FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I Semester Main Examinations, December 2017
Subject: Estimation and Specifications

Time: 3 Hours   Max. Marks: 75

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

PART – A (25 Marks)

1. List the essential requirements to prepare a good estimate.   [2]

2. How can you calculate economical depth of canal?   [3]

3. Find the volume of earthwork in an embankment of length 1 km, top width of a road is 6m and a depth is 3.0m. the side slopes are 2:1.   [3]

4. What is meant by Bar – bending schedule?   [2]

5. State different methods of estimating steel for staircase in a building.   [3]

6. What is meant by Rate analysis?   [3]

7. Give the specification for weathering coarse.   [2]

8. State the significance of work charged establishment   [2]

9. When do we go for termination of contract? Explain.   [2]

10. What is e- Tendering? Mention its advantages.   [3]

PART-B

11. For the building shown in figure 1, determine the quantities of the following items of work.   [10]
    a. Earthwork excavation for foundation
    b. I- class brick work in foundation and plinth
    c. Damp proof course (2.5 cm thick)
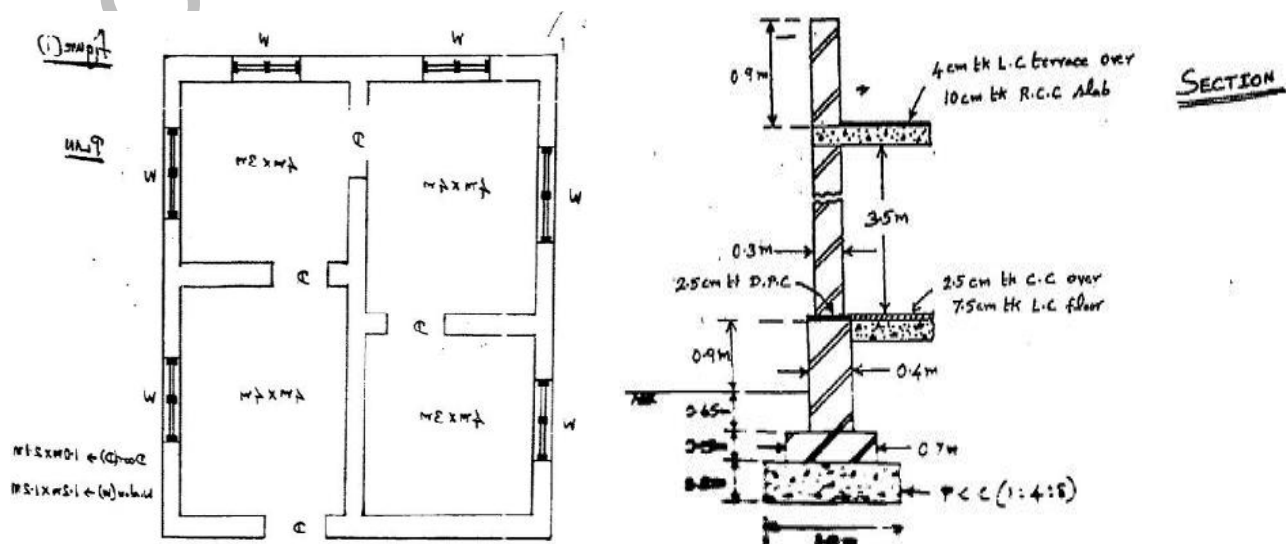
12. Compute the quantity of steel reinforcement in an R.C.C. roof slab of 2.5 meter clear span and 6.0 meters long, having 12mm dia main bars at 15 cm c/c and 8mm dia distribution bars at 20 cm c/c with alternate bent up bars. Extra rods of 10mm dia at 120mm c/c are provided at each corner of the slab for a length of 1 meter. Also prepare the schedule of bars for the R.C.C. slab. [10]

13. Work out the analysis of rates for the following: [10]
    a. M-20 concrete in R.C.C slab
    b. Providing the reinforcement steel in R.C.C. slab

14. Prepare detailed data for cement concrete 1:5:10 for foundations – rate per m^3 [10]

    Materials and labour required
    Cement mortar 1:5 – 1m^3
    Cement – 288 kg
    Sand – 1 m^3
    Mixing charge – 1 m^3
    Cement concrete (1:5:10) – 10 m^3
    Broken stone 40mm size – 9.7 m^3
    Cement mortar 1:5 -4 m^3
    Mason II class – 3 Nos.
    Mazdoor I class – 17 Nos.
    Mazdoor II class – 17 Nos.

