Code No. 3207

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I-Semester (Main) Examination, Nov. / Dec. 2016

Subject : Structural Engineering Design and Detailing-II (Steel)

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 Under what conditions buckling of web of a plate girder take place. 3
2 State the expressions for finding depth of web and thickness of web. Explain the parameters used. 3
3 State the purpose of providing stiffners in plate girders. 3
4 List out the various loads and forces acting on a gantry girder. 3
5 Explain with the help of neat sketch various types of splices which are commonly used in girders. 3
6 List out the stresses developed in bearings provided in bridges. 2
7 A gantry girder is subjected two moving loads which are at fixed distance from each other. At what position maximum BM occurs in the girder. Explain with the help of a sketch. 2
8 Explain what do you mean by EUDL. 2
9 Differentiate between through type and deck type railway bridges. 2
10 Explain about bracings in through type railway bridge. 2

PART – B (50 Marks)

11 A simply supported welded plate girder has an effective span of 20m and carries a working live load of 35 kN/m and dead load of 5 kN/m. Design the girder for flexure and carry out usual checks. Also design the welded connection between flange and web. Adopt Fe410 grade steel, use limit state method. Draw neat sketches showing design details permissible stress in weld = 110N/mm^2. 15

OR

12 Design intermediate vertical stiffners and bearing stiffner for a plate girder whose size of web is 1800 x 22mm and size of flange 500 x 24mm. The girder carries a factored udl of 40 kN/m including self weight over an effective span of 22m. Use Fe410 grade steel and adopt limit state method of design. 15

13 A simply supported gantry girder support MOT crane. The details of gantry girder are as follows :
i) Span of gantry girder = 8m
ii) Span of crane girder = 18m
iii) Self weight of crane = 200 kN
iv) Self weight of trolly = 50 kN
v) Crane capacity = 300 kN
vi) Wheel base = 3 m
vii) Minimum hook approach = 1.2 m
viii) Self weight of rails = 5 kN/m
Adopt Fe410 grade steel use limit state method. 15

OR

..2

14 A bridge girder is subjected to vertical loads due to live load, dead load and impact load = 1000 kN and due to wind load a vertical load of 200 kN and lateral load on pin due to wind load = 100 kN. Design a rocker bearing permissible stress in concrete= 7 N/mm^2. 15

15 A deck type railway bridge girder has an effective span of 24m. It is subjected to broad guage main line loading. EUDL for bending moment = 2280 kN per track and EUD for shear force is 2503 kN/track. Design the girder for flexure fix up the dimensions of the girder and check for bending stress and shear stress. Draw neat sketches showing cross-section and longitudinal section of the girder. 20

OR

16 A through type railway bridge consists of pratt truss of height 7m, it consists of 6 panel of 5m each over a span of 30m. Take EUDL equal to 2727 kN per track, Draw ILD for top chord member and design the member. Draw neat sketch showing design details of the member. 20

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Code No. 3218

FACULTY OF ENGINEERING

B.E. 4/4 (EEE) I – Semester (Main) Examination, December 2016

Subject: Power System Operation and Control

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Write the advantages and disadvantages of N-R method.
2 Discuss the classification of buses.
3 What is coordination equation? Give its physical significance.
4 Explain about incremental production cost curve.
5 Explain the necessity of maintaining a constant frequency in power system operation.
6 A 100 MW generator has a regulation parameter R of 5%. By how much will the turbine power increase if the frequency drops by 0.1 Hz with the reference unchanged?
7 List out the assumptions made in transient stability studies.
8 Explain the methods to improve steady state stability limit.
9 List out the generation and absorption of reactive power in power system components.
10 Define voltage stability.

PART – B (5x10 = 50 Marks)

11 Explain the fast decoupled load flow method of solution using Flow Chart.

12 Derive the transmission loss formulae in B-coefficients.

13 From the fundamentals obtain the complete block diagram of single area LFC system.

14 a) Derive the swing equation.
b) Explain the step by step solution of swing equation.

