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Question Paper Code : 80220

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Civil Engineering

CE 6605 – ENVIRONMENTAL ENGINEERING II

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

- Explain the meaning and significance of time of concentration?
- What are the typical characteristics of sewage from South Indian cities?
- Define Bore hole system.
- Write the objective of screen chamber.
- Define Hydraulic subsidence value?
- What is on site sanitation?
- List out the different methods of aeration in ASP?
- What is Sewage sickness?
- What is meant by ripened sludge?
- Define the 'treatment 'sludge conditioning'.

PART B — (5 × 16 = 80 marks)

- (a) (i) Define the terms BOD and COD? Differentiate between first stage BOD and second stage. (8)
- (ii) The BOD of a sewage incubated for one day at 30°C has been found to be 100 mg/L, what will be the 5 day 20°C BOD. Assume BOD rate constant $K' = 0.21 \text{ d}^{-1}$ at 20°C (base e). (8)

Or

- (b) (i) Explain briefly about Effluent standards. (8)

12. (a) (i) Explain the method of laying sewer line for the designed/desired alignment and gradient. (9)
- (ii) Determine the diameter of a sewer ($n = 0.013$) carrying $0.0125 \text{ m}^3/\text{s}$ of peak sewage flow at half full depth. Take slope as 1 in 400. (7)

Or

- (b) (i) List the sewer appurtenances commonly used? Explain any two with neat sketches? (10)
- (ii) List out the problems taken place during the Pumping of sewage. (6)
13. (a) (i) Explain briefly the operation and maintenance of Sewage Treatment Plants. (8)
- (ii) Design a primary clarifier of full scale STP with ASP for an average sewage flow of 12 Mld. Assume suitable data if necessary. (8)

Or

- (b) Explain with neat sketch component parts, functioning advantages and disadvantages of septic tank. Also discuss various methods of disposal of septic tank effluent. (16)
14. (a) With neat flow Diagram explain ASP in treating wastewater. Discuss the various Design Parameter involved in it. (16)

Or

- (b) Determine the size of a high rate TF for the following data. (16)
- Sewage flow = 6 mld
- Recirculation ratio = 1.5
- BOD of Raw Sewage = 230 mg/L
- BOD removal in PST = 30 %
- Final BOD effluent = 20 mg/L

15. (a) (i) Describe the anaerobic sludge digestion process and explain the effects of pH and Temperature on it. (10)
- (ii) Explain about Bio gas Recovery? (6)

Or

- (b) A town discharges 14 million litres per day sewage at a temperature of 23°C into a river having flow of $1.7 \text{ m}^3/\text{s}$ and water temperature of 20°C BOD₅ at 20°C for the wastewater is 160 mg/L and K (base 10) is 0.1 per day, If R is 0.2 per day what is the critical oxygen deficit and the distance at which it occurs. Assume the stream as 92% saturated with oxygen before the sewage addition the solubility of oxygen at 20°C as 9.0 mg/L and river flow velocity as 0.12 m/sec. (16)

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Question Paper Code : 80601

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Computer Science and Engineering

IT 6702 — DATA WAREHOUSING AND DATA MINING

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

What are the nine decisions in the design of data warehouse?

Define Star Schema.

List OLAP guidelines.

Comment on OLAP tools on Internet.

Give an example of outlier analysis for the library management system.

What are the different steps in Data Transformation?

Elucidate two phase involved in decision tree induction?

List the methods to improve Apriori's efficiency.

State the role of cluster analysis.

Q. Give the reason on why clustering is needed in data mining?

PART B — (5 × 16 = 80 marks)

1. (a) Explain seven components of Data warehouse architecture with neat diagram.