    (Cost of materials supplied at site)
    Cement Rs.5100 per ton
    Sand Rs.200 per m^3
    Broken stone 40mm size Rs.600 per m^3

    Cost of labour
    Mason II class – Rs. 170/head/day
    Mazdoor I class – Rs.130/head/day
    Mazdoor II class – Rs. 30 per m^3.

15. i. Explain in detail the various legal aspects of construction contractors. [6]
    ii. Detail the typical form of a tender notice. [4]

16. a). What are the Departmental (Govt.) procedures completion of a particular work in civil constructions? [5]
    b). explain briefly the various factors affecting the rate analysis. [5]

17. Briefly explain the following terms.

    a. BOT contract [3]
    b. Muster roll [4]
    c. Percentage Tender [3]

FACULTY OF ENGINEERING

B.E. 4/4 (Inst.) I Semester (Main BL) Examination, December 2017
Subject: Virtual Instrumentation

Time: 3 Hours   Max. Marks: 75

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

PART-A (25 Marks)

1. Define the terms: Virtual Instrument and LabVIEW.   2m

2. Discuss the Evolution of VI.   3m

3. Describe about file I/O in VI Programming.   2m

4. What is local variable? How it can be used in VI program.   3m

5. Why ADCs and DACs are components of Data Acquisition system?   2m

6. What is the role of timing and synchronization in DAS.   3m

7. List the common instrument busses.   2m

8. What do mean by Talker, Listener in GPIB bus system?.   3m

9. Draw the block diagram and front of Lab VIEW program to find correlation of signals   3m

10. What is a current loop? Write its applications.   2m

PART-B (50 Marks)

11. Explain in detail the architecture of a Virtual Instrument.   10m

12. Using suitable example explain any one method to create ID and 2D *arrays* and *clusters*.   10m

13. a) Give the block diagram construction steps to find the sum of first N numbers using for loop.   5m

b) What is auto indexing in an array in Lab VIEW? Explain using suitable examples.   5m

14. Why networking is essential for industrial and office applications? Also give detail classification of networking.   10m

15. What is serial communication interface? Explain any one in detail for interfacing an instrument.   10m

16. Write a Lab VIEW program to design IIR filter.   10m

17. Write short notes on:

 a) IVI drivers   b) Formula Nodes

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I-Semester (Main & Back Log) Examination, December 2017
Subject: Computer Networks

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

Note: Answer All Questions From Part–A. Answerany FIVE Questions FromPart-B

PART-A (25 Marks)

1. Find CRC code for P=1100011 and M=11100011 (P- Divisor and M-Message). (3)

2. What is bit stuffing? Give an example (2)

3. Describe the advantages of packet switching over circuit switching (3)

4. Explain briefly IEEE 802.2. (3)

5. What is flooding? Give its advantages (2)

6. What is broadcast routing? (2)

7. What is the ATM AAL layer protocol? (2)

8. Distinguish between TCP and UDP protocols (3)

9. Define the important aspects of security. (3)

10. What is the need of data encryption and decryption? (2)

PART-B (50 Marks)

11. a) Explain the architecture of TCP/IP protocol and compare it with OSI model (6)
    b) What are the topologies used for implementing local area network?
       Discuss their merits and demerits. (4)

12. a) What are the various switching technologies? (4)
    b) Explain the architecture of IEEE 802.11. (6)