15 Explain the principle of operation of
i) STATCOM
ii) TCSC

16 a) The incremental fuel costs for two plants are given by $\frac{dc_1}{dp_1} = 0.1\ P_1 + 20R_s$ / MWh; $\frac{dc_2}{dp_2} = 0.15\ P_2 + 22.5\ R_s$ / MWh. The system is operating at the optimum condition with $P_1 = P_2 = 100$ MW and $\frac{dP_1}{d_L} = 0.2$. Find the penalty factor at plant 1 and the incremental cost of received power.
b) Explain the symmetry property of the Jacobian matrix in N-R method.

17 Write short notes on:
i) Area control error
ii) Automatic voltage regulators.

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Code No. 3227

FACULTY OF ENGINEERING

B.E. 4/4 (Inst.) I - Semester (Main) Examination, December 2016

Subject : Virtual Instrumentation

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

1	Give an overview of virtual instrumentation in engineering application.	(2)
2	Write about the components of block diagram.	(3)
3	Explain in detail about the process involved in data flow.	(2)
4	Draw the front panel of LABVIEW.	(3)
5	Draw a simplified ADC.	(3)
6	Mention the differences between analog and digital interfacing.	(2)
7	Explain the concept of RS232C.	(3)
8	List out the properties of PXI.	(2)
9	Write a LabVIEW program to evaluate FT.	(3)
10	List the algorithm of Image processing.	(2)

Part B (5x10=50 Marks)

11 Explain conventional programming technique and how labview programming is different from conventional programming with suitable examples. (10)

12 (a) What are VIs and Sub VIs ? Write short notes on loops. (5)
(b) What are the various modes of waveform chart? Explain. (5)

13 (a) With sketches explain the different types of DAC architecture. (5)
(b) Write short notes on software and hardware installation. (5)

14 (a) Write short notes on VISA. (5)
(b) Explain with suitable diagram about Interface buses. (5)

15 (a) Explain the concept of filtering with suitable VIs. (5)
(b) With help of VI explain correlation application. (5)

16 (a) Discuss briefly the architecture of virtual instrument . (5)
(b) Write short notes on current loop. (5)

17 (a) Write short notes on string and local variable. (5)
(b) Write short notes on VXI bus system (5)

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Code No. 3234

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (Main) Examination, December 2016

Subject: Computer Networks

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1	Compare and contrast Bus, Star, Ring, and Hybrid line configurations.	3
2	Explain Hidden and Exposed terminal problem.	3
3	Distinguish between Router and Bridge.	2
4	List out the differences between virtual circuit network and a datagram network.	3
5	What is congestion control and how is it different from flow control.	2
6	What is the necessity of Network Address Translation?	2
7	Transport layer service is similar to the Network layer service, then what is the necessity of having two distinct layers.	2
8	Briefly explain the architecture of an ATM network.	3
9	Explain the concept of Domain Name System.	2
10	What is a Digital signature?	3

PART – B (5x10 = 50 Marks)

11	a)	Describe the ISO-OSI model.	5
	b)	Explain Sliding Window protocol with example.	5
12	a)	Describe IEEE 802.11 frame structure.	6
	b)	Explain CSMA protocol.	4
13	a)	Compare Broadcast, Multicast and Hierarchical routing.	5
	b)	What are different approaches to control congestion?	5
14	a)	Describe IPV4 protocol.	5
	b)	What is an IP address? Describe allocation of an IP address to a host.	5
15	a)	Describe SNMP and its role in network management.	5
	b)	Explain DES algorithm and describe its shortcomings.	5
16	a)	Describe TCP protocol and explain all the fields in the TCP header.	6
	b)	Describe the importance of UDP in the transport layer.	4

17 Write short notes on any two: 10
a) HDLC frame format
b) SMTP
c) Medium Access Control.

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Code No. 3243

FACULTY OF ENGINEERING

B.E. 4/4 (Mech.) I – Semester (Main) Examination, December 2016

Subject: Thermal Turbo Machines

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Show that the Mach angle is a function of Mach number in supersonic flow. 2

