BIRLA INSTITUTE OF TECHNOLOGY
MESRA – 835215, RANCHI, INDIA

UG

Name: …… Roll No.: ……..

Branch: …… Signature of Invigilator: ……

Semester: VIth Date: 06/05/2022 (MORNING)

Subject with Code: **ME291 RENEWABLE ENERGY SOURCES**

	Section A (30)	Section B (20)	Total Marks (50)
Marks Obtained			

INSTRUCTION TO CANDIDATE

1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.
2. The booklet will be distributed to the candidates before 05 minutes of the examination. **Candidates should write their roll no. in each page of the booklet.**
3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.
4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.
5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.
6. Write on both side of the leaf and use pens with same ink.
7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.
8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.
9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.
10. Always maintain the highest level of integrity. Remember you are a BITian.
11. Candidates need to **submit the question paper cum answer sheets before leaving the examination hall**.

BIRLA INSTITUTE OF TECHNOLOGY MESRA

END SEMESTER EXAMINATION

Semester – VI | ME 291 RES
Date – 06.05.2022 | (Open Elective)

Answer all the questions. | Full Marks –50

All Questions carry equal marks. (Subjective – 2 marks each Objective – 1 mark each)

Time – 2 Hours

Q1. What is meant by renewable energy sources?

Q2. Comment on the future availability trend of fossil fuel in the world.

Q3 Explain the importance of non-Conventional sources in context of global warming.

Q4. What do you mean by traditional form of energy? Mention its application.

Q5 Distinguish between flat plate collector and Parabolic Concentrator.

Q6 What is a green house?

Q7. What are the major advantages and disadvantages of a solar PV System?

Q8. Sketch and explain 'Pyranometer'.

Q9. Explain the term : Ethanol Fermentation Incineration.

Q10. Sketch and explain: Bio-gas generation plant.

MCQ (30) marks

Q1. Storages of bioman evnergy is:
(a) very difficult (b) Inbuilt feature (c) expensive (d) impossible

Q2. Bio-gas is predominently:

(a) Hydrogen (b) carbon monoxide (c)carbon dioxide (d) methane

Q3. Heating value of producer gas is
(a) 4-8 MJ/m^3 (b) 14-18 MJ/m^2 (c) 24-28 mJ/m^2 (d) 34-38 mJ/m^3
Q4. The water content in anhydrous ethenol is

(a) 20 % (b) 10 % (c) 5% (d) 0-7 %

Q5 Bio-diesel is :
(a) obtained from fermentation of sugars. (b) obtained from Pyrolyis process
(c) exudates of plants (d) an upgraded vegetable oil.
Q6 which of the following is not a biomas?
(a) plants and trees (b) wood (c) Cattle dung (d) Water.
Q7. Which of the following does not have energy at all ?

(a) Protein (b) Fat

(c) carbohydrayes (d) vitamin

Q8. Gasification of biomas is which type of conversion process ?

(a) Chemical (b) Biochemical (c) Biological (o) thermochemical

Q9. The gas garification generated through biomass is called

(a) ethane (b) biogas (c)Producer gas (d) Carbon dioxide

Q10. A Small percentage of hazardous waste is also genrated in the house which of the following is hazardous waste that is generated in the house?

(a) Paper (b) Leftover food stuff (c) old batteries (d) Plastic bags.

Q10. A Solar Cell a is basically :

(a) voltages source controlled by flux of radiation

(b) a current source controlled by flux of radiation.

(c) an an uncontrolled current source

(d) uncontrolled voltage source

Q11. The efficiency of a commercial solar cell lies in range

(a) 0-10% (b) 10-20 % (c) 20-30% 3.: (d) 50-66 %

Q12. Typical open Circuit voltageof a solar cell is:

(a) 12 V (b) 6 V (c) 3 V (d) 0.5V

Q13. Which of the following statement is not true about Solar Cell ?

(a) It has no moving part.

(b) It is reliable and almost maintenance free.

(c) It is modular in design.

(d) TF is cheap and efficient.

Q14. The energy associated with a photon is :

(a) directly proportional to wavelength (

b) inversely proportional to frequency

(c) directly proportional to intensity of radiation.

(d) 6. Inversely proportional to wave length

Q15. At maximum power point of the solar cell :.

(a)Current is maximum

(b) voltage is maximum

(c) Both voltage and Current are maximum

(d) The product of voltage and current are maximum.

Q16. The Photons having energy less than the energy gap:

(a) are absorbed and converted to heat

(b) are not absorbed by the semiconductor material as it behaves as transparent to them

(c) work jointly to produce electron hole pain

(d) are reflected from semiconductor material surface.

Q17. In a series string of mismatched Solar cell:

(a) a full voltage and current capability can be attained and losses are less

(b) losses are Tess

(c) full current capability cannot be attained and losses are more

(d) full voltage capability cannot be attained and Losses are more.

Q18. If no load connected to PV System
(a) It will stop absorbing light
(b) It will dissipate energy in panel and increase in temperature
(c) it's voltage will go on increasing till its breakdown.

(d) it will start reflecting the light.
Q 19. At a temperature of an OK Silicon behaves as a (an)

(a) Super Conductor (b) normal conductor (c) Insulator (d) Semiconductor.
Q20. A Solar thermal collector:

(a) collects the solar energy and reflects it back.

(b) absorbs the solar radiation and dissipate it to the ambient.

(c) collects and converts the solar energy into electrical energy

(d) collect and converts the solar energy into thermal energy and delivers it to heat transfer fluid.

Q21. The concentration type of solar collectors.
(a) first absorb the radiation and then increase its concentration.
(b) increase the density of Solar radiation before absorbing it.
(c) dilute the density of Solar radiation

(d) increase the intensity of solar radiation before absorbing it and then reflects it back.
Q22. Read the following statements about solar flat plate collectors and answer the questions.

(i) These are simple in construction
(ii) They have high efficiency.
(iii) They do not track the Sun
(iv) They make use of both beam as well as diffuse radiation.
(a) (i) & (ii) are correct
(b), (ii) and (iI) are correct
(c) only (ii) is correct
(d) (i), (ii) and (iv) are correct

Q23. The value of concentration ratio of flat plate collector is:

(a) 1

(b) 10

(c) 100
(d) 1000

Q24. The value heat removal factor FR of a flat plate collector lies in the range :
(a) 0 to 0.1
(b) 0 to 1
(c) 0-9 to 0.95
(d) 0.5 to 0.6

Q25. Use of Booster mirror with flat plate collector:

(a) increases the reflection to atmosphere
(b) decreases the refection to atmosphere
(c)increases the diffuse radiation component on absorber
(d) increases the beam radiation component absorber

Q26. A cylindrical parabolic concentrator requires :

(a) 2- axes tracking (b) 1-axis tracking (c) no tracking (d) seasonal adjustment only

Q27. Solar thermal water pump :

(a) Uses Solar thermal energy to evaporate water

(b) uses solar thermal energy to circulate hot water.

(c) use electric powered pump to circulate water heated by solar energy.

(d) uses solar thermal energy for production of power to drive the pump.

Q28. Glass Cover with high iron content

(a) has lower conduction losses

(b) has higher convection losses

(c) is mechanically stronger

(d) transmits less light through it.

Q29. Temper glass Cover:

(a) has lower convection losses

(b)transmits more light through it

(c) has higher thermal less capability

(d) is mechanical, stronger

Q30. What is the typical cooking time of a paraboloidal dish cooker?

(a) 2-3 hours

(b) 20-30 seconds

(c) 20-30 minutes

(d) 6-12 hours

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