Or

(b) Discuss DBMS schemas for decision support. Describe performance

12. (a) Discuss different tool categories in data warehouse business analysis. (16)

Or

(b) (i) Summarize the major differences between OLTP and OLAP system design. (8)

(ii) Describe about Cognous Impromptu. (8)

13. (a) Explain different strategies of Data Reduction. (16)

Or

(b) Describe Data Discretization and Concept Hierarchy Generation. State why concept hierarchies are useful in data mining. (8+8)

14. (a) Find all frequent item sets for the given training set using Apriori and FP-growth, respectively. Compare the efficiency of the two mining processes. (10+6)

TID	items_bought
T100	{M, O, N, K, E, Y}
T200	{D, O, N, K, E, Y}
T300	{M, A, K, E}
T400	{M, U, C, K, Y}
T500	{C, O, O, K, I, E}

Or

(b) Explain Naïve Bayesian classification with algorithm and sample example. (16)

15. (a) Describe the applications and trends in data mining in detail. (16)

Or

(b) Describe different partition methods in cluster analysis. (16)

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Question Paper Code : 80348

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Electronics and Instrumentation Engineering

EC 6651 — COMMUNICATION ENGINEERING

(Common to Electrical and Electronics Engineering and Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

Define modulation index.

Differentiate NBFM and WBFM.

Why flat top PAM is preferred over natural PAM?

What is slope overload error?

State the channel capacity theorem.

What is BCC and BSC?

What are the benefits of multiple access techniques in Communication Engineering?

Mention the significance of CDMA technique.

What is optical link?

List the merits and demerits of geosynchronous satellites.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the generation of DSB-SC wave using Balanced Modulator. Derive the power of DSB-SC signal. (16)

Or

- (b) Explain in detail about indirect method of FM generation. (16)
12. (a) Explain the generation and detection of PWM signals. (16)

Or

- (b) (i) Explain the concept of BPSK and QPSK techniques in data communication. (12)
- (ii) Compare PCM and DM. (4)
13. (a) Explain the procedure of Shannon fano algorithm and calculate the entropy for the following probabilities using the algorithm. (16)

m1	m2	m3	m4	m5	m6	m7	m8
4/32	2/32	16/32	2/32	2/32	1/32	1/32	4/32

Or

- (b) (i) Briefly discuss on various error control codes and explain in detail with one example for convolutional code. (12)
- (ii) Draw the polar, unipolar, bipolar and Manchester NRZ line code format for an information {1 0 11 0 0}. (4)
14. (a) Explain the operation of FH-SS. Compare slow and fast FH-SS. (16)

Or

- (b) Discuss the FDMA and TDMA techniques used in wireless communication with their merits and demerits. (16)
15. (a) (i) Write a brief note on INSAT. (8)
- (ii) Write a brief note on Intelsat. (8)

Or

- (b) (i) Draw the block diagram of satellite link and explain. (8)
- (ii) Explain in detail about SCADA. (8)

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Question Paper Code : 60510

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Electrical and Electronics Engineering

EE 2352/EE 62/10133 EE 602 — SOLID STATE DRIVES

(Regulations 2008/2010)

Common to PTEE 2352/10133 EE 602 – Solid State Drives for B.E. (Part-Time)
Sixth Semester – Electrical and Electronics Engineering – Regulations 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

What is dynamic torque?

Draw the load torque characteristics of constant power loads.

What are the drawbacks of rectifier fed DC drives?

Can a semi converter fed DC drive operated in quadrant IV? Justify your answer.

Write any two advantages of closed loop control system.

What do you mean by field weakening mode control?

What is slip power recovery scheme?

What is meant by super synchronous operation?

What are the modes of adjustable frequency control in synchronous motor drives?

When can a synchronous motor be load commutated?

PART B — (5 × 16 = 80 marks)

drives two loads. One has rotational motion. It is coupled a reduction gear with a = 0.1 and efficiency of 90%. The a moment of inertia of 10 kg-m² and a torque of 10 N-m. ad has a translational motion and consists of 1000 kg o be lifted up at an uniform speed of 1.5 m/s. Coupling this load and the motor has an efficiency of 85%. Motor has a of 0.2 kg-m² and runs at a constant speed of 1420 rpm. he equivalent inertia referred to the motor shaft and power d by the motor. (10)

the multi-quadrant operations of low speed hoist in speed lane. (6)

Or

the mathematical condition for steady state stability and um point. (8)

the operation of electrical drives in three different modes. (8)

steady state analysis of the single phase fully controlled separately excited DC motor drive for continuous current explain its operation in motoring and regenerating braking (16)

Or

the operation of four quadrant dc chopper drive. (10)

