REG. NO.												

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COLLEGE OF ENGINEERING AND TECHNOLOGY

EE8703 - RENEWABLE ENERGY SYSTEMS
UNIT 3 – SOLAR PV AND THERMAL SYSTEMS

1. Angle made by plane surface with horizontal is called _____
a) Slope
b) Altitude angle
c) Zenith angle
d) Hour Angle

2. The angle of deviation of the normal to the surface from the local meridian is called as _____
a) Surface azimuth angle
b) Solar azimuth angle
c) Solar altitude
d) Hour angle

3. The angle being measured from a plane and which is equal to angle between the beam of rays and normal to the plane is called _____
a) Incident angle
b) Azimuth angle
c) Hour angle
d) Declination

4. The vector sum of the components along the line normal of the titled surface in a direction normal to the tilted surface is called as _____
a) Solar intensity
b) Declination
c) Incident angle
d) Hour angle

5. The time from sunrise to sunset is termed as _____
a) Slope
b) Day length
c) Local solar time
d) Solar intensity

6. LST stands for _____

a) Local standard time

b) Local solar temperature

c) Low surface temperature

d) Land surface temperature

7. How much would be the angle of declination on DECEMBER 21 at 0900 h (LAT). The collector s located in New Delhi (28^{o}35'N, 77^{o}12'E) and is tilted at an angle of 36^o with the horizontal and is pointing south?

a) -44.28^o

b) -28.92^o

c) -23.45^o

d) -42.22^o

8. What is angle of declination on 305th day of year and what day is it?

a) -23.26^o, November 2

b) -15.06^o, November 1

c) -18.96^o, November 2

d) -10.52^o, November 1

9. What is the angle of declination on May 12 considering it's a leap year?

a) 20.34^o

b) 22.85^o

c) 29.42^o

d) 12.4^o

10. What is the angle of declination on 60th day of the leap year?

a) -8.29

b) 8.29

c) 4.82

d) 12.44

11. Which type of device is used to measure solar irradiance on a planar surface?

a) Pyranometer

b) Net radiometer

c) Gardon gauge

d) Pyrheliometer

12. Instrument used to measure direct beam of solar irradiance is called _____

a) Pyranometer

b) Net radiometer

c) Gardon gauge
d) Pyrheliometer

13. Which of the following energy has the greatest potential among all the sources of renewable energy?
a) Solar energy
b) Wind Energy
c) Thermal energy
d) Hydro-electrical energy

14. What is the rate of solar energy reaching the earth surface?
a) 1016W
b) 865W
c) 2854W
d) 1912W

15. What is total amount of solar energy received by earth and atmosphere?
a) 3.8 X 1024 J/year
b) 9.2 X 1024 J/year
c) 5.4 X 1024 J/year
d) 2.1 X 1024 J/year

16. Which is most common source of energy from which electricity is produced?
a) Hydroelectricity
b) Wind energy
c) Coal
d) Solar energy

17. In what form is solar energy is radiated from the sun?
a) Ultraviolet Radiation
b) Infrared radiation
c) Electromagnetic waves
d) Transverse waves

18. Solar radiation which reaches the surface without scattering or absorbed is called _____
a) Beam Radiation
b) Infrared radiation
c) Ultraviolet radiation
d) Diffuse radiation

19. The scattered solar radiation is called _____
a) Direct Radiation

b) Beam Radiation
c) Diffuse radiation
d) Infrared Radiation

20. Solar radiation received at any point of earth is called _____
a) Insolation
b) Beam Radiation
c) Diffuse Radiation
d) Infrared rays

21. Insolation is less _____
a) when the sun is low
b) when the sun right above head
c) at night
d) at sun rise

22. HHW stands for _____
a) High and Low water
b) High Level Waste
c) Heated Low Level water
d) High and Low Waste

23. The term photo voltaic comes from _____
a) Spanish
b) Greek
c) German
d) English

24. The volt is the units of emf that was named after its inventor _____
a) Alessandro volta
b) Alxender volta
c) Alexa volta
d) Alexandro volta

