AR13 SET-2

Code: 13CE2005

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH II SEM END EXAMINATIONS, JULY, 2015

CONSTRUCTION MATERIALS AND PRACTICE
(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[1 X 10 = 10M]**

1. a) Define igneous rock
   b) What is the role of 'Alumina' in brick earth?
   c) What is the role of 'Iron oxide 'in cement?
   d) What are the important properties of cement mortar?
   e) What is the volumetric proportion of M15 CONCRETE?
   f) Name any four advantages of timber as a building material
   g) What are the properties of steel?
   h) What are the uses of plastics as a building material?
   i) Write any three advantages of foundation
   j) Define brick masonry

PART-B

Answer any one question from each unit **[5 X 12=60M]**

UNIT-I

2. a) Compare clamp burning with kiln burning of bricks
   b) Draw a neat sketch of Hoffman's kiln with details and describe the manufacturing process of Bricks.

(OR)

3. a) Compare good qualities of stones with bricks
   b) Draw any four neat sketches of defects in timber.

UNIT-II

4 a) What are the constituents of paints and advantages of paints
   b) Explain in detail different types of paints according to their usage

(OR)

5. a) Explain in detail about the properties of Glass
   b) What are the different uses of glass as a building material?

Code: 13CE2005

UNIT-III

6. a) Explain in detail about shallow foundations and deep foundations .
   b) Draw a neat sketch of stepped footing and Pile foundations

(OR)

7. a) What are the advantages of stone masonry
   b) Describe English bond and Flemish bond of brick masonry with a neat sketch

UNIT-IV

8. Where do you use the following types of stair
   i) Spiral stair ii) dog legged stair iii) open well stair

(OR)

9. Draw detailed sketches of the following
   i) Brick lintel ii) RCC Lintel iii) Brick arches

UNIT-V

10. a) Explain the process of construction of a brick wall with 1:4 cement mortar.
    b) Briefly explain different types of Scaffolding.

(OR)

11. a) Explain in detail with neat sketches of the shuttering work for columns.
    b) Explain in detail with a neat sketch of formwork for RCC Slab.

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AR13 SET-2

Code: 13EE2009

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH II SEM END EXAMINATIONS, JULY, 2015

CONTROL SYSTEMS

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[1 X 10 = 10 M]**

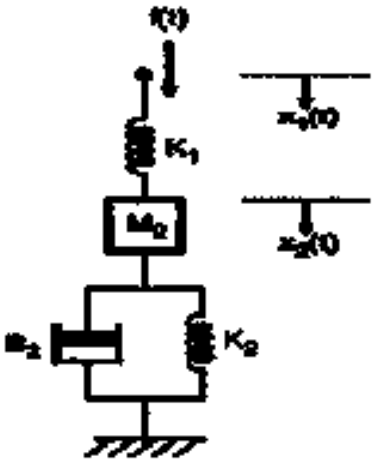
1. a) Define transfer function and write the limitations of transfer function
   b) Write the difference between open loop and closed loop system
   c) What is Synchro pair?
   d) What is the time response of a control system?
   e) What are the conditions to be satisfied for the root locus to exist at any point in the S-plane?
   f) What are the advantages of the Root Locus?
   g) State Nyquist stability criterion
   h) Define minimum phase transfer function
   i) Write any three properties of State transition matrix
   j) Draw the pole zero plot of the phase- lag network.

PART – B

Answer one question from each unit **[5 X 12=60M]**

UNIT-I

2. a) Write the differential equations governing the mechanical system and draw the Force voltage and Force current analogous circuit [8M]

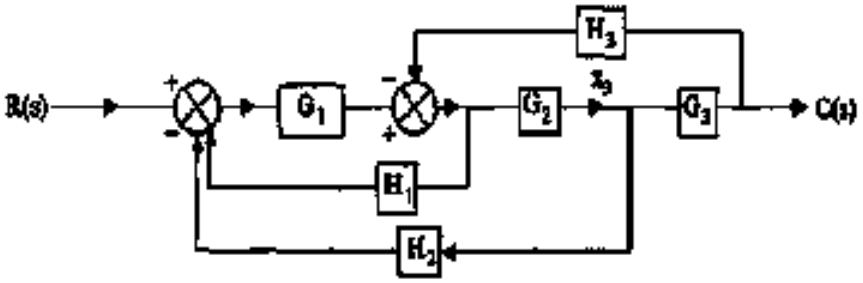


b) Explain the properties of closed loop system [4M]