V, 20 A, 1000 rpm separately excited dc motor has an e resistance of 2.5 Ω. The motor is controlled by a step chopper with a frequency of 1 kHz. The input dc voltage to the is 250 V. What will be the duty cycle of the chopper for the operate at a speed of 600 rpm delivering the rated torque? (6)

transfer function of dc motor-load system with converter fed age control. (16)

Or

e design procedure for speed controller of an electrical drive (8)

the factors involved in converter selection and equations d in controller characteristics. (8)

14. (a) A 2.8 kW, 400 V, 50Hz, 4.pole, 1370 rpm, delta connected squirrel cage induction motor has following parameters referred to the stator $R_s = 2 \Omega$, $R_r = 5 \Omega$, $X_s = X_r = 5 \Omega$, $X_m = 80 \Omega$. Motor speed is controlled by stator voltage control. When driving a fan load it rated speed at rated voltage. Calculate motor terminal voltage and torque at 1200 rpm. (16)

Or

- (b) (i) Explain the concept of V/f control in detail. (8)
(ii) Make a comparison between voltage/current fed inverters. (8)
15. (a) (i) Explain the open loop V/f speed control of multiple permanent magnet synchronous motors. (8)
(ii) Explain with the block diagram, the torque angle control of self controlled synchronous motor drive. (8)

Or

- (b) With a neat block diagram explain the closed loop control of load commutated inverter fed synchronous motor drive. (16)

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Question Paper Code : 60862

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Mechanical Engineering

ME 2354/ME 62/10122 ME 604 — AUTOMOBILE ENGINEERING

(Regulations 2008/2010)

(Common to PTME 2354/10122 ME 604 Automobile Engineering for
B.E. (Part-Time) Fifth/Sixth Semester – Mechanical Engineering –
Regulations 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the various cylinder arrangements for the multi-cylinder engines?
2. What are the advantages of Al alloy pistons?
3. List out the emissions that are common to both SI and CI engines.
4. What are the devices available for after-treatment of exhaust gases from SI engines?
5. Why do we provide slip joint in the propeller shaft?
6. What is the function of differential?
7. What do you mean by telescopic steering wheel?
8. Explain the basic difference between independent suspension system and conventional suspension system.
9. What are the advantages of Hybrid vehicle?
10. Mention the advantages of LPG usage in automobiles.

PART B — (5 × 16 = 80 marks)

11. (a) With a neat sketch explain constructional details of IC engine.

Or

- (b) Discuss the different types of chassis frame with neat sketches.

12. (a) Explain electronically controlled CRDI system for Diesel injection.

Or

- (b) (i) Write short notes on Turbocharger. (6)

- (ii) Discuss engine emission control measures for SI engines. (10)

13. (a) Explain the operation of single plate clutch with relevant diagrams.

Or

- (b) With the help of a neat sketch, explain the construction and operation of a sliding mesh gear box.

14. (a) Mention different types of braking systems in automobile and explain any one type in detail.

Or

- (b) (i) Write short notes on power steering. (6)

- (ii) Write briefly about independent type of front suspension system. (10)

15. (a) What are the characteristics of Alcohols? Write detailed notes on the use of Alcohols in Automobile.

Or

- (b) Explain in detail about the principle of operation of fuel cell.

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Question Paper Code : 60262

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Civil Engineering

CE 2354/CE 64/10111 CE 605 — ENVIRONMENTAL ENGINEERING — II

(Regulations 2008/2010)

Common to 10111 CE 605 — Environmental Engineering — II for B.E. (Part-Time)
Sixth Semester — Civil Engineering — Regulations 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

Differentiate between sewage and drainage.

Name two most important parameters used to characterize sewage.

State the components parts of a large pumping plant.

Enlist the various sewer appurtenances commonly used.

State the purpose of aeration process.

Draw the flow diagram of unit operation for domestic sewage treatment.

Differentiate between conservancy system and water carriage system.

Write notes on soak pits and vacuum filtering.

What do you mean by two stage digestion of sewage?

Compare sewage farming and effluent irrigation.

