D 10665

(Pages : 2)

Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Instrumentation

INS 5D 03—ELEMENTS OF ENVIRONMENTAL SCIENCE

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. What are the different types of environmental education ?
2. What is the difference between EIA and EIS ?
3. List any *two* types of atmosphere.
4. Discuss the importance of biosphere for living organisms.
5. List three pillars of sustainability.
6. Discuss the importance of forest resource conservation.
7. What is noise pollution caused by ?
8. What are the effects of thermal pollution ?
9. Why ozone layer is important ?
10. What happens during eutophication ?
11. What are the effects of biomagnification ?
12. What is the main component of photochemical smog ?

(8 × 3 = 24 marks)

Section B (Paragraph Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. What are the 5 sources of thermal pollution ?
14. Why it is called green house effect ?
15. List 5 parts of hydrosphere.
16. Discuss the effect of water pollution.
17. List the bad effects of acid rain.
18. Explain different types of environmental degradation.
19. How lithosphere is formed ?

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

20. Explain objectives of environment management.
21. Discuss the role of individual in prevention of pollution.

(1 × 11 = 11 marks)

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Name.....

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FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Instrumentation

ITN 5B 11—MICROCONTROLLERS

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Explain the classification of microcontrollers.
2. What is the significance of embedded systems ?
3. What is the function of program counter in 8051 ?
4. What are the bit processing instructions of 8051 ?
5. Explain any two assembler directives of 8051.
6. Define the method to set port 0 as output port.
7. Explain SBUF register in 8051.
8. What is the difference between asynchronous and synchronous communication ?
9. List the interrupt priorities of 8051.
10. Explain the interfacing of relays with 8051.
11. Write the table to rotate stepper motor in anticlockwise direction.
12. Explain about memory mapping.

(8 × 3 = 24 marks)

Section B (Paragraph Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Compare Microprocessors and Micro controllers.
14. Explain the internal RAM architecture of 8051.

Turn over

15. With suitable example, explain the addressing modes of 8051.

16. Explain the data transfer instructions of 8051.

17. Write an assembly language program to find the factorial of a 8 bit number.

18. Outline the TMOD register.

19. Describe the various methods of address decoding.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

20. Explain with neat block diagram the architecture of Intel 8051 microcontroller.

21. Write an ALP in 8051 to create a square wave with ON time 3 ms and OFF time 10 ms, on all pins of port 0. Assume XTAL-11.05 MHz.

(1 × 11 = 11 marks)

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FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Instrumentation

INS 5B 10—OPTO-ELECTRONIC INSTRUMENTATION

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Define the principle of interferometer.
2. Explain about magneto-optic devices.
3. What do you mean by the modulation of light ?
4. Explain the significance of Einstein relations.
5. What is the principle of operation of lasers ?
6. Define population inversion.
7. Explain the features of optical fibres.
8. Compare multimode and single mode fibres.
9. What is the principle of holography ?
10. Explain the principle of fibre optic sensors.
11. What is a refractive index profile ?
12. Explain about couplers.

(8 × 3 = 24 marks)

Section B (Paragraph Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

15. With suitable diagrams explain the different modes of laser operation.
16. Explain the safety measures of laser in research and development.
17. Explain in detail about LDA.
18. How the distance is measured using lasers ?
19. What are the different parameters for the measurement of fibre characteristics ?

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

20. Explain with neat diagram, the Mach Zehnder interferometer.
21. Write in detail about the classes of laser.

(1 × 11 = 11 marks)

D 10660 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Instrumentation

INS 5B 09—BIOMEDICAL INSTRUMENTATION

(2019 Admissions)

Time : Two Hours Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Distinguish between Exhibitory Post synaptic potential and inhibitory post synaptic potential.
2. What is ECG ? Draw and label the waveform.
3. Differentiate between Tidal volume and Residual volume.
4. Explain about the precautions to be taken to prevent electric shock hazards.
5. What is Compton Effect ?
6. What is the difference between leakage current and let go current ?
7. Differentiate between Systole and Diastole.
8. Explain the principle of generation of X-rays.
9. Differentiate between resting and action potential.
10. What is ventricular fibrillation ? Suggest a method to overcome it.
11. Differentiate between sensory and motor nerves.
12. What is the function of collimator in X-ray machine ?

(8 × 3 = 24 marks)

Section B (Paragraph Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

1. Explain the characteristics of resting potential.
2. Explain how image reconstruction is done in CT scan.
3. What are the different types of heart sounds and explain how it is produced ?
4. Discuss the principle and application of diathermy.
5. Write short notes on photo plethysmograph.
6. Describe the working of electronic pacemaker with necessary diagram.
7. Analyse the different types of EEG waves.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

1. List and explain the various types of electrodes and its applications.
2. With help of neat diagram write how the oscillometric method helps to measure blood Pressure.

(1 × 11 = 11 marks)

D 10659

(Pages : 2)

Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Instrumentation

INS 5B 08—CONTROL SYSTEMS

(2019 Admissions)

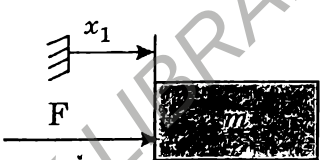
Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Write two examples for open loop system.
2. Define Linear time invariant system.
3. State Superposition theorem.
4. Draw the general block diagram of closed loop control system.
5. List any *two* elements of mechanical translator system.
6. Find the differential equation for this inertia element.