Code: 13EE2009

(OR)

3. a) Draw a signal flow graph and evaluate the closed loop Transfer function of a system [8M]



b) Explain the effect of feedback on the noise and sensitivity of the system [4M]

UNIT-II

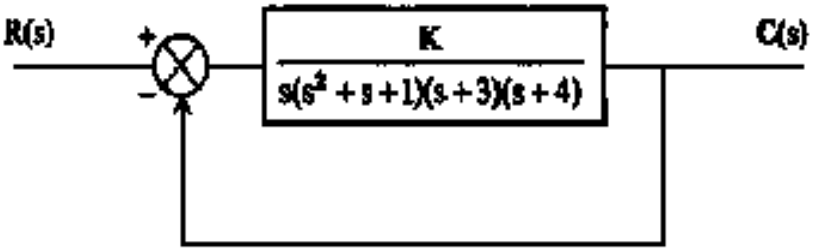
4. a) Derive the Transfer function of Field controlled DC servo motor [6M]
   b) A closed loop system has two complex conjugate roots at S_1,S_2= -2 + j1 and -2 – j1 , Determine the form of transfer function and all Time domain specifications [6M]

(**OR)**

5. a) For a unity feedback system G(S) =200/S(S+8) and r(t)= 2t ,Determine steady state error ,If it is desired to reduce this existing error by 5% ,Find the new value of gain of the system. [6M]
   b) Explain how synchro will acts as a error detector [6M]

UNIT-III

6. a) Explain absolute and relative stability [4M]
   b) Find the range of values of K for the closed loop system to remain stable .Find the frequency of sustained oscillations under limiting conditions [8M]



Code: 13EE2009

(OR)

7 .For a unity feedback system , $G(S)=\frac{K}{S(S+2)(S+4)}$,Sketch the Root locus and comment on the stability of the system [12M]

UNIT-IV

8. Obtain the Bode plot for the transfer function $G(S)=\frac{2}{(S+1)^2(S+16)}$ .From the bode plot ,Obtain phase margin and gain margin. [12M]

(OR)

9. a) What is the significance of Nyquist plots? [4M]

b) Sketch polar plot for the open loop system given by $\frac{(S+4)}{(S+1)(S-1)}$ [8M]

UNIT-V

10. Explain how a lag compensation can be obtained using Bode plots [12M]

(OR)

11. a) Evaluate the observability of the system with [6M]

$$A=\begin{bmatrix}0 & 1 & 0\\ 0 & 0 & 1\\ 0 & -2 & -3\end{bmatrix},\ B=\begin{bmatrix}0\\0\\1\end{bmatrix} \text{ and } C=[3\ \ 4\ \ 1]$$

b) Obtain the complete time response of system given by [6M]

$$\dot{X}(t)=\begin{bmatrix}0 & 1\\ -2 & 0\end{bmatrix}X(t)$$

$$where X(0)=\begin{bmatrix}1\\1\end{bmatrix} and Y(t)=\begin{bmatrix}1 & -1\end{bmatrix}X(t)$$

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AR13 SET-2

Code: 13ME2008

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH II SEM END EXAMINATIONS, JULY, 2015

FLUID MECHANICS AND HYDRAULIC MACHINERY

(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[1X10 =10 M]**

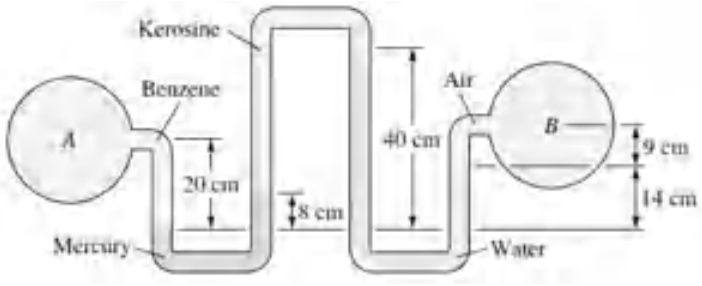
1. a) Define fluid.
   b) Write the Euler's equation of motion.
   c) Define surface tension?
   d) Differentiate control mass and control volume?
   e) Define stream line, path line and streak lines.
   f) Does the steady flow through a converging pipe accelerate or decelerate? Explain.
   g) What are the effects of cavitation ?
   h) Define cavitation in reciprocating pumps.
   i) Define the term governing of turbine.
   j) Define specific speed of centrifugal pump.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. In the Fig. all fluids are at 20°C. Determine the pressure difference (Pa) between points *A* and *B*. Take the specific weights to be Benzene:8640 N/m^3,Mercury: 133100 N/m^3,Kerosene: 7885 N/m^3,Water: 9790 N/m^3