13. a) Explain about static and dynamic routing algorithms in brief. (4)
    b) Give the header format of IPv4 and explain. (6)

14 a) Give the header format of UDP protocol and explain (5)
    b) Explain the structure of ATM adaptation layer (5)

15 a) Explain the process of encryption and decryption with a neat sketch. (5)
    b) Explain the architecture and services of E-mail. (5)

16 a) Explain the data communication system with the help of neat block diagram
      representing the typical flow of data through each block. (7)
    b) Write notes on sliding window of TCP. (3)

17 Write notes on any two the following: (10)
    a. SMTP
    b. CRC
    c. Load shedding

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FACULTY OF ENGINEERING

B.E. 4/4 (Mech.) I - Semester (Main & Backlog) Examination, December 2017
Subject: Thermal Turbo Machines

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   Define Wilson's line in steam nozzles.

2   Explain the terms: Mach angle and Mach cone with a neat labelled diagram.

3   What are the advantages and disadvantages of shocks?

4   Show Fanno curve, Rayleigh curve and normal shock on h-s diagram.

5   Explain the differences between centrifugal and axial flow compressors.

6   Define surging and chocking in compressors.

7   Write the differences between solid propellant and liquid propellant.

8   Define: propulsive power, thrust and propulsive efficiency.

9   Define the degree of reaction in turbines and compressors.

10 What is choked flow? What are critical properties?

PART- B (5x10=50 Marks)

11 (a) Air flows along a circular pipe with a diameter 50 mm. Assuming adiabatic and that Mach No. at the entrance to the pipe is 0.2. Calculate the distance from the entrance of the pipe to the section in which the Mach No. will be (i) 1 (ii) 0.6.Take friction factor as 0.00375 and ratio of specific heats for air as 1.4.

(b) Explain flow through convergent - divergent nozzle with the variation of back pressures?

12 A conical diffuser has entry and exit diameters of 15 cm and 30 cm respectively. The pressure, temperature and velocity of air at entry are 0.69 bar, 340 K and 180 m/s respectively. Determine (i) the pressure and velocity at exit, (ii) stagnation pressure and stagnation temperature and (iii) force exerted on the diffuser walls.

13 Air enters a normal shock at 22.6 kPa, 217 K and 680 m/s. Calculate the stagnation pressure and Mach No. upstream of the shock as well as pressure, temperature, velocity, Mach No. and stagnation pressure downstream of shock.

14 An axial flow compressor with an overall isentropic efficiency of 82% draws air at 17^0C and compresses it in the pressure ratio of 5:1.The mean blade speed and flow velocity are constant throughout the compressor. Assume 50% reaction blading .Take blade velocity as 240 m/s and work input factor as 1.05, calculate (i) flow velocity and (ii) number of stages. Assume $=15^0$ and $=45^0$.

15 A Single eye, single stage centrifugal compressor delivers 18kg of air per second with a pressure ratio of 4 ,when running at 14500 rpm. The pressure and temperature of the air at the suction side are 1.013 bar and 16^0C. Assume slip factor=0.9, work input factor=1.04, isentropic efficiency=75%. Find (i) the input power required to drive the compressor and (ii) blade angle at the impeller eye ,if the tip diameter is twice the root diameter.

16 In a Parsons Reaction turbine running at 1500 rpm, the available enthalpy drop of steam for the expansion is 65 kJ/kg. If the mean diameter of the rotor is 1m, find the number of the rows of the moving blades required. Assume stage efficiency as 80%, blade outlet vane angle is 20^0 and speed ratio is 0.7.

17 In an open cycle constant pressure gas turbine, air enters the compressor at 1 bar and 300 K. The pressure ratio is 4:1. The isentropic efficiencies of compressor and turbine are 78% and 85% respectively. The air fuel ratio is 80:1, calculate the power developed and thermal efficiency of the cycle if the flow rate of air is 2.5 kg/s. Assume C_P=1.005 KJ/Kg-R, =1.4 for air, C_{Pg}=1.147kJ/kg-K, =1.33 for gas, R=0.287kJ/kg- Calorific value of fuel =42000 kJ/kg.