7. Define Impulse signal.
8. Define Gain margin.
9. List advantages of root locus technique.
10. What is the principle of argument behind Nyquist stability criterion ?

11. List any *two* necessities of lead lag compensator.

12. Write the transfer function of lead compensator.

(8 × 3 = 24 marks)

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Compare closed and open loop systems.

14. Check the stability of the system whose characteristic equation is given by Routh stability criterion ?

$$s^4 + 2s^3 + 6s^2 + 4s + 1 = 0.$$

15. Derive equation for steady state error.

16. List any *five* advantages of bode plot.

17. What is the difference between Polar and Nyquist plot ?

18. Is lag compensator is a high pass filter ?

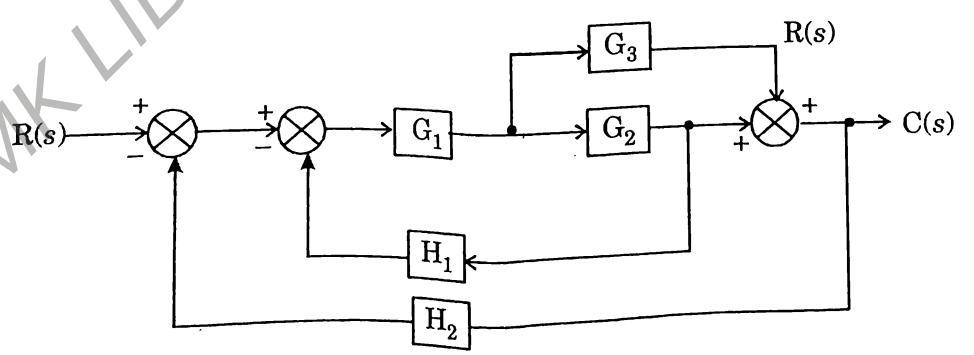
19. List disadvantages of lag compensator.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Obtain the transfer function C(*s*)/R(*s*) for the block diagram shown :



21. Describe steps to plot root locus.

(1 × 11 = 11 marks)

D 10658

(Pages : 2)

Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Instrumentation

INS 5B 07—ANALYTICAL INSTRUMENTATION

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Differentiate between UV visible and IR spectrophotometers.
2. What are Monochromators ?
3. Discuss on grating element monochromator with neat diagram.
4. What is the principle of operation of Raman Spectrometer ? Explain.
5. Explain any *two* applications of IR spectrophotometer.
6. List the types of IR spectrometers.
7. Explain the condition for resonance in NMR Spectrometer.
8. Differentiate between X-ray diffraction and absorption spectrometers.
9. Explain electron spin resonance.
10. Compare liquid and gas chromatographies.
11. Define adjusted retention time.
12. What are the types of columns commonly used in Chromatography ?

(8 × 3 = 24 marks)

Section B (Paragraph Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Explain the double beam scanning instruments in UV visible spectrophotometers.
14. Explain the detectors in UV visible spectrophotometers.
15. Briefly explain the principle of operation of Raman Spectroscopy.
16. Write notes on IR detectors.
17. Explain the constructional details of NMR Spectrometer.
18. Explain the working of an X-ray Fluorescent spectrometer with a neat diagram.
19. Write notes on the ion sources used in mass spectrometry.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

20. With neat diagram explain the working of X-ray Spectrometers in detail.
21. With a neat block diagram explain NMR Spectrometer in detail.

(1 × 11 = 11 marks)

D 10227 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER B.A./B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS–UG)

Instrumentation

ITN 5D 01—ELEMENTS OF ENVIRONMENTAL SCIENCE

(2018 Admissions)

Time : Two Hours Maximum : 40 Marks

Section A (Objective Type Questions)

Answer **all** *questions.*
1 *mark each.*

1. The atmospheric layer closest to the earth surface is ————————.
2. Prudent use of natural resources is one of the objectives of sustainable development. (True/False)
3. Oceans contain approximately ———————— percentage of the total water available in the world.
4. Carbon Monoxide is much more injurious to human health than a similar quantity of carbon dioxide. (True/False).
5. Chlorofluorocarbons (CFCs) are a major cause for the depletion of Ozone layer. (True/False).

(5 × 1 = 5 marks)

Section B (Short Answer Type questions)

One or two sentences each.
Answer **all** *questions.*
2 *marks each.*

6. What is temperature inversion ?
7. What is auxiliary water? Explain in brief.
8. List some of the physiological effects of noise pollution.
9. What are the major causes of depletion of the Earth's Ozone layer ?
10. What are the major sources of the greenhouse gas Methane ?

(5 × 2 = 10 marks)

Section C (Paragraph type questions)

Answer any **three.**
5 *marks each.*

11. What are the two branches of environmental education ? Explain briefly.
12. Briefly explain Hydrosphere.

Turn over

13. Describe some of the techniques used for management of forests.
14. Describe the techniques that can be used for controlling air pollution.
15. What strategies can be adopted to control/limit global warming ?

(3 × 5 = 15 marks)

Section D (Essay Type Questions)

Answer any **one.**
10 *marks Each.*

16. What are the actions recommended for promoting environmental education and awareness ?
17. What are the major sources of water ? Give a brief description.
18. Give a brief description of the major pollutants of air and their effects on environment and human body.

(1 × 10 = 10 marks)