(OR)

3. A 1.9-mm-diameter tube is inserted into an unknown liquid whose density is 960 kg/m^3, and it is observed that the liquid rises 5 mm in the tube, making a contact angle of 15°. Determine the surface tension of the liquid. There are no impurities in the liquid, and no contamination on the surfaces of the glass tube. The liquid is open to the atmospheric air.

Code: 13ME2008

UNIT-II

4. Define rotational and irrotational flow. The stream function and velocity potential for a flow are given by $\psi=2xy$, $\varphi=x^2-y^2$ show that the conditions of continuity and irrotational are satisfied.

(OR)

5. Name and briefly describe the four fundamental types of motion or deformation of fluid particles.

UNIT-III

6. An oil of relative density 0.90 flows through a vertical pipe of diameter 10 cm. The flow is measured by a 20 cm×10 cm venturimeter. The throat is 10 cm above the inlet section. A differential U-tube manometer containing mercury is connected to the throat and the inlet. If C_d= 0.99 ,What is the flow for the manometer reading of 9 cm and the manometer reading for a flow of 50 Litre/s.

(OR)

7. Two pipes one of 10cm diameter, 200 m long and another 15cm diameter, 400 m long are connected in parallel. The friction factors are 0.0075 for the smaller pipe and 0.006 for the large pipe. The total discharge through the system is 50 lit/sec. Find the discharge and head loss in each pipe. Neglect minor losses. Calculate the equivalent length of a 20 cm diameter having f=0.005.

UNIT-IV

8. A Pelton wheel has to be designed for the following data: power to be developed is 6000kW.net head available= 300m; speed 550rpm; ratio of jet diameter to wheel diameter =1/10 and overall efficiency=85%.Find (i) the number of jets (ii) diameter of the jet (iii) diameter of the wheel and (iv) quantity of water required.

(OR)

9. A turbine is to operate under a head of 25 m at 200rpm. If the discharge is $9m^3/s$ and turbine efficiency is 90%, calculate (i) power generated by the turbine, (ii) specific speed of the turbine and (iii) performance of the turbine under the head of 20m. Also state the type of the turbine.

UNIT-V

10. Obtain the expression for the minimum speed for starting a centrifugal pump.

(OR)

11. A double acting reciprocating pump having piston area $0.1m^2$ has a stroke of 0.30m long. The pump is discharging $2.4m^3$ of water per minute at 45 rpm through a height of 10 m. Find the slip of the pump and power required to drive the pump.

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AR13 SET-1

Code: 13EC2009

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH II SEM END EXAMINATIONS, JULY, 2015

ANALOG COMMUNICATIONS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[1 X 10 = 10 M]**

1 a) Draw the frequency spectrum of AM wave?
b) What is the percentage of power saving in SSB modulation?
c) What do you mean by image frequency rejection?
d) Why pre-emphasis used in FM?
e) What is diagonal clipping in diode detector?
f) What property of varactor diode is used to generate FM?
g) How do you generate PPM from PWM?
h) What is quantization error?
i) What is meant by noise figure of a network?
j) Define white noise?

PART-B

Answer One Question From Each Unit **[5 X 12=60M]**

UNIT-I

2 a) Define Modulation and give its need to communication Systems [6M]
b) Explain the generation of AM wave by using square law modulator. [6M]

(OR)

3 a) Draw and explain the circuit diagram of linear detector and derive the condition for choice of time constant? [6M]
(b) Find the modulation index , carrier and sideband frequency for the amplitude modulated wave given by the equation $f(t)=8\ Sin(2\pi 400X10^3t)-2\ Cos(2\pi 390X10^3t)+2\ Cos(2\pi 410X10^3t)$. [6M]

UNIT-II

4 a) Draw the circuit diagram for balanced modulator and explain its operation indicating all the waveforms and spectrums. [5M]
b) In an AM-SC system, modulating signal is a single tone sinusoid $4\ Cos\ (2\pi 10^3t)$, which modulates a carrier signal $6\ Cos\ (2\pi 10^6t)$. Write the equation of modulated wave. Plot the two sided spectrum of the modulated wave. Calculate the amount of power transmitted. [7M]