PART B — (5 × 16 = 80 marks)

Population of 30,000 is residing in a town having an area of 120 ha. If the average co-efficient of runoff for this area is 0.60 and the time of concentration of the design rain is 30 minutes. Calculate the storm water discharge. (10)

Explain the factors that affect the hydraulics of sewer lines. (6)

Or

Calculate the storm runoff for the following data :

Area = 120 ha
Population = 75000
Velocity = 3.5 m/s
Time of travel = 3 min
Pipe diameter = 22 mm (10)

Explain BOD. Explain its significance in sewage. (6)

Draw with neat sketch, the details of two pipe system. (10)

A 150 mm diameter sewer with an invert slope of 1 in 400 is flowing at full depth. Calculate the rate of flow in the sewers. (6)

Or

Design a circular sewer so as to cater to a residential colony based on the following data :

Area of the colony = 36 ha.
Per capita water consumption = 35 lpcd
Population = 8,000
Rainfall = 4 cm/h
Invert slope = 1 in 900. (10)

Explain the steps involved in laying of sewer lines. (6)

Design a septic tank for the following data :

Population = 100
Inflow = 120 lit/capita/day
Retention period = 1 year
Length to width ratio = 4 : 1. (10)

Explain the physical, chemical and biological characteristics of sewage water. (6)

Or

(b) (i) Describe with the help of neat sketch, the component of a Imhoff tank. (10)

(ii) Write a note on skimming tank with neat sketch. (6)

14. (a) (i) Give the flow diagram for the activated sludge process and describe the working condition of the activated sludge process. (10)

(ii) Enumerate the various methods used to dispose the digested sludge. (6)

Or

(b) (i) Explain the function and operation of trickling filter with a neat sketch. (10)

(ii) Enumerate the operational principles of septic tank and oxidation ponds. (6)

15. (a) (i) Design the dimensions required for sludge drying bed for the sludge obtained from the digestion tank for 40,000 population. (10)

(ii) State the objectives of sludge treatment in detail. (6)

Or

(b) (i) Elaborately discuss the different methods of sludge disposal. (10)

(ii) Write a brief notes on advances in sludge treatment and disposal. (6)

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Question Paper Code : 60463

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Electronics and Communication Engineering

EC 2353/EC 63/10144 EC 604 — ANTENNAS AND WAVE PROPAGATION

(Regulations 2008/2010)

Common to PTEC 2353 – Antennas and Wave Propagation for B.E. (Part-Time)
Sixth Semester – Electronics and Communication Engineering – Regulations 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

What is an elementary dipole and how does it differ from the infinitesimal dipole?

What is the effective area of a half wave dipole operating at 1 GHz?

What are the applications of loop antenna?

Define Pattern multiplication.

The impedance of an infinitesimally thin $\lambda/2$ antenna ($L = 0.5 \lambda$ and $L/D = \infty$) is $73 + j42.5 \Omega$. Calculate the terminal impedance of an infinitesimally thin $\lambda/2$ slot antenna.

Draw the geometry for E-plane type of metal-plate lens antenna.

Mention the types of feeding structures used for microstrip patch antennas.

Design a 3 element Yagi-Uda antenna to operate at a frequency of 200 MHz.

What is free space loss factor?

What is Gyro frequency?

PART B — (5 × 16 = 80 marks)

Effectiveness of the following parameters of an antenna :

(4 × 4 = 16)

solid angle

directivity

lobes

impedance.

Or

Describe the following parameters of an antenna : (4 × 4 = 16)

radiation pattern

efficiency

length

aperture.

Binomial array? (2)

Draw the radiation pattern of 10 element binomial array with spacing of the elements of $3\lambda/4$ and $\lambda/2$. (14)

Or

Derive expressions for field pattern of broad side array of n point

Compare flat reflector and corner reflector antennas. (2)

Explain how a paraboloidal antenna gives a highly directional radiation. (6)

Describe in detail about the feeding structure of parabolic reflector antenna. (8)

Or

Write notes on :

Helical antenna (8)

Log periodic antenna. (8)

14. (a) What are the importance of Helical antenna? Explain the construction and operation of Helical antenna with neat sketch.

Or

(b) Explain the principle of operation of Log periodic antenna with neat schematic diagram.

15. (a) (i) Discuss the factors that are involved in the propagation of radio waves. (6)

(ii) Draw a 2 ray model of Sky wave propagation and explain it in detail. (10)

Or

(b) (i) Derive the characteristic equations of Ionosphere. (8)

(ii) Define and explain : (8)

(1) Skip zone

(2) MUF

(3) Multihop propagation

(4) Whistlers.