25. The term photo voltaic is in use since _____
a) 1840
b) 1844
c) 1849
d) 1850

26. When the source of light is not sun light then the photo voltaic cell is used as _____
a) Photo diode

b) Photo voltaic cell
c) Photo detector
d) Photo transmitter

27. The region where the electrons and holes diffused across the junction is called _____
a) Depletion Junction
b) Depletion region
c) Depletion space
d) Depletion boundary

28. The current produce by the solar cell can be given by _____
a) $I_L - I_D + I_{Sh}$
b) $I_L + I_D - I_{Sh}$
c) $I_L + I_D + I_{Sh}$
d) $I_L - I_D - I_{Sh}$

29. The amount of photo generated current increases slightly with an increase in _____
a) Temperature
b) Photons
c) Diode current
d) Shunt current

30.Solar cells are made from bulk materials that are cut into wafer of _____ thickness.
a) 120-180μm
b) 120-220μm
c) 180-220μm
d) 180-240μm

31. _____ is one of the most important materials is also known as solar grade silicon.
a) Crushed silicon
b) Crystalline silicon
c) Powdered silicon
d) Silicon

32. _____ photo voltaic devices in the form of thin films.
a) Cadmium Telluroide
b) Cadmium oxide
c) Cadmium sulphide
d) Cadmium sulphate

33. _____ is a direct band gap material.
a) Copper Indium Gallium Selenide

b) Copper Selenide
c) Copper Gallium Telluride
d) Copper Indium Gallium Diselenide

34. Dye-sensitized solar cells are made from _____ organic dye.
a) Ruthium melallo
b) Aniline
c) Safranine
d) Induline

35. Quantum dot solar cells are based on _____
a) Gratzel cell
b) Solar cell
c) Voltaic cell
d) Galvanic cell

36. A solar cell is a _____
a) P-type semiconductor
b) N-type semiconductor
c) Intrinsic semiconductor
d) P-N Junction

37. Which of the following materials cannot be used as solar cells materials?
a) Si
b) GaAs
c) CdS
d) PbS

38. The principle of a solar cell is same as the photodiode.
a) True
b) False

39. What is the difference between Photodiode and Solar cell?
a) No External Bias in Photodiode
b) No External Bias in Solar cell
c) Larger surface area in photodiode
d) No difference

40. During the collection of e-h pairs, holes are collected by _____
a) Front contact
b) Back contact
c) Si-wafer
d) Finger electrodes

41. The I-V characteristics of a solar cell are drawn in the fourth quadrant.

a) True

b) False

42. What should be the band gap of the semiconductors to be used as solar cell materials?

a) 0.5 eV

b) 1 eV

c) 1.5 eV

d) 1.9 eV

43. Which of the following should not be the characteristic of the solar cell material?

a) High Absorption

b) High Conductivity

c) High Energy Band

d) High Availability

44. Reflector mirrors used for exploiting the solar energy are called

a) Mantle.

b) Heliostats.

c) Diffusers.

d) Ponds.

45. The function of a solar collector is of converting solar energy into

a) Radiations

b) Electrical energy directions.

c) Thermal energy.

d) All of these.

46. What are pyrheliometers?

a) Instruments measures beam radiations

b) Diffuse radiations.

c) Direct radiations only.

d) None of the above.

47. Temperature attained by cylindrical parabolic collector is of the order of

a) 50 – 100 °C

b) 100 – 150 °C

c) 150 – 200 °C

d) 200 – 300 °C

48. In a solar collector, why is the transparent cover provide for?

a) Protect the collector from dust.

b) Reduce the heat losses from collector beneath to atmosphere.

c) Transmit solar radiation only

d) All of the above.

49. A typical output of a solar cell is

a) 0.1 V

b) **0.26 V**

c) 1.1 V

d) 2 V

50. The efficiency of a solar cell may be in the range

a) 2 to 5%

b) **10 to 15%**

c) 30 to 40%

d) 70 to 80%