2 Determine the stagnation temperature and pressure of air flowing in a duct with a velocity of 325 m/s at 1 bar pressure and 300 K temperature. 2

3 State the assumptions for Rayleigh flow. Show the Rayleigh curve on a h-s diagram. 3

4 why are expansion shocks impossible? 2

5 Express Euler equation in terms of velocities at inlet and outlet of the impeller. 2

6 Show with a neat sketch of velocity triangles, the effect of “slip” in a centrifugal compressor. 3

7 Draw the velocity triangles for an axial flow reaction stage. 3

8 Draw the compound velocity triangle of an impulse turbine stage. 3

9 Draw a configuration diagram and temperature entropy diagram for a gas turbine with intercooling. 3

10 Define propulsive efficiency, thermal efficiency and overall efficiency of an aircraft propulsion system. 2

PART – B (5x10 = 50 Marks)

11 a) Derive an expression to show the variation of area with Mach number in an sentropic flow. 5

b) Describe the behavior of flow through a convergent divergent nozzle when it is operated at different pressure ratios. 5

12 a) State the assumptions used in the analysis of Fanno process and show the process on a T-s diagram. 5

b) Air at p_1=3 bar, T_1=288 K and M_1=1.5 is brought to sonic velocity in a frictionless constant area duct through which heat transfer can occur. Determine final pressure and temperature and the heat added during the process. 5

….2.

13 The inlet conditions of a centrifugal compressor are 1 bar 30^{o}C running at 10000 rpm. It delivers a free air stream of 1.5 m^{3}/sec. The compression ratio is 5. The velocity of flow is 50 m/s and is constant. Assume that the blades are radial at butlet. The slip factor is 0.92. Calculate: 10

i) The temperature of air at outlet
ii) The power required
iii) The impeller diameter
iv) The blade angle at inlet

Assume that the power factor is 1.11 and isentropic efficiency is 0.90.

14 a) What is compounding? Explain pressure compounding of an impulse turbine with the help of a neat sketch. 4

b) The following particulars refer to a stage of Parsons steam turbine. The mean diameter of the blade ring is 70 cm. The steam velocity at the inlet of the moving blades is 160 m/s. The outlet blade angle of moving blades is 20^{o}. The steam flow through the blades is 7 kg/s, speed 1500 rpm and efficiency is 0.8. Draw the velocity drawing and find the following: 6

i) Blade inlet angle
ii) Power developed in the stage
iii) Available isentropic enthalpy drop

15 a) Describe the working of a Ramjet engine. What are its advantages and disadvantages? 5

b) Determine the propulsive efficiency, thrust and thrust power if the diameter of the aircraft propeller is 3.5 meters. The speed ratio is 0.75 at a flight speed of 350 kmph. The ambient conditions of the flight are T=250 K and p=0.5 bar. 5

16 a) Draw a configuration diagram and temperature entropy diagram for a gas turbine cycle with regeneration. 5

b) In a gas turbine plant, operating on Joule cycle, air is compressed from 1 bar and 15^{o}C through a pressure ratio of 4.5. It is then heated to 700^{o}C in a combustion chamber and expanded to a pressure of 1 bar. Calculate the net work done, cycle efficiency and work ratio. 5

17 Write short notes on the following:

a) Surging and surge cycle in a compressor 5

b) Advantages of liquid propellants for rockets. 5

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Code No. 3256

FACULTY OF ENGINEERING

B.E. 4/4 (Prod.) I – Semester (Main) Examination, December 2016

Subject: Control System Theory

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Compare open-loop and closed loop control systems. 2

2 Find the behaviour at infinity for a system given by $G(s) = \frac{1}{s(s-1)}$. 3

3 Find the inverse Laplace transform of $F(s) = \frac{1}{s(s^2+6s+8)}$. 3

4 Sketch the polar plot of $G(s) = \frac{e^{-st}}{1+st}$. 3

5 The characteristic equation of a fed back system is given as $s(s^2+3ks+k+2)+4 = 0$. Find the value of 'k' for the stable system. 3