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FACULTY OF ENGINEERING

B.E. 4/4 (Prod.) I - Semester (Main & Backlog) Examination, December 2017
Subject: Control System Theory

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 Define open loop control and closed loop control systems with examples?   (2)

2 Find the laplace transform of $f(t) = -e^{-t} + 7e^{-2t} - 6e^{-3t}$.   (3)

3 Draw the Time domain specifications of 2nd order control systems?   (2)

4 For a unity feedback system whose open loop transfer function is

$G(s) = \dfrac{Ks^2}{(1+0.2s)(1+0.02s)}$, find the position, velocity & acceleration error constants   (3)

5 Determine the range of values of 'K' for the system to be stable $s^3 + 3s^2 + (K+2)s + 5k$.   (2)

6 What are the advantages of Bode's plot?   (3)

7 Sketch the polar plot for $G(s) = \dfrac{1}{(1+s)(1+4s)}$.   (2)

8 Explain about PID controller.   (3)

9 What are the properties of State Transition Matrix(STM).   (3)

10 Define zero input response(ZIR) and zero state response(ZSR).   (2)

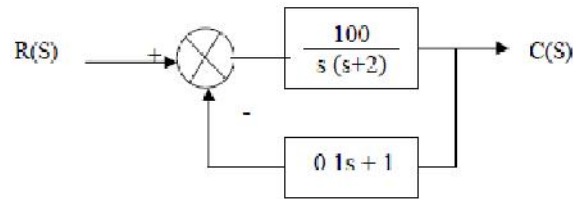## PART – B (50 Marks)

11 Write the differential equations governing the mechanical system, also find the transfer function $\dfrac{X(s)}{F(s)}$.   (10)
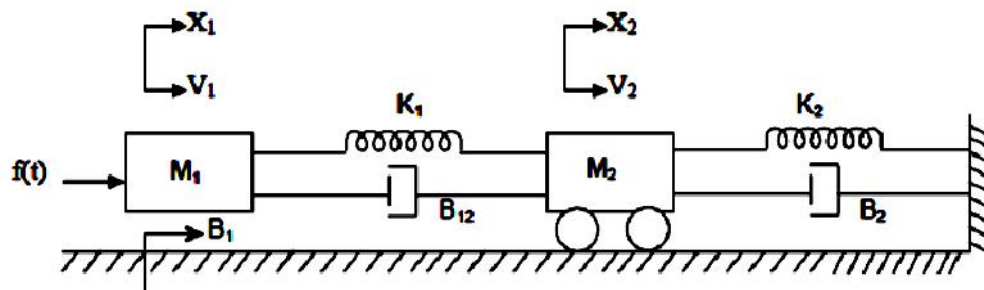
12 A positional control system with velocity feedback is shown in fig. What is the response of the system for unit step input?   (10)

13 Sketch the Root locus for the following open loop transfer function

$$G(s)= \frac{K}{s(s+2)(s^2+2s+5)}$$ and find the limiting value of 'K'? (10)

14 Plot the Bode diagram for the following transfer function and obtain the gain and phase cross over frequencies. $$G(S) = \frac{10}{S(1+0.4S)(1+0.1S)}$$ (10)

15 With the help of Nyquist criterion, determine the stability of a system of unity feedback system whose open loop transfer function is $$G(s)H(s)= \frac{K}{s(s^2+2s+2)}.$$ (10)

16 (a) Determine the state model of the system characterized by the transfer function

$$\frac{Y(s)}{U(s)} = \frac{s^2+3s+4}{s^3+2s^2+3s+2}.$$ (5)

(b) Test the controllability & observability of the system whose state space representation is given as by (5)

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -2 & 0 \\ 1 & -1 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix}u(t), t>0,$$

