .
6. What are the microwave antennas? Mention the advantages of the microwave antennas.
7. How does the transit time effect affect the high frequency amplifying devices?
8. List the application and limitations of the reflex klystron.
9. How does the function of the magnetic field in a TWT differ from its function in a magnetron?
10. Discuss the high frequency limitation of transistor comparing with vacuum tubes.
11. What are the types of parametric amplifier?
12. Using energy band diagrams, mention the tunnel diode characteristics.
13. Calculate the VSWR in db in a waveguide when the load is 3dB.
14. Mention the salient features of magic tee.
15. What are the components required for measuring the microwave frequencies?

Group– B**Marks: 5 x 14 = 70**

16. a) Find the directivity ,efficiency & effective area of an antenna if its $R_r=80\Omega, R_l=10\Omega$, power gain is 10dB & antenna operates at a frequency of 100MHz.
(OR)
- b) Give the expression for the following:
 - 1) Radiation pattern
 - 2) Beam solid angle
 - 3) Beam width
 - 4) Directivity
 - 5) Effective aperture
- 17.a) Explain in detail about the yagi-uda antenna and Derive the antenna parameters.
(OR)

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- b) How does the micro-strip antenna differ from other antennas? Explain the Micro strip antenna with neat sketch.
18. a) With the suitable sketches, discuss the materials, construction & characteristics of microwave varactors.
- (OR)**
- b) Sketch a Gunn diode construction and describe it briefly.
19. a) Explain the operation of the reflex klystron oscillator. Why is the transit time so important in this device?
- (OR)**
- b) Discuss briefly three methods of beam forming in TWT.
20. a) How to measure the VSWR? Explain the measurement procedure in detail.
- (OR)**
- b) i) Explain the Isolators and circulators. (5)
ii) How to measure the insertion loss and isolation of isolator and circulators? (9)