6 State Mason's given formula and explain each term in it. 2

7 What is the effect of a PI Controller on the system performance? 2

8 State the properties of STM. 2

9 If $A = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$ find ¤ (t). 3

10 What is the significance of linearization and non-linearization in control systems? 2

PART – B (5x10 = 50 Marks)

11 a) Derive the transfer function of a armature controlled DC Motor. 5

b) Use Mason's gain formula to find $T(s) = \frac{C(s)}{R(s)}$. 5

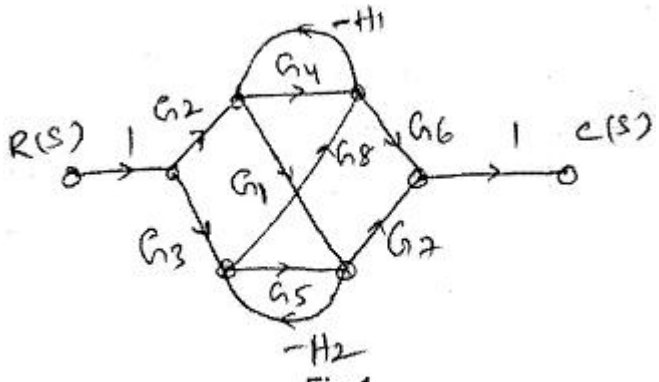

Fig.1

12 Find the TF and obtain the analogous electrical systems for the given mechanical system. 10

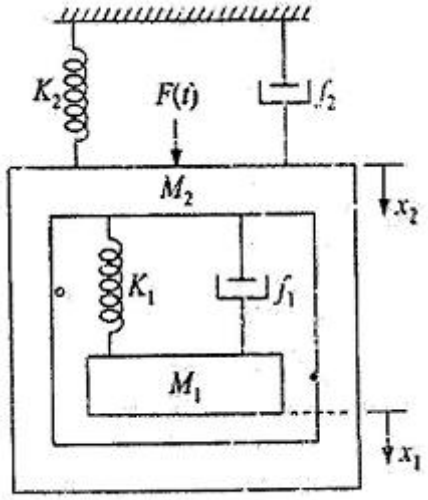

Fig.2

13 Sketch the complete root locus of a open loop TF of G(s)H(s) = $\frac{k}{s(s+4)(s^2+4s+20)}$. 10

14 Determine the stability of a system by the bode plot which is represented by unity open loop transfer function G(s) = $\frac{10K(s+0.5)}{s^2(s+2)(s+10)}$. 10

15 Sketch the Nyquist plot and find the stability of the closed loop system, whose open loop transfer function is G(s)H(s) = $\frac{Ks}{s^2+2s+11}$. 10

16 Check for controllability and observability of the system represented by unity feed back system G(s) = $\frac{s^2+3s+4}{s^3+2s^2+3s+2}$. 10

17 Discuss the following: 10

a) PID controllers

b) Sensitivity performance indices

c) Error constants.

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Code No. 3260

FACULTY OF ENGINEERING

B.E. 4/4 (AE) I – Semester (Main & Backlog) Examination, December 2016

Subject: Transport Management

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Define Industrial Psychology and Sociology?

2 Define Training and it‘s need?

3 State the importance of motor transport organization?

4 Differentiate between public and private transport?

5 Define Commuters, Commute?

6 What is “Stand time”?

7 What is contract carriage?

8 What are the details required to register the new motor vehicle?

9 What is Breakdown maintenance?

10 Discuss daily maintenance briefly?

PART – B (5x10 = 50 Marks)