17 Write short notes on (10)
   (a) Nyquist criterion for stability
   (b) Lead compensator
   (c) Importance of Mathematical modeling in control system
   (d) Concept of state, state variable and state model

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FACULTY OF ENGINEERING

B.E. 4/4 (AE) I - Semester (Main & Back log) Examination, December 2017

Subject: Transport Management

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 Explain characteristics of a good personnel policy.
2 Define Training and its need.
3 State the importance of motor transport organization.
4 Draw the organization structure of Transport organization.
5 Define schedule and commute.
6 What is spread over?
7 What is contract carriage?
8 State the importance of Traffic signs?
9 Discuss daily maintenance briefly.
10 What are cautionary signs?

PART – B (50 Marks)

11 (a) Explain Psychological Tests. (5)
   (b) Explain sources of new employers. (5)

12 (a) Explain in detail about the various functional wings of Transport system. (6)
   (b) Explain staffing. (4)

13 (a) Explain various types of fare collecting system. (5)
   (b) Explain development of selling price of a product. (5)

14 What are the different types of traffic signs, show them with three examples of
   each? (10)

15 Explain Tyre maintenance procedure and causes and remedies for the uneven
   Tyre wear. (10)

16 Explain facilities required at Bus depot and draw the layout of Bus depot. (10)

17 Write short notes on the following:
   (a) Better fuel economy (5)
   (b) Registration Requirements (5)

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FACULTY OF ENGINEERING

B.E. 4/4 (CSE) I-Semester (Main & Backlog) Examination, December 2017
Subject: Distributed Systems

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

Note: Answer all questions of Part-A, & Answer any FIVE Questions from Part-B.

PART-A (25 Marks)

1. What are the goals in Distributed Systems? (3)
2. What is a multithreaded process? (2)
3. Differentiate between marshalling and unmarshalling. (2)
4. Discuss how communication can be done between distributed objects. (3)
5. What are the physical and logical clocks? (3)
6. What is strongly consistent global state? (2)
7. What is ACID property? (2)
8. Discuss lost and update problem. (3)
9. Differentiate weak and strong consistencies (3)
10. What are the basic approaches in ensuring in ensuring fault tolerance in distributed systems? (2)

PART-B (50 Marks)

11. List and explain the challenges in distributed systems. (10)

12. (a) Describe inter process communication in UNIX with an example. (6)

    (b) Briefly explain RPC. (4)

13. (a) Explain the concept of Lamports totally ordered logical clocks (5)

    (b) What is election algorithm? Explain Bully algorithm. (5)

14. (a) Explain concurrency control method using time stamp ordering. (5)

    (b) Explain two phase commit protocol to ensure consistency. (5)

15. (a) Discuss about the implementation issues in Distributed Shared Memory (5)

    (b) Explain virtual file system in SUN network file system. (5)

16. (a) What is the importance of transaction recovery in Distributed System? What are the mechanisms used for recovery. (10)

17. Write short notes on:
a) CODA file systems. (4)
b) Distributed mutual exclusion (4)
c) Directory service using X.500 (2)

FACULTY OF ENGINEERING

B.E 4/4 (Civil) I-Semester (Main & Backlog) Examination, December, 2017
Subject : Construction Management and Administration

Time : 3 Hours   **Max Marks : 75**
Note: Answer all questions from part – A & any five questions from Part – B

Part – A (25 Marks)

1) What is the significance of construction management?   (3)
2) List out the advantages and disadvantages of functional organization.   (3)
3) What do you mean by a dummy activity? Why it is used in networking?   (3)
4) What is the difference between PERT and CPM?   (3)
5) Mention the three time estimate.   (3)
6) What are the different conditions of contract?   (2)
7) Define Tender.   (2)
8) What is lump sum contract? Mention its advantages.   (2)
9) Define slack variable.   (2)
10) Explain non negative restriction in LPP.   (2)

Part – B (50 Marks)

11) a) What are the objectives of construction management?   (4)

   b) With the help of neat sketch, explain Line and Staff Organizational Form. Give its
      relative advantages and disadvantages   (6)

