

10. The electrical efficiency of a dc shunt generator, if V = terminal voltage, I_a = armature current, I_L = load current, I_{sh} = shunt field current and E_g = generated voltage is
- a) $\frac{V \cdot I_a}{E_g \cdot I_a}$ b) $\frac{V \cdot I_L}{E_g \cdot I_a}$ c) $\frac{E_g \cdot I_a}{V \cdot I_a}$ d) $\frac{V \cdot I_{sh}}{E_g \cdot I_a}$
11. For given V - number, the number of modes that can be carried by step-index fiber is given by
- a) $V^2/2$ b) $V^2/4$ c) $V^2/3$ d) $V^2/5$
12. A graded index fiber has $NA=0.275$ and $N_1=1.487$. What is the bit rate restricted by modal dispersion for a 1 km length?
- a) 5.4Gbps b) 4.2Gbps c) 10 Gbps d) 1.38Gbps
13. An optical fiber communication is based on the principle of
- a) Polarization of light b) Total internal reflection
c) Interference of two beams d) Diffraction of light
14. From the measured optical properties of a thin film, which of the following information can be extracted?
- a) Optical band gap
b) Refractive index
c) Absorption coefficient, Optical band gap, Refractive index
d) None of the above
15. The application of thin film is in
- a) Photovoltaics b) Semiconductor c) Supercapacitor d) All a, b, and c
16. In a physical vapor deposition (PVD) system, the sputtering yield does NOT depend on
- a) mass of the incident ion b) energy of the incident ion
c) volume of the discharge d) atomic weight of the target material
17. In plasma enhanced *vapor deposition* for thin film preparation, one of the following steps is mandatory:
- a) The inert gas collides with sputtering target and releases the sputtered target atom which deposit on the substrate
b) The precursor solution is directly deposited on the substrate
c) The precursor solution is spin casted on the substrate
d) Chemical reactions are involved in the process, which occur after creation of a plasma of the reacting gases.
18. An advanced tool that is useful for determination of crystallinity and crystallite size is
- a) UV-Vis Spectroscopy b) Scanning Electron Spectroscopy (SEM)
c) EDX d) XRD
19. From the measured transmittance curve, transparent thin films' thickness is estimated. In this method, which of the following parameters are required
- a) Maxima and minima of a transmittance curve and associated wavelength
b) Transmittance values at the onset and off set of the curve
c) Refractive indices of the analyte and substrate
d) The parameters given in (a) and (c)
20. Cast iron is an alloy of Iron in which major impurities are
- a) Carbon and silicon b) Silicon and Magnesium
c) Carbon d) Potassium and Silicon