11	a)	Explain advantages of good and effective selection of employees?	5
	b)	Explain Psychology Verses Personnel Management?	5
12	a)	Explain various forms of transport ownership?	6
	b)	Explain development of selling price of a product?	4
13	a)	Explain design of fare structure?	5
	b)	What are the basic factors to be considered in bus scheduling?	5
14	a)	What is the necessity of Permit?	5
	b)	Explain fitness certificate?	5
15		Explain the different types of traffic signs and their importance?	10
16		Explain facilities required at depot and draw the layout of a Depot?	10
17		Write short notes on:	
	a)	Ticketing system and types of tickets.	5
	b)	Preventive maintenance system in transport industry.	5

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Code No. 3268

FACULTY OF ENGINEERING

B.E. 4/4 (CSE) I – Semester (Main & Backlog) Examination, December 2016

Subject: Distributed Systems

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1	What are the goals of Distributed systems?	3
2	Define Interaction model.	2
3	Explain RPC in brief.	3
4	Define DNS.	2
5	Logical time and logical clocks.	3
6	Define Distributed debugging.	2
7	What are fault tolerant services?	3
8	What is Timestamp ordering?	2
9	What are the distributed file system requirements?	3
10	List various task of recovery manager.	2

PART – B (5x10 = 50 Marks)

11	a)	Explain in detail about the challenges of distributed systems.	5
	b)	Discuss about operating system architecture.	5
12	a)	Explain about client – server communications.	5
	b)	Explain about external data representation in detail.	5
13	a)	Discuss about distributed mutual exclusion in detail.	5
	b)	What are the advantages of clock synchronization algorithms? Explain any one.	5
14	a)	Explain Nested transactions with example.	5
	b)	Explain CODA file system architecture.	5
15	a)	Explain in detail about release consistency.	5
	b)	Explain SUN network file system.	5
16	a)	Explain two phase commit protocol (2PL).	5
	b)	Explain consensus in synchronous systems.	5
17	Write short notes on:		
	a)	Distributed shared memory	4
	b)	Optimistic concurrency control	3
	c)	Distributed deadlock.	3

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Code No. 3279

FACULTY OF INFORMATICS

B.E. 4/4 (IT) I - Semester (Main & Backlog) Examination, December 2016

Subject : VLSI Design

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

1	Draw the transmission gate structure of 2 : 1 MUX.	(3)
2	Write about pass characteristics of nFET	(2)
3	Obtain the stick diagram representation of NOT gate.	(3)
4	List the layers used in CMOS integrated circuit.	(2)
5	What are the design rules used in the design of CMOS ICs?	(3)
6	What is propagation delay and write an expression for the same?	(2)
7	Compare static CMOS & dynamic CMOS circuits.	(2)
8	Draw the pseudo nMOS structure if 4 i/p AOI gate.	(3)
9	Differentiate blocking & non-blocking assignments in verilog.	(2)
10	What is floor planning & routing?	(3)

PART- B (50 Marks)

11 (a) Draw FET RC model. Obtain expression for drain resistance R_n and capacitances (7)

(b) A CMOS process produces gate oxide with thickness t_{ox} = 100 nm, Electron mobility $\mu_n = 550\ cm^2$/ v-sec. Calculate the oxide capacitance per unit area and the process transconductance of nFET (3)

12 (a) What is Latch-up? Write the steps to prevent latch-up? (4)

(b) Draw the layouts of following basic structures (6)
i) n+ region ii) p+ region iii) Active contact

13. (a) Analyze the DC characteristics of CMOS inverter and obtain an expression for the mid-point voltage V_M. (6)

(b) Define rise time and fall time of inverter and write the expressions for the same. (4)

14 (a) Explain the operation of dynamic CMOS logic circuit with an example. (6)

(b) Describe the operation modes of basic SRAM cell. (4)

15 (a) Write verilog code for a 8:3 priority encoder. (5)

(b) Describe different routing techniques used in design of Integrated circuits. (5)

16 (a) Draw the CVSL structure of AND/ NAND gate & OR/NOR gates. (6)

(b) Describe carry save adder (4)

17 Write short notes on:

(a) VLSI design Hierarchy (3)

(b) Difference between active contact & via contact (3)

(c) Photo Lithography (4)

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