12) a) List out the deficiencies of bar charts.   (4)
    b) Mention the advantages of large scale production.   (6)

13) The details of the network are given below and the duration is in days. Draw the project
    network and identify the critical path. Calculate the float for each activity   (10)

Activity	t_o	t_m	t_p
1-2	2	5	8
1-3	1	4	7
2-3	0	0	0
2-4	2	4	6
2-6	5	7	12
3-4	3	5	10
3-5	3	6	10
4-5	4	6	10
4-6	2	5	8
5-6	2	4	8

14) The following data are available regarding the activities, along with their duration and cost for a particular project. The indirect cost of the project is Rs.3,500/month. Determine the optimum cost and duration for the project. Also draw the least cost network. (10)

Activity	Normal Duration(Months)	Normal Cost (Rs)	Crash Duration (Months)	Crash Cost (Rs)
0-1	4	18000	3	25,500
0-2	8	15,000	5	19,500
1-2	6	17,000	4	19,000
1-3	9	19,000	2	26,000
2-3	5	16,000	3	22,000

15 (a) What are the different types of contract? (4)
   (b) Enumerate the salient features of Workmen Compensation Act. (6)

16) Optimize the following linear programming model (10)
    Maximize $Z = 6x_1 + 8x_2$
    Subject to constraints
    $5x_1 + 10x_2 \leq 60$
    $4x_1 + 4x_2 \leq 40$
    and $x_1, x_2 \geq 0$

17) Write short notes on any two of the following (10)
    a) PPP projects
    b) Conditions of contract.
    c) Advantages of Line Organization

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (New) Examination, December 2017

Subject: Electronic Instrumentation

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 accuracy and Precision of a measurement. (3)

2) Explain the difference between IEEE standards and Measurement standards. (2)

3) What is Radioactivity and which Instrument is used to measure radioactivity? (2)

4) How are Photo emissive and Photo voltaic transducers differ?

   Give one example of each transducer. (3)

5) What is Dew point? Define Relative humidity. (2)

6) What is Phon? How it is related to SPL. (2)

7) What are the advantages of Digital Voltmeter over Analog Volt Meter? (2)

8) Explain the Virtual Instrumentation concept with examples. (3)

9) Using Action potential diagram of a cell, explain Na-K pump. (3)

10) Compare Ultrasonic and Magnetic resonance Imaging (3)

Part – B (50 Marks)

11) a) Explain type of errors that occur in measurement. What are the methods used to eliminate or estimate the errors ? (5)

   b) A 500 volt DC voltmeter has an accuracy of 2% of full range. Calculate the limiting error when the instrument is to read 125 V DC. (5)

12) a) What is the principle of Inductive transducer. Explain the functioning of LVDT with a transfer function characteristic. (6)

   b) Compare the three Photo conductive transducers with examples. (4)

13) a) Why sound is measured in dB. Write short notes on the types of microphones with diagram. (4)

   b) Define and explain the thermodynamic laws. How is thermocouple used for measurement of temperature? (6)

14) a) With a neat block diagram, explain the principle and functioning of a Dual slope digital voltmeter. (5)

   b) What is the use of Delayed Time base Oscilloscope in measurements? Explain using waveforms, the operation of a Delayed time base Oscilloscope. (5)

15)a) Write on Bio-potential electrodes and their specific application. Compare X ray and CT scan imaging techniques. (6)

b) What is EMG, explain 10-20 electrode configuration of EEG and the signals that are recorded with amplitude and frequency. (4)

16)a) What is the principle of Hotwire anemometer fluid velocity measurement? Explain the constant current and constant voltage type of anemometers. (5)

b) Explain the block diagram of a Digital storage oscilloscope. What is the advantage of it over Analog storage oscilloscope? (5)

17)Write short notes on two of the following
a) IEEE Standards (5)
b) Principle of Wheatstone bridge for strain measurement (5)
c) Brief on ECG (5)

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