Code: 13EC2009

(OR)

5 a) Derive the time domain description of VSB Modulated wave? [6M]

b) What is Frequency division multiplexing? Explain FDM with a block diagram? [6M]

UNIT-III

6 a) Explain with relevant expression the demodulation of FM using PLL? [7M]

b) An angle modulated signal is defined by $S(t)=10\ Cos[2\pi X10^6 t+0.2\ Sin\ (2000\pi t)]$ Volts. Find the power in the modulated signal, Frequency deviation, Phase deviation and Transmission band width. [5M]

(OR)

7 a) Describe the spectral analysis of Frequency modulation? Compare the phasor diagram of narrow band FM signal and AM signal and discuss about the similarities and differences of the two signals? [8M]

b) An Armstrong modulator is required in order to transmit an audio signal of bandwidth 500Hz to 20 kHz. The narrowband phase modulator used for this purpose utilized crystal controlled oscillator to provide a carrier frequency of fc_1=0.25MHz. The output of the narrowband phase modulator multiplied by a multiplier with multiplication constant $n_1$and passed to mixer with local oscillator frequency of fc_2=10.5MHz. The desired FM wave at the transmitter output has a carrier frequency of 90 MHz, and frequency deviation Δf =75kHz, which is obtained by multiplying the mixer output frequency with n_2 using another multiplier. Find n_1 and n_2. Assume that NBFM produce deviation of 25 Hz for the lowest baseband signal. [4M]

UNIT-IV

8 a) Draw and explain the schematic diagram of an FM Transmitter? [7M]

b) In a broad cost super heterodyne receiver having an RF amplifier. The loaded Q of the antenna coupling circuit is 100. If the intermediate frequency is 455 kHz, calculate image frequency and its rejection ratio at 1000 kHz and 10 MHz. [5M]

(OR)

9 a) Explain how an RF amplifier improves the signal to noise ratio of a super-heterodyne receiver? [4M]

b) Compare and contrast the performance and applications of the various types of frequency demodulators? [4M]

c) What is AGC? What are its functions? [4M]

UNIT-V

10 a) Define figure of merit Derive an expression figure of merit for envelop detector? [7M]

b) Draw the circuit of PPM modulator, and explain the operation? [5M]

(OR)

11 a) Derive the expression for noise power spectral density at the phase discriminator output, draw its spectrum and derive the expression for figure of merit? [7M]

b) An AM receiver operating with a sinusoidal modulating signal has modulation index 0.8 and output signal to noise ratio 30 dB. What is the corresponding carrier to noise ratio. [5M]

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AR13 SET-1

Code: 13CS2006

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH II SEM END EXAMINATIONS, JULY, 2015

OBJECT ORIENTED PROGRAMMING
(COMMON TO CSE & IT)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[1 X 10 = 10M]**

1. a) What is a Class?
   b) Why Java is called portable?
   c) Explain about Super Key word?
   d) What is an abstract class?
   e) Write the three OOP principles
   f) What is type conversion?
   g) Write the difference between grid layout and card layout
   h) What is a package?
   i) Specify the use of threads?
   j) Which type of inheritance is not supported by Java?

PART-B

Answer one question from each unit **[5X12=60M]**

UNIT-I

2. a) What are the advantages of platform independent languages? Explain how Java is platform independent. [8M]
   b) Write about type conversion and type casting in Java [4M]

(OR)

3. Explain about Java Features [12M]

UNIT-II

4. Explain about constructor overloading and method overloading [12M]

(OR)

5. a) Explain about Class and Object with Suitable Example [8M]
   b) Explain the use of finalize( ) method with a simple example [4M]

UNIT-III

6. a) Discuss about different forms of inheritance with an example. [12M]

(OR)

7. a) What is interface? What are the possible contents of an interface? Explain. State the advantages of using interface. [8M]
   b) List the differences between Interface and abstract class [4M]

UNIT-IV

8. What is Exception? Explain about Exception Handling Mechanism [12M]

(OR)

9. Write down the ways by which Java can create multiple threads [12M]

UNIT-V

10. a) Explain different types of methods and constructors present in the CheckBox Class. [6M]
    b) Explain the role of Java applets in designing a web page. [6M]

(OR)

11. a) What is border layout? Write a java program which creates border layout and adds two text boxes to it. [6M]
    b) Explain the delegation event model? Explain the role of source and listeners with an example. [6M]

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